

A PHENOMENOLOGICAL INVESTIGATION OF TIME TO PRESENTATION,
DIAGNOSIS, AND TREATMENT FOR INDIANA FARMERS WITH PROSTATE
CANCER AND MEASUREMENTS OF TRADITIONAL MASCULINITY IDEOLOGY

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Submitted to the faculty of the University Graduate School
in partial fulfillment of the requirements
for the degree
Doctor of Philosophy
in the School of Public Health,
Indiana University
May 2020

Accepted by the Graduate Faculty, Indiana University, in partial fulfillment of the requirements
for the degree of Doctor of Philosophy.

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April 29, 2020

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To my wife, Paola, and children, Isabella and Leo, who have been with me every step of this journey with an unconditional love and unwavering spirit of support, encouragement, and motivation. You are the greatest days in my life.

Acknowledgements

I would like to first acknowledge my doctoral dissertation committee: Dr. Lohrmann, Dr. Obeng, Dr. Huber, Dr. Khan, and Dr. Kruger. To Dr. Lohrmann, thank you for continuing to believe in me throughout this entire process. Your patience, guidance, support, encouragement, and work ethic have helped me make it to this milestone. I will always be grateful for your efforts, and I hope to utilize the tools I have learned from you when mentoring future students. To Dr. Obeng, I offer my gratitude for inspiring me in the development of my passion for performing qualitative research. Your desire to continuously support me throughout this journey is truly appreciated. To Dr. Huber and Dr. Khan, I offer my thanks for your service on my committee. Your encouraging feedback, positive reinforcement, and time spent helping me complete this process is also greatly appreciated. And to Dr. Kruger, thank you so much for being a wonderful colleague and friend. I am incredibly grateful for your constant encouragement, guidance, and mentorship.

Next, I would like to acknowledge those who were directly involved with helping me complete my data recruitment and collection. To the farmers who participated in this study, thank you for offering your time and efforts in sharing about your prostate cancer experiences, as well as your beliefs about traditional masculinity. Your honesty, thoughtfulness, and wisdom will help inform men's health and other important areas of research and education, such as cancer, rural health, and gender studies. To Pastor Bauman and Pastor Teike, thank you for allowing me to recruit and interview individuals at your churches. Your assistance in this process was truly instrumental, and I thank both of you for your efforts. And to Sherry Detmer, owner of Mill St. Deli and Convenience, LLC, thank you for allowing me to recruit and interview customers of your business.

Finally, I thank my family, who have loved and supported me throughout this long journey. I offer a special thanks to my mother, Bonnie Nolting, father, Bruce Nolting, grandfathers, Dr. Charles Chasteen and Max Nolting, and my sister-in-law, Daniela Aldana, and brother-in-law, Cristian Aldana.

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A PHENOMENOLOGICAL INVESTIGATION OF TIME TO PRESENTATION, DIAGNOSIS, AND TREATMENT
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IDEOLOGY

Introduction: The most common and second-deadliest cancer in the U.S. for men is prostate cancer (PCa). Extensive research shows that farmers have higher PCa incidence and mortality than nonfarmers. This study aims to better understand U.S. farmers' increased risk of PCa by exploring care-seeking behaviors and masculinities in Indiana farmers with a history of PCa. Methods: Eleven farmers with a PCa history completed a questionnaire about their traditional masculinity beliefs and an interview focused on their PCa experiences, from signs and symptoms to after treatment. Interview questions were based on three theories, and the questionnaire was the 21-item Male Role Norms Inventory-Short Form (MRNI-SF). Results: MRNI-SF results showed farmers endorsed traditional masculine norms. Specifically, they agreed with avoiding femininity, having negative attitudes towards sexual minorities, being self-reliant through mechanical skills, toughness, and sex being important. Farmers did not endorse men being dominant nor with men restricting emotions. Seven themes described farmers' PCa experiences: the body was an occasional guide for detection, routine checkups were the primary method of suspicion, PSA-testing was a powerful predictor, biopsy was somewhat of a bugaboo, diagnosis put psychological health on display, healthcare professional characteristics and others' experiences reigned paramount in treatment decisions, and treatments invoked physical concerns and side effects. Discussion: Farmers did not agree with men always dominating and restricting emotions, which does not reflect previous studies. More research is suggested utilizing the MRNI-SF with larger populations of farmers. Based on the themes, increased somatic awareness is suggested for farmers, as well as continued routine checkups and PSA-testing. Farmers also require improved health education

and resources to prepare for a PCa biopsy, to cope with a diagnosis, to make treatment decisions, and to manage treatment symptoms.

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Chapter One: Introduction

Background of the Problem

Men live shorter lives than women in nearly every country in the world (Central Intelligence Agency [CIA], 2017; United Nations Development Programme [UNDP], Human Development Report Office [HDRO], 2016). Communicable diseases (CDs), noncommunicable diseases (NCDs), and injuries best account for the life expectancies of people (WHO, 2015e, 2016a). On average, global male life expectancy is 70.1 years, and global female life expectancy is 75 years (CIA, 2017; World Bank Group [WBG], World Bank [WB], 2017b). More than 7 out of 10 deaths occurring globally in 2015 were due to NCDs, such as cardiovascular disease (CVD), cancer, chronic respiratory diseases (CRDs), and diabetes, which are primarily associated with modifiable risk factors, such as smoking tobacco, unhealthy diet, physical inactivity, alcohol abuse, and high blood pressure, glucose, and cholesterol (WHO, 2016a, 2016d).

Among all countries in the world, men and women each live the longest in Monaco, where men live an average of 85.6 years and women 89.5 years. Explanations for the long lives of those living in Monaco may stem from following Mediterranean-style diets (Bach et al., 2006; Reedy et al., 2014; Sofi, Abbate, Franco Gensini, & Casini, 2010) and having a strong public health system (WHO, 2017c, 2017d). Of all women in the world, those in Chad have the shortest life expectancies (51.5 years), and of all men in the world, those from Guinea-Bissau have the shortest lives, at 48.6 years (CIA, 2017; Organisation for Economic Co-operation and Development [OECD], 2017b; United Nations [UN], Department of Economic and Social Affairs [DESA], Statistics Division [SD], 2017; WBG, WB, 2017b), largely from having some of the highest rates of CDs, perinatal, and nutritional conditions in the world (CIA, 2017; WHO, 2016a).

Another noteworthy country as far as life expectancies is Japan, which among all high-income, developed OECD countries, has the highest life expectancies for men at 81.7 years and women at 88.5 years (CIA, 2017; OECD, 2017b; UN, DESA, SD, 2017; WBG, WB, 2017). Japanese individuals have the

lowest death rates from all NCDs and CVD, in the world, the second lowest death rate for diabetes (WHO, 2014a), and have some of the lowest obesity rates (WHO 2014a). A number of studies have provided evidence for the Japanese diet playing important roles in increasing life expectancy and decreasing chronic disease (Alcain & Villalba, 2009; Kondo et al., 2013; Lane, Ingram, Ball, & Roth, 1997; Miyagawa et al., 2014; Nagai et al., 2016; Nakamura et al., 2014; National Institutes of Health [NIH], Office of Dietary Supplements, 2016; Okuda et al., 2015; Otsuka, Yatsuya, & Tamakoshi, 2014; Sato et al., 2016; Wilcox et al., 2007; Winnik, Auwerx, Sinclair, & Matter, 2015; Yamori et al., 2017). It is predicted that at least half of Japanese residents born in 2007 will have life expectancies as high as 107 years-old (K. Christensen, Doblhammer, Rau, & Vaupel, 2009).

Men also live shorter lives than women in the United States (U.S.), with a disparity of close to five years. In 2014, female life expectancy was 81.2 years and 76.4 years for men (Murphy, Kochanek, Xu, & Arias, 2015). Men also live shorter lives in every U.S. state and Washington, District of Columbia (D. C.; Kaiser Family Foundation [KFF], 2016). Of the 15 leading causes of death in the U.S., NCDs make up two-thirds of the total (Lozano et al., 2012), with more than half of all deaths occurring due to CVD and cancer (Murphy, Kochanek, Xu, & Arias, 2015; National Vital Statistics Report [NVSr], 2015). The WHO (2014c) predicted that of all deaths in the U.S., as many as 88% were related to NCDs, although other studies estimated this percentage as closer to 70% (NSVR, 2015).

The main killers in the world and U.S. are NCDs (Murphy, Kochanek, Xu, & Arias, 2015; WHO, 2016a), primarily due to the following modifiable risk factors: tobacco use, unhealthy diet, physical inactivity, alcohol abuse, elevated blood pressure, glucose, cholesterol (WHO, 2016d) and obesity (WHO, 2016e). Of the previously mentioned NCDs of global concern (i.e., CVD, cancer, CRDs, and diabetes), these eight modifiable risk factors help explain the impact on life expectancy in the U.S.

The connections between tobacco smoking and NCDs goes back more than 50 years (U.S. Department of Health, Education, and Welfare [USDHEW], United States Public Health Service [USPHS],

Surgeon General's Advisory Committee on Smoking and Health, 1964). Smoking tobacco has very strong links with NCDs occurring in most parts of the body (United States Department of Health and Human Services [USDHHS], Centers for Disease Control and Prevention [CDC], National Center for Chronic Disease Prevention and Health Promotion [NCCDPHP], Office on Smoking and Health [OSH], 2010, 2014), is one of the leading causes of preventable death, and the main cause of lung cancer, the top killer among all cancers in the U.S. (Siegel, Miller, & Jemal, 2016; USDHHS, CDC, NCCDPHP, OSH, 2014). In the U.S., men are more likely to smoke and use other tobacco products (Jamal et al., 2015; USDHHS, CDC, Division of Health Interview Statistics [DHIS], National Center for Health Statistics [NCHS], 2015), as well as die from the use of these products, than women (USDHHS, CDC, NCCDPHP, OSH, 2014).

Nearly a quarter of a century after the research causally linked tobacco use with lung cancer and chronic bronchitis, unhealthy diet was linked to a variety of NCDs, specifically CVD, different types of cancer, diabetes, and other chronic conditions (USDHEW, USPHS, Surgeon General's Advisory Committee on Smoking and Health, 1964; USDHHS, USPHS, 1988). A recent report estimated close to 700,000 deaths occurring in 2010 were due to a variety of unhealthy dietary practices (Lim et al., 2012; Murray et al., 2013). Men have less healthy diets than women in the U.S., especially concerning the consumption of vegetables and fruits (USDHHS, CDC, NCCDPHP, DPH, 2015a, 2015b, 2015c), nuts and seeds (Nielsen, Kit, & Ogden, 2014), overall calories and calories from processed foods (Eicher-Miller, Fulgoni III, & Keast, 2015), red and processed meats (Daniel, Cross, Koebnick, & Sinha, 2011), and sodium (United States Department of Agriculture [USDA], Agricultural Research Service [ARS], 2016a).

Eight years after the report to the U.S. about the health effects of unhealthy diet, a report was distributed indicating the health impacts of physical inactivity, specifically acting as a causal link with CVD, colon cancer, and diabetes (USDHHS, CDC, NCCDPHP, The President's Council on Physical Fitness and Sports, 1996). Murray et al. (2013) predicted around 234,000 occurred in 2010 as a result of physical

inactivity. Men report obtaining more physical activity in almost every state in the U.S., except for North Dakota and Idaho (CDC, NCCDPHP, DPH, 2016).

Almost 30 years ago, alcohol use was linked with NCD deaths, particularly different forms of CVD and cancer (USDHHS, CDC, 1990). Almost 30,000 U.S. deaths in 2012 were related to alcohol, with men representing almost 75% of those who died (Murphy, Kochanek, Xu, & Heron, 2015). Men are more likely to abuse alcohol and binge drink than women (USDHHS, CDC, NCCDPHP, DPH, 2014; USDHHS, CDC, NCHS, 2015a).

More than eight times the number of people suffered from hypertension in 2014 compared to the mid-1960s, a disease associated primarily with CVD and kidney disease (Subcommittee on Definition and Prevalence of the 1984 Joint National Committee, 1985; United States Department of Commerce [USDC], United States Census Bureau [USCB], PD, 2015; USDHEW, USPHS, Office of Program Planning and Evaluation [OPPE], Office of the Surgeon General [OSG], 1967; USDHEW, USPHS, Office of the Assistant Secretary for Health and Surgeon General, 1979; Yoon et al., 2015). Nearly 40 years ago, close to 300,000 deaths occurred due to hypertension (Amler & Eddins, 1987); however, in 2010, more than 440,000 deaths occurred (Center for Science in the Public Interest, 2016; Murray et al., 2013). Although there is conflicting historical evidence about male and female hypertension rates, more recent reports showed men having slightly higher prevalence rates (Nwankwo, Yoon, Burt, & Gu, 2013; Yoon et al., 2015).

Almost 50,000 deaths from diabetes occurred in the U.S. nearly 30 years ago (McGinnis & Foege, 1993), a number which increased to more than 86,000 in 2010 (Murray et al., 2013). Men tend to have higher prevalence and death rates from diabetes than women Kochanek, Murphy, Xu, & Tejada-Vera, 2016; USDHHS, CDC, NCHS, 2016a).

Dating back almost 70 years, men showed higher average levels of low-density lipoproteins (LDLs) and CVD rates when compared to women, with the LDL disparity narrowing over time between

the sexes (Gofman et al., 1950). As a result of Kannel, Dawber, Revotski, and Stokes' (1961) study, high total blood cholesterol (TBC) was determined to be a risk factor for CVD, with men showing higher average TBC levels and CVD rates, and the TBC levels between sexes narrowing over time as well. Despite a higher proportion of women having high and elevated TBC in the 1970s (Carroll, Sempos, Briefel, Gray, & Johnson, 1993), a recent longitudinal study of U.S. data found men to have higher LDL rates and use of cholesterol-lowering medication than women, while also having diets higher in saturated fat (Kuklina, Carroll, Shaw, & Hirsch, 2013). Men also showed significantly lower high-density lipoprotein (HDL) levels than women and a lower likelihood of receiving cholesterol preventive screenings (Carroll, Kit, Lacher, & Yoon, 2013). Recently, anywhere from 113,000 to 150,000 CVD deaths were predicted to have occurred due to high LDL levels, with men accounting for more of these deaths (Danaei et al., 2009; Murray et al., 2013).

Having excessive body fat is a major risk factor for many NCDs, a well-established finding from the previous century (Garfinkel, 1985; Hubert, Feinleib, McNamara, & Castelli, 1983; Larsson et al., 1984; Lew & Garfinkel, 1979; MacMahon, Wilcken, & MacDonald, 1986; Negri, Pagano, DeCarli, and La Vecchia, 1988; Razay & Wilcock, 1994; Ribstein, Ducailar, & Momran, 1995). From the 1950s through the mid-1990s, men have consistently been considered more overweight than women, with higher levels of class I obesity. Women, however, have showed higher class II and III levels of obesity than men (Flegal, Carroll, Kuczmarski, & Johnson, 1998).

Obesity, closely related to physical inactivity and an unhealthy diet (Hill & Peters, 1998; Ruderman, Chisholm, Pi-Sunyer, & Schneider, 1998; Ruderman, Schneider, & Berchtold, 1981; Weinsier, Hunter, Heini, Goran, & Sell, 1998), which together accounted for 300,000 deaths in the U.S. in 1990 (McGinnis & Foege, 1993), were predicted to have been linked to more than 530,000 deaths in 2005 (Danaei et al., 2009) and more than 900,000 deaths in 2010 (Murray et al., 2013). Recent data suggests men having slightly higher overall obesity rates and significantly higher overweight rates than women.

Overall, 58% of women and more than 70% of men are overweight and/or obese (CDC, NCCDPHP, DPH, 2016b; USDC, USCB, PD, 2015).

The previous section provides important information explaining the life expectancy disparity between men and women around the world and in the U.S., particularly concerning modifiable risk factors. In fact, nearly nine out of 10 deaths occurring in U.S. men are related to the eight modifiable risk factors above (Danaei et al., 2009; Kung et al., 2008). Courtenay (2011) provided an exhaustive review, making the case for gender being the most important determinant of U.S. men's increased overall risk for disease, disability, injury, and death, compared to women.

The social cognitive theory of gender role development (Bussey & Bandura, 1999) and the relational theory of men's health (Courtenay, 2000b/2011) both help describe the ways in which gender negatively affects the health beliefs and behaviors of men. Together, these theories help explain gender construction and influential factors for men's less healthy behaviors, beliefs, and increased susceptibility for morbidity and mortality (Bussey & Bandura, 1999; Courtenay, 2000b/2011, 2000c/2011; Mahalik, Burns, & Syzdek, 2007).

Most individuals recognize the characteristics associated with traditionally feminine and masculine qualities (Bem, 1974; Costa, Terracciano, & McCrae, 2001; Deaux & Lewis, 1984; Spence, Helmreich, & Stapp, 1975). Bussey and Bandura (1999) outlined several factors that assist in the construction and reconstruction of gender role competencies and knowledge over the lifespan. Experiences with siblings, parents, coaches, teachers, work colleagues, and healthcare providers, in a number of spaces, such as the home, school, athletic events, work, media, and healthcare, impact gender construction (Bussey & Bandura, 1999).

Several key works form the foundation for research in masculinities (Carrigan, Connell, & Lee, 1985; Connell, 1985, 1996, 2015; Connell & Messerschmidt, 2005), an area concerned with how men position themselves in society. A variety of masculinities are practiced, depending on the contextual

situation (Connell, 2015). Society's most-exalted form of masculinity is known as hegemonic masculinity or hegemony, which depending on who has the authority and power, is characterized as the most dominant and celebrated form of masculinity (Carrigan et al., 1985; Connell, 2015; Connell & Messerschmidt, 2005). Courtenay (2000b/2011) described how hegemonic and traditional masculinity practices generally undermine men's health but tend to persist, since these practices are often rewarded through authority and privilege throughout society, thus encouraging their continuation.

When compared with nonrural men and rural women, rural men may practice the most hegemonic and traditional masculinities, and among rural men, farmers practice the most traditional and hegemonic masculinity forms, especially when it comes to seeking and using healthcare services (Courtenay, 2006/2011).

Those living in rural U.S. counties are generally prone to higher morbidity and mortality rates, compared to more urban settings, and rural men tend to fair far worse than their female counterparts for several different categories (Meit et al., 2014). Those living in small rural areas are the least likely individuals to have health coverage, especially for those living below the poverty line. Rural areas tend to have much fewer healthcare facilities and providers. For all urbanization settings, men are less likely to be hospitalized but have longer hospital stays than women. Men are also less likely than women to report having mental health issues for all urbanization classifications. Major depression is highest in rural areas and levels were higher among women than men (Meit et al., 2014).

In order to best understand rural masculinities, Campbell and Bell (2000) urged individuals to explore the interactions between rurality and masculinity, particularly how rural images and concepts influence masculinity behaviors and beliefs (i.e., the rural masculine), and how these masculine behaviors and beliefs occur in rural settings, known as the masculine rural. Farming provides a good representation for each of these terms, particularly the farmer with the masculine rural (Campbell & Bell, 2000). The rural masculine, however, is a concept focused on how rurality influences masculinity in

both rural and urban spaces. That is, even individuals with jobs in urban settings can demonstrate rural and masculine behaviors and beliefs, such as the businessman working in the city who goes fishing on the weekend (Lobao, 2006).

Although the U.S. has fewer individual farms and overall farmland today compared to the 1930s (USDA, National Agricultural Statistics Service [NASS], 2014a, 2014b; USDC, Bureau of the Census, 1978, 1994), principle farm operators, individuals who run farms and earn most of their income from these farms (USDA, Economic Research Service [ERS], 2017b), have more individual farm acreage today than ever before (USDA, NASS, 2014a, 2014b). Non-Hispanic white men make up most principle farm operators in the U.S., of which there are a total of 2.1 million, with one million of those individuals having a different primary occupation (USDA, 2014a; USDA, NASS, 2014a, 2015). This study will refer to all those considered principle farm operators as farmers.

In the U.S. presidential election of 2016, rural voters voted predominantly in favor of President Donald J. Trump, with 62% of rural females, 72% of rural males, and 92% of all rural counties (which included those in critical “battleground” states) voting for him (Frey, 2017; Morin, 2016; Scala & Johnson, 2017; Scala, Johnson, & Rogers, 2015). Of the more than 400 rural U.S. counties with farming as one of the dominant occupations, Trump won significantly. The pattern of farming populations voting for the U.S. Republican presidential nominee in the general election occurred in every presidential election this century (Scala & Johnson, 2017; Scala et al., 2015). Small rural counties dominated by farming, which typically are less-educated, less diverse, have older people, and higher proportions of Evangelicals, are most likely to vote for conservative Republican candidates (Scala & Johnson, 2017). Conservative- and independent-voting farmers have steadily been increasing since the mid-1950s (Kaufman, 2016), and perhaps the political perspectives and attitudes of farmers today impacts their health beliefs, behaviors, and ultimately, how they demonstrate masculinities.

Farm masculinities represent an understudied field of research (Courtenay, 2006/2011). Utilizing Campbell & Bell's (2000) concepts of the rural homosexual and the homosexual rural, the author developed and explored the following terms: the masculine farmer and the farmer masculine. The former signifies how masculinity is formed and demonstrated in farmers, and the latter represents how farming helps depict characteristics and conceptions of masculinity.

Farmers may not only rule the current political state but also the recent world of media, which was particularly evident through the popularity of the 2013 television commercial titled, "Farmer," which advertised Dodge Ram pick-up trucks during the year's most-watched and most-popular television (TV) event, Super Bowl XLVII (Nielsen Company, 2013a, 2013b, 2013c, 2013d, 2013e; USA Today, 2013). At two minutes long, the commercial was twice as long as any others ranking in the top 10 (Nielsen Company, 2013a). The video has since been viewed several millions of times on YouTube (Ram Trucks, 2018) and has been touted as depicting the values and difficulties associated with farming in an emotional manner (Lee, Han, Kim, & Kim, 2014; Nielsen Company, 2013a; USA Today, 2013).

According to the author, the *Farmer* advertisement provides thematic evidence of the actions, values, characteristics, images, symbols, and other concepts related to the spirit and essence of the U.S. farmer, and more specifically, demonstrating the author's ideas of the masculine farmer and the farmer masculine. Hegemony and traditionally masculine concepts are portrayed in the advertisement's depiction of farming as a nearly impossible occupation to perform, from a physical and mental standpoint, romanticizing farmers as almost super-human figures. Farmers are celebrated as stoic, independent, noble, Godly, patriarchal, and patriotic individuals, to name a few, with tireless work ethics, working in spacious, lonely, solitary, and quiet environments, many times with large equipment and/or animals. The images presented in the advertisement portray mainly white males, with neutral or downtrodden facial expressions, appearing worn down and fatigued with hands and skin appearing leathery and rough (Ram Trucks, 2018).

For several years, traumatic, unintentional accidents, harmful exposures, and the increased risk for a variety of physical and mental health issues and health-risk behaviors have made farming one of the U.S.' most dangerous, debilitating, and deadliest jobs (National Coalition for Agricultural Safety and Health [NCASH], 1989; Rautiainen & Reynolds, 2002).

In general, men in the U.S. are more likely to die by suicide than their female counterparts (Stone et al., 2018), particularly non-Hispanic, white, rural men, between 35 and 64 years of age, who have access to firearms (Ivey-Stephenson, Crosby, Jack, Haileyesus, & Kresnow-Sedacca, 2017). Among all occupations in the U.S., male farmers and ranchers have fairly high suicide rates, with an 8.5% increase from 2012 to 2015 (Peterson et al., 2018; Tiesman et al., 2015), with farmers having the highest rates among all U.S. occupations dating back to the early 1990s (Ringgenberg, Peek-Asa, Donham, & Ramirez, 2017). The reasons for male farmer suicide rates being so high are extensive, but they are generally associated with a poor farm economy, struggles with personal finances, physical and/or mental issues, climate/weather problems, social/family troubles (Browning, Westneat, & McKnight, 2008; Dongre & Deshmukh, 2012; Ringgenberg et al., 2017), working alone (Stark et al., 2006), exposure to hazardous materials (Dongre & Deshmukh, 2012; Stallones & Beseler, 2002), being resistant to seek help (Judd, Jackson, Fraser et al., 2006; Routley & Ozanne-Smith, 2012) and high access to guns (Andersen, Hawgood, Klieve, Kolves, & De Leo, 2010; Browning et al., 2008; Hawton, Fagg, Simkin, Hariss, & Malmberg, 1998; Routley & Ozanne-Smith, 2012; Skegg, Firth, Gary, & Cox, 2010).

Of all private sector occupations, those working in agriculture, fishing, and forestry have the highest rates of physical injury and illness. More than 90% of the physical issues occurring in the above industries are due to injuries typically involving overexertion, slips/trips/falls, equipment, other people or animals, and transportation accidents. The most common injuries to the body are sprains and strains, soreness and pain, skin wounds, bruises, and broken bones (United States Department of Labor [USDL],

United States Bureau of Labor Statistics [USBLS], Office of Compensation and Working Conditions [OCWC]/Office of Safety and Health, 2017).

The second most common health issue experienced among farmers are respiratory conditions (Alterman, Steege, Li, Petersen, & Muntaner, 2008). Farmers producing animals and crops are at risk of exposure to several hazardous materials and chemicals, leading to respiratory symptoms and diseases (Nordgren & Bailey, 2016). However, the use of protective respiratory equipment is not common among farmers (Janssen & Nonnenmann, 2017; USDHHS, CDC, National Institute for Occupational Safety and Health [NIOSH], Division of Safety Research [DSR], 2014).

Skin issues and diseases are another common health problem among farmers, largely due to the variety of possible exposures (USDHHS, CDC, NIOSH, Health Effects Laboratory Division, 2012). Dermatitis is very common among the farming industry (McCall, Horwitz, Feldman, & Balkrishnan, 2005), as well as skin cancer (Carley & Stratman, 2015), perhaps due to their infrequent use of personal protective equipment (PPE; Carpenter, Lee, Gunderson, & Stueland, 2002; Susitaival, Beckman, Samuels, & Schenker, 2004).

A report from two decades ago found musculoskeletal issues to be the most common health problem among farmers, with more than half of farmers reporting issues, particularly in the lower back, hands, and knees. Jobs requiring heavy lifting, repetitive movements, and vibrations to the body all influence the musculoskeletal health of farmers (Alterman et al., 2008). The lower back seems to be especially vulnerable to injury during farm work (Fethke, Merlino, Gerr, Schall, & Branch, 2015; Osborne et al., 2012). Factors related to musculoskeletal help-seeking in farmers may be when arthritis is present, when help on the farm is available, and when experiencing pain in the hips or upper back (Tonelli, Culp, & Donham, 2015).

More than one-third of farmers experience some type of noise-induced hearing loss, the third most common health issue among farmers in the U.S. (Alterman et al., 2008). Despite the exposure to

loud environments, hearing PPE is not often utilized (Carpenter et al., 2002; Cramer, Wendl, Sayles, Duysen, & Achutan, 2017; USDHHS, CDC, NIOSH, DSR, 2014).

Exposure to pesticides is another common issue for farmers (Damalas & Koutroubas, 2016; USDL, Occupational Safety and Health Administration [OSHA], n.d.), who along with fisherman and forestry workers, make up more than three-fourths of all U.S. acute illnesses related to pesticides (USDHHS, CDC, NIOSH, Sentinel Event Notification System for Occupational Risk [SENSOR], n.d.). Despite the more than half of Midwestern farmers working with pesticides, PPE use remains extremely low (Carpenter et al., 2002), perhaps due to farmers' general willingness to accept and perhaps embrace the risks of various aspects of their profession (DellaValle et al., 2012). The Agricultural Health Study (n.d.) found significantly positive relationships between many different pesticides and all cancers (Beane Freeman et al., 2005; van Bemmelen et al., 2008), colorectal (Hou et al., 2006; Kang et al., 2008; Koutros, Lynch et al., 2009; Lee et al., 2007a, 2007b; Lerro, Koutros, Andreotti, Hines et al., 2015; Samanic et al., 2006; van Bemmelen et al., 2008), lung (Alavanja, Dosemeci et al., 2004; Bonner, Beane Freeman et al., 2017; Lee et al., 2004a; Lerro, Koutros, Andreotti, Hines et al., 2015), lymphohemopoietic (Beane Freeman et al., 2005; Lee et al., 2004b), leukemia (Andreotti, Koutros, Hofmann et al., 2018; Beane Freeman et al., 2005; Lerro, Andreotti et al., 2018; van Bemmelen et al., 2008), pancreatic (Andreotti, Freeman et al., 2009; Lerro, Koutros, Andreotti, Hines et al., 2015), melanoma (Lerro, Koutros, Andreotti, Hines et al., 2015; Mahajan, Blair, Coble et al., 2007), bladder (Koutros, Lynch et al., 2009; Koutros, Silverman et al., 2016), multiple myeloma (Rusiecki et al., 2006, 2009), prostate cancer (Koutros, Beane Freeman, Lubin et al., 2013), thyroid (Beane Freeman et al., 2011), and liver and follicular cell lymphoma (Silver et al., 2015).

Another possible pathway to illness for farmers is via livestock-associated (LA) zoonotic diseases (Klous, Huss, Heederik, & Coutinho, 2016), of which many are transmitted through animals like swine, poultry, goats, sheep, and cattle (LeJeune & Kersting, 2010; USDHHS, CDC, National Center for Emerging

and Zoonotic Infectious Diseases [NCEZID], 2015). Proper PPE use is recommended to prevent the spread of LA zoonotic diseases (National Association of State Public Health Veterinarians [NASPHV], Veterinary Infection Control Committee [VICC], 2016).

Farmers, fishermen, and forestry workers account for the most deaths due to work injuries among all major work industries, with farmers, ranchers, and agricultural managers suffering the second-highest proportion of fatal work injuries, trailing only the trucking and sales/driving sector. Most deaths occurring on farms are a result of accidents related to tractor overturns (Myers & Hendricks, 2010; Tinc et al., 2016; Tinc, Ayers, May, Purschowitz, & Sorensen, 2015; USDHHS, CDC, NIOSH Science Blog, Division of Safety Research, 2009), power take-offs (PTOs), other equipment/objects, violence from animals or people, falls, harmful environmental exposures, and fires and explosions (USDHHS, USBL, OSHA/Office of Safety and Health, n.d.).

Statement of the Problem

In spite of men being much more likely to suffer from a variety of different diseases and to die earlier than women in nearly every country in the world (CIA, 2017; KFF, 2016; Murphy, Kochanek, Xu, & Arias, 2015; Murphy, Kochanek, Xu, & Heron, 2015; UN, 2015; UNDP, HDRO, 2016; WHO, 2015e, 2016a), men are still much less likely to seek help for physical or mental issues (Addis & Mahalik, 2003). Male help-seeking is largely dependent upon masculinity beliefs, behaviors, and practices, as well as occupation and rurality, and less dependent on healthcare access, affordability, income, and overall health (Addis & Mahalik, 2003; Courtenay, 2006/2011; Galdas, Cheater, & Marshall, 2005). The group of men practicing the most traditional and hegemonic masculinity forms and the least amount of help-seeking for health-related issues are rural male farmers (Courtenay, 2006/2011).

As part of the *Rural Healthy People 2020 (RHP2020)* national survey, more than a third of U.S. rural health administrators, practitioners, educators, and researchers identified quality healthcare accessibility as the most important policy item for rural health this decade (Bolin et al., 2015). Those

working in the farming, fishing, and forestry industry tend to have much higher uninsured rates than the national average. The most likely to have health insurance are between 55-64 years of age, non-Hispanic white individuals, making at least \$75,000 per year, married, college graduates, and living in Medicaid-expansion states (Boal, Li, & Sussell, 2018). Most U.S. farmers are in favorable positions for having health coverage as most are married, non-Hispanic whites, above the age of 55 years-old, with higher-than-average household incomes (USDA, Economic Research Service [ERS], NASS, Agricultural Research Management Survey [ARMS], 2016). Data from 2015 showed an average of 9.1% of uninsured individuals in the U.S. (Barnett & Vornovitsky, 2016), with 10.7% of farm families not having health insurance and 9.6% of rural residents (USDA, ERS, NASS, ARMS, 2016). When comparing average insurance premiums and out-of-pocket expenses, farm households' premiums were a little more than \$3,000 and out-of-pockets costs were close to \$2,000 (USDA, NASS, ARMS, 2016), while the average U.S. premiums were more than \$6,000 with out-of-pocket costs of just over \$1,000 (Kamal & Cox, 2017).

More than three-quarters of individuals in the U.S. have a usual provider of primary healthcare, with rates increasing with age, among non-Hispanic whites, women, those who are college-educated, citizens, those with young children, those with public health plans, and families with higher incomes (USDHHS, Office of Disease Prevention and Health Promotion [ODPHP], 2018). A significantly greater proportion of rural individuals under the age of 65 (81%) have a usual source of primary healthcare than urban individuals (75%; Kirby & Muhuri, 2018), despite rural areas having much higher shortages of primary care, dental, and mental health professionals (USDHHS, Health Resources and Services Administration [HRSA], Bureau of Health Workforce, 2018). In a study of farming and nonfarming rural populations in New York, having a usual source of primary healthcare was significantly less likely among male farmers compared to female farmers and nonfarming rural men and women (Earle-Richardson, Scribani, Scott, May, & Jenkins, 2015).

So, why do male farmers seek less health-related help than nearly everyone else? The research suggests that perhaps there are stronger forces than having health coverage and a usual source of primary healthcare playing a role in male farmers' care-seeking behaviors. In a study of Canadian farmers, seeking care for mental health problems was more dependent on acceptability, pride, and knowledge of services than healthcare accessibility (Roy, Tremblay, & Robertson, 2014). Dairy farmers in central New York State endorsing the farming identity, characterized by self-reliance, resilience, and a strong work ethic, were factors in direct conflict with seeking help for health-related problems. Time and money were also seen as hindrances to help-seeking, since these resources were viewed as necessary to the farm's survival. Care-seeking was most likely when health issues were perceived as detrimental to the farm operation (Drouillard, Tinc, & Sorensen, 2017).

Concerning mental health and seeking help, farmers in South Australia were more likely than nonfarmers to be stoic and independent, to minimize their health issues, to lack understanding of their healthcare providers, to not know how to communicate with their healthcare providers about mental health problems, and viewed mental health-seeking as a shameful and weak action (Hull, Fennell, Vallury, Jones, & Dollman, 2017). In another study of Australian farmers, suicide was more common in male farmers due to certain traditional masculinity characteristics about the farming identity, such as being a "sturdy oak" and maintaining one's pride and privacy. Additional factors played a role in suicidality as well, such as the loneliness inherent in farming, having very long work hours, erratic sleep patterns, not exercising, and substance abuse (Perceval, Kölves, Reddy, & De Leo, 2017).

U.S. male farmers struggle seeking care and maintaining their physical and mental health (Judd, Jackson, Fraser et al., 2006). Of some of the most common preventive health screening procedures for adult men in the U.S., such as screenings for blood pressure, blood glucose, colorectal, prostate, and skin cancer, hearing loss, depression and suicide, etc. (U.S. Preventive Services Task Force [USPSTF],

2018), rural populations rank much worse than urban populations in their preventive practices and death rates for colorectal, prostate, and skin cancer (Henley et al., 2017; USDHHS, ODPHP, 2018b).

A study in the Midwest found farmers to be significantly more likely to be diagnosed with precancerous skin lesions than nonfarmers, despite being less likely to undergo regular screenings. Of farmers without a previous skin cancer diagnosis, only 6% had ever received regular skin cancer screenings, compared to more than 60% of farmers with a previous skin cancer diagnosis (Carley & Stratman, 2015). Among a study of North Carolina farmers attending a farm show, more than half of the participants reported never having received a skin cancer screening, even though more than 92% of them had health coverage (Kearney et al., 2013).

Routine colonoscopies and fecal occult blood tests are also less common among rural U.S. populations than those in urban areas (Coughlin & Thompson, 2004). In Earle-Robertson et al.'s (2015) study, when compared to rural male nonfarmers, male farmers were much less likely to have obtained a colonoscopy in the preceding five years. In Iowa, farmers reported lower rates of blood stool testing for colorectal cancer in the preceding 12 months than rural male nonfarmers and men living in urban areas (Park, Sprince, Jensen, Whitten, & Zwerling, 2002).

Baade, Qin, Yu, Smith, Dunn, and Chambers' (2015) meta-analysis of more than 90 countries found lower rates of PSA testing for prostate cancer among rural men than men in urban areas, late-stage diagnoses were more common in rural men, and survival rates were lower and death rates were increased for rural men as well. Studies in the U.S. have similar findings, with rural men having lower rates of PSA testing, and higher rates of late-stage diagnoses and death (Henley et al., 2017; Jemal et al., 2005). Lower PSA testing rates, when compared to rural male nonfarmers, have also been demonstrated in Iowan farmers (Muldoon, Schootman, & Morton, 1996) and those in New York (Earle-Richardson et al., 2015).

Among all male cancers in the world, prostate cancer is the second most-common and fifth deadliest. In nearly 60% of countries, prostate cancer is the most-diagnosed cancer, and it is the number one cancer killer in one-quarter of all countries (Bray et al., 2018). North America has some of the world's highest prostate cancer incidence rates, yet some of the lowest death rates (Ferlay et al., 2018). Prostate cancer incidence spiked in the U.S. and other industrialized countries in the 1980s and 1990s, largely due to PSA testing becoming commercially available; incidence rates are now decreasing in these countries (Center et al., 2012; Jemal et al., 2015; Kvale et al., 2007; Taitt, 2018; Zhou et al., 2016), potentially as a result of USPSTF recommending against PSA testing as a routine practice in 2012 and now recommending it be a choice left up to the individuals and their care provider (Grossman et al., 2018). In countries practicing increased uptake of PSA testing, incidence rates are following, as seen in the UK, Brazil, Costa Rica, Japan, Thailand (Bray & Piñeros, 2016; Center et al., 2012; Mottet et al., 2017; Zhou et al., 2016), and in several African countries (Chokunonga, Borok, Chirenje, Nyakabau, & Parkin, 2013; Wabinga et al., 2014).

Within the next 20 years, global prostate cancer incidence is predicted to grow, with the lowest rates forecasted in Europe and the highest in countries in Africa, Latin America, the Caribbean, and Asia (Ferlay et al., 2018). Increasing global life expectancies are contributing to higher prostate cancer incidence, as well as increased healthcare accessibility in developing countries (Rawla, 2019), and a greater uptake of Westernized diets around the world (Baade, Youlden, & Krnjacki, 2009).

Lower prostate cancer death rates in Northern and Western Europe, North America, Oceania, and developed countries in Asia (Baade et al., 2009; Bray & Piñeros, 2016; Center et al., 2012; Taitt, 2018; Wong et al., 2016) is most likely a result of better diagnostic procedures and treatments (Collin et al., 2008; Etzioni et al., 2008; Lim, Sherin, & the American College of Preventive Medicine Prevention Practice Committee, 2008), particularly for advanced-stage disease (Brawley, 2012).

Currently, one in nine U.S. men will be diagnosed with prostate cancer, and one in 41 will die from the disease (American Cancer Society [ACS], 2019a, 2019b), making prostate cancer the most common male cancer and the second deadliest (ACS, 2019a). Black men are 60% more likely than white men to be diagnosed with prostate cancer. Washington, D.C. has the highest prostate cancer incidence and mortality rates in the U.S., while Arizona has the lowest incidence rate and Hawaii has the lowest mortality rate (ACS, 2019).

In general, prostate cancer incidence in the U.S. has been declining since 2000, mainly due to less PSA testing; however, aggressive prostate cancer diagnoses have increased for men ages 50 to 74 years-old (Negoita et al., 2018; ACS, 2019a). Since the early 1990s, prostate cancer deaths have continuously declined, especially among African American men. However, in white men, death rates leveled off in 2013, a likely result of less PSA testing and more advanced-stage diagnoses (Negoita et al., 2018). Between 2010 and 2014, distal prostate cancer incidence rates increased significantly for white men, non-Hispanic men, and in those ages 50-64 and 75 to 84 (Li, Siegel, & King, 2018).

Ninety percent of prostate cancer diagnoses in the U.S. are localized or regional, having five-year survival rates of 100%. However, a distal prostate cancer diagnosis drops the five-year survival rate to 30%. Combining all prostate cancer stages, the 10-year survival rate is 98% (ACS, 2019a). In general, prostate cancer survival rates around the world have increased since the 1990s, having survival rates anywhere from 70-100% (Allemani et al., 2018).

Causes of prostate cancer are still not well-known (Rawla, 2019). Certain non-modifiable risk factors do have connections to increases in risk for prostate cancer, such as age, living in the U.S. or Caribbean and being of African descent, having a genetic history, and being tall in stature (MacInnis & English, 2006; Pernar, Ebot, Wilson, & Mucci, 2018; Rawla, 2019; Rebbeck et al., 2013). Until age 74, prostate cancer incidence increases in significant linear fashion for white men in the U.S., and until age 69 for African American men. Prostate cancer death rates are also significantly higher in men over the

age of 65 compared to those under 65, with the highest deaths rates occurring in men ages 85 and above (Howlader et al., 2019).

U.S. or Caribbean men of African descent have the highest prostate cancer incidence rates in the world, and sub-Saharan African men are diagnosed with the most advanced stages and make up the highest number of total deaths from the disease (Rebbeck et al., 2013). Biology, genetics, ancestral predispositions, as well as sociocultural, behavioral, environmental, and healthcare-related issues comprise some of the reasons for higher prostate cancer incidence and death among those of African descent (Rebbeck, 2018).

As many as one in 10 cases of prostate cancer are due to having a family history of the disease (ACS, 2019a), with some studies claiming prostate cancer to be one of the most heritable cancers (Hjelmborg et al., 2014; Mucci et al., 2016), increasing risk anywhere from 30% to as high as 72% (Barber et al., 2018; Bratt, Drevin, Akre, Garmo, & Stattin, 2016). In fact, having a family history of breast cancer was also shown to increase risk of total and lethal prostate cancer (Barber et al., 2018). More than 100 single-nucleotide polymorphisms (SNPs) have been discovered as linked with prostate cancer risk (Al Olama et al., 2015; Chen et al., 2015), with most of the SNPs increasing risk by around one-third (Al Olama et al., 2015). For those with advanced prostate cancer, the BRCA2 gene is the most likely culprit, a possible mutation in patients even without a family history (Nombela et al., 2019).

Modifiable risk factors playing a role in prostate cancer are obesity, having an unhealthy diet, consuming alcohol, smoking cigarettes, insulin-like growth factor and insulin, sex hormones, inflammation of the prostate, vasectomies, sexually transmitted infections (STIs), and various carcinogenic exposures (Rawla, 2019).

One potential option for decreasing one's risk for prostate cancer is to focus on health-promoting behaviors, such as having healthier dietary practices (Parsons, 2019, Rawla, 2019). Body weight management and a diet rich in vegetables and fruits, fiber, and antioxidants, especially an herb

mix called zyflamend, with fewer calories coming from saturated fats and refined carbohydrates may help prevent prostate cancer (Lin, Aronson, & Freedland, 2019). Another dietary approach to managing prostate cancer found broccoli soup enriched with high levels of glucoraphanin to be effective in slowing the progression of disease (Traka et al., 2019).

For those with high-grade prostatic intraepithelial neoplasia (HGPIN), a major precursor to prostate cancer, the drug toremifene has shown mixed results, reducing prostate cancer incidence in one study (Price et al., 2006) but not lowering incidence rates in another (Taneja et al., 2013).

Dutasteride, a 5-alpha-reductase inhibitor, mainly used for treating prostate hypertrophy (USDHHS, NIH, National Cancer Institute [NCI], n.d.), has also produced mixed results, slowing the progression of low-grade prostate cancer in one study (Fleshner et al., 2012), but not showing efficacy for those with HGPIN (Milonas et al., 2017). Another similar drug, finasteride, has generally proven to be effective in reducing prostate cancer risk (Andriole et al., 2005; Goodman et al., 2019; Redman et al., 2008; Stapff & Palm, 2019; Thompson et al., 2013; Unger et al., 2018).

Nonsteroidal anti-inflammatory drugs (NSAIDs) and aspirin may be effective in preventing prostate cancer (Rawla, 2019), as well as high levels of coffee consumption (Wilson et al., 2011) and frequent monthly ejaculations (Rider et al., 2016).

Regular prostate cancer screening for average-risk men is not currently recommended by any U.S. health organization, mainly due to issues with over-diagnosis, false-positive results, and the potential for harmful side effects. For men between the ages of 55-69 years-old considered at an average-risk for prostate cancer, the USPSTF and American Academy of Family Physicians (2012) recommend that patients make an informed personal choice with their healthcare provider about getting PSA-tested, but screening is not recommended for those ages 70 and above (ACS, 2019a; Grossman et al., 2018). The ACS (2019a) recommends that average-risk men, lacking prostate cancer symptoms, and expected to live at least 10 more years, begin a process of informed decision-making

with their provider by age 50. Men at higher-than-average-risk, such as African Americans and those with one first-degree male relative diagnosed before the age of 65, should begin the informed decision-making process by the age of 45. Those with at least two first-degree male relatives diagnosed with prostate cancer before the age of 65 should begin the informed decision-making process by age 40. The American College of Physicians recommends patients ages 50-69 years-old discuss the harms and benefits of PSA testing, and screening is not recommended for average-risk men under 50 and those ages 70 and above not expected to live 10-15 more years (Qaseem, Barry, Denberg, Owens, & Shekelle, 2013). The American Urological Association recommends against PSA testing in men under 40 and those ages 70 and above, who are not expected to live at least 10-15 more years. Routine screening is also not recommended for 40-54-year-olds, and those ages 55-69 years-old should undergo an informed decision-making process with their healthcare provider, with those who are screened doing so every two years or more (Carter et al., 2013).

Men typically do not know they have prostate cancer unless they are tested (Jahn, Giovannucci, & Stampfer, 2015), due to lacking symptoms and/or slow-progressing tumors (Rawla, 2019). Urinary issues are the most typical symptoms of prostate cancer (Rawla, 2019; Serlin, Heidelbaugh, & Stofel, 2018), with back pain being a likely symptom of metastasis (Rawla, 2019). Symptoms typically arise as the prostate gland increases in size, which tends to compress the urethra and/or sphincter (Michael & Pandha, 2013). More advanced prostate tumors (i.e., T3 and T4 tumors) tend to coincide with lower urinary tract symptoms (LUTS), although LUTS are also common with benign prostatic hyperplasia (BPH; Berry, Coffey, Walsh, & Ewing, 1984; Michael & Pandha, 2013; USDHHS, USPHS, NIH, National Institute of Diabetes and Digestive and Kidney Diseases [NIDDKD], 2012). In more advanced cases, and sometimes before the presence of LUTS, prostate cancer can cause sexual symptoms, bone pain (e.g., back, hips, pelvis, and perineum), weight and appetite loss, and fatigue (Han, Brannigan, Antenor, Roehl,

& Catalona, 2004; Michael & Pandha, 2013; Osborn, Getzenberg, & Trump, 1995; Rigor, 2000; Rosenthal et al., 1992).

A needle biopsy and analysis of prostate tissue is essential in diagnosing prostate cancer (Litwin & Tan, 2017). Based on the National Comprehensive Cancer Network (NCCN) Guidelines for Prostate Cancer Early Detection, PSA testing is recommended for 45-75-year-olds every two-to-four years when PSA levels are less than 1.0 nanogram [ng]/milliliter [ml]) and with normal digital rectal examinations (DREs) and every one-to-two years when PSA levels are one-to-three ng/ml and DRE is normal. Those with PSA levels above 3 ng/ml and/or with a very suspicious DRE must have a repeat PSA test and DRE (if not performed at the previous screening), with biopsy recommended for those with a repeat PSA level more than 3 ng/ml. Factors to consider before performing a biopsy are age, race, family history, overall health of the patient, preferences, and PSA kinetics. Patients opting to forego a prostate biopsy should have PSA testing and a DRE within six months to a year, with a recommendation for biopsy occurring in patients showing significant and continuous PSA level increases (Carroll et al., 2019).

Those ages 75 and above only should undergo PSA testing when considered very healthy, and when PSA levels are less than 4 ng/ml and the DRE is normal future screening should occur every one-to-four years. PSA levels greater than 4 ng/ml or a very suspicious DRE should result in repeat PSA testing, where a biopsy should be considered a possibility if repeat PSA levels remain higher than 4 ng/ml. For all age categories, several other biomarker tests as well as magnetic resonance imaging (MRI) should also be considered before proceeding to a biopsy (Carroll, et al., 2019).

Possible biopsy results are the following: benign, HGPIN, atypia (suspicious for cancer), and malignancy. A number of considerations and recommendations are made for those without malignancy, with a repeat biopsy being a consideration for those with benign results, HGPIN, and atypia, but not typically for those with prostate cancer, unless the patient is a candidate for active surveillance or if the cancer appears to be more aggressive than originally thought on the initial biopsy (Carroll et al., 2019).

Once prostate cancer is determined from a biopsy, the patient is placed into a risk group based on several criteria: tumor (both clinical and pathological), node, and metastasis (TNM) staging; Gleason grade; DRE; radiography; and PSA level (American Joint Committee on Cancer [AJCC], 2017; Mohler et al., 2019). After considering the characteristics and risks associated with the prostate cancer, an effective treatment plan is developed (Mohler et al., 2019).

The general treatments for prostate cancer are active surveillance, surgery, radiation, hormonal therapy, chemotherapy, and vaccines. Active surveillance is typically the best option for older patients with early-stage, less-aggressive tumors. More advanced cancers may be best treated with surgery, radiation, and/or hormones, with chemotherapy being most appropriate when cancer has metastasized to distal sites and when hormonal therapy is no longer working. Cancer not responding to hormonal therapy may also be treated with a cancer vaccination. In any event, the patient must consider the side effects of treatments, which tend to include urinary and erectile dysfunction issues. Also, biomarker testing may be efficacious to avoid overtreating the cancer (ACS, 2019). Specific prostate cancer treatment protocol recommendations by the NCCN are outlined in detail in Chapter Two of this study (Mohler et al., 2019). These recommendations from the NCCN were developed utilizing TNM staging procedures from the AJCC (2017) and Gleason scoring guidelines developed at the 2014 International Society of Urological Pathology (ISUP) Consensus Conference (Epstein et al., 2016).

Compared to those living in more urban areas, prostate cancer incidence is generally lower in rural areas throughout the world and in the U.S.; however, mortality rates are higher (Dasgupta et al., 2019; Henley et al., 2017). Overall, the smallest rural areas in the U.S. account for the highest death rates, except for the Midwest, where large central regions have the highest rates (Callaghan et al., 2018). Fear and pain from diagnostic procedures may act as hindrances to prostate cancer screening (Oliver, Grindel, DeCoster, Ford, & Martin, 2011). Among rural and urban individuals diagnosed with prostate cancer, rural individuals are less likely to have curative treatments (Baldwin et al., 2013).

Reports of farmers' increased incidence for prostate cancer compared to other jobs dates back more than 40 years (Williams, Stegens, & Goldsmith, 1977). An abundance of studies in the U.S. and other countries followed, demonstrating increased incidence and/or mortality rates for prostate cancer in farmers compared to nonfarmers (Blair, Dosemeci, & Heineman, 1993; Blair, Zahm, Pearce, Heineman, & Fraumeni, 1992; Brownson, Chang, Davis, & Bagby, 1988; Brownson, Reif, Chang, & Davis, 1989; Burmesiter, 1981; Burmeister, Everett, Van Lier, & Isacson, 1983; Davis, Blair, & Hoel, 1993; Delzell & Grufferman, 1985; Fincham, Hanson, & Berkel, 1992; Franceschi et al., 1993; Frey, 1996; Frey & Chen, 1996; Gallagher et al., 1984; Mallin, Rubin, & Joo, 1989; Reif, Pearce, & Fraser, 1989; Saftlas, Blair, Cantor, Hanrahan, & Anderson, 1987; van der Gulden, Kolk, & Verbeek, 1992), with only two studies demonstrating opposite findings (Gunnarsdottir & Rafnsson, 1991; Ronco, Costa, & Lynge, 1992). Infrequent prostate cancer screening and late-stage diagnoses were two potential reasons for farmers' increased morbidity and mortality due to prostate cancer (Blair, Malker et al., 1985).

Ensuing studies sought reasons for farmers' increased risk of prostate cancer, attempting to respond to various calls to action in the field (Blair, Zahm et al., 1992; Davis et al., 1993). Farmers working with herbicides (Morrison et al., 1993), wheat (Forastiere et al., 1993), beef and hay (Keller & Howe, 1994), pesticides and other agrochemicals (van der Gulden & Vogelzang, 1996), and farmers consuming dietary fat containing herbicides (Keller-Byrne, Khuder, & Schaub, 1997) were some initial findings.

Findings consistently show farmers having lower death rates than nonfarmers for all cancers combined, as well as for cancers of the esophagus, other respiratory organs, mouth (except lip), liver, and bladder, as well as being less likely to consume alcohol and smoke cigarettes, and engaging in more physical activity (Blair, Malker et al., 1985; Blair, Zahm et al., 1992; Cerhan et al., 1998; Pearce & Reif, 1990). However, higher prostate cancer death rates seemed to remain, even after adjusting for unhealthy lifestyle behaviors, such as a poor diet (Cerhan et al., 1998). Parker, Cerhan, Putnam, Cantor,

and Lynch's (1999) results supported farmers being diagnosed with more aggressive and late-stage disease.

Subsequent studies showed increased prostate cancer risk for a variety of farmers: animal farmers (Krstev, Baris, Stewart, Hayes et al., 1998; Lee, Burnett, Lalich, Cameron, & Sestito, 2002), crop farmers (Krstev, Baris, Stewart, Dosemeci et al., 1998), farm managers (Buxton, Gallagher, Le, Band, & Bert, 1998), and those applying pesticides (Fleming, Bean, Rudolph, & Hamilton, 1999a, 1999b; Settini, Comba et al., 2001; Settini, Masina, Andrion, & Axelson, 2003). In the Agricultural Health Study's first examination of prostate cancer risk among pesticide applicators, risk was reported as 14% higher. Incidence was greater in commercial applicators than private (typically farmers), and white farmers in Iowa had higher rates than white farmers in North Carolina. Additionally, a variety of pesticides were associated with farmers being at an increased prostate cancer risk (Alavanja, Samanic et al., 2003). In a subsequent study, Alavanja and Sandler et al. (2005) found farmers applying pesticides to be at a 26% increased risk of prostate cancer. Several other pesticides in the Agricultural Health Study showed associations with prostate cancer, especially when coupled with a family history of the disease (Bonner, Williams et al., 2010; Koutros, Mahajan et al., 2008; Mahajan, Bonner, Hoppin, & Alavanja, 2006). Additionally, overall and advanced prostate cancer risk increased in Agricultural Health Study participants consuming well-done and very-well-done pan-fried and/or grilled meat (Koutros, Cross et al., 2008), which contain heterocyclic amines, a carcinogen which can cause genetic problems (Koutros, Berndt, Sinha et al., 2009).

Increased prostate cancer rates in farmers continue (Ragin et al., 2013), with many factors influencing farmers' risk. Pesticide exposure in Canadian farmers (Band et al., 2010; Parent, Déry, & Siemiatycki, 2009), as well as Canadian farmers working with cattle (Kachuri et al., 2017), red meat and dairy consumption of farmers in Pakistan (Mahmood et al., 2012), Australian farmers (Fragar, Depczynski, & Lower, 2011), and French farmers using pesticides for cattle and hogs, hay, fruit,

potatoes, and tobacco (Lemarchand, Tual, Boulanger et al., 2016; Lemarchand, Tual, Levêque-Morlais et al., 2017) all demonstrate evidence of increased prostate cancer rates in farmers around the world. Australian farmers and urban nonfarm residents were found to have higher rates of advanced prostate cancer than rural nonfarm individuals, with farmers being less likely to seek care from a primary care provider (Depczynski, Dobbins, Armstrong, & Lower, 2018).

Although a plethora of research demonstrates the increased prostate cancer risk and mortality among farmers in the U.S. and around the world, some studies show this evidence to be weak or nonexistent (Depczynski & Lower, 2014; Sauv , Lavou , & Parent, 2016). Other studies have determined pesticides as not being a feasible link to prostate cancer in farmers (Mink, Adami, Trichopoulos, Britton, & Mandel, 2008). Regardless of these reports, the Agricultural Health Study and its participants (i.e., mainly white male farmers) are reported as having higher incidence and death rates from prostate cancer compared to the general population (Koutros, Alavanja et al., 2010; Waggoner et al., 2010) due to behavioral and environmental factors (Lerro, Koutros, Andreotti, Sandler et al., 2019). Aggressive prostate cancer was also more common in participants exposed to four insecticides (Koutros, Beane Freeman, Lubin et al., 2013). Particularly for Agricultural Health Study participants with a prostate cancer family history, positive correlations continue to be demonstrated for pesticide applicators and prostate cancer (Lewis-Mikhael et al., 2016). Recent Agricultural Health Study reports are concerned with genes and how pesticide use may impact prostate cancer risk (Andreotti, Koutros, Berndt et al., 2012; Barry, Koutros, Andreotti et al., 2011; Barry, Koutros, Berndt et al., 2012; Berndt et al., 2015; Christensen et al., 2016; Dadaev et al., 2018; Karami et al., 2013; Koutros, Andreotti et al., 2011; Koutros, Berndt, Hughes Barry 2013; Mancuso et al., 2018; Matejcic et al., 2018; Schumacher et al., 2018; Wang et al., 2012).

In order to better understand U.S. farmers' prostate cancer experiences, the authors explored masculinities and care-seeking behaviors in Indiana farmers who have/have had prostate cancer. Using

the 21-item Male Role Norms Inventory-Short Form (MRNI-SF), overall traditional masculinity ideology (TMI) was measured, as well as the following seven related constructs: avoidance of femininity (AoF), negativity toward sexual minorities (NTSM), self-reliance through mechanical skills (SRMS), toughness (T), dominance (Dom), importance of sex (IoS), and restrictive emotionality (RE; Levant, Hall, & Rankin, 2013). Similar to Emery et al.'s (2013) investigation of rural Australian individuals diagnosed with prostate, breast, lung, or colorectal cancer, this study utilized the model of pathways to treatment (Scott, Walter, Webster, Sutton, & Emery, 2013) to explore time to presentation, diagnosis, and treatment for Indiana farmers with prostate cancer. Moustakas' (1994) transcendental phenomenological approach was also employed, using in-depth interviews, along with aspects of his modified version of van Kaam's (1959, 1966) data analysis technique.

Purpose of the Study

Given farmers' increased risk for prostate cancer morbidity and mortality, as well as their lack of care-seeking behaviors, and increased likelihood of practicing traditional and hegemonic masculinities, the purpose of this phenomenological study was to describe the time to presentation, diagnosis, and treatment for farmers with prostate cancer, as well as to assess their overall TMI and AoF, NTSM, SRMS, T, Dom, IoS, and RE. Time to presentation was defined as the time elapsed from when a farmer first noticed prostatic changes to the first consultation with a healthcare provider for prostatic symptoms; time to diagnosis was defined as the time elapsed from when a farmer first noticed prostatic changes to the date of being told he had prostate cancer; and time to treatment was the time elapsed from when a farmer first noticed prostatic changes to the start of treatment (Walter, Webster, Scott, and Emery, 2012).

Research Questions

This study's central research question was: What meaning do farmers ascribe to their times to presentation, diagnosis, and treatment for prostate cancer? Additionally, this study also administered Levant et al.'s (2013) MRNI-SF questionnaire to describe farmers' overall beliefs concerning traditional

masculinity ideology (TMI), as well as beliefs related to the following constructs within the questionnaire: AoF, NTSM, SRMS, T, Dom, IoS, and RE. After reviewing important information related to the central research question (Andersen et al., 1995; de Nooijer et al., 2001; Oberoi et al., 2015; Prostate Cancer Foundation, 2019; Scott et al., 2013; Walter et al., 2012), four procedural subquestions (Creswell & Poth, 2018) were developed:

- How do you describe the major processes and contributing factors impacting the events leading up to a farmer's first consultation with a healthcare professional for prostate cancer symptoms?
- How do you describe the major processes and contributing factors impacting the events leading up to a farmer being told he has prostate cancer?
- How do you describe the major processes and contributing factors impacting the events leading up to a farmer receiving his first treatment for prostate cancer?
- How do you describe the contributing factors impacting a farmer's experience with prostate cancer treatment?

Importance of the Study

Mental health problems are incredibly common among farmers, and many previous studies have investigated and found a variety of factors influencing farmers' propensities for having mental health issues (Alston, 2012; Alston & Kent, 2008; Andersen et al., 2010; Berry, Hogan, Owen, Rickwood, & Fragar, 2011; Browning et al., 2008; Bryant, 1999; Bryant & Garnham, 2013, 2015; Cerhan et al., 1998; Fragar, Kelly, Peters, Henderson, & Tonna, 2008; Guiney, 2012; Hanigan, Butler, Kokic, & Hutchinson, 2012; Hanna, Bell, King, & Woodruff, 2011; Hawton et al., 1998; Hull et al., 2017; Ivey-Stephenson et al., 2017; Judd, Jackson, Fraser et al., 2006; Judd, Jackson, Komiti et al., 2006; King, Land, McDougall, & Greenhill, 2009; Parker et al., 1999; Perceval et al., 2017; Ramirez-Ferrero, 2005; Ringgenberg et al., 2017; Routley & Ozanne-Smith, 2012; Roy et al., 2014; Skegg et al., 2010; Stallones & Beseler, 2002; Staniford, Dollar, & Guerin, 2009; Stark et al., 2006; Stone et al., 2018; Tiesman et al., 2015). Despite a

number of studies demonstrating links between farmers and increased prostate cancer incidence and/or mortality, largely due to pesticide and other work exposures (Alavanja, Samanic et al., 2003; Alavanja, Sandler et al., 2005; Band et al., 2010; Blair, Dosemeci et al., 1993; Blair, Zahm et al., 1992; Bonner, Williams et al., 2010; Brownson, Chang et al., 1988; Brownson, Reif et al., 1981; Burmeister et al., 1983; Buxton et al., 1998; Davis et al., 1993; Delzell & Grufferman, 1985; Fincham et al., 1992; Fleming et al., 1999a, 1999b; Forastiere et al., 1993; Fragar, Depczynski et al., 2011; Franceschi et al., 1993; Frey, 1996; Frey & Chen, 1996; Gallagher et al., 1984; Kachuri et al., 2017; Keller & Howe, 1994; Keller-Byrne et al., 1997; Koutros, Alavanja et al., 2010; Koutros, Beane Freeman, Lubin et al., 2013; Koutros, Mahajan et al., 2008; Krstev, Baris, Stewart, Dosemeci et al., 1998; Krstev, Baris, Stewart, Hayes et al., 1998; Lee et al., 2002; Lemarchand, Tual, Boulanger et al., 2016; Lemarchand, Tual, Levêque-Morlais et al., 2017; Lerro, Koutros, Andreotti, Sandler et al., 2019; Lewis-Mikhael et al., 2016; Mahajan, Bonner et al., 2006; Mahmood et al., 2012; Mallin et al., 1989; Morrison et al., 1993; Parent et al., 2009; Ragin et al., 2013; Reif et al., 1989; Saftlas et al., 1987; Settimi, Comba et al., 2001; Settimi, Masina et al., 2003; van der Gulden & Vogelzang, 1996; van der Gulden et al., 1992; Waggoner et al., 2010; Williams et al., 1977), with recent studies investigating relationships between pesticide exposure and genetics (Andreotti, Koutros, Berndt et al., 2012; Barry, Koutros, Andreotti et al., 2011; Barry, Koutros, Berndt et al., 2012; Berndt et al., 2015; C. H. Christensen et al., 2016; Dadaev et al., 2018; Karami et al., 2013; Koutros, Andreotti et al., 2011; Koutros, Berndt, Hughes Barry et al., 2013b; Mancuso et al., 2018; Matejcic et al., 2018; Schumacher et al., 2018; Wang et al., 2012), relatively little is known about other factors playing a role in farmers' increased prostate cancer risks, especially behavioral factors, and aspects related to help-seeking and masculinity practices.

A few studies have shown rural and farm populations as less likely to obtain routine prostate cancer screenings (Baade et al., 2015; Earle-Richardson et al., 2015; Jemal et al., 2005; Muldoon et al., 1996). However, research describing and explaining care-seeking behaviors among farmers for prostate

cancer symptoms is lacking. One study (i.e., Emery et al., 2013), qualitatively described potential reasons for farmers' reluctance to undergo prostate cancer screening, utilizing the model of pathways to treatment (Scott et al., 2013). However, this study did not also explore farmers' masculinity beliefs.

Thus, the primary importance of this study is that it (for the first time) explored and described the lived experiences of Indiana farmers with prostate cancer utilizing a transcendental phenomenological approach (Moustakas, 1994), with an additional emphasis on examining farmers' masculinity constructions (Bandura, 1986, 1997; Bussey & Bandura, 1999; Carrigan et al., 1985; Connell, 2015; Connell & Messerschmidt, 2005; Courtenay, 2000b/2011, 2006/2011), as well as their time to presentation, diagnosis, and treatment for prostate cancer (Bandura, 1986, 1997; Leventhal, Meyer, & Nerenz, 1980; Scott et al., 2013).

From a theoretical perspective, this study will inform those who conduct gender and health behavior research. Farm masculinities and care-seeking behaviors for prostate cancer symptoms are underexplored areas, and the utilization of a variety of related theories made this study unique and applicable to several academic disciplines. This study may also help healthcare practitioners who work with largely rural populations of patients. Specifically, healthcare practitioners will be more informed about the factors influencing care-seeking among farmers with prostate cancer symptoms.

The results of this study may additionally impact individuals and groups in society. First and foremost, farmers may gain new knowledge related to care-seeking behaviors and beliefs for prostate cancer symptoms. Understanding the factors that influence care-seeking among farmers with prostate cancer symptoms may help other farmers in making beneficial and advantageous decisions regarding prostate health. Additionally, the potential exists for decreasing barriers for farmers in obtaining prostate cancer screenings. That is, understanding the factors influencing extended times to presentation, diagnosis, and treatment for farmers with prostate cancer may allow other farmers to seek help earlier and more often for prostate cancer symptoms or other health symptoms in general.

Finally, family members, friends, and others in farmers' social networks may benefit from the study's results. These individuals may be better able to provide social support and encouragement to farmers for care-seeking for prostate cancer symptoms. The results may demonstrate certain aspects of farm masculinities, beliefs, and behaviors that could help family members and friends better understand why farmers do/do not seek care for prostate cancer symptoms.

Scope of the Study

This study explored farmers' lived experiences with prostate cancer. The research participants in this study were farmers who currently have or previously had prostate cancer. The recruitment of participants occurred over a four-week period. Eleven participants were eventually interviewed over the subsequent four-to-six weeks. Finally, once the researcher determined results, interpretations, and conclusions, member checking occurred for two weeks. The final study report was completed in May of 2020.

Phenomenological approaches to data collection, analysis, and interpretation were utilized (Moustakas, 1994; van Kaam, 1959, 1966). The interview emphasized time to presentation for prostate cancer symptoms, specifically addressing appraisal and help-seeking intervals of the model of pathways to treatment (Bandura, 1986, 1997; Leventhal, Meyer et al., 1980; Scott et al., 2013); however, time to diagnosis, treatment, and experiences during and after treatment were also explored. The study took place in Indiana, with participants being recruited through two Indiana churches, a small Indiana deli and convenience store, as well as two rural health clinics in Indiana and Illinois.

Limitations

One limitation of this study was having a small and unique sample size. Since participants included only farmers, currently or previously with prostate cancer, attending or affiliated with attendees of two Indiana churches, an Indiana deli and convenience store, or two small rural health clinics in Indiana and Illinois, the results were not generalizable beyond the research participants. Another limitation of this study concerned the participants' candor in their responses during the

interview process. Responses lacking openness and honesty may have not adequately and/or accurately reflected the rest of the participants' views and experiences. Since farmers are typically reluctant to discuss and seek care for health issues, especially those considered private, such as prostate issues, another limitation was a lack of willingness to participate in the study by the recruitment population. This was evident in that all of the participants came from the two churches and an Indiana deli and convenience store, and none of the recruited individuals at the rural health clinics responded to participate in the study. Furthermore, since most farmers dedicate a great deal of their time and energy to farming duties, scheduling and conducting an in-depth interview was challenging in some cases. A final limitation concerned researcher bias and subjectivity, especially as it pertained to the Epoche process. With the Epoche being a very difficult state to achieve, free of all biases, prejudices, preconceptions, notions, and subjectivities (Moustakas, 1994), the researcher cannot guarantee each interview was conducted in a perfect Epoche state of mind.

Delimitations

Incorporating specific gender and health behavior theories (Bandura, 1986, 1997; Bussey & Bandura, 1999; Carrigan et al., 1985; Connell, 2015; Connell & Messerschmidt, 2005; Courtenay, 2000b/2011, 2006/2011; Leventhal, Meyer et al., 1980; Scott et al., 2013), this study examined Indiana farmers with prostate cancer and their time to presentation, diagnosis, treatment, and experiences with treatment, as well as beliefs about traditional masculinities, using specific phenomenological approaches (Moustakas, 1994; van Kaam, 1959, 1966) and the 21-item MRNI-SF.

The delimitations for participants in this study were that individuals must have identified as Midwestern farmers, who currently have or previously had prostate cancer, and who attended or who had an affiliation with someone from one of two churches, an Indiana deli and convenience store, or who appeared in the electronic medical records system of one of two small rural health clinics in Indiana and Illinois. Participants must also have agreed to participate in a 10-minute survey measuring

traditional masculinity beliefs and one in-depth, semi-structured, and audio-recorded interview, lasting anywhere from 35 minutes to two hours. The interviews took place with 11 research participants at their residences.

Definitions of Key Terms

The definitions that follow are listed to provide understanding and consistency of these terms throughout the study. The researcher constructed all definitions not containing citations.

Active Surveillance: The preferred initial therapy for prostate cancer treatment, usually involves having PSA testing every six months, DRE, repeat biopsy, and multiparametric MRI every year, with more rigorous follow-up recommended for younger men. If disease progresses, curative treatment typically starts (Mohler et al., 2019). Generally, this is the best prostate cancer treatment option for older patients with less aggressive, earlier-stage disease (ACS, 2019).

Adenocarcinoma of the Prostate: Also called prostatic carcinoma and comprising 95% of prostate cancers, diagnosis is determined by architectural (primary) and cytological (secondary) criteria, with tertiary criteria supporting the diagnosis (Shevchuk & Robinson, 2013).

Agency: An important concept in both the social cognitive theory of gender role development (Bussey & Bandura, 1999) and the relational theory of men's health (Courtenay, 2000b/2011), which means the ability that individuals and other entities possess in (re)defining their personal and/or collective world (Bussey & Bandura, 1999).

Appraisal Interval: the time elapsed from first noticing a bodily change to acknowledging it as a symptom and a reason to talk with a healthcare provider (Walter et al., 2012).

Atypia: tissue in the prostate that are normal but "distorted by artifact," or "prostate cancer that does not meet the histologic criteria for a diagnosis of prostate cancer" (Carroll et al., 2019, p. MS-30).

Bracketing: involves the researcher placing the research topic and questions in brackets, while setting aside all other aspects away from the topic and study question (Moustakas, 1994).

Castration-Naïve Prostate Cancer: prostate cancer that has progressed without ever receiving previous treatments of ADT (Mohler et al., 2019).

Castration-Resistant Prostate Cancer: occurs when disease has advanced upon clinical examination, imaging, or biochemical testing, even when castrate levels of serum testosterone are below 50 ng/mL (Mohler et al., 2019).

Cause: “underlying mechanism/link to illness” (Leventhal, Phillips, & Burns, 2016, p. 2).

Clarification of Biases: a statement provided in the manuscript of a study by the researcher delineating the various ways in which his/her approaches and conclusions have been formed, including biases, viewpoints, and previous experiences (Creswell & Poth, 2018).

Common-Sense Model of Illness Self-Regulation: a theory explaining:

the perceptual, behavioral, and cognitive processes involved in the creation of individuals’ representations of the somatic and functional properties of the Self, the properties of illnesses, and the treatment required to manage illnesses, including formation of action plans for carrying out the treatment. (Leventhal, Phillips et al., 2016, p. 1)

Communicable Diseases (CDs): also referred to as infectious diseases and “are caused by microorganisms such as bacteria, viruses, parasites and fungi that can spread, directly or indirectly, from one person to another” (WHO Regional Office for Africa, n.d., para. 1).

Confirmability: Qualitatively demonstrating the value of a study’s data. In order to best establish confirmability in the data, the study must undergo an external audit, typically performed by someone not affiliated with the study (Lincoln & Guba, 1985).

Consequences: “functional, social, and financial” costs “due to illness and/or treatment” (Leventhal, Phillips et al., 2016, p. 2).

Control: “how far treatment goes towards complete symptom/condition management” (Leventhal, Phillips et al., 2016, p. 2).

Decision to Consult HCP (Healthcare Professional) and Arrange Appointment: processes occurring during the help-seeking interval, where despite an individual believing there may be a reason to consult with a healthcare provider, this does not mean the individual will decide to seek help, nor does it mean he/she wants or intends to seek help. Additionally, things like employment, responsibilities related to caring for others, healthcare expectations, and healthcare convenience play important roles in the help-seeking process (Scott et al., 2013).

Diagnostic Interval: the time elapsed from the first appointment with a healthcare provider to the receipt of an official diagnosis, which may include a complex process of events (Walter et al. 2012).

Digital Rectal Examination (DRE): with a lubricated glove on, a doctor checks for any hardenings or bumps on the prostate by inserting his/her finger into the rectum (ACS, 2019c).

Disease Factors: how a disease is assessed, both clinically and physiologically (e.g., location, growth, and development; Scott et al., 2013).

Epoche: The first step in using the transcendental phenomenological approach, which involves a purification of conscience, whereby the researcher sets aside all prejudices, stereotypes, biases, and preconceptions about a particular phenomenon, in order to authentically and naively hear, listen, see, think, feel, and imagine the phenomenon, as if it were the first time (Moustakas, 1994).

Facilitation: “providing tools, resources, or environmental changes that make new behaviors easier to perform” (McAlister, Perry, & Parcel, 2008, p. 171).

Farm: A few definitions exist for farm:

- “a tract of [rural or urban] land devoted to the actual farming activities” (FLSA, 1938, p. 559)
- “A farm is defined as any place from which \$1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the year” (USDA, 2017, para. 2).
- A farm signifies profitably operating, managing, and cultivating a variety of items, such as “livestock, dairy, poultry, fish, [and] fruit” in many different spaces, including “truck farms . . .

plantations, ranches, ranges, and orchards and groves” (Department of the Treasury, IRS, 2016, p. 1).

Farmer: The term *farmer* is difficult to define. In fact, paragraph 614 of section 780 of the Fair Labor Standards Act (FLSA) of 1938, titled “Definition of a farmer,” begins with, “The Act does not define the term ‘farmer’ ” (p. 593). Rather, a farmer, considered as “individual persons, . . . an association, a partnership, . . . a cooperation or a farmers’ cooperative” (pp. 557, 593), is best understood through work-related actions related to “agriculture” (p. 549), described in paragraph 103 of section 780 of the FLSA (1938), which are the following:

the cultivation and tillage of the soil, dairying, the production, cultivation, growing, and harvesting of any agricultural or horticultural commodities . . . , the raising of livestock, bees, fur-bearing animals, or poultry, and any practices [including forestry or lumbering operations] performed by a farmer or on a farm as an incident to or in conjunction with such farming operations, including preparation for market, delivery to storage or to market or to carriers for transportation to market. (pp. 549-550)

And the Internal Revenue Service (IRS; 2017) states that, “An individual is a *qualified farmer* . . . if at least two-thirds of his or her gross income from all sources . . . was from farming” (Qualified Farmer section, para. 1).

Farmer Masculine: the ways in which notions of farming help constitute notions of masculinity.

Farming Identity: characterized by being a “sturdy oak,” hardworking, self-reliant, and resilient individual, traits perceived by farmers to be in direct contrast to help-seeking for health issues (Drouillard et al., 2017; Perceval et al., 2017).

Farm Operator: The USDA and ERS (2017b) refer to a farmer as a *farm operator*, who “is the person who runs the farm, making the day-to-day management decisions,” and “could be an owner, hired manager, cash tenant, share tenant, and/or a partner” (para. 3).

Favorable-Intermediate-Risk Prostate Cancer: Those considered at favorable intermediate risk include patients with either a T2b to T2c clinically-staged tumor or PSA level from 10 to 20 ng/mL, as well as belonging to grade group one or two, and having less than half of the cores obtained from biopsy considered malignant (Mohler et al., 2019).

Gender: a fluid and (re)constructive behavioral process, whereby gendered acts occur based on varying social contexts in order to sexually categorize oneself as male or female (West & Zimmerman, 1987).

Gleason Grading System:

based entirely on the primary criteria of *architecture*, evaluated at low to intermediate magnification (using the 4× and 10× objective lenses). The grade of the most common (primary) pattern is added to the grade of the second most common (secondary) pattern. Patterns range from 1 to 5, with pattern 1 being the most differentiated. (Shevchuk & Robinson, 2013, p. 236)

The most recent system for grading prostate cancer was developed by Epstein and colleagues (2016) at the 2014 ISUP Consensus Conference, which developed five different groups based on Gleason scoring: Grade group one contains prostate cancer patients with Gleason scores of six or less; grade group two signifies a 3+4=7 Gleason score; grade group three contains those with a 4+3=7 Gleason score; grade group four contains those with 4+4=8 and 5+3=8 Gleason scores; and grade group five patients have Gleason scores of nine or 10 (Epstein et al., 2016).

Gleason Score:

The sum of the primary and secondary patterns is called the Gleason score and ranges from 2 to 10. An example is a Gleason score 7 (4 + 3) (primary pattern 4 + secondary pattern 3). Should only one pattern be present in the prostatic carcinoma that pattern is doubled to give the Gleason score. An example is Gleason score 6 (3 + 3). Reporting of the Gleason score, along with the primary and secondary patterns, is recommended because this gives valuable information to the treating physician. (Shevchuk & Robinson, 2013, p. 236)

HCP Appraisal, Investigations, Referrals, and Appointments: define the processes occurring during the diagnostic interval, where the healthcare provider first assesses the patient to decide about the potential diagnosis, which may also involve further testing and/or referrals to other healthcare providers (Scott et al., 2013).

Healthcare Provider and Symptom Factors: Elements related to how healthcare is accessed, delivered, and legislated (Scott et al., 2013).

Healthy People: “a set of goals and objectives with 10-year targets designed to guide national health promotion and disease prevention efforts to improve the health of all people in the United States” (USDHHS, ODPHP, 2010, p. 2).

Hegemonic Masculinity or Hegemony: Society’s most-exalted form of masculinity, which depending on who has the authority and power, is characterized as the most dominant and celebrated form of masculinity (Carrigan et al., 1985; Connell, 2015; Connell & Messerschmidt, 2005).

Help-Seeking Interval: the time elapsed from acknowledging the symptoms as a reason to talk with a healthcare provider to the first appointment with the provider concerning the symptom (Walter et al., 2012).

High-Grade Prostatic Intraepithelial Neoplasia (HGPIN): Despite having similar cellular characteristics to cancerous prostate tumors, distinguishes itself by having “a basal layer on the acini” (Carroll et al., 2019, p. MS-30). For HGPIN considered *multifocal*, patients should heed the same recommendations as those with atypia. Patients with HGPIN considered *focal* should abide by the same recommendations as those patients with benign biopsies (Mohler et al., 2019).

High-Risk Prostate Cancer: High-risk patients are those with any of the following disease characteristics: tumor clinically-staged as T3a (tumor extends beyond one or both sides of the prostate), belonging to grade group four or five, or having PSA levels above 20 ng/mL (Mohler et al., 2019).

Homosexual Rural: the wistful image of the “countryside” (i.e., rural) in the minds of both rural and urban gay men (Bell, 2006).

Horizontalization: listing and grouping statements that best relate to the study question and topic (Moustakas, 1994)

Horizons: meaningful textural descriptions of phenomena (Moustakas, 1994).

Identity: “pattern, location, and severity of somatic sensations/symptoms and their possible meaning or label” (Leventhal, Phillips, & Burns, 2016, p. 2).

Imaginative Variation: a four-step process requiring the researcher to employ imaginative and creative interpretations in order to develop structural descriptions of experiences (Moustakas, 1994).

Incentive Motivation: “the use and misuse of rewards and punishments to modify behavior” (McAlister et al., 2008, p. 171).

Intentionality: the intentional relationship between acts and objects (real or imaginary) of consciousness, inherently combining both noema and noesis, which constitute external and internal perceptions, respectively (Gurwitsch, 1967; Husserl, trans. 1931).

Intermediate-Risk Prostate Cancer: Those patients considered to be at intermediate-risk contain zero high- or very-high-risk characteristics, and have at least one intermediate risk factor (IRF), which include a T2b (palpable tumor comprised in more than 50% of one side of the prostate) to T2c (palpable tumor in both sides of the prostate) clinically-staged tumor, being in grade group two (Gleason score of 3+4=7) or three (Gleason score of 4+3=7), and having a PSA level anywhere from 10-20 ng/mL (Mohler et al., 2019).

Intersubjectivity: component of transcendental phenomenology underscoring the value of practicing empathy in learning about others (Husserl, trans. 1970a).

Large Central Counties/Inner Cities: contain the entire population [i.e. at least one million residents] of the largest principal city of the MSA; are completely contained in the largest principal city of the MSA; or contain at least 250,000 residents of any principal city of the MSA (Meit et al., 2014, p. 76)

Large Fringe/Suburban Counties: all counties of at least one million residents within an MSA but not part of the largest principal city of the MSA (Meit et al., 2014).

Large Rural/Micropolitan Counties: have populations of at least 10,000 but less than 50,000 residents (Meit et al., 2014).

Life Expectancy at Birth: “how long, on average, a newborn can expect to live, if current death rates do not change. . . . one of the most frequently used health status indicators” (OECD, 2018, para. 1).

Lower Urinary Tract Symptoms (LUTS): issues with urine storage, problems with voiding, and post-micturition difficulties (Abrams et al., 2003).

Low-Risk Prostate Cancer: Low-risk prostate cancer patients are in grade group one, with PSA levels under 10 ng/mL, and have a tumor clinically staged anywhere from T1 (tumor cannot be felt or clinically identified) to T2a (palpable tumor comprised in 50% or less of one side of the prostate; Mohler et al., 2019).

Masculine Farmer: the various ways in which masculinity is constructed within farmers.

Masculine Rural: “The various ways in which masculinity is constructed within what rural social scientists would recognize as rural spaces and sites” (Campbell & Bell, 2000, pp. 539, 540).

Masculinity: “the pattern or configuration of social practices linked to the position of men in the gender order, and socially distinguished from practices linked to the position of women” (Connell, 2015, p. 40).

Metropolitan Statistical Areas (MSAs): urban counties, or populations of at least 50,000 residents (Meit et al., 2014).

Midwestern: states considered part of the “East North Central” Midwest (i.e., Wisconsin, Illinois, Michigan, Ohio, and Indiana), and those located in the “West North Central” Midwest (i.e., Iowa, Nebraska, Missouri, South Dakota, North Dakota, Minnesota, and Kansas; Meit et al., 2014, p. 129).

Model of Pathways to Treatment: a theory presenting the “events, processes, and intervals that may occur in the period prior to the start of medical treatment and identifies the factors that may contribute to the duration of each interval” (Scott et al., 2013, p. 47).

Noncommunicable Diseases (NCDs): also referred to as chronic diseases, which generally last long periods of time and occur as a result of factors related to behavior, genetics, environment, and physiology (WHO, 2018).

Noema: Considered external perceptions (Gurwitsch, 1967; Husserl, trans. 1931), or the various meanings (i.e., noematic phases) of the textures of what one experiences (Husserl, trans. 1931; Ihde, 1977; Keen, 1975; Moustakas, 1994).

Noesis: Considered internal perceptions (Gurwitsch, 1967; Husserl, trans. 1931), or the various meanings of the structures of how one experiences something (Husserl, trans. 1931; Ihde, 1977; Keen, 1975; Moustakas, 1994).

Nonmetropolitan Statistical Areas (non-MSAs): rural counties, or populations with less than 50,000 residents (Meit et al., 2014).

Observational Learning: “learning to perform new behaviors by exposure to interpersonal or media displays of them, particularly through peer modeling” (McAlister et al., 2008, p. 171).

Outcome Expectations: “beliefs about the likelihood and value of the consequences of behavioral choices” (McAlister et al., 2008, p. 171).

Patient Appraisal and Self-Management: processes occurring throughout the appraisal interval, where once somatic issues are assessed, the individual may attempt to manage his/her issue in several ways (e.g., active monitoring, self-medicating, making lifestyle changes, or searching for layperson assistance).

Throughout the self-management process, sociocultural factors are extremely relevant, especially assistance from family members and friends (Scott et al., 2013).

Patient Factors: Individual patient characteristics, accompanying illnesses, prior experiences, and sociocultural and psychological factors related to the patient (Scott et al., 2013).

Pesticides: “any substance used to kill, repel, or control certain forms of plant or animal life that are considered to be pests” (NIH, National Institute of Environmental Health Sciences, 2019, para. 1).

Phenomenological Reduction: the second step of transcendental phenomenology, which involves bracketing, or placing the research topic and question in brackets, while setting aside all other aspects (Moustakas, 1994).

Phenomenon: “to bring to light, to place in brightness, to show itself in itself, the totality of what lies before us in the light of day” (as cited in Heidegger, 1977, pp. 74-75).

Planning and Scheduling of Treatment: processes occurring during the pre-treatment interval where discussions about treatment options occur, as well as subsequent treatment planning and scheduling (Scott et al., 2013).

Pre-Treatment Interval: the time elapsed from receiving an official diagnosis to the beginning of treatment (Walter et al., 2012).

Prostate Gland:

part of the accessory sex gland system in human males that synthesizes and secretes both organic and inorganic components of the seminal plasma. . . . a compact gland that extends from the bladder neck proximally to the external urethral sphincter complex at its distal apex.

(Costello & Corcoran, 2013, p. 11)

Prostate Cancer: occurs when prostate gland cells increase beyond control (ACS, 2019d).

Prostate-Specific Antigen (PSA): a protein made by normal and malignant prostate gland cells and largely present in semen with smaller levels in the blood (ACS, 2019c).

Prostate-Specific Antigen (PSA) Blood Test: This test measures the level of PSA in the blood in ng/mL. As the PSA level increases, the risk of prostate cancer does as well, but there is not a cutoff point for knowing with certainty that someone has or does not have prostate cancer (ACS, 2019c).

Radical Prostatectomy: excision of the prostate via surgery (Costello & Corcoran, 2013).

Reciprocal Determinism: “environmental factors influence individuals and groups, but individuals and groups can also influence their environments and regulate their own behavior” (McAlister et al., 2008, p. 171).

Relational Theory of Men’s Health: with perspectives in social constructionism and feminism, this theory:

suggests that health-related beliefs and behaviours, like other social practices that women and men engage in, are a means for demonstrating femininities and masculinities. . . . This theory proposes that health behaviours are used in daily interactions in the social structuring of gender and power. It further proposes that the social practices that undermine men's health are often signifiers of masculinity and instruments that men use in the negotiation of social power and status. (Courtenary, 2000b/2011, p. 141)

Rural: nonmetropolitan statistical areas with populations of less than 50,000 residents (Meit et al., 2014).

Rural Homosexual: the homosexual male (used loosely to signify men who have sex with men) previously or currently living in a rural space (Bell, 2006).

Rural Masculine: “the way in which notions of rurality help constitute notions of masculinity” (Campbell & Bell, 2000, pp. 539, 540).

Rural Masculinities: “the symbolic, discursive, or ideological constructions that we use to demarcate some things, some people, and some places as masculine rather than feminine” (Campbell & Bell, 2000, p. 539).

Self-Efficacy: “beliefs about personal ability to perform behaviors that bring desired outcomes”

McAlister et al., 2008, p. 171).

Self-Regulation: “controlling oneself through self-monitoring, goal-setting, feedback, self-reward, self-instruction, and enlistment of social support” (McAlister et al., 2008, p. 171).

Small Cell/Neuroendocrine Prostate Cancer: “a highly aggressive subtype of prostate cancer that may either arise de novo or much more commonly after hormonal therapy for prostate adenocarcinoma” (Beltran, Mosquera, & Rubin, 2013, p. 277).

Small Metro Counties: MSAs with populations of less than one million residents (Meit et al., 2014).

Small Rural/Non-Core Counties: non-MSAs with populations of less than 10,000 residents (Meit et al., 2014).

Social Cognitive Theory: a theory positing “that human behavior is the product of the dynamic interplay of personal, behavioral, and environmental influences” (McAlister et al., 2008, p. 170).

Social Cognitive Theory of Gender Role Development: a theory of gender differentiation explaining the determinants and mechanisms through which gender roles and behaviors are developed. The main sociocognitive channels influencing the lifelong development of gender roles, cognitions, and behaviors involve: observing and modeling, learning via direct teachings, and understanding the potential self and societal outcomes of specific gendered behaviors. Within each of these channels, sociocultural and institutional mechanisms, experiences, and resources impact gender differentiation, roles, and behaviors (Bussey & Bandura, 1999).

Social Constructivism: a worldview common in qualitative research, particularly phenomenology, where the researcher is concerned with obtaining a deeper knowledge of others’ lived experiences (Creswell & Creswell, 2018; Creswell & Poth, 2018).

Social Theory of Gender Relations: a theory concerned with:

the social subordination of women, and the cultural practices that sustain it; the politics of sexual object-choice, and particularly the oppression of homosexual people; the sexual division of labour; the formation of character and motive, so far as they are organised as femininity and masculinity; the role of the body in social relations, especially the politics of childbirth; and the nature and strategies of sexual liberation movements. (Connell, 1985, p. 261)

Timeline: “rate of illness onset; perception of illness duration and rates of decline” (Leventhal, Phillips et al., 2016, p. 2).

Time to Diagnosis: the time elapsed between first noticing a bodily change and once an official diagnosis has been made (Scott et al., 2013).

Time to Presentation: the time elapsed between first noticing a bodily change and the first visit to a healthcare provider, whether it be for the presumed symptoms or a preventive screening (Scott et al., 2013).

Time to Treatment: the time elapsed from first noticing a bodily change and starting curative or palliative treatment (Scott et al., 2013).

TNM Staging System: globally, the most often utilized cancer staging system by healthcare professionals; “based on the extent of the tumor (T), the extent of spread to the lymph nodes (N), and the presence of metastasis (M)” (AJCC, n.d., para. 7).

Traditional Masculinity: an “ideology . . . viewed as the dominant (referred to as ‘hegemonic’) form of masculinity that strongly influences what members of a culture take to be normative” (American Psychological Association, Boys and Men Guidelines Group, 2018, p. 6).

Transcendental Phenomenology: “a scientific study of the appearance of things, of phenomena just as we see them and as they appear to us in consciousness” (Moustakas, 1994, p. 49).

Unfavorable-Intermediate-Risk Prostate Cancer: Patients with a T2b to T2c clinically-staged tumor and a PSA level somewhere from 10-20 ng/mL, and/or belonging in grade group three, and/or having at least 50% malignant biopsy cores are considered at unfavorable intermediate risk (Mohler et al., 2019).

Very-High-Risk Prostate Cancer: Those considered as having very-high-risk disease will have a tumor clinically-staged anywhere from T3b (invasion of seminal vesicle(s) by tumor) to T4 (a fixed tumor or one invading nearby tissue or organs other than the seminal vesicles like the rectum, the wall of the pelvis, the external sphincter, levator muscles, and/or bladder), a value of five for primary Gleason pattern, or more than four biopsy cores considered as grade group four or five (Mohler et al., 2019).

Very-Low-Risk Prostate Cancer: Prostate cancer considered to be *very-low-risk* must meet all of the following criteria: T1c staging (tumor is not detectable via DRE and may be in both sides or just one side of the prostate), Gleason score of 6 or less (grade group one), PSA level below 10 ng/mL, PSA densities under 0.15 ng/mL/g, cancer present in two or less biopsy cores, and 50% or less of each cancerous biopsy is composed of prostate cancer (Mohler et al., 2019).

Chapter Two: Review of the Literature

The literature was organized and presented under the following major topics: (a) Global Life Expectancies at Birth (All Races), (b) United States (U.S.) Life Expectancies at Birth (All Races), (c) Leading Preventable Causes of Death in the U.S. (All Races), (d) Gender: Primary Determinant of Men's Health, (e) Masculinities and Farming, (f) Farmer Health, (g) Farmers' Healthcare-Related Help-Seeking and Utilization Beliefs and Behaviors, (h) Prostate Cancer, (i) Model of Pathways to Treatment and Time to Presentation (j) Moustakas and Transcendental Phenomenology, and (k) Summary.

Global Life Expectancies at Birth (All Races)

Life expectancy at birth (LEB) is used to estimate the average potential years of life to be lived by a population of people born in the same year, and it also is a good indicator of the general health, quality of life, and mortality of a population (Central Intelligence Agency [CIA], 2017; WHO, 2016c; Xu, Murphy, Kochanek, & Bastian, 2016). The average female and male LEB estimates in 2016 for 223 countries, territories, and small states/islands of the world was 75 and 70.1 years, respectively (72.5 years for both sexes; see Tables A1 and A2 in Appendix A for life expectancies at birth (years) in 2016; CIA, 2017; WBG, WB, 2017b), with a similar, earlier report estimating 2015 LEB for women and men to be 73.8 and 69.6 years, respectively (71.7 years for both sexes; UNDP, HDRO, 2016). With the exception of three sub-Saharan African countries (i.e., Mali, Swaziland, and Botswana) and a very small island in the Caribbean (i.e., Montserrat), women outlive men in every other country, territory, and small state/island in the world (CIA, 2017; UNDP, HDRO, 2016). CDs, and maternal, perinatal, and dietary/nutritional issues account for the majority of deaths in Mali, Swaziland, and Botswana, and despite men smoking considerably more and consuming more alcohol than women in each of these countries, women are much more likely to suffer from obesity and to die from NCDs such as CVD (specifically ischemic heart disease) and stroke (ischemic and hemorrhagic), and diabetes. Thus, female deaths due to CVD and diabetes may play a part in explaining the higher male LEB in each of these three countries (WHO, 2014c, 2015b, 2015f, 2015h, 2016a). Similarly, more women in Montserrat suffer and

die from diabetes than men, while also having more hypertension- and anemia-related hospitalizations, all perhaps playing a role in the LEB gender disparity with men (Pan American Health Organization, WHO Regional Office for the Americas, 2012).

Of the developing countries of the world, the low-income developing countries with the lowest LEB for women and men are Chad (51.5 years) and Guinea-Bissau (48.6 years), respectively, with Chad also having the lowest LEB for both sexes (50.2 years; CIA, 2017; UN, DESA, SD, 2017; WBG, WB, 2017b). The low-income developing country with the highest LEB for women is North Korea (74.5 years) and Nepal for men (70.1 years) and both sexes (70.7 years). The lower-middle-income developing country with the lowest LEB for both sexes and women is Swaziland (51.6 years for both sexes and 51 years for women), while Zambia has the lowest LEB for men (50.8 years) of the lower-middle-income developing countries. The lower-middle-income developing countries with the highest LEB for women, men, and both sexes are Sri Lanka (80.4 years), Tonga (74.7 years), and Morocco (76.9 years), respectively. Gabon is the upper-middle-income developing country with the lowest LEB for both sexes (52.1 years), women (52.5 years), and men (51.6 years), while Cuba has the highest LEB for both sexes (78.7 years) and men (76.4 years), with Panama having the highest LEB for women (81.6 years) of the upper-middle-income developing countries. The high-income developing country with the lowest LEB for both sexes (67.1 years), women (70.5 years), and men (63 years) is Nauru, while Singapore has the highest LEB for both sexes (85 years), women (87.8 years), and men (82.3 years) of the remaining high-income developing countries (CIA, 2017; UN, DESA, SD, 2017; WBG, WB, 2017b).

Of the developed countries of the world, excluding those belonging to the Organisation for Economic Co-operation and Development (OECD; 2017b), which contains members from 35 economically influential countries that play a role in the vast majority of global investing and trading (OECD, 2017a), Moldova is the low-income developed non-OECD country with the lowest LEB for both sexes (70.7 years), women (74.8 years), and men (66.9 years), and Ukraine is the low-income developed

non-OECD country with the highest LEB for both sexes (71.8 years), women (76.9 years), and men (67.1 years). Russia is the upper-middle-income developed non-OECD country with the lowest LEB for both sexes (70.8 years), women (76.8 years), and men (65 years), while Albania has the highest LEB for both sexes (78.3 years), women (81.2 years), and men (75.7 years) of the remaining upper-middle-income developed non-OECD countries. The high-income developed non-OECD country with the lowest LEB for both sexes (72.4 years) and women (75.2 years) is Greenland and Lithuania for men (69.5 years), while Monaco has the highest LEB of the remaining high-income developed non-OECD countries for both sexes (89.5 years), women (93.5 years), and men (85.6 years). Lastly, of the high-income developed OECD countries, Latvia has the lowest LEB for both sexes (74.5 years), women (79.3 years), and men (69.9 years), while Japan has the highest LEB for both sexes (85.1 years), women (88.5 years), and men (81.7 years; CIA, 2017; OECD, 2017b; UN, DESA, SD, 2017; WBG, WB, 2017b).

The country with the greatest gender disparity for LEB is Russia, where women live nearly 12 years longer than men (CIA, 2017). Nearly three out of every five Russian men smoke tobacco compared to one out of every four women, and men also consume more than three times the amount of alcohol compared to women (WHO, 2014c). These behaviors and others have significantly contributed to an increase in overall Russian male mortality and years of life lost, especially due to issues such as CVD (e.g., cardiomyopathies), cancer (e.g., lip and oral, pharyngeal, esophageal, stomach, liver, tracheal, bronchial, lung, kidney, bladder, and laryngeal), HIV/AIDS, cirrhosis of the liver, respiratory issues (e.g., chronic obstructive pulmonary disease [COPD], lower respiratory infections, and tuberculosis), injuries (e.g., road accidents, drownings, poisonings, falls, fire-, temperature-, and mechanical-related incidents, self-harm, and violence), neonatal and congenital issues, and alcohol- and drug-use disorders (Kossova, Kossova, & Sheluntsova, 2017; Leon et al., 1997; Naghavi et al., 2015; Peto, Lopez, Boreham, Thun, & Heath, 1992; WHO, 2016a; Zaridze et al., 2009).

CDs, NCDs, and injuries help explain life expectancies (WHO, 2015e, 2016a). Of the world's more than 7.3 billion people in 2015, males outnumbered females by more than 65.5 million and accounted for more deaths due to all causes (53.5%), CDs (52.8%), NCDs (52%), and injuries (67.2%), findings that help explain why men die almost five years before women globally. In 2015, an estimated 21.2% of global deaths were caused by CDs, and maternal, perinatal, and nutritional conditions, which totaled close to 12 million people. However, in Chad, where LEB is the lowest in the world for both sexes and women, these rates were 65.6% for both sexes and 67.7% for women, and in Guinea-Bissau, which has the world's lowest LEB for men, nearly 63.3% of male deaths are caused by CDs, perinatal, and nutritional conditions (CIA, 2017; WHO, 2016a). Deaths related to CDs, and maternal, perinatal, and nutritional conditions tend to occur at earlier ages than deaths from other causes (e.g., NCDs), thus resulting in a higher percentage of years of life lost in a population (WHO, 2015c). Eight out of the 10 leading causes of death for both sexes (i.e., lower respiratory infection, diarrheal disease, HIV/AIDS, birth asphyxia/trauma, preterm birth complications, malaria, meningitis, and protein-energy malnutrition) and women (i.e., lower respiratory infection, diarrheal disease, HIV/AIDS, maternal conditions, preterm birth complications, malaria, birth asphyxia/trauma, and meningitis) living in Chad are related to CDs, and maternal, perinatal, and nutritional conditions. These eight causes of death account for 52.7% of all deaths in the country for both sexes and 56.6% for all female deaths. Among the leading causes of death for men living in Guinea-Bissau, eight out of the top 10 of these causes (i.e., lower respiratory infections, HIV/AIDS, tuberculosis, diarrheal disease, birth asphyxia/trauma, preterm birth complications, neonatal sepsis/infections, and malaria) can be attributed to CDs, perinatal, and nutritional conditions and account for 59.2% of all male deaths (WHO, 2016a).

Of the 56.4 million global deaths occurring in 2015, more than 39.5 million of these deaths (70.1%) were due to NCDs (e.g., CVD, cancer, CRDs, and diabetes), which are largely influenced by modifiable risk factors such as tobacco use, unhealthy diet, physical inactivity, alcohol abuse, and

elevated blood pressure, glucose, and cholesterol (WHO, 2016a, 2016d). Around 56.7% of the total number of 2015 deaths were caused by the four aforementioned diseases, with nearly 31.4% due to CVD (15.7% women; 15.7% men), 15.5% to cancer (6.7% women; 8.8% men), 6.9% to CRDs (3.2% women; 3.8% men), and 2.8% to diabetes (1.5% women; 1.3% men). Roughly 81% of all deaths due to NCDs (42.2% men; 38.6% women) were caused by these four diseases as well: 44.7% due to CVD (22.4% women; 22.4% men), 22.2% to cancer (9.6% women; 12.6% men), 9.9% to CRDs (4.5% women; 5.4% men), and 4% to diabetes (2.2% women and 1.8% men; WHO, 2016a).

As previously stated, of all countries in the world (no matter the development-, income-, or OECD-status), Monaco has the highest LEB for both sexes (89.5 years), women (93.5 years), and men (85.6 years; CIA, 2017; OECD, 2017b; UN, DESA, SD, 2017; WBG, WB, 2017b), which was highlighted and praised by WHO Regional Director for Europe, Dr. Zsuzsanna Jakab, at a special 2016 meeting of small European countries in Monaco (WHO, 2017c). In 2012, along with the other 52 member states of the European Region, Monaco, represented by Ms. Carole Lanteri and Dr. Anne Nègre, elected to adopt the Health 2020 public health policy framework (WHO, 2012b), which has the following aims: “significantly improve the health and well-being of populations, reduce health inequalities, strengthen public health and ensure people-centred health systems that are universal, equitable, sustainable and of high quality” (WHO, 2013a, p. 11). The following year, Monaco and seven other countries (with populations of less than one million) in the European Region formed the small countries initiative (WHO, 2013b), which met one year later and resulted in the “San Marino Manifesto,” an agreement outlining the key commitment areas of the small countries initiative for the WHO Regional Office for Europe (WHO, 2014b, 2014d). San Marino plays a particularly important role in this process as they were the first of these eight countries to fully align their country’s health plan with Health 2020 (WHO, 2015a), and dating back to 2012, San Marino’s Minister of Health and Social Security, National Insurance and Gender Equality, Claudio Podeschi, signed an agreement with the WHO Regional Office for Europe to develop and support a five-

year project (WHO, 2012a), which would later be known as the small countries initiative (WHO, 2013b). In 2016, the small countries initiative met in Monaco, producing the “Monaco Statement,” which reaffirmed the small countries initiative’s commitment to improving the health of all people and the environment by continuing to adhere to the agendas of Health 2020 and the 2030 Sustainable Development Goals (SDGs; WHO, 2017), with SDGs being an agreement that Secretary-General of the United Nations, Ban Ki-Moon stated “is a road map for people and the planet . . . to integrate and balance the three dimensions of sustainable development – economic, social and environmental – in a comprehensive global vision” (UN, DESA, SD, 2016, p. 2).

Part of an urban principality of 30,581 people (51.4% female; 48.6% male), comprised of a 55% immigrant population, with a pleasing climate, beautiful landscape, exceptional tourism industry, 2% unemployment rate, no income tax, bordered by the southeastern part of France, Italy and the Mediterranean Sea, and with the highest population density of any country in the world, Monacans enjoy the highest LEB in the world (CIA, 2017; Monaco, 2017). Monaco has historically placed public health funding, promotion, education, prevention, screening, collaboration, and infrastructure at the core of its health framework, focusing on vulnerable populations (e.g., young, older people, and those with disabilities), families, youth risk behaviors (e.g., unsafe sex, smoking tobacco, and drug use), school health (free annual medical and dental care for children), worksite health and safety, mental health, CDs and NCDs, medical emergency and disease outbreak monitoring and preparedness, and cooperative public and private social security agreements with France and Italy (Monaco, 2017; WHO, 2014b, 2015g, 2016b, 2017a).

Tracking extensive public health data on the residents of Monaco is difficult due to a couple critical reasons: As many as 45,000 – 50,000 workers commute to Monaco on a daily basis (WHO, 2015g, 2017a); however, only around 18,000 live there, and Monaco and France have agreements stating that residents from each country can receive healthcare in either country (WHO, 2015g). Despite these data-

monitoring issues, WHO (2014b) reported that 86% of deaths in Monaco can be attributed to NCDs, 8% to injuries, and 6% to CDs. The majority of NCD mortality is due to CVD (33%) and cancer (28%), with 5% and 2% of Monacans dying from CRDs and diabetes, respectively (2014b), despite other WHO (2014a) research reporting a 0% prevalence rate of diabetes in Monaco. Regardless, compared with the WHO (2016a) rates mentioned above, Monacans have a greater proportion of overall NCD deaths and deaths due to CVD and cancer.

So, why do those living in Monaco have the longest LEB compared to all other countries in the world? One plausible explanation could be that the stronger one adheres to a Mediterranean-style diet pattern, which is based on a primary intake of complex carbohydrates, legumes, seeds, nuts, vegetables, fruits, a moderate intake of fish, low- to moderate- red wine consumption when dining, and olive oil as the primary fat source (Bach et al., 2006), the more significant the reduction in all-cause mortality (8%), CVD (10%), cancer (6%), and neurodegenerative diseases (13%; Sofi et al, 2010). A study of older Americans following four similar versions of the Mediterranean diet found that mortality rates for all-causes, CVD, and cancer were reduced anywhere from 12-28% for both men and women (Reedy et al., 2014). Other explanations could be that Monaco was the only country reporting zero traffic-related deaths in 2013; has the highest skilled health worker density in the world, with 266.3 health workers per 10,000 population; is the only country in the world (besides Barbados) with a tuberculosis incidence of zero; is tied with Italy, Denmark, and Austria for the 10th lowest mortality rate for children less than five years of age (3.5 per 1,000 live births) and is tied with Belarus for the 10th lowest neonatal mortality rate (1.9 per 1,000 live births); has the 12th lowest air pollution levels in the world; is one of just 24 countries that delivers all three vaccinations for preventing hepatitis B to 99% of all infants and is one of only 29 countries delivering the required vaccinations for diphtheria, tetanus, and pertussis to 99% of all infants; is one of 51 countries that delivers safe and improved drinking-water sources to 100% of its residents and is one of 23 countries providing improved sanitation services to 100% of its residents; is one of 79

countries where more than 95% of the population relies on clean household energy; and is tied with Canada for the 15th highest proportion of its government spending going towards the health of its inhabitants at 18.8% (WHO, 2017d).

Certainly, these lifestyle eating patterns and impressive health achievements are partially to credit for the long LEB for those living in Monaco, a country where LEB has increased by a quarter-of-a-century over the last 100 years (WHO, 2017c). Furthermore, and arguably the most important reason for the health achievements mentioned above, Monaco's universal healthcare system operates under "life-course" and "salutogenic" approaches, which have been modeled after the European Region's Health 2020 and San Marino's national health plan frameworks (WHO, 2013a, p. 60, 2015a, p. 12, 2017a). Monaco implements the life-course approach in-much-the-same-way as described by Ben-Shlomo and Kuh (2002): caring for all its inhabitants from gestation to death and across generations, focusing on chronic disease and the social determinants of health, with Monaco also placing a particularly special emphasis on caring for its older population (Monaco, 2015, 2017; WHO, 2017c). The salutogenic model places health promotion at its foundation, where health is viewed on a spectrum and "salutary" factors are prioritized rather than just risk factors. This holistic approach to health promotion emphasizes assisting individuals in their efforts toward better health (Antonovsky, 1996, p. 14). The WHO (2015c) and its former Director-General, Dr. Margaret Chan (WHO, 2017b), firmly stated that access to quality healthcare and universal health coverage (UHC) should be considered "the linchpin . . . to promote physical and mental health and well-being, and to extend life expectancy for all" (pp. iii, 8). Worldwide, countries have been urged to accomplish UHC for all, where individuals have access to quality, affordable, vital, and safe healthcare services, medication, and vaccines (WHO, 2015c). As Monaco continues to actively practice, lead, and thrive in these endeavors, while also improving, innovating, and strengthening in others, such as in the improvement of their public health information data reporting system via the establishment and implementation of the Small Countries Health Information Network

(SCHIN), as well as in the innovative medical and environmental research taking place through the Scientific Centre of Monaco, (Scientific Centre of Monaco, 2017; WHO, 2017c), and even in the building of stronger individual, community, and societal resilience by following the examples of three of the countries in the small countries initiative (i.e., Malta, San Marino, and Iceland; WHO, 2017a), all of these efforts will continue to play decidedly important roles in explaining why its inhabitants have the longest LEB in the world.

The high-income developed OECD country with the longest LEB for both sexes, women, and men is Japan, where the average LEB for both sexes is 85.1 years, and for women and men is 88.5 and 81.7 years, respectively (CIA, 2017; OECD, 2017b; UN, DESA, SD, 2017; WBG, WB, 2017). Japan also has the highest life expectancy at 60 years-of-age at 25.8 years (tied with Hong Kong) and the highest median age (46.5 years), with Japanese women having the longest life expectancy at age 50 of all other women in the world at 37.7 years (UNDP, HDRO, 2016). What factors may help play a role in the long LEB for those living in Japan? First, and interestingly enough, those living in Japan have a greater proportion of deaths due to NCDs when compared to the rest of the world for both sexes (81.8% to 70.1%), women (82.6% to 72.4%), and men (81% to 68.1%). Furthermore, of all deaths in Japan, 40.3% and 41.5% are due to NCD deaths in women and men, respectively, whereas global rates are 33.7% from women and 36.4% from men. When comparing Japanese mortality rates from CDs and maternal, perinatal, and nutritional conditions, NCDs, and injuries between sexes, Japanese men account for higher proportions in all three categories: 50.5% to 49.5% for deaths due to CDs and maternal, perinatal, and nutritional conditions; 50.7% to 49.3% for deaths due to NCDs; and 60.5% to 39.5% for injury deaths. World averages have similar trends, as far as men accounting for a higher proportion of deaths in all three categories; however, the numbers are slightly higher: 52.8% for deaths due to CDs and maternal, perinatal, and nutritional conditions; 52% for deaths due to NCDs; and 67.2% for injury deaths.

Additionally, men account for roughly 51.2% of total deaths in Japan, whereas 53.5% of total global deaths are men (WHO, 2016a).

As far as deaths from the four previously mentioned specific diseases, around 67.5% of all deaths in Japan (35.4% men; 32.1% women) are due to CVD (27.8%), cancer (30.1%), CRDs (8.5%), and diabetes (1.1%), which is higher than the global proportion of 56.7% (CVD [31.4%], cancer [15.5%], CRDs [6.9%], and diabetes [2.8%]), consisting of 29.6% men and 27.1% women. Japanese men account for more cancer, CRDs, and diabetes deaths than women (17.5% to 12.6%; 4.9% to 3.6%; and 0.58% to 0.56%, respectively), but Japanese women account for more CVD deaths (15.4% to 12.4%). On a global scale, women and men account for an equal make up of CVD deaths (15.7% each), with men having higher rates for cancer (8.8% to 6.7%) and CRDs (3.8% to 3.2%), and women with a slightly higher rate for diabetes (1.5% to 1.3%). When considering only NCD deaths in Japan, 82.6% (43.1% men; 39.5% women) are due to these four diseases (CVD [34%], cancer [36.8%], CRDs [10.4%], and diabetes [1.4%]). For all countries of the world, these four diseases make up 81% (42.2% men; 38.6% women) of all NCD deaths (CVD [44.7%], cancer [22.2%], CRDs [9.9%], and diabetes [4%]), and in similar fashion to the information mentioned above, when compared with Japanese women, Japanese men account for higher proportions of NCD deaths due to cancer (21.4% to 15.4%), CRDs (5.9% to 4.5%), and diabetes (0.71% to 0.68%), with women accounting for a higher proportion of NCD deaths due to CVD (18.9% to 15.1%), and globally, women and men make up equal amounts of deaths due to NCDs for CVD (22.4% each), but men make up a larger proportion of NCD deaths than women for cancer (12.6% to 9.6%) and CRDs (5.4% to 4.5%), with women accounting for more NCD deaths due to diabetes than men (2.2% to 1.8%; WHO, 2016a).

WHO (2017c) data from 2015 indicated that the possibility of dying from CVD, cancer, CRDs, or diabetes between 30 and 70 years-of-age in Japan is 8.8%, which is the 3rd lowest rate in the world, trailing only Switzerland at 8.7% and South Korea and Iceland (both at 8.3%). Additionally, 14.7% of

female NCD deaths and 27.2% of male NCD deaths occur before the age of 70, tying Japanese women with German and Swedish women for the 4th lowest rate in the world, with Japanese men having the 5th lowest rate in the world. When ranking (by country) age-standardized deaths rates (per 100,000 persons) from all NCDs as well as from CVD, cancer, CRDs, and diabetes, Japan's long LEB is further understood. First, Japanese women have the lowest *age-standardized death rates* (ASDRs) from all NCDs and CVD in the world, at 173.5 and 58.9, respectively, while having the 2nd lowest ASDR for diabetes, at 2.5, trailing only Belarus. Japanese women's ASDRs for CRDs (8.9) and cancer (73.2) rank 15th (tied with Belize) and 26th, respectively. Japanese men have the 2nd lowest ASDRs for all NCDs and CVD, at 333.3 and 108, respectively, trailing Singapore for all NCDs and Israel for CVD. Men in Japan also have an ASDR for diabetes of 5.4, which is the 7th lowest rate in the world, while ranking 29th and 109th, respectively, for ASDRs for CRDs (26.2) and cancer (144.9; WHO, 2014a).

As previously mentioned, the four primary NCDs of interest (described above) are largely influenced by the following modifiable risk factors and their prevalence: tobacco use, unhealthy diet, physical inactivity, alcohol abuse, overweight and obesity, and elevated blood pressure, glucose, and cholesterol levels (WHO, 2016d, 2016e). The 2011 tobacco smoking prevalence rates for those ages 15 years and above in Japan for both sexes, women, and men were 22%, 11%, and 34%, respectively (WHO, 2015d), which when compared to 2012 global rates (due to no 2012 data for Japan) rank 37th, 43rd, and 48th lowest out of 104 countries, respectively. Japanese tobacco smoking rates were similar for WHO (2017c) data from 2015, where 33.7% of men and 10.6% of women ages 15 and over were considered tobacco smokers. Concerning alcohol consumption (age-adjusted) of those 15 years and older from 189 countries, Japanese women and men consumed an average of 4.2 and 10.4 liters of pure alcohol in 2010, respectively, which ranked 41st (tied with Brazil, Malta, South Africa, and Uruguay) and 66th lowest, respectively. In 2012, both sexes in Japan consumed an average of 6.6 liters of pure alcohol, which ranked 55th lowest (tied with the Dominican Republic). Japan ranks even worse when it comes to heavy

drinking episodes, showing that out of 183 countries, 18.4% of both sexes, 6.6% of women, and 30% of Japanese men have had a heavy drinking episode within the previous month, ranking 88th (tied with Burkina Faso), 43rd, and 102nd lowest (tied with Rwanda and Portugal), respectively. The rankings do improve for Japan as far as alcohol disorders, which show prevalence rates of 3.3% for both sexes, 1.2% for women, and 5.3% for men, ranking 27th, 13th (tied with Romania), and 30th lowest out of 189 countries, respectively. In 2008, Japan ranked poorly in terms of age-adjusted elevated (i.e., ≥ 5 mmol/L) TBC for those ages 25 years and above, with both sexes tied with Poland and Cyprus (out of a total of 189 countries) for the 141st lowest prevalence (57.1%); WHO, 2011a). Japanese women's 55.7% prevalence of elevated TBC ranked 136th lowest (tied with Kuwait; WHO, 2011b), and men in Japan ranked 142nd lowest (tied with Qatar, Slovenia, and New Zealand), with a prevalence of 58.2% (WHO, 2011c). For those 25 years-old and above with high age-adjusted TBC levels (i.e., ≥ 6.2 mmol/L), Japan has a prevalence rate of 15.8% for both sexes (tied with Bahrain for the 93rd lowest), 15.7% for men (tied with Brunei Darussalam for 96th lowest), and 15.8% for women, tying Belarus for the 89th lowest female rate in the world (WHO, 2008). Of 146 countries measured for physical inactivity for those 18 years and above in 2010 (age-adjusted), Japanese prevalence rates for both sexes (33.8%), women (36.5%), and men (31.1%) ranked 86th, 82nd, and 97th lowest, respectively. Japan has similar rankings for 2014 age-adjusted elevated blood pressure prevalence for those 18 years and above, with both sexes ranked 73rd out of 191 countries (prevalence of 7.5%), 5.7% of women had high blood pressure levels (66th), and the 9.4% rate in men placed them in the 81st lowest position in the world. Age-adjusted elevated fasting blood glucose levels in 2014 for those 18 years and above indicated much better outcomes for Japan, ranking both sexes with the 20th lowest prevalence (25.7%) out of 189 countries (tied with Guinea, Spain, and Niger), and the female and male rates of 23.1% and 28.3%, respectively, ranked them 12th and 33rd lowest, respectively, with men also being tied with Benin, Bulgaria, Sri Lanka, the U.S., South Korea, and Mali. As far as overweight and obesity (as measured by body mass index [BMI]), Japan ranks

very well globally, especially women. The 2014 average BMI for both sexes (22.6), women (21.7), and men (23.6) in Japan rank 16th (tied with Laos, Myanmar, and Zambia), 5th, and 27th (tied with Thailand) of 191 countries, respectively. Considering those 18 years and older who are overweight (BMI \geq 25 [age-adjusted]) in 2014, Japan ranks 21st for both sexes (24.2% overweight), 3rd for women (19.7% overweight), and 29% of men are overweight, which is the 50th lowest rate in the world of 191 countries. Of the same population, the age-adjusted obesity rates (BMI \geq 30) for both sexes (3.3%), women (3.2%), and men (3.4%) rank 6th (tied with Nepal), 2nd (tied with Timor-Leste), and 18th (tied with Sri Lanka and Zambia), respectively (WHO, 2014a).

The final primary modifiable risk factor associated with the four NCDs mentioned above that will be discussed is diet, which Japan bases on the “Japanese food guide spinning top,” which recommends ample amounts of physical activity, tea, and water, at least five servings each of both grains and vegetables, three to five servings of fish, soy, and/or meat, just two servings each of both fruit and dairy products, and limited intake of sugary-drinks, sweets, salt, and fat (Food and Agriculture Organization of the United Nations, 2017, para. 6). Ischemic or coronary heart disease (CHD) is the leading cause of death in the world, accounting for 15.5% of all deaths, but Japan currently has the 3rd lowest CHD mortality rate among all high-income developed OECD countries at 11.9%, just behind Portugal and France (OECD, 2017b; UN, DESA, SD, 2017; WBG, WB, 2017; WHO, 2016a). The high consumption of omega-3 fatty acids in the Japanese diet via fish intake helps protect from CVD (Miyagawa et al., 2014; USDHHS, NIH, Office of Dietary Supplements, 2016), and with soy-based foods also being a staple in Japan, Yamori and colleagues (2017) found an inverse relationship between fish and soy consumption and CHD risk factors in a large sample of 30 to 79 year-olds living in Japan (a CHD-protective effect primarily due to increases in high-density lipoprotein cholesterol [HDL-C] and folate), with the authors concluding this relationship as a major reason for Japan having the highest LEBs in the world. Similarly, Okuda et al. (2015) found an inverse relationship between vegetable and fruit consumption and deaths

from CVD, showing that as vegetable and fruit intake increases, so does the intake of fish, dairy, legumes, soy, fiber, protein, and potassium, with meat consumption declining. As Japanese men and women age, their consumption of vegetables, fruits, fish, and beans increase, while fats, oils, meat, and wheat intake decreases; however, younger generations show the opposite consumption patterns (Otsuka et al., 2014). In regard to Japanese women, diets with increased dairy consumption and/or low in carbohydrates have protective effects against CVD-related morbidity and mortality (Kondo et al., 2013; Nakamura et al., 2014). Also, Japanese women use mineral supplements at higher rates (e.g., iron and calcium) than men, behaviors linked to healthier eating and physical activity practices (Sato et al., 2016). Another effective dietary behavior for decreasing NCD morbidity and mortality and ultimately increasing LEB is restricting calories, which triggers sirtuin activity and can promote longevity (Alcain & Villalba, 2009; Winnik et al., 2015). Colman and colleagues (2009) provided evidence of the direct relationship between calorie restriction and NCDs in a 20-year longitudinal study of rhesus monkeys, showing calorically restricted monkeys to have higher long-term survival rates and fewer cases of NCDs (i.e., CVD, cancer, diabetes, and dementia-related disease) than those who were not on caloric restrictions. Similar findings occurred in Nagai and colleagues' (2016) follow-up study of Japanese adults, showing that women and men with low-calorie diets resulted in fewer CHD deaths, as well as less all-cause and cancer-related male deaths, and the authors stated that "these findings partly support the animal evidence and imply that caloric restriction might also decrease mortality in humans" (p. 348). Further support of low-energy diets and longevity comes from Willcox and colleagues' (2007) study of older individuals from Okinawa, Japan, who experience some of the longest lives and healthiest aging in the world. When older Okinawans were compared to the general Japanese and American populations, those from Okinawa showed the following: more calorically-restrictive diets (without malnutrition), physical activity, and energy deficits; lower BMIs across the lifespan; higher dehydroepiandrosterone (DHEA) plasma levels when older, a beneficial physiological adaptation in response to calorie restriction

(Lane et al., 1997; Willcox et al., 2007); decreased mortality due to NCDs (i.e., CHD, lymphoma, and breast, colon, and prostate cancer), and increased life expectancy (Willcox et al., 2007). If current aging trends continue in Japan, at least half of the individuals in each yearly birth cohort since the year 2000 will live to be more than 100 years-old, with at least 50% of those born in 2007 projected to live up to 107 years (K. Christensen et al., 2009).

From 1950 until 2016, average global LEB for both sexes has increased from nearly 47 years to 72.5 years, an estimated increase of 25.5 years, with LEB increasing during every five-year increment during this time period. Not only has the global LEB for both sexes significantly increased since 1950, but female global LEB has increased nearly 26.7 years, from 48.3 years to 75 years, and male global LEB has increased nearly 24.7 years, from 45.4 years to 70.1 years (CIA, 2017; UN, 2015). Although global LEBs have increased for men and women every five years since 1950, men have had shorter LEBs at each five-year increment. From 1950 until 2015, men have lived an average of roughly four years less than women (UN, 2015). Gender disparities in global LEBs is significant for nearly every country throughout at least the last 65 years, revealing that women live longer than men in over 98% of countries, territories, and small states/islands around the world (CIA, 2017; UN, 2015). This paper will further explore this topic by focusing on the U.S.

U.S. Life Expectancies at Birth and the Leading Causes of Death (All Races)

The U.S. LEB for both sexes combined was at an all-time high in 2012, at 78.8 years (Murphy, Kochanek, Xu, & Heron, 2015), an increase of 0.1 years from 2011 (Arias, 2015); however, LEB for both sexes combined has remained unchanged through 2014 (Murphy, Kochanek, Xu, & Arias, 2015). Since 2010, women have continued to live 4.8 years longer than men (Murphy, Kochanek, Xu, & Heron, 2015), and in 2014, the LEB for women was 81.2 years and for men was 76.4 years (Murphy, Kochanek, Xu, & Arias, 2015). When considering all 50 states in the U.S. and Washington, D.C., women have higher life expectancies at birth in every location. In fact, the smallest disparity in LEB is 3.8 years in Utah, where

women live 82.1 years and men live 78.3 years. The greatest gender disparity for LEB is 7.3 years in Washington, D.C., where women live 80.1 years and men live 72.8 years. The states with the highest life expectancies at birth for men and women are Minnesota and Hawaii, respectively, where men live 78.7 years in Minnesota and women live 84.7 years in Hawaii. The state with the highest LEB for both sexes combined is Hawaii at 81.3 years. The state with the lowest life expectancies at birth for men and women is Mississippi, where men live 71.9 years and women live 78 years. Mississippi is also the state with the lowest LEB for both sexes combined, which is 75 years (KFF, 2016).

The primary global public health challenge of this century are NCDs (Hunter & Reddy, 2013), and four specific disease groups (i.e., CVD, cancer, CRDs, and diabetes) account for roughly eight out of every 10 global NCD deaths (Lozano et al., 2012). In the U.S., 10 of the 15 leading causes of death for both sexes are considered NCDs (Lozano et al., 2012; Murphy, Kochanek, Xu, & Heron, 2015), and seven of these NCDs are in the top 10 leading causes of death (i.e., CVD, cancer, CRDs, stroke, Alzheimer's disease, diabetes, and kidney disease; Murphy, Kochanek, Xu, & Heron, 2015). From 2010 to 2012, the top 10 leading causes of death for both sexes in the U.S. remained the same:

1. CVD;
2. cancer;
3. CRDs;
4. stroke;
5. unintentional injuries;
6. Alzheimer's disease;
7. diabetes;
8. influenza and pneumonia;
9. kidney disease; and
10. suicide (Murphy, Kochanek, Xu, & Heron, 2015; Murphy, Xu, & Kochanek, 2013).

In 2014, stroke and unintentional injuries traded ranks, as well as influenza and pneumonia and kidney disease; however, more importantly, over 72% of all U.S. deaths were attributed to the seven NCDs on the above list. The proportion of deaths from CVD, cancer, and CRDs are 30.7%, 22.5%, and 5.6%, respectively, and 2.9% from diabetes (Murphy, Kochanek, Xu, & Arias, 2015; NSVR, 2015). Stroke, Alzheimer's disease, and kidney disease account for the remaining percentage (slightly over 10 percent) of total deaths due to the seven aforementioned NCDs. The U.S. age-adjusted death rate for all causes is 724.6, while the age-adjusted death rates for CVD and cancer are 167.0 and 161.2, respectively, and 40.5 and 20.9 for CRD and diabetes, respectively. Stroke, Alzheimer's disease, and kidney disease have age-adjusted death rates of 5.1, 3.6, and 1.8, respectively (Murphy, Kochanek, Xu, & Arias, 2015).

As of 2013, the total U.S. population was estimated to be nearly 316.5 million people (USDC, USCB, PD, 2015), and roughly 2.6 million of those individuals died, 50.1% were men and 49.9% were women (NSVR, 2015). Of all the U.S. deaths, over 15.4% and 15.2% were attributed to male and female CVD deaths, respectively. Additionally, 12% of men and 10.6% of women died from cancer, 2.6% of men and 3% of women died from CRDs, 2.1% of men and 2.9% of women died from stroke, 1% of men and 2.27% of women died from Alzheimer's disease, 1.5% of men and 1.4% of women died from diabetes, and 0.9% of men and 0.9% of women died from kidney disease (NSVR, 2015).

Most male and female deaths in the U.S. are due to NCDs (Murphy, Kochanek, Xu, & Arias, 2015); roughly 70.6% of male deaths are due to the seven NCDs mentioned above, and 73.2% of female deaths are due to these same NCDs (NSVR, 2015). Overall, the WHO (2014c) estimated that 88% of U.S. deaths are due to NCDs. When examining global life expectancies at birth in specific locations of interest, in order to compare men and women, the author focused on the top four NCD killers in the world (i.e., CVD, cancer, CRDs, and diabetes; WHO, 2014a) and their associated primary modifiable risk factors (i.e., tobacco use, unhealthy diet, physical inactivity, alcohol abuse, and elevated blood pressure, glucose, and cholesterol; WHO, 2016d), as well as overweight and obesity (WHO, 2016e). Life

expectancies at birth for men and women in the U.S. can also be explained by these four NCDs and eight modifiable risk factors. Additionally, since seven out of the 10 leading causes of death in the U.S. are due to NCDs, the author will also focus on the following NCDs: stroke, Alzheimer's Disease, and kidney disease (Murphy, Kochanek, Xu, & Heron, 2015), in order to compare men and women in the five states previously mentioned in this section. The following section will report U.S. data and statistics about the eight modifiable risk factors and their association with the top seven NCDs in the U.S. and in the five states mentioned at the beginning of this section (i.e., Utah, Washington, D.C., Minnesota, Hawaii, and Mississippi).

Leading Preventable Causes of Death in the U.S. (All Races)

Tobacco use.

Tobacco use, particularly tobacco smoking, was first causally linked to NCDs (i.e., lung cancer and chronic bronchitis) and premature death more than 50 years ago (USDHEW, USPHS, Surgeon General's Advisory Committee on Smoking and Health, 1964) and is now linked to NCDs occurring in nearly every bodily organ (USDHHS, CDC, NCCDPHP, OSH, 2010, 2014). Tobacco smoking continues to be one of the top primary cause of preventable death, and is the leading cause of lung cancer, which remains the leading cause of cancer death for all sites and ages (Siegel et al., 2016; USDHHS, CDC, NCCDPHP, OSH, 2014). From 2005 to 2009, men and women 35 years of age and older experienced over 480,000 early deaths annually due to tobacco smoking and tobacco smoke exposure. Out of these yearly death averages, nearly 279,000 were men and almost 202,000 were women (USDHHS, CDC, NCCDPHP, OSH, 2014). Results from the 2014 National Health Interview Survey (NHIS; USDHHS, CDC, DHIS, NCHS, 2015) concerning adults (those 18 years of age and older) indicated that almost 19% of men and 15% of women were current cigarette smokers, totaling 40 million people (Jamal et al., 2015). When examining overall tobacco use (i.e., cigarettes; cigars, cigarillos, and small cigars; chewing tobacco, snuff, and dip; water pipes; snus; and pipes), 32.2% of men and 18.5% of women are considered users (King, Dube, & Tynan, 2012). Among 25-79-year-old current smokers and nonsmokers, current male smokers have only

a 26% probability of living to the age of 80, while nonsmoking males have a 61% chance; current female smokers have a 38% probability of living to the age of 80, and nonsmoking females have a 70% chance. Furthermore, male and female smokers have a relative risk (RR) of death three times that of nonsmokers, and their life expectancies on average, will be 10 years less than their nonsmoking counterparts (Jha et al., 2013).

Of the five states mentioned in the beginning of this section, Utah and Washington, D.C. have the smallest and greatest gender disparities in LEB, respectively (KFF, 2016). According to 2011 to 2014 adult tobacco smoking survey data from the Behavioral Risk Factor Surveillance System (BRFSS; USDHHS, CDC, NCCDPHP, Division of Population Health [DPH], 2016b), in Utah, 11.2% of men and 8.2% of women are current smokers, and 18.4% of men and 14.6% of women are current smokers in Washington, D.C. In Minnesota and Hawaii, where men and women have the longest life expectancies at birth, respectively, 17.9% of men and 12.1% of women are current smokers. In Mississippi, where LEB is the shortest for both sexes, 23.2% of men and 22.7% of women are current smokers (Kaiser Family Foundation, 2016; USDHHS, CDC, NCCDPHP, OSH, 2016). In terms of *smoking-attributable mortality* (SAM), which “is the number of deaths caused by cigarette smoking based on diseases for which the U.S. Surgeon General has determined that cigarette smoking is a causal factor” (USDHHS, CDC, NCCDPHP, OSH, 2015, Smoking-Attributable Mortality, Morbidity, and Economic Costs (SAMMEC) – Smoking Attributable Mortality (SAM), para. 1), males in Utah account for 52% of these deaths, 50% in Washington, D.C., 51% in Minnesota, 57% in Hawaii, and over 51% in Mississippi (USDHHS, CDC, NCCDPHP, OSH, 2015).

Unhealthy diet.

Twenty-four years after U.S. Surgeon General Dr. Terry Luther’s 1964 report, which illustrated the causal associations of tobacco and morbidity and mortality, *The Surgeon General’s Report on Nutrition and Health* was disseminated (USDHEW, USPHS, Surgeon General’s Advisory Committee on Smoking and Health, 1964; USDHHS, USPHS, 1988). Under the leadership of U.S. Surgeon General, Dr.

Charles Everett Coop, this report detailed the detrimental causal links of unhealthy diet and NCDs, particularly, CVD (i.e., coronary heart disease and atherosclerosis [saturated fat, cholesterol, and calories]), various forms of cancer (i.e., lung [alcohol], breast [fat, calories, and alcohol], colon, prostate, and endometrial [fat and calories], rectal [fat and alcohol], oral [alcohol], stomach [pickled, salted, and smoked foods], kidney, cervical, and thyroid [calories], and esophageal [alcohol and pickled, salted, and smoked foods]), stroke (sodium), diabetes (fat and calories; USDHHS, USPHS, 1988), as well as links to other risk factors, such as, “high blood pressure, obesity, dental diseases, osteoporosis, and . . . kidney and gastrointestinal diseases” (USDHHS, USPHS, 1988, p. 22). Specific dietary components revealing causally-linked protective roles for CVD and cancer, respectively, were found to be the following: poly- and mono-unsaturated fats (Grundy, Nix, Whelan, & Frankling, 1986; Kromhout, Bosschieter, & Lezenne Coulander, 1985) and water-soluble fiber (Anderson, Chen, & Sieling, 1980; Anderson et al., 1984; Jenkins, Leeds, Newton, & Cummings, 1975; Kirby et al., 1981), each protective against CVD; vitamin A found in fruit and vegetables, shown to be protective against lung (Kvale, Bjelke, & Gart, 1983; Shekelle et al., 1981), breast (Graham et al., 1982), colon (Modan, Cuckle, & Lubin, 1981), prostate (Schuman, Mandel, Radke, Seal, & Halberg, 1982), bladder (Mettlin, Graham, & Swanson, 1979), oral (Graham et al., 1981; Ibrahim, Jafarey, & Zuberi, 1977), stomach (Stehr et al., 1985), and cervical cancer (La Vecchia et al., 1984); and water-insoluble fiber (protective against colon cancer; Pilch, 1987). As far as protecting against stroke, diabetes, and kidney disease, the following dietary recommendations were made: decrease sodium intake to lower risk of stroke (Kawasaki, Delea, Bartter, & Smith, 1978; Koolen & Van Brummelen, 1984), consume food high in complex carbohydrates, water-soluble fiber, and low in total fat (i.e., saturated fat), cholesterol, and protein to decrease risk of diabetes (Albrink, Newman, & Davidson, 1979; American Diabetes Association [ADA], 1987; Anderson, 1980; Anderson & Chen, 1979; Anderson, Gustafson, Bryant, & Tietyen-Clark, 1987; Anderson & Tietyen-Clark, 1986; Vahouny, 1982; Wheeler, 1982), and decrease protein in the diet (Hostetter, Troy, & Brenner, 1981).

In addition to the aforementioned NCDs, an unhealthy diet is also linked to several other forms of cancer (Bhaskaran et al., 2014; Renehan, Tyson, Egger, Heller, & Zwahlen, 2008). In fact, 35% of cancers can be attributed to an unhealthy diet (Baena Ruiz & Salinas Hernandez, 2014). In 2005, roughly 102,000 adult deaths in the U.S. were attributable to a diet high in sodium (49,000 men and 54,000 women). Also, a diet low in omega-3 fatty acids resulted in approximately 84,000 deaths (45,000 men and 39,000 women), and a diet high in dietary trans-fatty acids claimed around 82,000 lives, which totaled 46,000 men and 35,000 women. Additionally, 58,000 deaths occurred due to diets low in fruits and vegetables (33,000 men and 24,000 women), and 15,000 lives (9,000 men and 6,000 women) were lost due to low consumption of polyunsaturated fatty acids (Danaei et al., 2009). Murray and colleagues (2013) reported that in 2010 nearly 680,000 deaths in the U.S. (CSPI, 2016) were attributable to 14 diet-related risk factors (Lim et al., 2012). Of these 14 diet-related risk factors, diets low in vegetables, fruits, and nuts and seeds, and high in processed meat, sodium, and trans-fatty acids, are most noteworthy in the U.S. (Murray et al., 2013).

Over 23% of adults (both sexes) in the U.S., D.C., Guam, and Puerto Rico report consuming less than one vegetable serving per day (USDHHS, CDC, NCCDPHP, DPH, 2015c), and nearly 40% consume less than one serving of fruit per day (USDHHS, CDC, NCCDPHP, DPH, 2015b). These rates increase substantially for men-only, at over 26% and 44.5%, respectively. Considering our five U.S. states of interest (i.e., Utah, D.C., Minnesota, Hawaii, and Mississippi), more men report consuming less than one vegetable serving and less than one serving of fruit per day than women in each of these states (USDHHS, CDC, NCCDPHP, DPH, 2015b, 2015c). Additionally, nearly 77% of U.S. adults consume less than five servings and vegetables and fruits each day. Similar to the previous information, significantly more men (81%) report consuming less than five servings of vegetables and fruits per day, compared to the national average for both sexes and for women (72.8%; USDHHS, CDC, NCCDPHP, DPH, 2015a). The state consistently reporting the least amount of vegetable and fruit consumption for both sexes, men, and

women is Mississippi (USDHHS, CDC, NCCDPHP, DPH, 2015a, 2015b, 2015c). Over 85% of men and more than 81% of women in Mississippi reporting consuming less than five servings and vegetables and fruits each day (USDHHS, CDC, NCCDPHP, DPH, 2015a) . Nearly one-third of these men and almost 30% of these women report consuming less than one vegetable serving each day (USDHHS, CDC, NCCDPHP, DPH, 2015c), and these rates increase by 168% and nearly 157% in these men and women, respectively, when reporting the consumption of less than one fruiting serving each day (USDHHS, CDC, NCCDPHP, DPH, 2015b). The state reporting the highest rate of vegetable and fruit consumption five or more times each day for both sexes, men, and women, is Washington, D.C. (USDHHS, CDC, NCCDPHP, DPH, 2015a). Men in D.C. also report higher consumption of one or more vegetables and one or more fruits each day, compared to the other four states. And more women in Utah report consuming vegetables one or more times each day and fruits one or more times each day than women in any of the other four states (USDHHS, CDC, NCCDPHP, DPH, 2015b, 2015c).

According to data from the 2009-2010 National Health and Nutrition Examination Survey (NHANES), more adult (ages 20 years and above) women (40.5%) than men (36.5%) recalled eating nuts and seeds on any particular day (Nielsen et al., 2014). An analysis of NHANES data from 2003-2008 indicated that men (ages 19 years and above) reported higher caloric intake from all foods ($2,578 \pm 20$ kilocalories [kcal]), including all categories of processed food ($1,817 \pm 22$ kcal) than women from all foods ($1,815 \pm 22$ kcal) and from all categories of processed food ($1,324 \pm 16$ kcal; Eicher-Miller et al., 2015). NHANES data from 2003-2004 indicated that 58% of all meat consumed in the U.S. is red meat, and 22% of that meat is processed. The average daily meat (i.e., red meat, poultry, and fish) consumption (in grams [g]) for both sexes was about 128.5 g. For men this number increased to an average of 153.8 g, and nearly 57% of this daily total was consumed via red meat, and nearly 19% of men's total daily meat consumption was processed. Women consumed less meat per day (103.2 g), and

roughly 51% and 17% of their daily meat intake was red meat and processed, respectively (Daniel et al., 2011).

A national survey combining the USDHHS' NHANES and the USDA's Continuing Survey of Food Intakes by Individuals (CSFII; 2016b) was created in 2002 called What We Eat in America (WWEIA), which display dietary consumption data for 2013-2014, revealing that men (ages 20 years and above) consumed nearly 1,100 milligrams (mg) more sodium per day than adult women ($\approx 4,100$ mg to $\approx 3,000$ mg; USDA, ARS, 2016a), with both totals considerably higher than U.S. federal daily recommendations (i.e., 2,300 mg; USDHHS, USDA, 2015). Powles and colleagues' (2013) study estimated daily adult sodium intake for countries and regions around the world via one hundred forty-two 24-hour urine surveys and 103 dietary intake surveys, which were converted to equivalent 24-hour urine outputs. Results for the U.S. were comparable to the above WWEIA estimates, although revealing slightly higher totals for both sexes (3,700 mg) and women (3,560 mg), and men consumed just over 10% more sodium per day than women at 3,930 mg (Powles et al., 2013), whereas WWEIA calculated men as consuming nearly 37% more daily sodium than women (USDA, ARS, 2016a).

In addition to "the most important dietary risks in the United States" (Murray et al., 2013, p. 596) mentioned above (i.e., diets low in vegetables, fruits, nuts and seeds, and high in processed meat and sodium), a diet high in trans-fatty acids also belongs in this category (Murray et al., 2013). In fact, Danaei et al. (2009) and Lim et al. (2012) demonstrate the deadly impact of diets high in trans-fatty acids for adults in the U.S. and globally. In 2005, roughly 46,000 U.S. men died because of having diets high in trans-fatty acids (Danaei et al., 2009), and in 2010, more than 293,000 men died worldwide due to the same factor (Lim et al., 2012). In the U.S. and globally, diets high in trans-fatty acids kill 31% more men than women each year (Danaei et al., 2009; Lim et al., 2012), and over 74% more men than women worldwide experience more disability-adjusted life-years attributable to diets high in trans-fatty acids (Lim et al., 2012).

Physical inactivity.

U.S. Surgeon Generals Luther and Coop established precedents for presenting important health information to the nation in 1964 and 1988, and it is their reports on tobacco smoking and nutrition, respectively, that spurred Surgeon General (Acting) Audrey F. Manley's seminal report on physical activity (USDHEW, USPHS, Surgeon General's Advisory Committee on Smoking and Health, 1964; USDHHS, CDC, NCCDPHP, The President's Council on Physical Fitness and Sports, 1996; USDHHS, USPHS, 1988). In terms of overall mortality rates, several studies reviewed in Manley's report revealed an increase in death rates from all-causes for those who were physically inactive for both sexes (Arraiz, Wigle, & Mao, 1992; Blair, Kohl et al., 1989; Chang-Claude & Frentzel-Beyme, 1992; Kaplan, Seeman, Cohen, Knudsen, & Guralnik, 1987). Of the top seven current leading causes of death in the U.S., Manley's report concluded that physical inactivity acted as a causal factor in adults (both sexes) for CVD, colon cancer, and diabetes (USDHHS, CDC, NCCDPHP, The President's Council on Physical Fitness and Sports, 1996).

Murray and colleagues (2013) reported that in 2010, roughly 234,000 deaths of U.S. adults (CSPI, 2016) were due to low or no physical activity, deaths largely due in part to CVD (\approx 183,000), cancer (\approx 30,000), and diabetes (\approx 21,000), with Danaei and colleagues (2009) predicting a slightly higher total number of deaths attributable to physical inactivity in women than in men. In addition to the convincing and significant association between physical inactivity and colon cancer (USDHHS, CDC, NCCDPHP, The President's Council on Physical Fitness and Sports, 1996), the World Cancer Research Fund and the American Institute for Cancer Research (2007) concluded a probable link with postmenopausal breast and endometrial cancers, with Ehemann and colleagues (2012) concurring. Thus, based on Murray and colleagues' (2013) estimations, nearly 914,000 U.S. adults die annually from an unhealthy diet and physical inactivity, which is more than three times the amount in 1990, reported by McGinnis and Foege (1993), and almost 2.3 times the amount in 2000, reported by Mokdad and colleagues (2004).

A report of 2012 BRFSS data demonstrated that 23.4% of U.S. adults (ages 18 years and over) reported getting no leisure-time physical activity, such as golfing, taking a walk, going for a run, working in the garden, or performing calisthenics, in the preceding month (Chowdhury et al., 2016). According to 2015 BRFSS data (excluding Puerto Rico, Guam, and the Virgin Islands), nearly 26% of adults reported getting no leisure-time physical activity (Segal, Rayburn, & Martin, 2016). Thus, in a three year timeframe, self-reported U.S. physical inactivity levels increased from roughly 56.2 million adults to almost 64.4 million adults (Chowdhury et al., 2016; Segal et al., 2016; USDC, USCB, PD, 2015). Data from the 2015 NHIS indicated that nearly half of U.S. adults did not meet the national physical activity requirements for leisure-time aerobic activity and nearly eight out of 10 do not meet the requirements for both leisure-time aerobic and muscle-strengthening activities (Ward, Clarke, Nugent, & Schiller, 2016), which is over 198 million people (USDC, USCB, PD, 2015; Ward et al., 2016). Men were more likely than women to meet the requirements for leisure-time aerobic activity (52.9% to 46.7%) and leisure-time aerobic and muscle strengthening activities (25.1% to 17.9%; Ward et al., 2016).

Among the five states of interest, Chowdhury et al. (2016) cited 2012 BRFSS data, which demonstrated that over 30% of adults (both sexes) in Mississippi reported getting no leisure-time physical activity in the preceding month, with only two other U.S. states reporting higher rates: Arkansas (31.5%) and Puerto Rico (42.4%). Conversely, 16.5% of Utah adults reported not getting any leisure-time physical activity, which is the second-lowest rate in the U.S., trailing only Oregon at 16.3% (Chowdhury et al., 2016). And compared to the 23.4% of adults reporting no leisure-time physical activity nationwide, D.C., Hawaii, and Minnesota all report lower rates (i.e., 17.4%, 18.7%, and 17.6%, respectively; Chowdhury et al., 2016).

Segal et al. (2016) cited 2015 BRFSS data (excluding Puerto Rico, Guam, and the Virgin Islands), which identified Mississippi adults as the least active U.S. state, with nearly 37% of adults reporting no leisure-time physical activity. The other four states of interest (i.e., D.C., Hawaii, Minnesota, and Utah)

all reported lower physical inactivity rates than the 26% national average (i.e., 19.4%, 22.5%, 21.8%, and 20.3%, respectively), and the only states reporting less physical inactivity than D.C. were Washington (19%), Oregon (18.8%), and Colorado (17.9%), which is the most active U.S. state (Segal et al., 2016).

When considering gender and national physical inactivity rates, men reported less physical inactivity than women in every state except Idaho and North Dakota, according to 2014 BRFSS data. In terms of our five states of interest, men in Utah (15.5%) and Hawaii (16%) ranked second and fourth in terms of reporting the least amount of physical inactivity, behind only Colorado (14.8%) and Oregon (15.8%), respectively. Men in Minnesota (19%) and D.C. (18.4%) reported lower physical inactivity rates than the national male average (21.4%); however, Mississippi men (26.7%) reported physical inactivity rates well above the national male average, with only Arkansas (28.9%) and Puerto Rico (34.2%) reporting higher physical inactivity rates (CDC, NCCDPHP, DPH, 2016).

Alcohol use.

According to a synthesis of U.S. epidemiological data and clinical case studies from 1987, alcohol use was causally linked to NCD deaths, such as CVD (i.e., hypertension and alcoholic cardiomyopathy), cancer (i.e., lip, oral, pharyngeal, esophageal, stomach, liver/intrahepatic bile duct, and laryngeal), and stroke; these three NCDs alone accounted for over one-fourth of the estimated alcohol-related mortality (USDHHS, CDC, 1990). A few years later, alcohol use would be considered a leading cause of preventable death in the U.S., behind tobacco smoking, unhealthy diet, and physical inactivity (McGinnis & Foege, 1993), and would remain in this position (Mokdad, Marks, Stroup, & Gerberding, 2004). Alcoholic liver disease is the predominant cause of liver-related morbidity and mortality as well (O'Shea, Dasarathy, McCullough, the Practice Guideline Committee of the American Association for the Study of Liver Diseases, & the Practice Parameters Committee of the American College of Gastroenterology, 2010; Paula et al., 2010). In fact, in 2005, nearly 46% of deaths due to cirrhosis were alcohol-related (Yoon & Yi, 2008). In terms of CVD and cancer, alcohol use remains a detrimental causal link to hypertensive

heart disease (Shield, Parry, & Rehm, 2013; Taylor et al., 2010), and in addition to the above-mentioned forms of cancer, alcohol use is also causally linked to breast (women only), colon, and rectal cancer (Corrao, Bagnardi, Zambon, & La Vecchia, 2004; Shield et al., 2013; WHO, International Agency for Research on Cancer [IARC], 2010) and is detrimental, but not causally linked, to tracheal, bronchus, lung, ovarian, and prostate cancer (Bagnardi, Blangiardo, La Vecchia, & Corrao, 2001; Dennis, 2000; Fillmore et al., 2009; Rota et al., 2012; Shield et al., 2013). Alcohol use plays a causally-linked protective role against ischemic heart disease, ischemic stroke, and diabetes, but only when consumed in limited daily amounts (Baliunas et al., 2009; Patra et al., 2010; Roerecke & Rehm, 2012).

In 2012, nearly 28,000 adult (i.e., ages 18 years and older) deaths in the U.S. were alcohol-induced, which included psychological and behavioral, neuromuscular, cardiac, gastric, hepatic, and pancreatic diseases, as well as alcohol poisoning. Of these deaths, men accounted for almost three out of every four deaths and an age-adjusted death rate nearly three times higher than women (Murphy, Kochanek, Xu, & Heron, 2015). In 2014, nearly 25% of adults in the U.S. reported having at least one heavy drinking day in the past year. The age-adjusted percentage of men aged 18 and over who had five or more alcoholic drinks in one day at least once in the past year was 32.3%, and the age-adjusted percentage of women aged 18 and over who had four or more alcoholic drinks in one day at least once in the past year was 20.2% (USDHHS, CDC, NCHS, 2015a).

The 2014 National Survey on Drug Use and Health (NSDUH) reported that nearly 24.7% of U.S. adults (i.e., ages 18 years and older) engaged in binge alcohol use in the previous month; however, the latest BRFSS data estimates this rate to be closer to 22.2% (USDHHS, CDC, NCCDPHP, DPH, 2014; USDHHS, Substance Abuse and Mental Health Services Administration [SAMHSA], Center for Behavioral Health Statistics and Quality [CBHSQ], 2014). In our five states of interest, the NSDUH estimated adult binge alcohol use at 17.44% in Utah, 35.6% in Washington, D.C., 26.04% in Minnesota, 26.15% in Hawaii, and 21.46% in Mississippi (USDHHS, SAMHSA, CBHSQ, 2014). The BRFSS had more modest estimates:

11.4% in Utah; 25.3% in Washington, D.C.; 19.7% in Minnesota; 19.7% in Hawaii; and 13.05% in Mississippi. Using the BRFSS data to compare binge alcohol use rates between men and women, respectively, reveals the following for each of the five states mentioned: 15.3% and 7.5% in Utah; 31.2% and 19.4% in Washington, D.C.; 24.6% and 14.8% in Minnesota; 28% and 11.4% in Hawaii; and 18.5% and 7.6% in Mississippi (USDHHS, CDC, NCCDPHP, DPH, 2014).

Elevated blood pressure.

In a 1967 report to U.S. Surgeon General, William H. Stewart, an estimated 9.2 million U.S. adults (~ 5-10%) were reported to have hypertension in 1965 (USDHEW, USPHS, OPPE, OSG, 1967). By 1972, the National High Blood Pressure Education Program (NHBPEP) initiative through the National Heart, Lung, and Blood Institute (NHLBI) began to increase the U.S. public's awareness of hypertension (Jones & Hall, 2002), which by 1979, affected an estimated 35 million U.S. adults (USDHEW, USPHS, Office of the Assistant Secretary for Health and Surgeon General, 1979). By 1983, nearly 58 million U.S. adults had hypertension (Subcommittee on Definition and Prevalence of the 1984 Joint National Committee, 1985), and in 2014, over 71 million U.S. adults were hypertensive (USDC, USCB, PD, 2015; Yoon, Fryar, & Carroll, 2015). From all of the major reports above, hypertension was associated with CVD, stroke, and kidney disease, and over eight times the number of U.S. adults were hypertensive in 2014 compared to 1965 (Subcommittee on Definition and Prevalence of the 1984 Joint National Committee, 1985; USDC, USCB, PD, 2015; USDHEW, USPHS, OPPE, OSG, 1967; USDHEW, USPHS, Office of the Assistant Secretary for Health and Surgeon General, 1979; Yoon et al., 2015).

In 1980, over 297,000 U.S. adult deaths occurred as a result of hypertension (Amler & Eddins, 1987), which increased to almost 443,000 deaths by 2010 (CSPI, 2016; Murray et al., 2013). In terms of sex and hypertension prevalence, women have been reported to have twice the rate of men in an early report (USDHEW, USPHS, OPPE, OSG, 1967) and slightly higher levels than men (i.e., 30.1% to 27.1%) in a later study, which examined NHANES data (Hajjar & Kotchen, 2003). However, another early study

examining NHANES II data from 1976-1980 reported men having a 6% higher hypertension prevalence rate than women (i.e., 33% to 27%; Subcommittee on Definition and Prevalence of the 1984 Joint National Committee, 1985) and slightly higher levels than women in later studies examining NHANES data from 2011-2012 (i.e., 29.7% to 28.5%; Nwankwo et al., 2013) and 2011-2014 (i.e., 30% to 28.1%; Yoon et al., 2015). Men were also significantly less aware and in control of their hypertension than women and less likely to receive drug therapy compared to women (Nwankwo et al., 2013; Subcommittee on Definition and Prevalence of the 1984 Joint National Committee, 1985; Yoon et al., 2015).

Data from the 2013 BRFSS reported that 31.4% of U.S. adults (18 years and older) had been diagnosed with hypertension, and 78.1% of U.S. adults were currently taking medication for hypertension. Mississippi had the third highest rate of hypertension diagnoses at 40.2%, trailing only Alabama (40.4%) and West Virginia (41%) and had the second highest number of medicated hypertensive adults (tied with Delaware and Missouri), trailing only Tennessee at 83.9%. Utah had the least amount of hypertensive adults (24.2%), while Alaska had the least amount of medicated hypertensive adults (61.3%). As far as the other states of interest, D.C., Hawaii, and Minnesota each had less reported hypertensive adults than the national average (28.4%, 28.5%, and 27%, respectively), while D.C., Minnesota, and Utah had fewer medicated hypertensive adults than the national average (73.6%, 77%, and 67.9%, respectively), with Hawaii being slightly above the national average at 78.8%. Additionally, out of the five states of interest (i.e., D.C., Hawaii, Minnesota, Mississippi, and Utah), there are more male than female hypertension diagnoses in each state except Mississippi, where women have only a slightly higher rate (40.3% to 40%). The state with the fewest number of hypertensive males and females is Utah, at 27.1% and 21.3%, respectively, and West Virginia and Mississippi have the highest numbers of hypertensive males and females, at 42.7% and 40.3%, respectively (USDHHS, CDC, 2016).

Elevated blood glucose.

Physician, Elliott P. Joslin, became perhaps one of the world's most notable clinical diabetes educators with the publication of his article, "The Treatment of Diabetes Mellitus" (ADA, 2016b), which raised awareness and provided practical treatment applications "for the prevention of diabetic coma" and deaths due to diabetes in the most vulnerable populations at the time, which were children and those recently diagnosed (Joslin, 1916, p. 673). Over 40 years later, Yalow and Berson (1960) published a landmark study, in which they stated that their diabetic subjects' glucose levels' "lack of responsiveness . . . in the face of . . . adequate . . . insulin . . . is obviously of importance in the interpretation of the pathogenesis of this type of diabetes" (p. 1173); and *this* [emphasis added] result helped trigger the discovery and differentiation of type 1 and type 2 diabetes mellitus (ADA, 2016a; Kahn & Roth, 2004; Yalow, 1978; Yalow & Berson, 1960).

One of the first U.S. surveys to study diabetes on a national level was the National Health Examination Survey (NHES; Israel, 1976), now known as the NHANES (USDHHS, CDC, NCHS, 2015b). The data from the first NHES was collected from October 1959 through December 1962 and sampled 6,672 U.S. adults ages 18 and over (3,091 and 3,581 men and women, respectively; USDHHS, USPHS, Office of Health, Research, Statistics, and Technology [OHRST], NCHS, 1981a). Results revealed that approximately 121 (~ 1.81%) of the subjects had been told by their healthcare providers that they had diabetes, 114 (1.71%) definitely had diabetes, and 131 (1.96%) thought they had diabetes. Only 0.5% of the 6,672 subjects reported that they were currently taking insulin and just 0.7% were taking oral medication for their diabetes (USDHHS, USPHS, OHRST, NCHS, 1981b).

NHANES-II data collected from 1976-1980 included a total of 18,447 subjects (8,645 men and 9,802 women), ages 12-74 years-old, with nearly 4.2% reporting that they had diabetes (USDHHS, USPHS, NCHS, 1985), a rate comparable to that shared in a 1976 diabetes report to the U.S. congress, stating that there were "approximately 10,000,000 individuals with diabetes in the U.S." (USDHEW, USPHS, Health Services Administration [HSA], Bureau of Medical Services [BMS], 1976, p. 131), which

would have been a rate equal to roughly 4.6% of the U.S. (USDHEW, USPHS, HSA, BMS, 1976; USDHHS, CDC, NCHS, n.d.). Also, in the NHANES-II data, 6% of the total population reported to be borderline-, potential-, or pre-diabetics, and almost 5.5% stated that a physician had previously notified them of having sugar in their urine. Additionally, almost 1.5% of the total population reported taking insulin injections and 3.3% taking pills for their diabetes (USDHHS, USPHS, NCHS, 1985).

In terms of mortality from diabetes, in 1977, over 25,000 deaths of individuals ages 15 years-old and above were caused by diabetes (USDHEW, USPHS, Office of the Assistant Secretary for Health and Surgeon General, 1979; USDHHS, CDC, NCHS, n.d.; USDHHS, CDC, Office of Public Health Scientific Services [OPHSS], Center for Surveillance, Epidemiology, and Laboratory Services [CSELS], Division of Scientific Education and Professional Development [DSEPD], 2012), which was known to play a role in CVD, stroke, and hypertension (USDHEW, USPHS, Office of the Assistant Secretary for Health and Surgeon General, 1979). Ten years later, around 38,000 deaths occurred due to diabetes, nearly 1.8% of all deaths in 1987 (USDHHS, CDC, NCHS, n.d.; USDHHS, CDC, OPHSS, CSELS, DSEPD, 2012; USDHHS, USPHS, 1988; USDHHS, USPHS, CDC, NCHS, 1989). At this time, roughly 11 million adults had diabetes, and type 2 diabetes accounted for around 90% of these cases (Harris, Hadden, Knowler, & Bennett, 1987; Kovar, Harris, & Hadden, 1987; USDHHS, USPHS, 1988), with diabetes being a causal factor in roughly 95,000 additional deaths, largely for CVD and stroke, as well as kidney disease and some cases of pancreatic cancer (Kovar et al., 1987; USDHHS, USPHS, 1988; USDHHS, USPHS, NIH, National Institute of Arthritis, Diabetes, and Digestive and Kidney Diseases [NIADDKD], National Diabetes Data Group [NDDG], 1985).

As of 1990, an estimated 48,000 deaths in the U.S. were due to diabetes (McGinnis & Foege, 1993), a number increasing to nearly 70,000 one decade later (Mokdad et al., 2004), and in 2005, elevated blood glucose was a causal factor in close to 191,000 total deaths (due to CVD, diabetes, kidney disease, breast, colorectal, and pancreatic cancer, and all other causes) in both sexes (102,000 and

89,000 in men and women, respectively; Danaei et al., 2009). By 2010, roughly 86,100 deaths from diabetes occurred, and elevated fasting blood glucose played a causal factor for somewhere between 212,500-225,000 total deaths (Murray et al., 2013).

Of the 33,672 U.S. adult participants (15,071 men and 18,601 women) in the 2015 NHIS, almost 11% had been told that they had diabetes at some point in their lives, nearly 6% had prediabetes at some point in their lives, and a little more than 21% were currently taking insulin, almost 55% were currently taking diabetic pills, and over 50% of the total subject population had not had a fasting blood glucose test in the past year (USDHHS, CDC, NCHS, 2016b). NHANES data from 2011-2014 indicated that 12.6% of adults ages 20 years and over had diabetes (9.6% physician-confirmed and 3% undiagnosed), with males having higher rates than women (13.2% to 12.1%). Also, 3.5% of males had undiagnosed diabetes compared to 2.5% in women, and men had just slightly higher physician-diagnosed diabetes rates than women (9.7% to 9.5%) Thus, the total number of adults in the U.S. with physician-confirmed diabetes today is more than 30.6 million people, while there are over 9.5 million who are undiagnosed, meaning almost 40.2 million U.S. adults have diabetes. There are over 1.4 million more men with undiagnosed diabetes than women, while there are nearly 160,000 more women with physician-confirmed diabetes than men, which means that well over one million more men are currently living with diabetes (physician-confirmed and undiagnosed) than women (USDHHS, CDC, NCHS, 2016a).

In 2014, a total of 76,488 deaths were attributed to diabetes (41,111 or 54% of men and 35,377 or 46% of women), which was 2.9% of all U.S. deaths (Kochanek, Murphy, Xu, & Tejada-Vera, 2016). Concerning the five states of interest, D.C. and Hawaii had lower rates of death from diabetes than the national average, at 2.5% and 2.6% of their states' total deaths, respectively, while Minnesota equaled the national average, at 2.9%. Mississippi and Utah had rates above the national average, at 3.3% and 3.4%, respectively (Kochanek et al., 2016). Of D.C.'s 440 deaths from diabetes in 2014, according to data from the National Vital Statistics System (NVSS), 53% were men and 47% were women, and of Hawaii's

901 deaths from diabetes in 2014, 58.% were men and 41.5% were women. In Minnesota, 54% of the 4,814 deaths from diabetes in 2014 were men and the remaining 46% were women. In Mississippi, a total of 3,061 deaths in 2014 were from diabetes, with 52.3% being men and 47.7% women. Finally, in Utah, 1,274 deaths from diabetes occurred in 2014, and 53.1% were men and 46.9% were women (CDC, NCCDPHP, DPH, 2016a).

The overall (crude) prevalence rate of diagnosed diabetes for both sexes in D.C. is 8.4%, which totals 55,515 people, of which nearly 24,695 are men (7.9%) and almost 30,820 are women (8.9%; CDC, NCCDPHP, DPH, 2016a; Kochanek et al., 2016; USDC, USCB, PD, 2015), and 34.2% of the rest of adults in D.C. have prediabetes (ADA, 2015). In Hawaii, the overall (crude) prevalence rate is 9.8%, totaling 138,465 people, of which 72,528 are men (10.1%) and 65,937 are women (9.4%; CDC, NCCDPHP, DPH, 2016a; Kochanek et al., 2016; USDC, USCB, PD, 2015), and 41.5% of adults have prediabetes (ADA, 2015). The overall (crude) prevalence rate for Minnesota is 8.1% (444,545 people), with 8.8% being men (238,660) and 7.5% being women (205,885; CDC, NCCDPHP, DPH, 2016a; Kochanek et al., 2016; USDC, USCB, PD, 2015), and 35.1% of adults have prediabetes (ADA, 2015). For Mississippi, the overall (crude) prevalence rate is 13% (389,570), with 12.6% of men (183,274) and 13.4% of women (206,296) affected (CDC, NCCDPHP, DPH, 2016a; Kochanek et al., 2016; USDC, USCB, PD, 2015), with 37.5% of the adult population having prediabetes (ADA, 2015). And in Utah, 7.1% of the population have been diagnosed with diabetes, which totals 209,012 people, of which 7.5% are men (110,981) and 6.7% are women (98,031; CDC, NCCDPHP, DPH, 2016a; Kochanek et al., 2016; USDC, USCB, PD, 2015), and 32.7% of adults have prediabetes (ADA, 2015). According to Segal et al. (2016), Mississippi's prevalence rate for diabetes ranks first in the U.S. (both sexes), Colorado ranks last (51st), while Utah ranks 50th, Minnesota 48th (tied with Alaska), and D.C. and Hawaii 39th.

Elevated total blood cholesterol.

Building upon the foundation of Anitschkow's (1913) work, which established a link between elevated blood cholesterol and atherosclerosis in rabbits, Gofman and colleagues (1950) connected these findings to humans, demonstrating the following: (a) Males ages 20-40 years-old without disease had higher levels of LDLs and atherosclerosis than women in the same age category; (b) Patients with diabetes had higher LDL levels and an increased likelihood for developing severe atherosclerosis at earlier ages than those without diabetes; (c) LDL levels increased substantially in both sexes after the age of 40; however, there was a narrowing in the disparity between the sexes over time; (d) There was a significant increase in LDLs for nearly all the subjects who had suffered a myocardial infarction (MI); (e) In 20 patients who were fed a cholesterol- and fat-restrictive diet, 17 had a decrease in their LDLs within two to four weeks; (f) All subjects with normal levels of TBC had lower LDL levels than those with abnormal TBC levels; and (g) Atherosclerosis may be more pronounced in those with kidney disease, angina, hypothyroidism, and hereditary hypercholesteremia. Keys et al.(1955) further developed Gofman and colleague's (1950) argument, specifically regarding the consumption of dietary fat and its effects on TBC and atherosclerosis, postulating diet as a primary determinant.

As rates of CVD continued to rise throughout the 20th century, the NHLBI and Boston University began a groundbreaking longitudinal research project in 1948, the Framingham Heart Study (FHS), which would study CVD, to determine the factors playing a role in its development (FHS, 2016). Even considering the findings in the previous paragraph, the FHS did not determine high TBC as a CVD risk factor until Kannel, Dawber, Kagan, Revotskie, and Stokes' (1961) reported findings, which also found results similar to that of Gofman et al. (1950): Men had higher TBC and rates of CVD (specifically coronary heart disease [CHD]) across the lifespan when compared to women, especially at younger ages, as the TBC level differences between the sexes narrowed over time. Additionally, when considering just men in the study, those with a TBC greater than 244 mg/deciliter (dL) had CHD

incidence rates greater than three times that of male subjects with TBC levels below 210 mg/dL (Kannel et al., 1961).

Among a multitude of items, the NHES-I contained TBC levels from a sample of 6,672 U.S. adults ages 18 and over (as noted in the previous section; USDHHS, USPHS, Office of Health, Research, Statistics, and Technology [OHRST], NCHS, 1981a). Utilizing the most current cholesterol level standards from the Expert Panel of the National Cholesterol Education Program (NCEP), 4,090 out of 6,497 (63%) NHES-I participants had either borderline-high or high TBC, with specifically 2,111 (32.5%) of the 4,090 participants having borderline-high TBC and 1,979 (30.5%) having high TBC (USDHHS, NCHS, 1989; USDHHS, USPHS, NIH, NHLBI, NCEP, 2001). Additionally, 24% of the participants had definite or suspected CVD, with almost 13% having definite CVD and 11% with suspected CVD (USDHHS, NCHS, 1989). Roughly nine years after the conclusion of the NHES-I data collection, the NHANES-I data collection process was initiated, from April 1971 to June 1974, and Abraham, Johnson, and Carroll (1978) have provided a report specifically focused on 13,671 of the examined men and women (ages 18-74 years-old) and their cholesterol information. Men had average TBC levels in the borderline-high range for all age ranges 25 years and above, and women had borderline-high TBC levels from ages 35-54 years, and high TBC levels from ages 55 years and above. Women did have a higher overall increase in TBC from the 18-24 years to the 65 years and above age ranges (an increase of almost 67 mg/dL), while the male increase was 47 mg/dL. Additionally, the average female TBC levels increased in every age range, while male TBC levels began to decrease beginning at age 55. Men did have higher TBC levels than women at 25-34 years and 35-44 years, while female rates were higher in every other age range (Abraham et al., 1978).

Using NHANES-II data, collected from 1976-1980, an estimated 26.8% of adults in the U.S. (ages 20-74 years-old) had high TBC levels (24.9% in men and 28.5% in women), with an extra 30.3% having borderline-high TBC levels (31.1% in men and 29.6% in women). Thus, over 57% of the nation had

borderline-high or high TBC levels (56% in men and 58.1% in women; Carroll et al., 1993). A recent report using NHANES data from 1976-2010, revealed that the prevalence rates for high levels of low-density lipoprotein cholesterol (LDL-C), a major CVD risk factor (USDHHS, USPHS, NIH, NHLBI, NCEP, 2001), decreased significantly, from 59% to 27%, while the use of cholesterol-decreasing medication increased from 5% to 23%, and there was an overall increase in diets that met the national guidelines for being low in saturated fat, from 25% in 1976-1980 to 41% in 1988-1994, remaining steady through 2007-2010. Men had higher LDL-C prevalence rates than women at each NHANES data collection time period (i.e., 1976-1980, 1988-1994, 2001-2004, and 2007-2010), higher use of cholesterol-decreasing medication during 2001-2004 and during 2007-2010 and were less likely to meet the national guidelines for a diet low in saturated fat (Kuklina et al., 2013). NHANES data from 2011-2012 demonstrated a significant sex disparity in terms of low levels of HDL-C, another major CVD risk factor (USDHHS, USPHS, NHLBI, NIH, NCEP, 2001), with 26.4% of men having low HDL-C levels and only 9% of women with low HDL-C levels, and men were also significantly less likely to obtain cholesterol screenings. Lastly, nearly 13% of men and women had high TBC levels, with a slightly (but not significantly) higher rate in women (14.4 % to 11.1% in women and men, respectively; Carroll et al., 2013).

A few years after the conclusion of the NHES-I, Klebba's (1971) report estimated that 39% of all deaths in the U.S. (a total of 721,268) were CVD-related, with males having much higher age-adjusted death rates (per 100,000 population) for all causes than women (364.5 to 186.8), as well as for CVD (i.e., atherosclerosis and CHD; Klebba, 1966). Utilizing Wilder's (1974) incidence estimates of U.S. adults with evident symptoms of CHD worthy of medical intervention, Goldman and Cook (1984) projected that roughly 3.3 million adults met this criteria in the late 1970s; and because elevated TBC levels had been strongly linked to CHD, particularly in those studies previously mentioned in this section (Anitschkow, 1913; Gofman et al., 1950; Kannel et al., 1961; Keys et al., 1955), while also showing an overall decline in the U.S. population from 1968-1976, Goldman and Cook (1984) estimated that the total lives saved from

CHD death by a reduction in TBC levels in this eight-year timespan was nearly 190,000, or a 30% decrease in CHD mortality.

Analyzing 7,733 subjects from the FHS, Lloyd-Jones, Larson, Beiser, and Levy (1999), determined that nearly 49% of men and 32% of women ages 40 years and above would develop CHD in their lifetime. In regards to the relationship between TBC classification (i.e., desirable, borderline-high, and high; USDHHS, USPHS, NIH, NHLBI, NCEP, 2001) and the risk of CHD over a lifetime, an investigation of subjects (both sexes) enrolled in the FHS demonstrated that men (ages 40-80 years) had significantly higher likelihoods (in the shorter- and longer-term) of developing CHD than women (ages 40-80 years), no matter the TBC classification of the subject, and each sexes' risk of CHD increased as TBC classification levels increased (Lloyd-Jones et al., 2003). And considering that the prevalence of the desirable TBC classification levels in both sexes has not changed since 1988, the nation's CVD health could be affected (Yang et al., 2012).

Although McGinnis and Foege (1993) and Mokdad et al. (2004) provided compelling and quantifiable evidence for "actual causes of death" (McGinnis & Foege, 1993, p. 2211) within the U.S. from 1990 to 2000, mainly attributed to "major external (nongenetic) modifiable factors" (Mokdad et al., 2004, p. 1338), neither study explored the specific influence of elevated cholesterol levels on U.S. death rates (Foege & McGinnis, 1993; Mokdad et al., 2004). However, Danaei et al. (2009) and Murray et al., (2013) do assess the specific attributable effects of several modifiable risk factors on mortality for a variety of diseases, including high LDL-C and high TBC and CVD deaths. Using 2003-2006 NHANES data and 2005 mortality rates, Danaei et al. (2009) estimated that a total of 113,000 CVD deaths (both sexes) were attributable to high LDL-C levels, accounting for 60,000 male deaths and 53,000 female deaths. Murray and colleagues (2013), and their cooperative work on the Global Burden of Disease 2010 study, estimated that over 150,000 CVD and cerebrovascular deaths were related to elevated TBC levels.

Having elevated levels of TBC, and more specifically, LDL-C, is a primary risk factor for CVD morbidity and mortality (Xu, Kochanek, Murphy, & Tejada-Vera, 2010), and roughly one out of every three U.S. adults (ages 20 years and above) have high LDL-C levels (Kuklina, Shaw, & Hong, 2011), with less than 30% of them actually having control of these levels (Johnson, Hayes, Brown, Hoo, & Ethier, 2014). Data from the 2013 BRFSS reports that 38.4% of all U.S. adults have been told they have elevated TBC levels, which is over 93 million men and women (CDC, NCCDPHP, DPH, 2015; USDC, USCB, PD, 2015). The state with the highest prevalence of high TBC for both sexes and women is Alabama (44.4% and 44.8%, respectively), and in men, Mississippi has the third highest rate of high TBC (tied with Michigan at 43.5%) behind Alabama (43.9%) and South Carolina (44.5%). Utah and Minnesota have the lowest rates of high TBC for both sexes (33.4% and 33.6%, respectively) and women (31.2% and 31.4%, respectively), while DC has the lowest rate for men at 35.7%. And of the remaining five states of interest and gender categories not mentioned, the following have lower rates of high TBC levels than the national average: Hawaii and D.C. for both sexes (35% and 34%, respectively), men in Hawaii, Minnesota, and Utah (37.6%, 36.2%, and 35.8%, respectively), and women in D.C. and Hawaii, at 32.6% and 32.5%, respectively (CDC, NCCDPHP, DPH, 2015).

Using 2012-2014 data from the NCHS, the estimated mortality rates (per 100,000 population) for all heart disease-related deaths in U.S. adults (ages 35 years and above) is 328.3 (both sexes), 414.3 (men), and 260.1 (women). Mississippi has the highest death rates for both sexes, men, and women (450.7, 564.3, and 361.8, respectively), and Minnesota has the lowest CVD death rates in all three categories (when excluding the U.S. Virgin Islands, Guam, American Samoa, N. Mariana Islands, and Puerto Rico) at 229.5 for both sexes, 301.2 for men, and 173 for women, with Hawaii right behind Minnesota women at 190.2. Among our three remaining states of interest, D.C. has the next highest death rates for all three gender categories (411, 523.4, and 330.4, respectively), then Utah at 286.4 (both sexes), and Hawaii at 264 (both sexes). However, men in Hawaii have higher death rates than men

in Utah, at 354.3 and 337.9, respectively, whereas women in Utah have higher death rates than women in Hawaii (241.8 to 190.2, respectively; USDHHS, CDC, NCCDPHP, Division for Heart Disease and Stroke Prevention [DHDSP], 2015). CVD deaths in the five states of interest contributed 3.7% of all U.S. CVD deaths in 2014, almost 30,000 total adults (ages 35 years and above), with men accounting for nearly 51% of these deaths. More men than women died of CVD in Hawaii, Mississippi, and Minnesota (totaling 440 more men), but more women died of CVD in D.C. and Utah, totaling 85 more women (USDHHS, CDC, NCHS, 2015c).

Overweight and obesity.

Adult body “weight increases as the square of the height,” a theory known as the Quetelet Index, discovered by Adolphe Quetelet in 1832 (Eknoyan, 2008, p. 47), and later in this century and early- to mid- 20th century, rising body weight/fat would be established as a major risk factor for growing morbidity and mortality rates in the U.S. (Armstrong, Dublin, Wheatley, & Marks, 1951; Bray, 1987; Dublin, 1953; Dublin & Lotka, 1938; Dublin & Spiegelman, 1952; Eknoyan, 2006, 2008; Gephart, 1915; Marks, 1960; USDHHS, USPHS, 1988; Van Itallie, 1985). Du Bray (1925) stated “that body weight is a simple measurement of extreme importance in clinical medicine” (p. 574), and the key findings from the epidemiological studies of the Metropolitan Life Insurance Company (MLIC) for more than half of the 20th century (Hutchinson, 1959; MLIC, 1942a, 1942b, 1959) informed important concepts such as “body mass index” (BMI; Keys, Fidanza, Karvonen, Kimura, & Taylor, 1972, 2014, p. 656) and “height to weight” tables (MLIC, 1983), which helped to classify individuals into different weight categories, such as “average,” “ideal,” or “desirable” (Weigley, 1984), and currently, “underweight,” “normal,” “overweight,” “obesity,” or “extreme obesity” (USDHHS, USPHS, NIH, NHLBI, 1998).

Excess body fat (i.e., obesity) was linked to all seven NCDs of interest in the 20th century: CVD and stroke (Hubert et al., 1983; Larsson et al., 1984; MacMahon et al., 1986), cancer (i.e., colorectal and prostate in men and endometrial, cervical, ovarian, breast, and gall bladder in women; Garfinkel, 1985),

diabetes (Lew & Garfinkel, 1979), kidney disease (Ribstein et al., 1995); CRDs (Negri et al., 1988); and AD (Razay & Wilcock, 1994). From the NHES-I (1959-1962) through the NHANES III (1988-1994), prevalence of overweight adults (ages 20 years and above) showed no significant changes (31.6% to 32.6%), but men had higher prevalence of overweight than women on each of the following surveys: NHES-I (38.3% to 25.3%), NHANES-I (41.5% to 24.3%), NHANES-II (39.2% to 24.8%), and NHANES-III (39.9% to 25.7%). Class I obesity levels increased for men and women from NHES-I to NHANES-III (9.1% to 14.3% in men and 11.2% to 14.5% in women), and men had consistently higher levels than women from ages 40-69. Class II obesity levels increased at every survey measurement for both sexes, men, and women, and class III obesity levels increased from NHES-I to NHANES-III for both sexes, men, and women. Women had higher levels of class II and class III obesity than men at every survey measurement (Flegal et al., 1998). Thus, over the more than three decades of survey data discussed, men who were overweight or obese increased from 48.9% to 59.5% (25.9 million to 51.2 million), women increased from 41.5% to 50.6% (23.1 million to 46.2 million), and both sexes increased from 45% to 54.9% (49 million to 97.4 million). In terms of obesity specifically, men increased from 10.6% to 19.6% (5.6 million to 16.9 million), women increased from 16.2% to 24.9% (9 million to 22.8 million), and both sexes increased from 13.4% to 22.3% (14.6 million to 39.7 million; Flegal et al., 1998; USDC, USCB, PD, 2001, 2004). Another study examining NHANES-III data and adults ages 25 years and older estimated that 63% of men and 55% of women were overweight or obese during the time period of 1988-1994 (Must et al., 1999).

The primary modifiable determinants of obesity are an unhealthy diet (largely due to the consumption of excess calories and fat) and physical inactivity (Hill & Peters, 1998; Ruderman et al., 1998; Ruderman et al., 1981; Weinsier et al., 1998). McGinnis and Foege (1993) estimated that around 300,000 U.S. deaths (all ages) from unhealthy diet and physical inactivity occurred in 1990, meaning overweight and obesity may have played a strong role in the causation of 14% of the total number of deaths. A subsequent study by Allison and colleagues (1999) estimated the number of deaths

attributable to obesity in 1991 to be somewhere between 280,000 to 325,000, with the lower limit representing the entire subject population and the upper limit representing only nonsmokers and those who have never smoked. BRFSS data collected from 1991-1998 demonstrated increases in obesity prevalence for adults (ages 18 years and above) of nearly 6%, from 12% to 17.9%. Male and female obesity prevalence rates increased each year, with females increasing 5.9% (12.2% in 1991 to 18.1% in 1998) and males increasing 6%, from 11.7% to 17.7% (Mokdad et al., 1999). Consequently, the number of deaths due to overweight and obesity (i.e., unhealthy diet and physical inactivity) increased from the 300,000 predicted by McGinnis and Foege (1993) to 400,000 (Mokdad et al., 2004). Using NHANES data from 2003-2006, Danaei and colleagues (2009) estimated that deaths attributable to overweight and obesity in 2005 was around 216,000 (largely due to CVD [i.e. ischemic heart disease and hypertensive heart disease], stroke, cancer [i.e. postmenopausal breast, colorectal, corpus uteri, kidney, pancreatic, and non-Hodgkin lymphoma], and diabetes), with males accounting for 114,000 and women 102,000. It is important to note that this calculation did not include the total number of deaths attributable to physical inactivity and specific unhealthy dietary practices (i.e., high sodium consumption, low consumption of omega-3 fatty acids, high trans fatty acids consumption, low fruit and vegetable intake, and low consumption of polyunsaturated fatty acids), which together accounted for 531,000 deaths. Thus, Danaei and colleagues (2009) have made perhaps a conservative estimate in regard to mortality attributable to overweight and obesity. In comparison, a more generous estimation came from Murray and colleagues (2013), predicting 364,000 deaths attributable to overweight and obesity in the U.S. in 2010; however, they also excluded unhealthy diet and physical inactivity from this calculation, which were attributed to 678,000 and 234,000 deaths, respectively.

According to 2013-2014 NHANES data, the age-adjusted obesity prevalence rate for both sexes (ages 20 and above) was 37.7% (35% in men and 40.4% in women), and class III (i.e., extreme obesity) rates in both sexes was 7.7% (5.5% and 9.9% in men and women, respectively; Flegal, Kruszon-Moran,

Carroll, Fryar, & Ogden, 2016). BRFSS data from 2015 suggests slightly more modest estimates; around 35.5% of adults (both sexes) ages 18 years and above are overweight (~ 86.2 million) and 29.3% are obese (~ 71.1 million), which means that more than 157.3 million (64.8%) U.S. men and women are overweight or obese (Segal et al., 2016; USDC, USCB. PD, 2015). According to BRFSS data from 2014, 29.5% of men (~ 35.2 million) and 29.1% of women (~ 36.7 million) were considered obese, and 41.1% of men (~ 49 million) and 28.9% of women (~ 36.4 million) were considered overweight (CDC, NCCDPHP, DPH, 2016b), thus, over 84.2 million men (70.6%) and more than 73 million women (58%) were overweight or obese (CDC, NCCDPHP, DPH, 2016b; USDC, USCB, PD, 2015).

Concerning overweight, obesity, and overweight or obesity (combined) in the five states of interest for both sexes, 2015 BRFSS data suggests that D.C. has the lowest prevalence of overweight of all the states at 32.3%, as well as the lowest prevalence of adults who are overweight or obese at 54.4%. In the remaining states of interest, the following are the rates of overweight and overweight or obesity, respectively: 34.3% and 57% in Hawaii, 36.7% and 62.8% in Minnesota, 34.5% and 70.1% in Mississippi, and Utah has rates of 35.1% and 59.6%. Nevada has the highest prevalence of overweight adults at 38%, and 71.1% of adults in West Virginia are overweight or obese, which is the highest rate in the U.S. Other than Colorado at 20.2%, D.C. has the lowest obesity rate at 22.1%, and Hawaii, Minnesota, Mississippi, and Utah have obesity rates of 22.7%, 26.1%, 35.6%, and 24.5%, respectively, with Louisiana having the highest rate of adult obesity in the U.S. at 36.2% (Segal et al., 2016; USDC, USCB. PD, 2015).

Data from the 2014 BRFSS stratifies the overweight and obesity prevalence rates based on gender. Among men, those in Alabama had the lowest overweight rate at 37%, and Idaho had the most overweight males at 43.6%. D.C. had the second lowest rate of overweight at 37.1%, and Hawaii, Minnesota, Mississippi, and Utah had male overweight rates of 43.2%, 42.3%, 39.4%, and 41.1%, respectively. The highest and lowest obesity rates for males in the U.S. were in Arkansas and D.C. at 35.6% and 19.8%, respectively. Hawaii had 23.4% obesity in males, while Minnesota, Mississippi, and

Utah had rates of 29.6%, 33.7%, and 26.6%, respectively. The state with the highest rate of overweight or obesity was North Dakota at 77.6%, and D.C. had the lowest rate at 56.9%. Males in Hawaii, Minnesota, Mississippi, and Utah had overweight or obesity rates of 66.6%, 71.9%, 73.1%, and 67.7%, respectively (CDC, NCCDPHP, DPH, 2016b; USDC, USCB, PD, 2015).

Among U.S. women, Oregon and Tennessee had the lowest and highest rates of overweight in the nation at 26.1% and 31.7%, respectively. D.C. women had an overweight rate of 30.3%, and Hawaii, Minnesota, Mississippi, and Utah had overweight rates of 27.9%, 29.8%, 30.5%, and 27.1%, respectively. The lowest female obesity rate in the nation was Colorado at 20.6%, and the highest rate was for women in Mississippi at 38.4%, while D.C. and Hawaii women had rates of 23.9% and 21.7%, respectively. Women in Minnesota had an obesity rate of 25.2%, and Utah women had a rate of 26.3%. Colorado had the least amount of women who were overweight or obese at 48.9%, and Mississippi had the highest rate for overweight or obesity at 68.9%. D.C., Hawaii, Minnesota, and Utah each had rates of overweight or obesity at 54.2%, 49.6%, 55%, and 53.5%, respectively (CDC, NCCDPHP, DPH, 2016b; USDC, USCB, PD, 2015).

Gender: Primary Determinant of Men's Health

The previous section provides a strong case for explaining the nearly five-year life expectancy disparity between men and women in the U.S., where overall, men die sooner in every state and territory (KFF, 2016; Murphy, Kochanek, & Heron, 2015; NSVR, 2015). There has not always been such a large LEB disparity among men and women in the U.S. In fact, in 1920, males and females had average life expectancies at birth of 53.6 years and 54.6 years, respectively (Foudray, 1923; USDC, USCB, 1999). However, by 1975, there was an all-time high, 7.8-year disparity in LEB for men and women, with men living an average of 68.8 years and women living an average of 76.6 years (USDC, USCB, 1999). Even though this age gap has narrowed in recent years, men continue to live significantly shorter lives than women (Murphy, Kochanek, & Heron, 2015). Of the seven NCDs in the top 10 leading causes of U.S.

deaths, males have higher mortality rates for CVD, cancer, and diabetes (NSVR, 2015). Men contribute to their own disease and death largely from the aforementioned major modifiable risk factors (Bauer, Briss, Goodman, & Bowman, 2014; Danaei et al., 2009; McGinnis & Foege, 1993; Mokdad et al., 2004; Murray et al., 2013; Yoon, Bastian, Anderson, Collins, & Jaffe, 2014), which may account for up to 88% of all male deaths in the U.S. (Danaei et al., 2009; Kung, Hoyert, Xu, & Murphy, 2008).

Concerning tobacco use, more males smoke, use other tobacco products, and die from tobacco smoking each year than women (Jamal et al., 2015; King et al., 2012; USDHHS, CDC, NCCDPHP, OSH, 2014), more men than women die each year from low intake of omega-3 fatty acids, fruits and vegetables, nuts and seeds, polyunsaturated fats, and high consumption of trans- fatty acids (Danaei et al., 2009; Nielsen et al., 2014; USDHHS, CDC, NCCDPHP, DPH, 2015a), and males also consume more overall calories, processed food, overall meat, red meat, sodium, alcohol (Daniel et al., 2011; Eicher-Miller et al., 2015; Powles et al., 2013; USDA, ARS, 2016a; USDHHS, CDC, NCHS, 2015a), and have higher death rates due to alcohol (Murphy, Kochanek, & Heron, 2015). Women do show higher average blood pressure levels in some studies (Hajjar & Kotchen, 2003; USDHEW, USPHS, OPPE, OSG, 1967), while men have higher levels in other reports and are also less aware of their elevated blood pressure levels, are in less control of them, and are less likely to receive medication to treat them (Nwankwo et al., 2013; Subcommittee on Definition and Prevalence of the 1984 Joint National Committee, 1985; Yoon et al., 2015). Men do have greater likelihoods of dying from diabetes and CVD due to elevated blood glucose and total blood cholesterol (i.e., high LDL-C), respectively, than women (Danaei et al., 2009; Lloyd-Jones et al., 1999, 2003; USDHHS, CDC, NCCDPHP, DHDS, 2015), and the male prevalence of elevated blood glucose is higher than females (USDHHS, CDC, NCHS, 2016a), as well as borderline-high TBC, high LDL-C, and low HDL-C (Carroll et al., 1993, 2013; Kuklina et al., 2013), and men also use more cholesterol-lowering medication, are less likely to follow a diet low in saturated fatty acids, and receive less cholesterol screenings (Carroll et al., 2013; Kuklina et al., 2013). Prevalence and mortality rates for men

who are overweight or obese are higher than women (Danaei et al., 2009; Flegal et al., 1998; Must et al., 1999; USDC, USCB, PD, 2001, 2004), there are more overweight men than women (CDC, NCCDPHP, DPH, 2016b; USDC, USCB, PD, 2015), as well as significantly more class I obese 40-69 year-old men than women (Flegal et al., 1998), and concerning overall obesity, one study (using NHANES data) showed women to have higher rates than men (Flegal et al., 2016), while recent BRFSS data shows men having slightly higher rates (CDC, NCCDPHP, DPH, 2016b). And as far as physical inactivity, men do self-report less physical inactivity than women in every U.S. state except North Dakota and Idaho (CDC, NCCDPHP, DPH, 2016).

Dr. Will Courtenay's (2011) scoping review of men's health literature through roughly 2010 describes why men die nearly five years before women in the U.S. and suffer more injury, disease, and disability. Informed by revised/modified versions of his previous research (Courtenay, 1998/2011, 1999/2011, 2000a/2011, 2000b/2011, 2000c/2011, 2000d/2011, 2001/2011, 2002/2011, 2003/2011, 2004/2011, 2006/2011; Courtenay & McCreary, 2011; Courtenay, McCreary, & Merighi, 2002; Courtenay & Sabo, 2001; Mansfield, Addis, & Courtenay, 2005; McCreary, Saucier, & Courtenay, 2005), a concerted effort is made to explain why *gender* is the primary determinant of men's health and longevity, which West and Zimmerman (1987) described as a fluid and (re)constructive behavioral process, whereby gendered acts occur based on varying social contexts in order to sexually categorize oneself as male or female. Courtenay (2003/2011) identified four categories of factors (i.e., health behaviors, health beliefs, factors that influence health behaviors and beliefs, and healthcare), which describe a total of 31 critical determinants that influence the health of men (see Appendix B). Additionally, Courtenay (2000a/2011) acknowledged 10 areas focused solely on several modifiable health behaviors, since they play a critical role in NCD morbidity and mortality (see Appendix C; Murphy, Kochanek, Xu, & Arias, 2015; Murphy, Kochanek, Xu, & Heron, 2015; NSVR, 2015; WHO, 2014c, 2016a, 2016d). Because close to 88% of all male deaths can be attributed to the eight modifiable risk factors from the previous section

(Danaei et al., 2009; Kung et al., 2008), which are controllable via health-promoting behaviors, the next part of this section will focus on the sociocultural and institutional factors that influence health behavior, demonstrating how gender may be the most influential (Courtenay 2000c/2011).

In this section, Bussey and Bandura's (1999) social cognitive theory of gender role development and Courtenay's (2000b/2011) relational theory of men's health are used to demonstrate how gender significantly impacts health-related behaviors and beliefs. These theories explain gender development as a constant construction and reconstruction taking place throughout the entire lifespan, influenced largely by sociocultural and structural systems, subsystems, and determinants (Bussey & Bandura, 1999; Courtenay, 2000c/2011). In terms of the sociocultural and institutional factors affecting health-related behaviors and beliefs, "Gender . . . is a fundamental issue" (Bussey & Bandura, 1999, 676), that "is . . . one of the first social categories that children learn in today's societies" (Kachel, Steffens, & Niedlich, 2016, p. 1), and ultimately "is the most important of these factors" (Courtenay, 2000b/2011, p. 141).

Psychological and sociostructural frameworks are integrated into the social cognitive theory of gender role development (Bussey & Bandura, 1999), and Courtenay's (2000b/2011) relational theory of men's health involves feminist and social constructionist perspectives, with both theories placing particular emphasis on the concept of *agency*, which is the ability that individuals and other entities possess in defining and redefining their personal or collective world (Bussey & Bandura, 1999). The main sociocognitive channels influencing the lifelong development of gender roles, cognitions, and behaviors involve observing and modeling, learning via direct teachings, and understanding the potential self and societal outcomes of specific gendered behaviors (Bussey & Bandura, 1999). Within each of these channels, sociocultural and institutional mechanisms, experiences, and resources impact gender differentiation, roles, and behaviors, generally resulting in men adopting and upholding unhealthy behavioral practices and beliefs, leading to increased injury, disability, disease, and death, compared to women (Bussey & Bandura, 1999; Courtenay, 2000b/2011; Mahalik et al., 2007).

Gender has historically been discriminated into traditionally masculine and feminine traits, which Constantine (1973) described as persistent biological, genetic, and psychological qualities that define men and women in regard to physical appearance, behaviors, and attitudes. Men and women generally have a strong understanding of what it means to be stereotypically masculine or feminine (Bem, 1974; Costa, Terracciano, & McCrae, 2001; Deaux & Lewis, 1984; Spence, Helmreich, & Stapp, 1975). For example, some masculine traits on the Bem Sex-Role Inventory (BSRI) include: self-reliance, being a risk-taker, independent, self-sufficient, and aggressive, whereas some of the feminine traits consist of being nurturing, displaying emotional sensitivity and compassion, yielding to others, and being affectionate (Bem, 1974). The Personal Attributes Questionnaire (PAQ), developed by Spence et al. (1975), includes similar characteristics to the BSRI, with examples of additional masculine items such as enjoying science and mathematics, having mechanical and business skills, and not giving in to pressure/stress, with feminine items including: having a need for security, approval, being religious, and oriented towards staying at home. A study of college students and adults from 26 different cultures by Costa et al. (2001) demonstrated that women are typically seen as more nurturing, submissive, concerned with feelings over ideas, and as having a higher overall tendency for experiencing negative affect (e.g., anxiety, depression, shame, guilt, low self-esteem, etc.). Prentice and Carranza (2002) examined traditional gender stereotype desirabilities and perceptions in American society versus Princeton University undergraduate students, and their analysis found that “people believe men and women . . . differ in most of the ways they are supposed to” (p. 275), and when “gender-intensified prescriptions or proscriptions” (p. 279) are not followed, men and women may be sanctioned accordingly.

From birth and throughout the lifespan, gender role competencies and knowledge are continuously being formed and reformed by the teaching, modeling, and feedback of others (e.g., parents, siblings, peers, teachers, coaches, co-workers, healthcare providers, etc.) through a variety of

social, cultural, and structural/institutional sub-systems (e.g., home, school, athletics, workplace, media, healthcare, etc.; Bussey & Bandura, 1999).

Parental influence.

Kane's (2006) interview analyses of parents with three- to five-year-old children concluded "that parents are . . . consciously aware of gender as something . . . they must . . . construct, at least for their sons" (p. 172), and gender nonconformity is generally rejected by parents (especially heterosexual fathers; Kane, 2006; Rieger, Linsenmeier, Gygax, & Bailey, 2008), and nonconforming children typically experience significant pressure to change nonconforming behaviors (Thomas & Blakemore, 2013). Starting at infancy, boys and girls typically have different parental attachment levels, due in large part, to paternal and maternal sensitivity levels. Mothers are generally warmer, more loving, nurturing, and sensitive, while fathers tend to interact through play (Grossman, Grossman, Kindler, & Zimmerman, 2008), even though mothers have been found to participate in more physically intense interaction (e.g., "play lifting" and "repositioning") with sons than daughters (Fausto-Sterling, Crews, Sung, & Garcia-Coll, & Seifer, 2015, p. 1355). Despite this finding, maternal-infant attachment and bonding is significantly stronger than that of the father and infant (DeWolff & van IJzendoorn, 1997), perhaps implying that mothers have stronger and more positive influences on emotional regulation early and later on in life than fathers (Braungart-Rieker, Garwood, Powers, & Wang, 2001), while also helping to decrease the likelihood of later antisocial and maladaptive outcomes more so than fathers (Kochanska & Kim, 2012). In fact, the strength of the association between paternal sensitivity and infant attachment has not significantly changed over the last 30-plus years (Lucassen et al., 2011).

Mothers also respond more frequently than fathers to infant vocal cues, the mother's speech is preferred by the infant, and mothers reveal a preference for speaking more to their infant daughters than infant sons (Johnson, Caskey, Rand, Tucker, & Vohr, 2014), which may result in language/vocabulary acquisition and social, cognitive, and emotional development repercussions in

boys (Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991; Page, Wilhelm, Gamble, & Card, 2010). Indeed, infant- and toddler-aged girls seem to acquire and demonstrate linguistic abilities (i.e., gesturing, word production and combination) earlier than boys of the same age (Eriksson et al., 2011), while also having significantly more advanced sensitivities for recognizing nonverbal communicative signals, a skill known as “facial expression processing,” which begins during infancy and lasts throughout adulthood (Hall, 1978, 1984; Hall & Matsumoto, 2004; McClure, 2000, p. 424). Maternal vocal modeling, responsiveness, and sensitivity provided to infants as young as four months significantly influences the attachment security of those infants at two-and-a-half years-old, with vocal modeling and responsiveness playing a larger role than sensitivity (Bigelow et al., 2010). By three months of age, infants can express a variety of emotional expressions (i.e., anger, pain, interest, joy, enjoyment, brow flash, and knit brow), and mothers demonstrate high expression modeling and response rates to their infants, expressing mostly positive emotions (i.e., enjoyment, interest, surprise, and brow flash), but showing more variability in expressions to female infants, who display significantly higher rates of interest expressions than their male infant counterparts (Malatesta & Haviland, 1982). Additionally, at four months of age, both male and female infants tend to communicate more with mothers than fathers, demonstrating longer gazing time at the mother, as well as producing more smiles and vocalizations when interacting with the mother (Colonesi, Zijlstra, van der Zande, & Bogels, 2012). As early as two months, infants show preferences toward more attractive versus less attractive female faces (Langlois et al., 1987). Between three and four months, infants show preferences for faces of the same sex of their primary caregivers, who are typically the mothers (Quinn, Yahr, Kuhn, Slater, & Pascalis, 2002). At six months, infants begin to classify male faces based on facial masculinity over attractiveness (Rennels, Kayl, Langlois, Davis, & Orlewicz, 2015), and between six and nine months, infants of both sexes display the capacity to match female faces with their voices (Boisferon et al., 2015). By 12 months, among adult male faces of low

masculinity features (i.e., more similar to female characteristics), the attractive faces are preferred (Rennels et al., 2015).

Rheingold and Cook (1975) demonstrated that parents designed boys' rooms with significantly more traditionally masculine toys (e.g., military and sports objects, soldiers, Indians, cowboys, animals, art and educational materials, vehicles) and themes (i.e., animal motifs) than the girls' rooms, which were furnished and designed in stereotypically feminine manners, with toys consisting of dolls, doll accessories, doll houses, and items related to taking care of the home, as well as having floral, lacy, and frilly themes. Thus, boys may associate their interests with traditionally masculine activities that take place mainly outside of the home, while girls have a higher likelihood of adopting traditionally feminine home-oriented roles (Bussey & Bandura, 1999). By 18 months, girls and boys show preferences for stereotypical female and male toys (e.g., baby dolls for girls and locomotives, automobiles, and tractors for boys; Serbin, Poulin-Dubois, Colburne, Sen, & Eichstedt, 2001), with one study finding similar evidence for three- to eight-month-olds (Alexander, Wilcox, & Woods, 2009). Serbin et al. (2001) also found that 18-month-old girls can match vehicles with male faces and dolls with female faces, whereas same-aged male infants cannot. A pilot study by Ben-Zeev and Dennehy (2014) noted that for U.S. boys to wear pink is significantly more forbidden than for U.S. girls to wear blue, and boys who do wear pink are violating traditional gender conduct and may be situated in a more subordinate position to those boys wearing blue. These results were further verified in their follow-up experiment where subjects were shown three photos of male infants dressed in pink or blue and two hypothetical vaccination options (one more risky than the other) to prevent a certain flu strain, and results indicated that the majority of male infants wearing blue were chosen to receive the less risky vaccine than those wearing pink (Ben-Zeev & Dennehy, 2014).

As far as risk-taking in children, parents tend to promote more risk behaviors in boys than girls and perceive boys to have a lower susceptibility to injury than girls (Morrongiello & Dawber, 1999),

despite unintentional injuries being the number one cause of death for males and females from ages one through 44 years (USDHHS, CDC, NVSS, NCHS, National Center for Injury Prevention and Control [NCIPC], 2016), with males having higher injury and mortality rates in every age category (USDHHS, CDC, NVSS, NCHS, NCIPC, 2015). Hagan and Kuebli's (2007) study of parental responses to their preschool-aged children taking part in an obstacle course revealed that fathers monitored their daughters significantly more closely and carefully than their sons, by standing closer to them during balancing activities and giving more verbal feedback. Mothers were inclined to monitor the risk-taking behaviors of sons and daughters equally; however, more verbal feedback and encouragement was given to daughters than to sons (Hagan & Kuebli, 2007). A later study by Morrongiello, Zdzieborski, and Normand (2010), showed that when the exact same risk-taking behaviors in two-year-old boys and girls led to injury, mothers and fathers reacted with significantly higher levels of disciplinary action with sons but had reactions focused on safety with daughters. Mothers also reacted more angrily with sons but were disappointed and surprised with their daughters' behavior. Parents attributed their sons' risk-taking behaviors to innate, personality-based traits, whereas the behaviors of their daughters were perceived to be correctable and more circumstantial (Morrongiello et al., 2010). Another study found that in three- and four-year-old boys and girls, boys reported a higher desire for risk-taking than girls when it comes to situations such as climbing stairs, trees, playgrounds, and diving boards, and fathers were reported as being markedly more tolerant of their sons engaging in risky behaviors than their daughters (Galligan & Kuebli, 2011). Hallers-Haalboom and colleagues (2016) found that in children from one-year-old to three-and-a-half years-old, mothers disciplined their sons and daughters more often than fathers, and mothers used significantly more physical punishment with their sons than fathers used with them. However, a study with fifth- and sixth-grade children found that although boys received more verbal and corporal discipline than girls, the fathers were issuing higher levels of each compared to the mothers (McKee et al., 2007). Corporal and verbal punishment are forms of "harsh-negative" parental conduct,

often involving coercive and intimidating techniques that attempt to physically and psychologically punish the child (Rueger, Katz, Risser, & Lovejoy, 2011, p. 4), which have clear and significant links to later antisocially-driven behaviors, depressive symptoms, and aggression (Grogan-Kaylor, 2004; Harper, Brown, Arias, & Brody, 2006; Lansford et al., 2014; Wang & Kenny, 2013). Additionally, parental severity of corporal punishment and levels of support impact depression and aggression symptoms in children, particularly showing that high paternal support, irregardless of high or low levels of maternal corporal punishment, acts as a significant protective factor against later detrimental psychosocial symptoms in the child (Harper et al., 2006). Similarly, Khaleque and Rohner (2012) found that children's "perceived paternal acceptance" (p. 793) was a stronger predictor of later mental health outcomes than "perceived maternal acceptance" (p. 793).

As children age, fathers are perceived as less accepting and understanding of negative affect (i.e., sadness and pain) than mothers, and boys tend to inhibit feelings of sadness and pain by passively withdrawing, using aggression, and not seeking help, while girls are more inclined to openly express their sadness and pain by seeking support from others (Zeman & Garber, 1996). Another study of parent-child interaction indicated that mothers talked to four-year-old daughters and sons about events evoking happiness, sadness, fear, and anger, the causes of those emotions, and used emotion-related words more than fathers. Both mothers and fathers discussed sad and scared feelings more often with daughters than sons and had more interpersonally situated discussions of emotions with daughters than with sons (Fivush, Brotman, Buckner, & Goodman, 2000). Child perceptions of parental love expressions have also been found to differ in children ages four- to six- years-old, with girls reporting physical contact from mothers and gifts from fathers and boys reporting quality time with mothers and meeting fathers' expectations as the primary expressions of parent-child love (Kilicgun, 2016). As far as help-seeking, Fagot's (1978) study of children ages 20-months to two-years-old is a reminder that young boys are discouraged from and given more negative feedback for seeking help than girls, who sought help

over three times that of the boys in the study (Fagot, 1978). Parents are instrumental agents in their children's later help-seeking behaviors, and as early parental positive affect, responsiveness, and support for the child increase, the parent-child attachment becomes more secure, allowing the child to develop trust and confidence in the parent, especially when solving a stressful and difficult problem. These parent-child experiences increase the confidence and motivation (i.e., self-efficacy) of the child to approach, interact with, and trust other important individuals (e.g., peers and adults), as they share in the help-seeking relationship (Newman, 2000). A similar conceptual model proposed by Nelson-Le Gall (1981) termed the "instrumental help-seeking process" (pp. 224, 227), stresses the importance of children identifying the need for assistance, making a decision to seek out assistance, determining possible "helpers" (p. 230), requesting assistance through effective strategies, and evaluating and reacting to the help-seeking outcomes.

Sibling influence.

Parent-child relationships are quite related to sibling interactions, which provide children and adolescents opportunities for developing social competencies that can be translated to extrafamilial relations (Steinberg & Morris, 2001). In fact, sibling relations can "have a consistent and enduring effect on later peer relationships" (Roskam, Meunier, & Stievenart, 2015, p. 11). A longitudinal study by Rust and colleagues (2000) demonstrated that older brothers have the strongest effect on masculinizing and defeminizing younger brothers and sisters than having an older sister or being an only-child. Older brothers may also impact later conduct of younger siblings, especially when early childhood relationship issues exist, the older brother is involved with a deviant peer group, and the younger sibling is exposed to and models the older sibling and peer groups' risky behaviors (Snyder, Bank, & Burraston, 2005). As far as birth order effects, McHale, Updegraff, Helms-Erikson, and Crouter (2001) found that first-born siblings in the fourth and fifth grade were more significant factors in shaping their one- to three-year-younger second-born sibling's traditional gender roles than that of the parents; it is around fourth grade

that children perceive sibling relationships as the most supportive, especially among girls, but it is also a time that children perceive the highest level of conflict in sibling relationships, and boys also perceive higher levels of power than girls in sibling relationships (Furman & Buhrmester, 1992). Sibling relationships involving hostility, negativity, and conflict are largely related to maladaptive and antisocial behaviors of adolescent boys and girls in “nonstepfamilies” and boys in “stepfather families” (Kim, Hetherington, & Reiss, 1999, p. 1209).

Peer influence.

Gendered beliefs and behaviors are further developed by one’s peers, who Connell (1996) referred to as “bearers of gender definitions” (p. 220). Among child and adolescent peer groups, boys tend to rank themselves and their male peers as demonstrating significantly higher levels of overt physical aggression and victimization towards peers than their female counterparts, behaviors which may come in the form of physical threats and attempts to hit, shove, taking things away, and even abuse against others when showering (Bjorkqvist, Lagerspetz, & Kaukianinen, 1992; Crick & Grotpeter, 1996). Kreiger and Kochenderfer-Ladd (2013) found that among fourth-grade boys and girls, increased peer victimization and decreased social acceptance occurred to those who preferred more traditionally feminine activities and associated with predominately females. According to Thomas and Blakemore (2013), gender-nonconforming children are expected (as adults) to experience more psychopathology and pressure to change gendered behaviors and to exhibit less heteronormative sexuality, especially for boys demonstrating traditionally feminine qualities. Additionally, in a population of preadolescents, the harassment and abusive victimization and discrimination of gender nonconformists was markedly elevated as a result of maltreatment from boys and girls who reported high levels of social acceptance and attractiveness, as well as by those who demonstrated insecurity and frustration about their own gender identity (Pauletti, Cooper, & Perry, 2014). It is those children who feel unpopular and rejected by their peers who experience the most physical and social peer victimization, the least peer social support,

and the highest levels of depression, social anxiety, loneliness, and social avoidance (Crick & Grotpeter, 1996).

Teacher influence.

Garrahy (2001) stated that upon “considering the time students spend in school, the magnitude of gender imbalance and gender bias could be enormous and . . . detrimental to the education of girls and boys” (p. 93). Indeed, the teacher-child relationship in the early elementary and adolescent years plays a strong role in future risk behaviors and academic outcomes (Hamre & Pianta, 2001; Olsson, Fahlen, & Janson, 2008; Reio, Marcus, & Sanders-Reio, 2009; Voisin, DiClemente, Salazar, Crosby, & Yarber, 2006). In kindergarten, boys tend to have significantly more distant and problematic relationships with their teachers, demonstrate poorer class-related behaviors such as “listening, participation, compliance, cooperation, and study habits,” and violate more school disciplinary policies than girls, which all help forecast future school-related behaviors and academic outcomes (Hamre & Pianta, 2001, p. 629). Additionally, elementary-aged boys perceived by their teachers as overly dependent (e.g., especially reliant on and attached to them) are typically given less class-related behavioral praise on grade reports and struggle with future school-related behavior, whereas these effects are not seen when teachers perceive girls as dependent. Girls also tend to have better class-related behaviors in kindergarten through fourth grade and fewer disciplinary issues in fifth and sixth grade when the teacher-child relationship is viewed as close (e.g., open lines of interpersonal communication, comforting, and loving), whereas these results are not present when teachers perceive close relationships with boys (Hamre & Pianta, 2001).

During adolescence, positive socioemotional health outcomes (e.g., feeling engaged and connected to one’s school community, displaying high levels of responsibility, and increases in prosocial and other psychologically healthy behaviors) are a result of strong teacher-student bonds (Herrero, Estevez, & Musitu, 2006; Wentzel, 2002). In a study similar to Hamre and Pianta (2001), Rudasill, Reio,

Stipanovic, and Taylor (2010) found that boys typically have lower quality relationships (i.e., less closeness and more conflict) with teachers in grades four through six than girls and demonstrate significantly higher likelihoods of engaging in risky behaviors (i.e., not wearing car safety belt, tobacco smoking, consuming alcohol, stealing, and physical fighting) in sixth grade than girls. Conversely, girls tend to have closer and less conflictual teacher-student relationships, thus resulting in less risk-taking behavior by sixth grade (Rudasill et al., 2010).

Teachers also influence students' attitudes and perceptions in regard to academic abilities and potential career field motivations and choices from an early age. As early as the end of first grade, children are able to perceive and distinguish their competencies in mathematics and reading as well as establish the value of each area as it pertains their own enjoyment, interest, importance, and usefulness (Eccles, Wigfield, Harold, & Blumenfeld, 1993). Despite Hyde, Fennema, and Lamon's (1990) scoping review concluding that girls typically have stronger overall mathematical abilities in elementary and middle school, Fennema, Peterson, Carpenter, and Lubinski's (1990) study of 38 first grade teachers demonstrated that boy students are typically regarded as being more mathematically competent, as well as valuing mathematics more than girls. These results may help explain Eccles' et al. (1993) findings that early elementary boys perceive themselves as having stronger mathematical competencies than do girls, whereas girls perceive greater competency in reading compared to boys' perceptions, findings which are consistent with more current research (see Beilock, Gunderson, Ramirez, & Levine, 2010).

Despite teachers' attempts to decrease and (perhaps) reverse explicit and implicit gender biases over time by adopting philosophies of " 'gender blindness' " (Garrahy, 2001, p. 92) or pinning girls and boys as generally over- and underachieving, respectively (Jones & Myhill, 2004a, 2004b), the principal learning culture favoring largely boy students has appeared to continue dominating classrooms (Garrahy, 2001), with children as young as seven and eight years-old recognizing the traditionally acceptable and prescribed gender behaviors and boundaries in a classroom (Skelton et al., 2009). Leaper

and Brown's (2008) study of 600 female adolescents, comprised of mainly ethnic minority groups (77.5%), reported that more than half of these individuals had heard at least one academically sexist statement about their science, technology, or math abilities, with nearly one out of four of these subjects reporting statements being made by a teacher or coach. Such discriminatory statements are further evidence that science, technology, engineering, and mathematics (STEM) careers continue to be normalized as inherently masculine, which can negatively impact the self-efficacy of young women in regard to their STEM abilities, thus decreasing the likelihood that they will enter or succeed in such fields (Cheryan, Ziegler, Montoya, & Jiang, 2017).

Athletics influence.

After Title IX of the 1972 Education Amendments to the Civil Rights Act was passed, requiring schools to provide women with equal access for all activities (Stevenson, 2007), female participation rates in high school athletics rose exponentially from 4% (compared to nearly 50% in males) in 1971 to 53% in 2015, in turn, increasing the total participation rates (females and males) from 27.7% in 1971 to close to 58% in 2015 (National Federation of State High School Associations [NFSHSA], n.d.; Snyder, 1993; USDHHS, CDC, Division of Adolescent and School Health [DASH], National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, 2016). Despite these increases in female high school sport participation, a gender gap still remains, with 62.2% of boys and 53% of girls participating today (USDHHS, CDC, DASH, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, 2016), and sport in U.S. society continues to be viewed as a predominantly male social institution portraying many of the most fundamental and exemplary representations of hegemonic masculinity, which are enforced/reinforced and constructed/reconstructed at all ages and levels of participation and competition (Connell, 1992, 1996, 2005; Messner, 1990a, 1990b; Messner & Sabo, 1994). This institutionalized subordination of women in sport was further detailed in an analysis of 14 federal court cases involving teenage boys being denied opportunities to play on girls' athletic teams (when no boys'

teams were available) when Love and Kelly (2011) concluded that “the language of these rulings is that women are legally defined as weak, fragile, and athletically inferior to men. The courts perceive girls-only teams as an appropriate solution to this problem” (p. 245). If U.S. federal judges’ decisions are able to demonstrate gender bias, prejudice, and/or discrimination as it pertains to women and sport, it should come as no surprise that nearly eight in 10 adolescent girls have been the victim of a misogynistic statement in relation to their athletic prowess and ability by age 18, with almost 28% of these victims reporting hearing these statements from a teacher or athletic coach (Leaper & Brown, 2008).

Eccles et al. (1993) found that by first-grade, boys already value and perceive greater competence in sports than girls, beliefs that only grow stronger over time, despite the very small differences in actual athletic abilities as measured by the researchers and reported by the students’ teachers. An additionally interesting finding is that of the specific measured sport competencies (i.e., sports, throwing a ball, catching a ball, and tumbling/gymnastics), boys had more positive competency perceptions for sports, throwing, and catching, whereas girls had more positive competency perceptions only for their tumbling/gymnastics abilities. The gender differences in the self-perceived ratings of sport domain competencies had significantly higher effect sizes than for the other domains measured (i.e., mathematics, reading, and instrumental music; Eccles et al., 1993). In a related study, Cherney and London (2006) surveyed children ages five to 13 years-old and found that boys spent considerably more time playing outdoor, ball-related, physical, violent, and dangerous sports (e.g., basketball and football) than girls (e.g., swimming and riding bicycles), and adults perceived and rated the boys’ favorite sports as requiring more overall athletic skill, visuospatial ability, aggression, and team-based conceptual knowledge than the girls’ preferred sports (Cherney & London, 2006). Thus, one can see clear gendered delineations of the perceptions, beliefs, values, and attitudes of children, adolescents, and adults pertaining to gender roles, norms, and behaviors in athletic activities and environments starting at very young ages.

For boys and men, athletics has been described as “the social process of the masculinization of the male body through sport” (Messner, 1990b, p. 144), a process that has normalized physical and mental abuse of self and others (Sabo, 1986), the denial of emotional, psychological, and physical pain and suffering, the lack of intimate friendships/bonding with other athletes, and obstructing and/or damaging relationships with others (e.g., creating enemies) in order to “win” or “succeed” (Kidd, 1987; Messner, 1987). Indeed, sports culture is very much a brutal and continuous cycle of attempting to assert one’s masculinity in order to potentially accumulate “masculine capital” (de Visser, Smith, & McDonnell, 2009, p. 1048) or perhaps more easily understood, “ ‘man points’ ” (de Visser & McDonnell, 2013, p. 9), despite the negative short-, mid-, and long-term personal and/or interpersonal consequences (Curry, 1993; Laurendeau, 2014), “and displaying these behaviors like badges of honor” is antithetical to healthy practices and outcomes (Courtenay, 2000b/2011, p. 146).

Recent data indicates that a total of almost 7.9 million U.S. high school students participate in school athletics (4.5 and 3.3 million men and women, respectively), and of the top 10 most popular sports for each sex, around 1.1 million more men engage in sports that involve physical contact with others (NFSHSA, n.d.), which is the primary cause of major high school sports injuries (Darrow, Collins, Yard, & Comstock, 2009). Kerr, Collins, Fields, and Comstock (2011) estimated that on a national scale, male high school athletes accounted for almost 79% of total (both sexes) “player-player contact injuries” (p. 594) in major high school sports (i.e., football, soccer, volleyball, basketball, wrestling, baseball, and softball) from 2005 to 2009, with more than half of these injuries occurring in football alone. A more recent report of the total number of reported high school injuries for men and women in the U.S. for the same sports mentioned above demonstrates that men make up nearly 69% of total injuries (contact and non-contact), with football accounting for almost 41% of the total and 59.2% of male-specific injuries (largely from tackling or being tackled by someone). Additionally, males suffer higher overall numbers of injuries to the head/face, ankle, knee, shoulder, and hand/wrist, with women suffering more injuries to

the hip/thigh/upper leg (Comstock, Currie, & Pierpoint, n.d.). The proportion of male high school athletes getting injured during the 2015-2016 season in football, soccer, wrestling, basketball, and baseball were around 53%, 40%, 37%, 15%, and 9%, respectively, and for girls' soccer, basketball, softball, and volleyball, the proportion of athletes who were injured were 55%, 23%, 18%, and 13%, respectively. Upon considering the top three most injury-prone sports for boys and girls, boys accounted for 69% of total injuries, with more than one in four football and one in five soccer and wrestling injuries resulting in diagnosed concussions for men and one in three female soccer injuries resulting in diagnosed concussions. Furthermore, nearly one in six football players, one in 11 male soccer players, one in 12 wrestlers and almost one in five female soccer players will be diagnosed with a concussion during the season (Comstock et al., n.d.; NFSHSA, n.d.). Earlier data looking at concussion-specific injuries in 20 different high school sports indicated that more than one in eight injuries were the result of a concussion, and 47.1% of total concussions occurred in football, 8.2% in girls' soccer, and 5.8% and 5.5% in boys' wrestling and girls' basketball, respectively, with the highest concussion rates occurring in football and boys' wrestling and lacrosse. At 22.2%, boys' ice hockey had the highest concussion-to-total-injury proportion, but girls had greater overall concussion rates than boys upon comparison of all "gender-comparable" sports (Marar, McIlvain, Fields, & Comstock, 2012, p. 748). Although girls have historically had higher concussion rates than boys (Lincoln et al., 2011), boys tend to underreport sports injuries in general (Dick, 2009), including concussions (Davies & Bird, 2015; Meier et al., 2015; Miyashita, Diakogeorgiou, & VanderVegt, 2016), which may blur the reported concussion incidence data (Dick, 2009).

The American Medical Society for Sports Medicine (AMSSM) urges increasing concussion education programs for coaches, especially those in sports involving collision and other contact, so that concussions are more easily recognized, managed, and ultimately prevented (Harmon et al., 2013). A major AMSSM recommendation for coaches is to teach and model "fair play," which includes promoting

safety of all athletes (including opponents) in regard to specific sport techniques and rules (Harmon et al., 2013, p. 25). Another important recommendation, and at least according to a study of U.S. National Collegiate Athletic Association (NCAA) coaches in Divisions I-III by Kroshus, Baugh, Hawrilenko, and Daneshvar (2015), more important recommendation, is to change the beliefs, attitudes, and overall culture of concussion prevention and management among coaches (Harmon et al., 2013), particularly for men who coach all-male teams, who demonstrate the most negative beliefs and attitudes when it comes to concussions in athletes, which in turn, leads to less concussion-safety and education support (Kroshus et al., 2015). For example, when compared with male coaches of all-female teams, men who coached all-male teams were significantly more likely to believe that athletes are not as “ ‘tough’ ” nowadays, that it is acceptable for athletes to wait until a competition is over to report symptoms to the team medical staff, and they expressed significantly higher levels of worry about concussion-related regulations and what they were doing to their sport (Kroshus et al., 2015, p. 535).

Coaches are responsible for motivating athletes to take action in order to produce and achieve a desired result (Ryan & Deci, 2000), and coaches have the potential to impact boys’ and girls’ lives in constructive or destructive manners, specifically as it pertains to the athletes’ perceived level of coaching support and instruction (Smith & Smoll, 1990; Smith, Smoll, & Cumming, 2007; Smoll, Smith, Barnett, & Everett, 1993). In fact, Mageau and Vallerand (2003) stated that “the coach-athlete relationship is one of the most important influences on athletes’ motivation and . . . performance” (p. 884), and “whether intended or not, coaches are agents in the construction of their players’ masculinities” (Adams, Anderson, & McCormack, 2010, p. 295). For example, in an ethnographic-observational study of a men’s semi-professional football (i.e., soccer; Ekstrand, Hägglund, & Waldén, 2011) team in the UK, Adams et al. (2010) found the relationship between athlete and coach to be highly asymmetrical, with the coaches deeply entrenched in hegemonic, traditionally-masculine, and dominant discourse towards players, saying things such as, “ ‘This is a man’s game! . . . If you haven’t got

the balls for it, there's a women's team you can play on' " (p. 286), and " 'Slit their fuckin' throats! . . . We want to see more players . . . with blood on their shirts' " (p. 286), and even " 'What are you, a pussy?' " (p. 287). In addition to themes of violence, aggression, misogyny, and "femphobia," other coach-to-player discourse used homophobic British terms (i.e., " 'poofs' " and " 'tarts' ") and extreme language invoking the castration and sexual assault of opponents, all to motivate players to assert their hypermasculinity against others to win (Adams et al, 2010, pp. 288, 292, 296). The discourse from coach-to-player resulted in similar player-to-player treatment on the field, with discourse between teammates such as, " 'Fuck off, you poof. I hardly touched you. Get on with it and stop being such a shithouse [an English euphemism for sissy or coward],' " and even discourse to opposing players such as, " 'Get up you fuckin' bender. I didn't even touch you' " (with bender being a slang term for a gay man; Adams et al., 2010, p. 290). The asymmetrical coach-player relationship explained above negatively impacted team dynamics via an unsupportive, coach-built, hegemonic social culture, which disrupted team and player-to-player harmony, self-efficacy, and internal loci of control, or what Ryan and Deci (2000) referred to as "relatedness," "competency," and "autonomy," respectively, constructs which when maintained and/or enriched, play vital roles in facilitating others' "intrinsic motivation," which is better understood as one's "inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn" (pp. 69-71), endeavors which directly benefit mental health and wellness.

Workplace influence.

Over three decades ago, West and Zimmerman (1987) pointed out the overt labor divisions in society, demonstrating the importance placed upon work allocation based on stereotypically feminine and masculine roles. Despite significant progress through increasing female workforce participation, decreasing wage gaps with men, and enhancing women's opportunities for college education, there remains an obvious division of labor in U.S. society (USDL, USBLS, Division of Information and Marketing

Services [DIMS], 2017). For example, men work in the vast majority of the most dangerous and fatal jobs in the U.S., jobs such as logging workers (97.3%), fishermen and related fishing workers (> 99%), aircraft pilots and engineers (90.6%), roofers (97.7%), refuse and recyclable material collectors (89.6%), structural iron and steel workers (97.8%), driver/sales workers and truck drivers (94.9%), farmers, ranchers, and other agricultural managers (76.1%), electrical power-line installers and repairers (98.8%), and first-line supervisors of landscaping, lawn service, and grounds-keeping workers (93.4%), with agriculture, fishing, and forestry jobs having the highest fatal injury rates (per 100,000 full-time equivalent workers; USDL, USBLS, DIMS, 2017; USDL, USBLS, OCWC/Office of Safety and Health, 2016), and in 2015, men accounted for 93% of the 4,836 total job-related fatalities in the U.S. (USDL, USBLS, OCWC/Office of Safety and Health, 2016). In addition to the deadliest jobs in the U.S., men also tend to occupy greater proportions of high-wage positions of power, such as physicians and surgeons (62.1%), dentists (74.1%), chief executives (72.1%), general and operations managers (72.4%), lawyers (65.5%), aircraft pilot and flight engineers (rate mentioned above), air traffic controllers and airfield operations specialists (75%), judges, magistrates, and other judicial workers (61%), architectural and engineering managers (92.6%), astronomers and physicists (78.6%), petroleum engineers (90.7%), financial advisors (62.1%), computer hardware engineers (87.2%), and computer and information systems managers (72.8%), with all of these jobs having average annual salaries of at least \$118,200 (USBL, USBLS, DIMS, 2017; USDL, USBLS, Division of Occupational Employment Statistics [DOES], 2017). The lucrative nature of traditionally male-dominated jobs and improved anti-discrimination hiring policies and practices helped increase the incentive for women to enter into these masculine roles over the past 50-plus years, despite sociocultural sanctions; however, largely due to poorer compensation, less opportunities for advancement, and sociocultural sanctioning, the same trend has not occurred with men entering into jobs historically dominated by women (England, 2010). This is apparent in today's U.S. workforce considering that more than 90% of women make up each of the following traditionally female-

dominated occupations: preschool and kindergarten teachers (96.8%), teacher assistants (91.4%), dietitians and nutritionists (94.6%), speech-language pathologists (98.6%), nurse practitioners (90.8%), dental hygienists (96.4%), dental assistants (94.1%), medical assistants (90.7%), licensed practical and licensed vocational nurses (90.1%), hairdressers, hairstylists, and cosmetologists (94.2%), childcare workers (94.9%), billing and posting clerks (90.1%), receptionists and information clerks (90.6%), secretaries and administrative assistants (94.5%), and word processors and typists (92.1%; USDL, USBLS, DIMS, 2017).

In 2015, men worked 57% of the nearly 2.8 billion total hours of work recorded for both sexes (USDL, USBLS, OCWC/Office of Safety and Health, 2016), with lower rates of absenteeism and loss of worktime overall and due to injury and illness than women, with the lowest absenteeism rates (both sexes) due to injury and illness for those working in management, finance, professional and business services, and mining, quarrying, and oil and gas extraction, and the lowest lost worktime rates (both sexes) due to injury and illness for those in legal occupations, professional and technical services, and management, farming, fishing, forestry occupations, as well as other related agricultural jobs (USDL, USBLS, Division of Labor Force Statistics [DLFS], 2017), with the majority of the positions mentioned having higher proportions of men except for legal and finance occupations, which have slightly higher female representation (USDL, USBLS, DIMS, 2017). Lower job-related absenteeism in men was also found in Oke, Braithwaite, and Antai's (2016) study of women and men living in Sweden, Norway, Denmark, and Finland; however, they suggested that this finding is perhaps "indicative of women's tendency to be proactive regarding their health, consulting health services and being more likely than men to take absence in relation to health issues" (p. 137). Bergström, Bodin, Hagberg, Aronsson, and Josephson (2009) found a dose-response relationship for what they refer to as sickness presenteeism and future sickness absenteeism for female- and male-dominated occupations, suggesting that the more days one is present at work when sick enough to warrant not being there, then more days of future

absenteeism due to illness will occur as a result. In a study of Swedish governmental workers over a 12-year period, Barclay (2012) posited that males' higher propensity for sickness presenteeism played a potential role for a significantly increased risk of all-cause mortality compared to women, a risk that increased by 1.3% for every 1% increase in the proportion of males in the workplace, stating that "it seems plausible that refusing to take the opportunity to recuperate when it is necessary should have a general deleterious effect on the body" (p. 819).

Indicative of the above information is the general pattern of men working long hours, in jobs that are dangerous and/or prestigious but not traditionally female-dominated, with little regard for their health as evidenced by behaviors such as sickness presenteeism. It is when working becomes such a vital necessity that it is performed despite potentially harmful health consequences that one may fit the criteria as a "workaholic" (Oates, 1971), and in a study of two representative samples of those working in Israel in 1981 and 1993, Harpaz and Snir (2003) discovered that being a man was the strongest predictor of being a workaholic (i.e., working significantly more hours than females in the study). In a cross-national follow-up study of Japan, the U.S., The Netherlands, Israel, and Belgium, Snir and Harpaz (2006) found similar results, with men having a significantly higher likelihood of working longer weekly hours than women (47.71 to 39.61), thus being more inclined to "workaholism" (p. 384). This term was most recently defined by Clark, Michel, Zhdanova, Pui, and Baltes (2016) in the following manner:

An addiction to work that involves feeling compelled or driven to work because of internal pressures, having persistent and frequent thoughts about work when not working, and working beyond what is reasonably expected (as established by the requirements of the job or basic economic needs) despite potential negative consequences. (p. 1840)

Meta-analytic data from Clark et al. (2016) found significant personality- and work-related determinants for workaholism. Characteristics representative of Type A personality, such as being a perfectionist, a nondelegator, having a negative affect, and being extraverted were positively associated

with workaholism. Being a manager, work-role conflict and overload, having a supportive boss, work hours, and job commitment, involvement, engagement, absorption, and enjoyment were all positively associated with workaholism, whereas work-role ambiguity (i.e., insufficiently defined job duties as perceived by the employee) and job control revealed negative relationships with workaholism. In terms of outcomes, workaholism was positively related to job stress, counterproductive work behavior, work-life conflict, marital disaffection, burnout, emotional exhaustion, cynicism, and depersonalization, and negatively related to job, family, and life satisfaction, and mental and physical well-being. Relationships between workaholism and its associated characteristics of compulsive inclinations (i.e., excessively hard worker and not being able to unwind after a day of work) and control (i.e., frustration when things do not go a certain way) and NCDs (i.e., CVD [i.e. CHD and high cholesterol], and diabetes) and sleep (i.e., drowsiness in the morning and during the day, poor quality, and inadequate number of hours per day) have recently been identified in samples of 194 women and men working in a variety of occupations in the southeastern part of the U.S. as well as in 537 women and men working in five Spanish hospitals (Aziz, Wuensch, & Shaikh, 2017; Salanova et al., 2016), thus demonstrating the impact of gendered workplace behaviors and overall health.

Media influence.

Never throughout history have people been as “media-saturated and media-engaged” as today (Wood & Fixmer-Oraiz, 2017, p. 234), consuming and producing media content via a multitude of platforms and content types. From September 26, 2016 through December 25, 2016, TV, radio, TV-connected devices (i.e., multimedia devices, game consoles, and videocassette recorder [VCR], and digital video disc [DVD] players), personal computers (PCs), smartphones, and tablets were used by 89%, 93%, 44%, 50%, 83%, and 37% of all adults ages 18 years and older in the U.S., respectively, in an average week. During an average minute of the week, 44% of media consumption is TV, 17% is radio listening, 6% involves TV-connected devices, PCs account for 9%, smartphones represent 20%, and 5% of

this time involves tablet-use. Additionally, U.S. adults engage with TV, radio, smartphones, and tablets at least 5 days per week for each of these platforms, 4.3 days per week for PCs, and 3.6 days per week for TV-connected devices. And as far as time, 78.2 hours of a U.S. adult's week is spent on the following: TV (34.53 hours), radio (13.03 hours), TV-connected devices (4.3 hours), PCs (6.9 hours), smartphones (15.85 hours), and tablets (3.55 hours). Thus, an adult in the U.S. spends 46.5% of their week on the above-mentioned media platforms and content-types (Nielsen Company, 2017). For those in middle school (i.e., grades six through eight) in the U.S., Youth Risk Behavioral Survey (YRBS) data from 2015 estimated that 28.3% of these youth (28.5% of girls and 28% of boys) watched at least three hours of TV during a typical school day, and 41.9% (42% of females and 41.8% of males) played non-school-related computer or video games for at least three hours on a typical school day (USDHHS, CDC, Division of Adolescent and School Health [DASH], National Center of HIV/AIDS, Viral Hepatitis, STD, and TB, 2016b). Of U.S. high school (i.e., grades nine through 12) students, YRBS data from 2015 showed that 24.7% spent at least three hours per school day watching TV, with boys having slightly higher rates than girls at 25% to 24.45. Nearly 42% of high school girls and boys spent at least three hours per school day playing computer or video games for non-school-related purposes, with girls having higher rates than boys at 42.8% to 40.6% (USDHHS, CDC, DASH, National Center of HIV/AIDS, Viral Hepatitis, STD, and TB, 2016a).

According to the gender similarities hypothesis, women and men are cognitively more similar than they are different, showing significant dissimilarities for just a few measures (i.e., faster throwing speed and longer throwing distance in men, higher male masturbation incidence, more positive perceptions of casual sexual encounters in men, and higher physical aggression in men; Hyde, 2005). Despite these important findings, mass and digital media have traditionally portrayed gender in stereotypically different manners (Grau & Zotos, 2016), with Eisand (2010) stating that "marketers . . . react to gender-specific developments in society and use existing values . . . to promote their brands rather than trying to alter these values" (436), which occurs through the misrepresentation of gender

roles, the subordination of women, the glorification of traditional and hegemonic masculinity practices in men, and violence towards women (Collins, 2011; Wood & Fixmer-Oraiz, 2017).

The evidence is clear that tobacco promotion in the media leads to smoking in youth and adolescents (Pierce, Choi, Gilpin, Farkas, & Berry, 1998; USDHHS, CDC, NCCDPHP, OSH, 2012, p. 508), and dating back more than 60 years ago, advertising and marketing strategies would begin and continue reaching out to men and women using themes of traditional masculinity (Cortese & Ling, 2011; Starr, 1984). In a January 7, 1955 letter to Roger Greene, the advertising director of Philip Morris (producers of Marlboro), Leo Burnett (chief executive officer of Leo Burnett Company) detailed his plans for the “New Marlboro” mass media campaign, and some of his key statements that would shape the tobacco industry, leading to powerful tobacco-promoting personalities for men and women were the following:

All these advertisements feature men . . . We know . . . that women . . . tend to buy . . . a man’s cigarette. So . . . men . . . have been . . . selected to appeal to both sexes. . . . They’re army . . . navy . . . and business men. . . . They give our advertising virility without vulgarity . . . quality without snobbery. The cowboy is an almost universal symbol of admired masculinity [which would become the Marlboro Man]. The man in the . . . suit has a tattoo on his wrist. . . . It will say to . . . men that here is a successful man who used to work with his hands. To . . . women . . . it will suggest a romantic past. (Burnett, 1955, p. 3)

The above example is evidence of how Marlboro made “masculinity as much a product of consumption as the cigarette” (Cortese & Ling, 2011, p. 5). Burnett’s (1955) New Marlboro market plan was a similar framework used by Philip Morris as well as Brown and Williamson Tobacco Company around 40 years later with their “new lad” magazine campaign, which had the aim of increasing tobacco product sales in young men by selling them their magazines laced with tobacco advertisements and popular masculine content involving other risky behaviors (e.g., extreme sports, eating contests, etc.).

These strategies helped to “normalize risk as a positive masculine trait, while disguising the risks associated with tobacco use” (Cortese & Ling, 2011, pp. 6, 9).

A large cross-sectional study of 4,919 middle school students in New Hampshire and Vermont found a very significant positive association between tobacco use exposure in popular motion pictures and trying smoking (Sargent et al., 2001). In an analysis of 88 top-selling U.S. motion pictures in 2002, male characters were significantly more likely to smoke than female characters, and smoking occurred with no physical health consequences. The most significant predictors of smoking in these films were being male, white, having a lead role, being in a position of power in the film, and being 60 years-of-age or older (Dozier, Lauzen, Day, Payne, & Tafoya, 2005).

A systematic review of seven longitudinal cohort studies including 13,255 individuals between the ages of 10 and 26 years found a significant and direct relationship between exposure to alcohol-related media marketing and advertisements and alcohol consumption behaviors for each study examined (Smith & Foxcroft, 2009). Anderson, de Bruijn, Angus, Gordon, and Hastings (2009) performed a similar review of 13 studies, totaling more than 38,000 individuals aged 10 to 21 years, with 12 of the studies concluding that exposure to alcohol-related advertisements and promotional media is significantly predictive of alcohol consumption initiation in nondrinkers and increased alcohol consumption in those who already drink. The one other study reviewed found that the intention to consume alcohol increases with outdoor media materials placed in close proximity to subjects’ schools (Anderson et al., 2009). A systematic review by Noel, Babor, and Robaina (2017) examined marketing practices of the alcohol industry and found that youth males are especially targeted, and according to Ringel, Collins, and Ellickson (2006), this may be due in large part to youth and adolescent males’ significantly higher likelihood of consuming sports-related cable and broadcast TV programming than their female counterparts, which contain the majority of alcohol-related advertising.

An analysis of 225 undergraduate male Facebook users found that more than 85% of profiles contained references to alcohol (mostly beer/malt beverages), and these references significantly increased with each year of college and as Facebook friends increased, in effect increasing the social normalcy of consuming alcohol in college men (Egan & Moreno, 2011). A study of social media-related alcohol exposure and drinking behaviors of 408 U.S. incoming freshmen college students found that although females were significantly more exposed to alcohol-related posts than males in the beginning of the fall semester (due to checking Facebook, Instagram, and Snapchat more often), alcohol consumption in the second semester was significantly higher in males, highlighting the impact of alcohol-related social media posts for male college students (Boyle, LaBrie, Froidevaux, & Witkovic, 2016) and perhaps the influence of students' perceptions of peer alcohol consumption behaviors (Egan & Moreno, 2011).

Exposure to food advertisements, especially when products are energy-dense, fattening, and sugar-sweetened, are directly and significantly predictive of child food choice and weight status (Lobstein & Dobb, 2005), with similar findings for adults in a systematic review by Vukmirovic (2015). Upon viewing food-related advertisements, higher-weight children and adults are more likely to consume higher amounts of unhealthy, energy-dense foods than their lesser-weight peers (Halford et al., 2008; Mills, Tanner, & Adams, 2013). An experiment by Harris, Bargh, and Brownell (2009) found that after university students viewed healthy and unhealthy food-related commercials, men consumed significantly more food than women, and unhealthy food commercials led to much higher food intake than healthy food commercials in men.

When it comes to media and gendered weight portrayal, content analyses of high-rated TV programs in the U.S. found men to be more overweight and obese, to have more instances of eating (Greenberg, Eastin, Hofschire, Lachlan, & Brownell, 2003), and to stigmatize others more often about their weight status than women (Eisenberg, Carlson-McGuire, Gollust, & Neumark-Sztainer, 2015). The

finding that male characters are more likely to eat during prime-time TV programs (Greenberg et al., 2003) may have implications, considering that Poor, Duhachek, and Krishnan (2013) found that exposure to food being consumed by someone else (i.e., consummatory images) versus food-only images have a powerful effect on food consumption behaviors, especially when involving unhealthy food.

As an industry, it appears media advertising is not in the business of gender equality. Eisand's (2010) meta-analysis of 37 TV/radio advertisement content analyses from 1975-2007 found many significant gender portrayal disparities, with men being more likely than women to be older, voiceovers, product experts, autonomous, in an occupational setting, scientific/accurate in their arguments, given the final word in an advertisement, and surrounded with other men in the background. A recent content analysis of gendered roles in prime-time TV commercials across 13 different countries yielded many interesting and similar findings to Eisand (2010), which were the following: In 12 of the 13 countries, males were significantly more likely to do voiceovers (representing nearly 62% of voiceovers compared to the 32% female voiceover representation); Women were portrayed as significantly younger in the U.S., Austria, Japan, Slovakia, Germany, Spain, and France; Leading male roles were significantly associated with automobile and technology commercials in the Netherlands, Germany, Brazil, the UK, and Spain, but there was not a significant effect for these products in South Korea, Japan, Austria, Romania, Slovakia, China, or the U.S.; Women were significantly more likely to promote personal hygiene, cleaning, beauty, and toiletry items in 12 of the 13 countries (no significant effect in Japan); Women were significantly more likely to appear in home/domestic settings in Brazil, Spain, Germany, China, South Korea, Romania, and the Netherlands, whereas men appeared in work-related settings significantly more than women in the UK, France, Japan, Austria, Germany, and the Netherlands. The major overall finding of this analysis is that TV commercials generally persist in portraying women and men in stereotypical ways on a global scale, irregardless of the gender progressiveness and culture of any specific country (Matthes, Prieler, & Adam, 2016). Another recent content analysis focused on U.S.

prime-time (8:00 p.m. – 11:00 p.m.) TV stations (i.e., TNT, TBS, ABC, AMC, USA, NBC, CW, and FOX) between September 2013 and December 2013 totaling 1,254 characters on 89 programs found that more than 60% of the characters were men, with male characters much more likely than female characters to be bullies, physically and verbally aggressive, less attractive, less sexually provocative, less liked, less family-oriented, heavier, older, and law enforcement or military characters (Sink & Mastro, 2017).

Focusing particularly on violence and sexual portrayals in top-selling movies, Bleakley, Jamieson, and Romer (2012) identified and analyzed content from 855 of the highest-selling movies from 1950-2006, coding for violent and sexual content among main female and male roles. Results indicated that 69% of the main roles were played by men, sexual content appeared in more than eight in 10 films, violence occurred in almost nine in 10 films, and explicit sex and violence increased in women and men over time. Specifically, women were much more likely to engage in implicit and explicit sexual content (i.e., kissing, being nude, sexual conduct, and coitus), while men were much more likely to commit violent acts (Bleakley et al., 2012). It is well-established that viewing violence through media is a causal factor for thinking, feeling, and behaving aggressively, violently, and for having decreased empathy (Anderson et al., 2010; Bushman, 2016; Fuld et al., 2009; Gabbiadini, Riva, Andrighetto, Volpato, & Bushman, 2016), which is particularly concerning for youth-aged individuals, a population saturated with media and typically having access to media more suitable for adults (McAnally, Robertson, Strasburger, & Hancox, 2013; Ybarra & Mitchell, 2013). As far as exposure to media-delivered sexual content, Smith et al. (2016) conducted a meta-analysis of 14 cross-sectional studies finding that among 10 to 24 year-olds, viewing sexually explicit internet sites was predictive of not using condoms during sexual intercourse, and cellular phone sexting was significantly associated with past and present sexual intercourse experiences, recently having sex with multiple people, and using drugs and alcohol before having sex. Concerning media and sexually violent perpetration, Ybarra and Mitchell (2013) surveyed

1,058 internet-using participants aged 14 to 21 years as part of the Growing Up With Media study, and results showed that 9% of those surveyed had committed some form of sexual violence (involving mostly oral and vaginal sex) against another person (typically a school peer), with victims usually being romantic partners of the perpetrators, and being held (at least partially) responsible for the sexually violent act more than 80% of the time. Males reported significantly more coercive sex and attempted rape than women and represented most perpetrators ages 17 and younger. Additionally, perpetrators had viewed significantly more sexually violent (i.e., X-rated) media (i.e., portraying a perpetrator physically harming his/her victim while forcing a sex act on them) and tended to watch more violent-only (i.e., involving physical fights, firearm use, and murder) and sexual-only media (Ybarra & Mitchell, 2013).

A qualitative content discourse analysis by Clarke, van Amerom, and Binns (2008) examined 75 articles related to CVD from the 20 most popular magazines in the U.S. and Canada from 1991 to 2001, finding that the articles were largely biased towards men, reporting information and personal stories from celebrity male patients and doctors with CVD as more of a “man’s disease,” or “as almost inevitable, a badge of successful manhood” (p. 30), where treatment was described in mechanical and even aggressive terms (e.g., “blasting and zapping of his heart” [p. 23]), and lifestyle changes after surgery were essentially guaranteed to happen in each patient, and that CVD in men “was one of the accepted prices of success, power and hard work” (p. 30). These themes were in stark contrast to those found in articles covering female CVD patients, where women were depicted as feeling shame for having CVD, demonstrating ignorance about the condition, responsible for overseeing their male partner’s CVD health rather than their own, having a more complicated, confusing, disease-prone, and difficult-to-treat body after menopause, with doctors expressing less confidence in treatment success, and as powerless, passive victims of scientific research (Clarke et al., 2008).

According to gendered portrayals in the media, it seems that the above information provides support for the four overarching themes from Wood and Fixmer-Oraiz's (2017) latest work (mentioned previously): that gender roles for women and men are largely misrepresented, women are typically the victims of subordination and dominance by men, hegemonic and traditional masculinity practices are more popular and favorable than feminine portrayals, and there is far more violence directed towards women than men. Although there has been progress in these areas in recent years, a gendered media persists, perhaps providing backing for Sink and Mastro (2017) when they stated "that the current offerings on primetime TV [and arguably in all media outlets and content] do not signal a 'golden age' for women despite the fact that the popular press continues to proclaim this as reality" (p. 18).

Healthcare influence.

Care-seekers.

Before delivering an address about the racial/ethnic inequalities and segregation experienced by many within the U.S. healthcare system at the annual meeting for the Medical Committee for Human Rights, Dr. Martin Luther King Jr. was quoted by the Associated Press (1966) as stating the following at a press conference: " 'Of all the forms of inequality, injustice in health is the most shocking and the most inhuman because it often results in physical death' " (p. 22). From the previous information in this chapter, it seems that Dr. King's words are also appropriate for addressing gender inequities in the U.S. healthcare system. As part of its vision through 2019, the WHO (2014e) is devoted "to the mainstreaming of gender, equity and human rights . . . and scaling up equitable access to quality care services within a rights- and gender-based framework" (pp. 19, 60), processes which aim to achieve gender equality in healthcare, which was aptly-defined by the National Women's Council of Ireland (2012) as, "equal visibility, power and participation between women, men and transgender persons in all spheres of public life and in the delivery of services. It concerns economic equality, political equality, cultural equality and caring equality" (p. 6). According to Payne (2009), as healthcare systems and services further prioritize the reduction of gender disparities related to healthcare preventive and

utilization practices, health behaviors, and healthcare accessibility and treatment, better health will result for women and men. It is when gender inequities in health are not addressed that problems persist or worsen, such as disparities in morbidity and mortality, and healthcare underutilization and/or dissatisfaction (Payne, 2009).

Global and U.S. health disparities among women and men for LEB, a variety of personal health behaviors, and NCD morbidity and mortality have been examined in previous sections of Chapter Two (see parts a-c), and healthcare utilization and help-seeking behaviors are comprehensively examined in a following section of Chapter Two (see letter e). So, a portion of what follows in this section will describe the overall structure of the U.S. healthcare system and services and how they “may exacerbate gender inequalities” and inequities faced by those seeking healthcare services in the U.S. (Payne, 2009, p. vi).

Privately- and publicly funded insurance is offered through the U.S. healthcare system, with most individuals (67.2%) carrying private, which is primarily obtained via employer-sponsored plans (Barnett & Vornovitsky, 2016). As of 2015, almost 91% of individuals in the U.S. had health insurance, and despite the U.S. having the second highest gross domestic product (GDP) in the world (behind China) and spending the highest percentage of total GDP on healthcare in the world (17.9%; CIA, 2017), 9.1%, or 29 million people, went uninsured (Barnett & Vornovitsky, 2016). Of eight high-income OECD member countries strategically selected by Braithwaite et al. (2017) based on growing achievements in developing and disseminating health system performance frameworks and indicators, the U.S. was the sole country without a nationally integrated healthcare performance plan in place, or (as in Denmark’s case) under development. However, Hospital Compare, the Agency for Healthcare Research and Quality (AHRQ and part of the USDHHS), and The Commonwealth Fund, are the U.S. monitoring- and reporting-bodies of healthcare indicator performance data at the local, national, and international levels, respectively. Hospital Compare reports data through the US Centers for Medicare & Medicaid Services (USCMMS; 2017c) focusing on the following domains: general hospital information, patient satisfaction,

infection- and surgery-related complications, usefulness of outpatient medical imaging, timeliness and effectiveness of care, hospital costs (per Medicare patient and those who have had heart attacks, heart failure, and pneumonia), and rates of readmission and death. The four “AHRQ Quality Indicators” are measured using inpatient discharge data (for patients of any and all ages) focusing on inpatient complications (i.e., safety quality indicators), hospitalizations related to poor healthcare access and quality (i.e., prevention quality indicators), hospital stay experiences (i.e., inpatient quality indicators), and the safety, prevention, and inpatient quality for newborns and youth (i.e., pediatrics quality indicators; Truven Health Analytics, Stanford University, 2014, p. 2). Like Hospital Compare and the AHQR, the Commonwealth Fund’s domains of interest are healthcare accessibility, preventive and treatment-related healthcare delivery, preventable hospitalizations and fees, and the general health status of those living in the U.S. (Radley, How, Fryer, McCarthy, & Schoen, 2012).

Although not exclusively devoted to healthcare performance and only used as a guide by most but not all states and territories (USDHHS, ODPHP, 2017b), “*Healthy People* is a set of goals and objectives with 10-year targets designed to guide national health promotion and disease prevention efforts to improve the health of all people in the United States” (USDHHS, ODPHP, 2010, p. 2). Used as a health improvement guide by several U.S. states and territories, one primary goal of *Healthy People 2020 (HP2020)* is the elimination of health disparities and inequities for a number of demographic factors, including gender (USDHHS, ODPHP, 2010), and according to the *HP2020* midterm progress report, of “535 population-based measurable objectives” (i.e., having nationwide baseline values) comparing women and men, women had more favorable health outcomes for 345 objectives (64.5%), and of the 462 measured objectives considered “trackable” (i.e., having targets and two or more data points) comparing women and men, 40.3% of women had accomplished, or surpassed *HP2020* targets, and 25.5% of men had accomplished, or surpassed *HP2020* target values (USDHHS, CDC, NCHS, 2017, pp. III-6, III-13). When comparing measurable objectives related to healthcare service accessibility at the

HP2020 midpoint, many disparities between females and males were identified. Of those less than 65 years-old, lower proportions of males (compared to females) had insurance for prescription-drugs (61.1% to 61.5%), dental visits (52.3% to 52.7%), and medical visits (88% to 90.7%). Also, fewer percentages of males had regular providers of primary healthcare (72.3% to 79%), continuous and specific healthcare sources for all ages (84.6% to 90.7%) and those 65 years and above (95.8% to 96.8%). A higher proportion of males aged 17 and below had a continuous and specific healthcare source compared to females (95.7% to 95.5%) while having a lower proportion of individuals who delayed or who were unable to receive necessary dental care (6% to 6.8%). Additionally, smaller proportions of males than females had emergency room wait times (no matter the urgency of need) that are longer than estimated (20.9% to 28%): immediate (level-1) visits (85.1% to 87.6%), emergent (level-2) visits (59.2% to 64.6%), and semi-emergent (level-4) visits (8.8% to 9.2%; USDHHS, ODPHP, 2017a). Of the *HP2020* healthcare access indicators just described, two (increasing medical insurance in those less than 65 years and increasing the proportion of those with a regular provider of primary healthcare) are considered “leading health indicators,” which were identified in the *HP2020* plan and are part of a list of 26 “high-priority health issues that represent significant threats to the public’s health” (USDHHS, ODPHP, 2010, p. 4).

As noted by Braithwaite et al. (2017) above, the U.S. is not currently implementing one integrated national health performance system focusing on standardized indicators; however, “The national effort to establish a Key National Indicator System [KNIS] for the United States originated at the local level more than 20 years ago” (State of the USA [SUSA], 2017, para. 1). Efforts to formally address a KNIS occurred in a 2003 collaborative meeting between the U.S. General Accounting Office (GAO) and the National Academies (i.e., the National Academic of Sciences [NAS], the National Academy of Engineering [NAE], the Institute of Medicine [IOM], and the National Research Council), with the agreement that “there is no generally accepted comprehensive, integrated indicator system at the

national level,” but “developing a key national indicator system is important” and necessary for the future of American democracy (GAO, 2003, p. 11). The GAO (2004) produced a research report the following year, which provided an extensive review of indicator systems already occurring in the U.S. and around the world, demonstrating the importance of KNIS and how it could provide “a common base of facts from many different topical areas on a strategic issue for the country” (p. 177). After significant efforts to construct a KNIS among those who were a part of the “Key National Indicators Initiative,” the GAO (2006, para. 6) officially proposed (to Congress) for a KNIS to be developed in the U.S., which would measure “performance, position, and progress” (p. 36) of the nation. Several months later, SUSA was established and recognized as tax-exempt and became instrumental in leading major development of a KNIS in the U.S., which eventually was proposed in a bi-partisan U.S. Senate bill sponsored by the late Senator Edward Kennedy and Senator Michael Enzi (Key National Indicators Act [KNIA] of 2008) and would later become integrated into the Patient Protection and Affordable Care Act (PPACA) of 2010 (SUSA, 2017) as Section 5605 titled, “Key National Indicators” (p. 680). As part of this section of the PPACA of 2010, a commission of eight individuals were selected by the Speaker of the House and the Senate and House majority and minority leaders to develop and establish a comprehensive KNIS, with 70 million dollars allocated for this process from 2010 through 2018, to create a “single, interactive, trusted [and online] source of quality information on all of the issues required to fully assess the state of the United States on a regular basis” (KNIA of 2008, p. 2). Through the creation of “Partnership for Open Performance Systems,” SUSA (2015, para. 1) has begun a pilot-testing process of creating and testing a web-based system with key national stakeholders, aiming to deliver comprehensive national information to the public at some point in the future. In summary, there are a number of monitoring and evaluative approaches already being implemented in the U.S. for healthcare- and health-related indicators, and certainly the KNIS currently being developed and tested provides promise for a comprehensive and integrated KNIS, focused on delivering a variety of information (e.g., economic,

educational, environmental, health, etc.) through “a single, freely available [online] source for key indicators of a jurisdiction’s position and progress that is disseminated to broad audiences,” all as a public service to better inform and direct the U.S. moving forward (GAO, 2004, “Informing Our Nation,” para. 2).

Placing the emphasis back on gender disparities in healthcare, female and male rates of medical insurance and having a regular primary care provider were discussed previously, which are two leading health indicators for *HP2020* (USDHHS, ODPHP, 2010, 2017a). So, gender-related factors concerning access to and use of medical insurance and primary care providers will be explored in the following portion of this section, detailing information that may help explain why higher proportions of women have usual primary healthcare providers and medical insurance than men.

First, one must be reminded of the socioeconomic differences between men and women in the U.S. For example, of those ages 16 years and above who are in the noninstitutionalized civilian labor force, 65.8% of men and 54.1% of women were employed in 2016 (USDL, USBLS, DLS, 2017). Men also occupy higher proportions of occupations with higher wages, power, and prestige, such as surgeons, chief executives, judges, and computer and information systems managers (USDL, USBLS, DOES, 2017) and work more dangerous and deadly jobs, such as logging, fishing, roofing, and farming (USDL, USBLS, OCWC/Office of Safety and Health, 2016). Also, of all those working in full-time salaried or waged positions in 2015, women’s weekly median incomes were just 81% of what men earned (\$726 to \$895). Additionally, one-fourth of women compared to less than one-eighth of men worked part-time in 2015, and three out of five women worked full time the entire 2014 calendar year compared to almost three out of four men (USDL, USBLS, DIMS, 2017). In summary, men have more job opportunities, higher job-status and higher-paying jobs, work longer hours, and work riskier and more fatal jobs than women, all of which (one would think) increase men’s abilities and motivations to carry medical insurance and have

a regular primary healthcare provider; however, women are more likely to have medical insurance and a regular provider of primary healthcare. So, again, the question is why?

Recent U.S. healthcare policy provides some helpful information regarding coverage rates among different groups of people. Five years after the enactment of the 2010 PPACA, there was a 43% reduction in the uninsured rate, with a 2010 rate of 16% (49 million people) dropping to 9.1% (29 million people) in 2015, with Wyoming, South Dakota, and North Dakota being the only states not experiencing significant decreases during this time period. Since its passing, various PPACA provisions, such as the Young Adult Provision, (which requires insurance companies to cover parents' children up to age 26), Medicaid expansion (which has been elected by 32 states), "Health Insurance Marketplaces," which are plans directly-bought through exchanges such as HealthCare.gov (currently used by 39 states) or "State-Based Marketplaces," which are currently used by 12 states (Simmons et al., 2016, p. 3; USCMMS, 2017a, para. 2), "an insurance market that includes all people regardless of any preexisting conditions" (Obama, 2016, p. 529), and policies that are required to: pay for essential health services, place limits on patients' out-of-pocket expenses, and eliminate yearly and lifelong coverage limits (USDHHS, Office of the Assistant Secretary for Planning and Evaluation [ASPE], 2017a), have increased health insurance access, as demonstrated by annual decreases in uninsured rates for each specific age below 65 years from 2013-2015 (Barnett & Vornovitsky, 2016). By increasing insurance accessibility to individuals, death can be prevented (Wilper et al., 2009), perhaps as many as close to 45,000 per year (Kung, Hoyert, Xu, & Murphy, 2008). There are many demographic determinants for health insurance coverage rates, such as statuses related to birth, race and ethnicity, living situation (e.g., with family members or not), work, dwelling place, matrimonial/relationship, disability, education, salary, poverty, and age. From 2014 to 2015, more privileged, less vulnerable populations had higher overall health insurance coverages rates than those who were less privileged and more vulnerable. For example, U.S. natives, non-Hispanic whites, residing with family year-round, full-time workers, suburban residences, married people,

graduate or professional degrees, household salaries at least four times above the federal poverty level, and being less than 19 years-old or at least 65 years-old were significant determinants for having higher rates of health insurance coverage. The only disadvantaged group having higher rates of health insurance coverage than their advantaged counterpart was those with a disability. Interestingly, during this same time period, the greatest overall increases in coverage rates occurred for those groups with the least privileges and most vulnerabilities and disadvantages. For example, non-U.S. natives, Hispanics, living with non-family members, the lowest household salaries and education levels, working year-round but less than full-time, being separated from a spouse, and being aged 19 to 64 years were all predictive of significant coverage rate increases. The only privileged group having higher overall coverage rate increases than their less privileged counterpart was those without a disability (Barnett & Vornovitsky, 2016).

The above information provides interesting evaluations of the PPACA and health insurance coverage rates for a variety of groups, but the main issue is that gender was not mentioned in the report (Barnett and Vornovitsky, 2016). However, Simmons et al. (2016) gave an overarching review of the PPACA and its impact on women in relation to access, quality, and affordability of healthcare, which may help further explain why higher proportions of women have medical insurance and regular primary healthcare providers than men. First, for women ages 18-64 years, 44% less were uninsured in 2015 (8.9 million or 10.8%) compared to 2013 (15.9 million or 19.3%). In this same age category, 13% of low-income women in 2014 received insurance through the Children's Health Insurance Program (CHIP) and Medicaid, 69.6% had private insurance (an increase from 64.7% in 2013), and 8.2% had some other form of public insurance. Of the 12.7 million 2016 Marketplace enrollees (all ages), 53.6% were girls and women, which increased to 54% for those enrolling in the 2017 Marketplace, despite the overall number of 2017 Marketplace enrollees decreasing by 465,871 people (Simmons et al., 2016; USCMMS, 2017a) and national monthly unsubsidized premium prices increasing by an average of 105% since 2013, from

\$232 to \$476 in 2017 (USDHHS, ASPE, 2017b). As of January 31, 2017, more women and girls had enrolled in Marketplace insurance than men and boys in every state, including Washington, D.C., with Mississippi having the largest gender disparity (59% of all enrollees were women), and North Dakota and New York having the smallest gender disparities, with 51% of all enrollees in each state being women (USCMMS, 2017b). The most commonly purchased Marketplace plans are Bronze and Silver plans, with 23% and 71% of all enrollees purchasing Bronze and Silver plans, respectively (USCMMS, 2017a). Bronze plans “provide a level of coverage that is designed to provide benefits that are actuarially equivalent to 60 percent of the full actuarial value of the benefits provided under the plan,” and silver plans “provide benefits . . . equivalent to 70 percent of the full actuarial value of the benefits provided under the plan” (PPACA of 2010, p. 167). Thus, Silver plans provide more coverage than Bronze plans, and of the 2017 Marketplace enrollees, 56% of Silver plan holders were women and 44% were men, and 51% of Bronze plan holders were women and 49% were men (USCMMS, 2017b). It is forecasted that of all women with private insurance coverage, 55.6 million will be able to obtain preventive medical services at no extra cost out-of-pocket (e.g., vaccinations, screenings for cervical and breast cancer, resources and services for tobacco use, contraception, sexual health, pregnancy and lactation, intimate partner violence, and well check-ups; USDHHS, HRSA, 2016, 2017; USDHHS, ASPE, 2015). Around 14.3% of women ages 18 and over reported cost as a reason for delaying or not seeking healthcare in 2010; however, in 2014 this number fell to 11.8%, with notable decreases in ethnic minorities and those with very low incomes. In Medicaid-expansion states, uninsured hospitalizations were reduced by 50.5% for women 19-64 years compared to only 4% in states not electing to expand Medicaid. Rates of women with a regular source of healthcare also increased from 2010 to 2014 for those 18-64 years-old from 83.3% to 86.4%, an increase of 3.1 percentage points, largely as a result of a provision in the PPACA called the Women’s Preventive Services Guidelines (USDHHS, HRSA, 2017). Another PPACA-funded program, the Strong Start for Mothers and Newborns Initiative, has helped prevent 25,000 premature elective deliveries from 2010 to

2013 (USCMMS, 2015, 2017d; USDHHS, Office of the Secretary, Office of the Assistant Secretary for Health, Office on Women's Health, 2015). Also, Medicare prescription drug coverage has become more affordable for women ages 65 years and over, with 37.3% fewer women in 2014 reporting not being able to afford prescription drugs compared to reports in 2011. So, overall, the quality, accessibility, and affordability of women's healthcare has improved as a result of the PPACA healthcare reform legislation (Simmons et al., 2016).

As far as healthcare policy and insurance coverage, the PPACA of 2010 "is the most important health care legislation enacted in the United States since the creation of Medicare and Medicaid in 1965" (Obama, 2016, p. 525), greatly increasing the number of women and men covered, especially those ages 18 to 64. In fact, since 2013, twenty million more of 18 to 64 year-olds have health insurance, 17.7 million via the Marketplace and 2.3 million through the Young Adult Provision, and women have experienced more favorable results. Between 2013 and 2016, the rate of uninsured 18 to 64 year-old women decreased from 18.9% to 9.5%, which was a 49.9% reduction, and uninsured male rate declined by 37.9%, from 21.8% to 13.6%. In other words, around 81.8 million women were insured in 2013, which increased by 9.5 million to total about 91.2 million in 2016; for men, around 78.3 million were insured in 2013, which increased by 8.3 million to total around 86.5 million in 2016 (Uberoi, Finegold, & Gee, 2016). The PPACA of 2010 has improved healthcare coverage and decreased uninsured rates for "all income levels, age groups, races and ethnicities, and urban and rural areas" (Avery, Finegold, & Whitman, 2016, p. 1); however, gender disparities in coverage still exist. In fact, when examining the healthcare law, the PPACA of 2010 mentions the word "women" 146 times, and "woman" 12 times, with many different provisions and sections dedicated to enhancing women's health (USDHHS, Office of the Secretary, Office of the Assistant Secretary for Health, Office on Women's Health, 2015); however, the word "men" is stated just once, with no specific section or portion of the bill devoted to men's health. Furthermore, when considering major diseases in women and men, such as breast and prostate cancer

(Price, Golden, Wasil, & Denton, 2017; Rojas & Stuckey, 2016), the word “breast” is mentioned 43 times (always in reference to women), but the word “prostate” is never mentioned. Despite the disparity based on gender-specific provisions within the PPACA of 2010, the law does move toward gender equity by prohibiting insurers from charging higher monthly premium rates to women Gaffney & McCormick, 2017), a historically common practice (Courtot & Kaye, 2009). But the question remains, why do less men have insurance in the U.S. than women?

There are a variety of reasons for not having health insurance, but the primary reason cited by 18 to 64 year-old adults is high cost (KPP, Kaiser Commission on Medicaid and the Uninsured, 2016). In fact, 2015 data indicated that 46% of those without insurance who attempted to purchase insurance did not do so due to high cost (DiJulio, Firth, & Brodie, 2015). Other reasons for being uninsured may be that one’s job does not offer coverage (or it is too expensive), one may not qualify for Medicaid coverage (especially those in non-expansion states), being undocumented, and not knowing if one qualifies for coverage. Of those without insurance, 54% do not have a regular care source when ill or needing health services (KPP, Kaiser Commission on Medicaid and the Uninsured, 2016), and when uninsured individuals do see a healthcare provider, there is a lower chance of the patient following through with provider suggestions and services (Hadley, 2007). The author contends that men have lower rates of medical insurance and regular sources of care through primary providers due to traditional masculinity practices, which help deter them from seeking out healthcare, whether preventive or curative.

To examine factors for men having lower proportions of medical insurance coverage and regular primary care providers than women, several recent studies will be presented. Green, Johnson, and Yarborough (2014) interviewed 75 women and 75 men ages 21 to 64 years-old, living in Oregon and Washington, concerning care-seeking determinants. Although the authors did not delineate themes and direct responses by gender, the results are still relevant and informative, showing that a warm, inviting healthcare staff and compassionate, communicative, deliberate, and thorough providers, focused on

health education and disease prevention, all facilitated patient care-seeking. Hindrances to care-seeking were high cost, long appointment waiting periods, and time-consuming, tedious, and (sometimes) difficult patient duties (e.g., appointment scheduling and filling and refilling drug prescriptions). Some patients cited fear of being diagnosed with disease or illness, having to undergo uncomfortable procedures (e.g., colonoscopy or mammogram), or putting off care until emergencies as reasons for not seeking care. One patient, perhaps a man, although Green et al. (2014) did not indicate, stated:

I'm old school. I get pretty sick before I go to the doctor. I don't go in just for anything. That is kind of a last resort and I think that's the way I grew up; you self-medicate until you need drugs and then you go to the doctor. [Laughs.] That's just the way I was brought up. (291)

This same patient said that the reasoning for not seeking care for most health issues were having beliefs that these issues “ ‘will kind of work themselves out in a few days, or a week . . . I usually will just try to put up with them ” (Green et al., 2014, p. 291).

On the opposite side of the U.S., in the Northeastern region, a 40-question web-based survey was administered by Luquis and Kensinger (2017) to 946 women and men ages 18 to 34 years-old, regarding their existing health practices and opinions about health insurance and the PPACA law. Significantly more men than women reported their current health status as excellent and/or very good ($p < .05$), felt that health coverage was worth the price ($p < .05$), had more positive views of the PPACA ($p < .01$), viewed health coverage as something that prevented medical-related charges ($p < .01$), and had received more counsel about physical fitness and activity ($p < .01$), whereas significantly more females reported having received more screenings for cancer, while also viewing health insurance coverage as “something they need[ed]” ($p < .01$; Luquis & Kensinger, 2017, “Perceptions of Health and Health Insurance,” para. 2).

Lower proportions of men looking at health insurance as a need compared to women was well depicted in Noone and Stephens' (2008) study of male farmers, who generally described women as

persistent care seekers, even for trivial issues, who also openly discuss health issues with others (e.g., family, friends, etc.), whereas men often do not seek out care for a number of reasons, largely related to characteristics and behaviors considered as part of a hegemonic masculinity framework (this will be further explored in letter f of this chapter). In a quantitative analysis of 442,745 healthcare visits of 18-86 year-old patients living in a suburban and urban region of the mid-Atlantic U.S., four age groups were compared: those born between 1925 and 1945 (i.e., Silent Generation), 1946 and 1960 (i.e., Baby Boomers), 1961 and 1981 (i.e., Generation X), and 1982 and after (i.e., Generation Y or Millennials; Bolton et al., 2013; O'Connor, 2016). Results indicated that men (overall) visited a healthcare provider considerably less than women ($p < .001$), and even when having insurance compared to women without coverage, men utilized health services significantly less ($p < .001$). However, among each generation, these significant disparities between genders exist only for Baby Boomers and Generation X, with no considerable main effects in care utilization for the Silent Generation or Millennials. O'Connor (2016) also found that healthcare utilization disparities increase as income decreases, in favor of women, but men are more likely to utilize healthcare when their yearly salary is around \$147,000, with income only acting as significant enabling force to obtain care for the Baby Boomers ($p < .001$). Another study of 476 urban patients, hospitalized for a variety of emergency-related heart conditions at Columbia University Medical Center, as part of the institution's longitudinal PULSE (Prescription Use, Lifestyle, Stress, Evaluation) study, were interviewed on-site in regard to a number of emergency care-seeking behaviors, particularly calling 911. Newman and colleagues (2013) found that calls to 911 for acute cardiac symptoms were low for both sexes (23%), similar proportions of women and men called for angina pectoris symptoms (15% and 13%), but women with heart attack symptoms were over two times more likely to call 911 compared to men with heart attack symptoms (57% versus 28%; $p < .001$). As far as age, gender, and calls to 911 for heart attacked symptoms, women less than 65 years-old were significantly more likely to call 911 than men, but there was not a considerable different between women and men

ages 65 and over. Even though women were more likely to call 911 for heart attack symptoms than men for those less than 65 and overall, it is important to note that of the 476 hospitalized study participants, 66% of the participants were men (Newman et al., 2013).

The investigations by O'Connor (2016) and Newman et al. (2013) provide interesting examinations of urban and suburban care seekers, but upon analysis of their rural counterparts, healthcare utilization is even less (Douthit, Kiv, Dwolatzky, & Biswas, 2015). According to Douthit et al. (2015), factors related to lower rates of care-seeking practices in rural populations were economic limitations, sociocultural determinants, transportation difficulties, low access to care, low volume of skilled care providers, and lack of access to high-speed internet. As a result of the mentioned factors, health outcomes are significantly worse in rural areas compared to urban populations, and there are greater problems with obtaining and retaining skilled doctors and staying up-to-date as far as medical facility capabilities (Note: rurality and care-seeking are two topics which will be further examined in letter f of this chapter; Douthit et al., 2015).

Care providers.

Just as gender plays a role for those seeking healthcare, it also is a significant factor for those working in healthcare. In the health workforce, formal policies and informal practices and conduct tend to create normalized cultures of traditionally gendered environments. Work schedule and leave policies are formal procedures regulated by local, state, and/or federal government entities for institutions around the U.S. and world. Antiquated, less-progressive, and inflexible U.S. practices regarding work hours and leave tend to reinforce traditional gender roles, with women as homemakers and/or caretakers and men as breadwinners (Wood & Fixmer-Oraiz, 2017).

Informal practices in health workplaces also perpetuate traditional gender roles and experiences through a variety of conduct and behaviors (Wood & Fixmer-Oraiz, 2017). Harassment based on sex and gender seems to be a normalized experience of female medical students, residents, and healthcare

providers. For example, a 1992 survey of internal medicine residents at the University of California, San Francisco, found that 73% of female residents had been sexually harassed during residency and/or medical school, with 73% of harassment episodes being nonphysical (e.g., unwelcome verbal and nonverbal displays) and 23% physical in nature. Twenty-three of the 24 victimized women reported a man as the perpetrator, who was usually the attending doctor or other doctors (about 67% of the time). One particularly disturbing example came from a female resident reporting about her harassment experience in the office of an attending doctor during her third year of medical school to review her evaluation:

He stopped suddenly in the midst of the discussion and asked, 'Have you seen the movie *Deep Throat?*' When she shook her head, he leaned across the desk toward her, opened his mouth wide, and ran his tongue slowly all the way around his lips. (Komaromy, Bindman, Haber, & Sande, 1993, p. 323)

Komaromy et al. (1993) recounted another female resident's experiences during medical school rotations in surgery in the following manner: "the senior resident . . . had instructed her on several occasions to stand next to him in the operating room and had repeatedly rubbed his groin against her during the surgical procedure" (p. 323).

In a larger study of fourth-year medical students across 14 private and public U.S. institutions, 92.8% of females and 83.2% of males had been exposed to harassment and discrimination based on sex and gender at least once during coursework, clerkship training, or when choosing a residency. Females, no matter the setting, experienced, witnessed, and heard about more sexual and gender discrimination and harassment than males and were likely to report these exposures as having impacted their medical specialty and residency selections. Those students experiencing the most gender discrimination and sexual harassment were women who chose to specialize in general surgery and women and men

choosing to pursue obstetrics and gynecology (OBGYN; Stratton, McLaughlin, Witte, Fosson, & Nora, 2005).

A follow-up study by Witte, Stratton, and Nora (2006) of graduating medical students from 12 U.S. institutions, particularly interested in the most striking incidents of sexual harassment or gender discrimination exposure (i.e., witnessed, heard, or experienced) during medical training, found that personal experiences were more common in women than men; however, both sexes provided personal accounts. Of the male medical students, those pursuing OBGYN seemed to face the greatest amount of gender discrimination, which came from female students, nurses, residents, attending doctors, and male residents and attending doctors, who all tended to favor other females whether it be during pelvic examinations, the birthing process, educational instruction and evaluation, or from a relationship point of view. Good-looking female students were typically treated better by male residents and attending doctors than male students, and one male student noted that many dating relationships between male residents and female students occurred on a regular basis, creating an unfair environment when being evaluated. Female medical students also reported gender discrimination regarding educational training, mainly from other male residents and attending doctors, and one of these female students said,

Male attending physicians speak to female medical students as if they are inferior and treat you as [if] you are a little child. They treat male medical students with utmost respect and ask them all the questions since they feel females can't answer them. (Witte et al., 2006, p. 650)

There was one female student who recalled a female resident being more favorable towards male students, while other female students recalled using their sexuality and attractiveness to receive special favors (e.g., decreased work responsibilities and hours; Witte et al., 2006).

Female and male students also faced specific episodes of being stereotyped based on sex or gender by patients, residents, attending, doctors, and administrative leaders. Female students were often mistaken as nurses by male patients and were at times viewed by male residents and attending

doctors as lacking the intelligence and/or capabilities, compared to male students, for serving as surgeons but being more suitable for “ ‘mommy’ ” (Witte et al., 2006, p. 651) specialties like OBGYNs or pediatricians. Female students were also sexually harassed to a much higher degree than male students, typically by male patients, residents, attending doctors, professors, and administrative leaders. These harassing episodes came in the form of inappropriate remarks and compliments on female students’ appearances, persistent sexual advances, innuendos, and relationship requests, inquiries into personal sexual behaviors, and invasion of personal spaces. While referring to his patient’s genitals, a male urologist said the following in front of a female medical student: “ ‘ “Doesn’t this penis look great? How many penises have you seen? No one is allowed to have a bigger penis than mine” ’ ” (Witte et al., 2006, p. 651). Other instances of sexual and gender discrimination and harassment occurred to female students with unwelcome sexual contact made by male medical superiors (e.g., hand-stroking, leg-, back-, or shoulder-touching, waist-pinching, slapping the buttocks, and groping the breasts). Other examples of demeaning, sexist remarks by male patients, residents, physicians, and administrative leaders towards female students were when these students were referred to as “ ‘ “honey,” ’ ’ “girl,” ’ . . . “babe,” ’ . . . “just like my wife,” ’ . . . “attractive women,” ’ ” and “ ‘ “his angels” ’ [a reference to *Charlie’s Angels* made by a male resident to a group of female students under his supervision]” (Witte et al., 2006, p. 652). After witnessing a disparaging statement made by a male doctor about female physicians during a patient exam, a female medical student gave Witte and colleagues (2006) a particularly powerful response, highlighting the hegemony and traditionally-masculine nature of the medical institution by saying, “ ‘Normally in any other situation if a sexist comment like that was made to me, I would have spoken back. However, in the hierarchy of medicine when your career is at stake – I just stayed quiet’ ” (p. 652). Other remarks emphasizing the hegemonic culture in medical/healthcare settings, particularly from male patients, residents, attending doctors, and administrative leaders towards female students, came from a female student who said, “ ‘My sensitivity for [gender

discrimination] and [sexual harassment] has become much lower since I entered medicine. I learned what things to just let roll off my back; otherwise I would be upset too often' ” (Witte et al., 2006, p. 653). And finally, not only were the specifically described and detailed instances of gender discrimination and sexual harassment of female medical students in Witte and colleagues' (2006) study particularly eye-opening in relation to hegemonic masculinity in medicine and healthcare, but one female student's intentional lack of self-disclosure created perhaps an even more powerful image of female medical students' experiences when she said that,

The biggest incident for me is so specific that I am not comfortable writing it even here. I suppose many people imagine that this is true for things that have happened to them as well. . . . Even on an anonymous form, these feelings silence many of us. (p. 653)

The subordination and silencing of female health professionals in healthcare and medicine seems to be an informal practice that has remained relatively unchanged over time. Babaria, Adedin, Berg, and Nunez-Smith (2012) conducted a longitudinal study of third-year female medical students and their gendered experiences during clinical clerkship training and had similar findings to Witte and colleagues (2006); male patients exhibited discriminatory and harassing behavior based on gender and sex, referring to the majority of the female students in flirtatious ways using words like “ ‘honey,” ’ ” “ ‘sweetie,” ’ ” and some even insinuated sex acts, with one wanting his underwear changed by a female student and another male patient masturbated while a female student was getting his medical history (Babaria et al., 2012, p. 1015). It is important to note that residents, attending doctors, and other supervisors and administrators normalized these male patient behaviors with female students and rarely did anything to address the problems. An interesting finding was that female students seemed to be much more comfortable when seeing female patients, often able to communicate with more ease, without fear of harassment or unwelcome advances or comments. Similarly, female residents, attending doctors, and other leaders provided female students with a sense of value as a future physician, while

also supporting an atmosphere of gender equity, where discrimination and harassment were no longer present. On the other hand, female students experienced similar sexual harassment and gender discrimination with male residents, attending doctors, supervisors, and other administrative leaders as they did with male patients. Verbal, nonverbal, and physical displays of sexual harassment was a definite pattern during female students' clinical clerkship training. Unwelcome, uncomfortable, and inappropriate discourse, gestures, misogyny, sarcasm, taunting, intimidation, bodily contact, etc., were the major exhibitions of sexually harassing conduct from these male superiors. A female student recalled a married male attending doctor "massaging her" while saying she was, " "such a good medical student. You're always . . . so interested. I can't tell you . . . how gratifying it is for me to have you here" " (Babaria, 2012, p. 1016). Female students were also taunted and mocked throughout certain training experiences, especially with male attending surgeons, who were known to engage in frequent misogyny. After making denigrating comments about women in the presence of female students, male attending surgeons were reported by many female students as making sneering remarks to them such as, " "Oh, what are you going to do? Tell [the dean]? . . . tell [the ombudsman]? . . . Oh, it's ok if you tell [the dean], she knows I'm an asshole" " (Babaria, 2012, p. 1017). Such normalized behavior by male healthcare "leaders" of female medical students in Babaria and colleagues' (2012) study left the female subjects desensitized to and accepting of such traditionally masculine and hegemonic conduct, albeit while also feeling guilty, isolated, and silenced. Rationalization of such conduct also occurred among these female students, with some saying, " 'it's probably a lot better than it used to be' " and another stating that " ' This is the way a system has been set up. . . . you either adapt . . . or . . . revolutionize and . . . I don't think I can revolutionize' " (Babaria, 2012, pp. 1017, 1018).

Men were responsible for creating the U.S. healthcare system (Niles, 2018), most other U.S. occupational structures, as well as the masculine and hegemonic system of relationships between men in these workplaces, which is commonly referred to as the "old boy network" (Wood & Fixmer-Oraiz,

2017, p. 223). In fact, one female student in Babaria and colleagues' (2012) study, who was planning to practice in an OBGYN setting, joked that she wanted " "to run away to a field that has fewer men' " because "medicine was 'an old boy's club' " (p. 1017). Gender discrimination and sexual harassment (overt or implicit) of female healthcare professionals by male healthcare professionals remain commonplace procedures today, with recent evidence in the contexts of surgery (Burgos & Josephson, 2014), plastic surgery (Phillips, Tannan, & Kalliainen, 2016), cardiology (Lewis et al., 2017), and physician-researchers in academic medicine (Holliday et al., 2014; Moutier et al., 2016). Some solutions for creating gender equity among healthcare professionals starts with assessing and understanding an institution's cultural climate regarding gender (Burgos & Josephson, 2014; Lewis et al., 2017; Moutier et al., 2016), increasing the number of female-surgeon role models for those in-training (Burgos & Josephson, 2014) "and achieving parity in . . . sex" (Lewis et al., 2017, p. 462), evaluating female medical faculty candidates based on credentials and not gendered assumptions (Phillips et al., 2016), increasing resources for female medical faculty (Holliday et al., 2014), and accomplishing these objectives through awareness and educational interventions aimed at achieving gender equity, with activities including diversity courses, national workshops, presentations, and social media (Holliday et al., 2014; Moutier et al., 2016; Phillips et al., 2016).

Masculinities and Farming

Masculinities.

Studying masculinity and men's health involves understanding the impact of male gendered behavioral practices and beliefs on other men and women (Connell, 2015). *Masculinity* is defined as "the pattern or configuration of social practices linked to the position of men in the gender order, and socially distinguished from practices linked to the position of women" (Connell, 2015, p. 40). There is no single model which fully explains the dynamic complexities inherent in masculinity practices, but conceptual frameworks related to social norms (i.e., sex role theory; Mead, 1949; Parsons & Bales, 1955), evidenced, for example, in the sanctioning of boys who wear pink (Ben-Zeev & Dennehy, 2014),

gender inequities, considered by Connell (1985, 2015) as “categoricalism” (p. 264) or “categorical theory” (p. 41), are seen in wage and power gaps between women and men (USDL, USBLS, DIMS, 2017), and even the sociocultural structuring and ordering of gendered practices over time, provide a more comprehensive approach to understanding masculinity (Connell, 2015). Such an approach demonstrates that masculinity is not one-dimensional, but rather, a plural concept (Carrigan et al., 1985; Connell, 1995, 1996; Connell & Messerschmidt, 2005), constructed and reconstructed in a variety of ways depending on the sociocultural context of different situations (Connell, 2015). Some masculinities may be subject to marginalization and/or subordination, such as those practiced by racial minority, homosexual, poor, or even rural individuals, while other masculinity practices may be acts of resistance, complicity, or dominance (Connell, 2015; Courtenay, 2000b/2011). Masculinities are also hierarchical in nature, having exemplary or “exalted form[s]” (Carrigan et al., 1985, p. 592), a concept known as *hegemony* or *hegemonic masculinity*, signifying privileged men’s disparate “position[s] of cultural authority and leadership” (but not complete domination) of other men and women (Connell, 2015, p. 44; Connell & Messerschmidt, 2005). The determination of hegemonic masculinities within different groups of men is based on who has the “power [e.g., economic, political, cultural, social, etc.] and wealth, and how they legitimate and reproduce the social relationships that generate their dominance” (Carrigan et al., 1985, p. 592). Despite the attempts of the 1970s Men’s Liberation movement to break out of normalized gender roles, men’s traditional and hegemonic masculinity practices largely continue, likely due to a concept Connell (2015) referred to as *patriarchal dividend*, where men are rewarded (in relation to women and less dominant men) for enacting exalted types of masculinities (Courtenay, 2000b/2011). As men practice traditional and hegemonic forms of masculinity, health is typically undermined, mainly through risky and unhealthy behaviors and beliefs; however, it is these gendered acts that are rewarded and reinforced in society and culture, allowing men to obtain and maintain privilege and power (Courtenay, 2000b/2011).

The previous section provided an in-depth examination of various masculinities, constructed and reconstructed in diverse sociocultural and institutional settings, such as the home, school, sports, work, media, and healthcare. This process involves the acquisition of gendered competencies and knowledge through direct teaching, modeling, feedback, and sanctioning, by individuals such as parents, siblings, peers, teachers, coaches, co-workers, and healthcare providers (Bussey & Bandura, 1999; Courtenay, 2000c/2011). Through the seemingly unending pursuit of traditional, idealized, dominant, and hegemonic masculinities in the settings mentioned and examined in the previous section, men place themselves at greater risk for a multitude of diseases, injuries, illnesses, disabilities, and death than women. This seems to be particularly apparent in rural male environments, where the highest levels of traditional and dominant masculinity beliefs and behaviors are present, when compared to nonrural men and rural women (Courtenay, 2006/2011). Among rural men, farmers may practice the most traditional, patriarchal, and dominant forms of masculinities, particularly for help-seeking and healthcare utilization (Courtenay, 2006/2011).

Rural – urban delineations and health comparisons.

Defining rural (as it pertains to geography) in the U.S. is difficult, as no universal meaning exists (Coburn et al., 2007). This is due, in large part, to the multifaceted nature of rurality, specifically as it pertains to each rural area's culture, demographics, and the economy. And when considering a rural definition for public health research and policy, selecting an appropriate meaning of rurality for the topic being studied is particularly important (Hart, Larson, & Lishner, 2005). Therefore, the definition, or more appropriately referred to as "delineation" (Sunstein, 2010, p. 37249) of rural for this paper will be that incorporated into the PPACA of 2010, which is determined by the Office of Management and Budget and its Director, and more specific delineations will be explained using information from the Rural Health Reform Policy Research Center, which incorporates further rural-urban delineations from the NCHS and the USDA's "Rural-Urban Continuum Codes," which further stratifies rural and urban locations

based on population size (Meit et al., 2014, p. 135). Urban counties in the U.S. are *metropolitan statistical areas* (MSAs) with populations of at least 50,000 residents, and *rural* counties are *nonmetropolitan statistical areas* (non-MSAs) with populations of less than 50,000 residents. MSAs with less than one million residents are considered *small metro counties*, whereas *large central counties*, or *inner cities*:

contain the entire population [i.e. at least one million residents] of the largest principal city of the MSA; are completely contained in the largest principal city of the MSA; or contain at least 250,000 residents of any principal city of the MSA (Meit et al., 2014, p. 76)

All the other counties of at least one million residents within an MSA are referred to as *large fringe* or *suburban*. There are two specific types of non-MSA or rural counties; *Large rural counties* are referred to as *micropolitan counties*, which have at least 10,000 but less than 50,000 residents, and *small rural* (i.e., *non-core*) *counties* are non-MSAs with less than 10,000 residents (Meit et al., 2014).

Differences exist on social, environmental, economic, and demographic levels regarding an area's urbanization classification. Such disparities impact the overall health and well-being of communities. For example, urban populations typically have more access to healthcare than rural residents, many times due to MSAs having more providers of healthcare, as well as longer commuting times for non-MSA residents (Meit et al., 2014).

Sixty-five percent of U.S. counties (2,046 out of 3,147) in 2011 were rural but made up just 17% of all U.S. residents, with more than 50% living within inner cities. Since this paper places an emphasis on the Midwest, states considered part of the "East North Central" Midwest are Wisconsin, Illinois, Michigan, Ohio, and Indiana, and those located in the "West North Central" Midwest are Iowa, Nebraska, Missouri, South Dakota, North Dakota, Minnesota, and Kansas (Meit et al., 2014, p. 129). The Midwest contains 22% of all U.S. residents, 75% of Midwestern counties are rural, and 23% of Midwestern residents live in rural areas (with 10% of these individuals in small rural areas), while 46%

live in inner cities. As rurality increased in the U.S., age did as well, especially in the Midwestern states, which had the highest proportion of those 65 years-old and above living in small rural areas (close to 19%). Inner cities had the most racial and ethnic diversity, containing just 45% of non-Hispanic White residents, as opposed to all other MSAs and non-MSAs, which contained anywhere from 69% of non-Hispanic Whites in suburban counties to 82% of non-Hispanic Whites in small rural counties. In the Midwest, the proportion of non-Hispanic White residents are higher than national averages for all five urbanization classifications: inner cities (55%); suburban counties (80%); small metro counties (83%); large rural counties (90%); and small rural counties (93%). The racial/ethnic minority with the largest representation in large and small rural Midwest counties is the Hispanic population. Poverty in the U.S. is lowest in suburban counties (between 9 and 13%), but compared to suburban counties, rates are roughly two times greater in rural Western and Southern states and inner cities in the Northeast and Midwest. Poverty levels in the Midwest was almost 20% within inner cities, a little more than 10% in suburban cities, and a little more than 15% in small metro, large rural, and small rural counties (Meit et al., 2014).

As demonstrated in previous sections, morbidity and mortality from a variety of NCDs and injuries are largely preventable via healthy behavioral practices. However, specific MSAs and non-MSAs face greater obstacles to health, specifically those living in rural and inner-city counties, who face disadvantages related to sparsely populated areas and increasing age (for rural residents) and socioeconomic barriers (for inner city residents; Meit et al., 2014).

Smoking and rurality among adolescents (ages 12-17 years) and adults (18 years and above) have direct and positive relationships. From 2010 to 2011, more than twice as many adolescents living in small rural counties smoked (11%) compared to inner city adolescents (5%), and those living in small rural areas in the Midwest have the highest smoking rates in the U.S. (13%). Among adults, rural men and women smoke at much higher rates than their inner-city counterparts: 29% of rural men compared

to 19% of inner-city men and 25% of rural women compared to 13% of inner-city women. In the Midwest, men and women smoke at nearly identical rates (25.4% of men and 25.5% of women; Meit et al., 2014).

As far as alcohol consumption behaviors, men (ages 18-49 years) were two times more likely to have drunk heavily at least once in the preceding year than women (40% versus 20%), but levels of drinking are much lower for men and women in the inner city, except in Southern states, where drinking and rurality are inversely proportional. In the Midwest, men are more likely to drink heavily than women at every urbanization classification: inner cities (43.3% to 24.3%); suburban counties (50.8% to 27.1%); small metro counties (49.2% to 29.1%); and rural counties (48.1% to 26.1%; Meit et al., 2014).

Like smoking, obesity levels seemed to be directly proportional to rurality, with the lowest female and male levels in the inner cities and the highest levels for each sex in the small rural areas. Thirty percent of inner-city men and 31.7% of inner-city women were obese; in suburban counties, 30.2% of men and 29.1% of women were obese; in small metro counties, 29.8% of men and 32.7% of women were obese; and of rural men and women, 32.8% of men and 35.3% of women were obese. Interestingly, Midwestern men living in rural counties had the lowest obesity rates of all other rural regions of men in the U.S. (Meit et al., 2014).

Leisure-time physical inactivity rates between 2010 and 2011 were highest in small rural counties of the U.S., with an average of 41% for both sexes. Rural areas (large and small) had the highest levels of physical inactivity in all parts of the U.S. except the Northeastern states and Western region women. Midwestern physical inactivity rates for men and women were the following: inner cities (25.6% to 30.9%); suburban counties (21.1% to 28.3%); small metro counties (29.2% to 32.3%); and rural counties (37.5% to 37.8%; Meit et al., 2014).

Death rate disparities in the U.S. based on urbanization classification are evident throughout the life course. Of the entire U.S. from 2008-2010, those living in suburban counties had the lowest

mortality risk for every major age category, while those in small rural counties had the highest risk of mortality. Among those 65 years and above, those living in the inner city and suburban counties had the lowest mortality risk, and those in small rural counties had the highest rates. Additionally, men had higher rates of death in every age category and urbanization classification compared to women (Meit et al., 2014).

As far as infants, overall U.S. death rates are lowest in suburban counties (5.7 deaths per 1,000 live births); however, in Midwestern and Northeastern regions, inner cities have the highest infant mortality, whereas, rural counties of Southern and Western states have the highest risk of mortality. Specifically, in the Midwest, mortality rates (per 1,000 live births) were the following: inner cities (8.9); suburban counties (5.9); small metro counties (6.7); large rural counties (6.2); and small rural (6.4). Among those ages one to 24 years (i.e., children and young adults) from 2008-2010, mortality from all-causes in both sexes was highest in small rural counties and lowest in suburban counties, with rates of death in small rural counties more than 40% higher than their suburban counterparts. Young men and boys had higher death rates than young women and girls at every urbanization classification, with rates increasing as age and rurality increased. In the Midwest, small rural counties had the highest death rates for both men and women, but male rates (per 100,000 population) were 103% higher than females (67.5 to 33.3). Across all five levels of urbanization in the Midwest, male mortality risk from all-causes was anywhere from 91% (in large rural counties) to 153% (within inner cities) higher than females; however, the highest death rate for men and women was for men living in small rural counties (Meit et al., 2014).

Within the 25 to 64-year-old age group, again, the lowest mortality rates were present in suburban counties, and the highest rates were for those living in small rural counties. Midwestern and Northeastern states had the highest mortality rates (both sexes) in their inner cities, while Southern and Western states had the highest rates in rural counties. In the Midwest, men had higher rates of death

than women in all five urbanization classifications, ranging from 63% higher in rural counties to 71% higher in inner cities. Despite inner city men having the highest death rate from all causes among all urbanization classifications in the Midwest, those living in large and small rural counties have higher death rates than men living in suburban and small metro counties (Meit et al., 2014).

Those ages 65 years and above accounted for 75% of all deaths in the U.S. from 2008-2010, with rurality and mortality having direct and positive relationships. Men's mortality rates were 31.7% and 29.5% higher than women within inner cities and suburban counties, respectively, and 31.6% higher in rural counties. Midwestern older women living in small rural counties were the only age, sex, and urbanization category of all U.S. regions in which those in small rural areas outlived their inner city and suburban area counterparts, and this was true among men and women. Other than rural men in Southern states, rural Midwestern older men had the highest mortality rates of all U.S. regions. Rural Midwestern older men also had higher mortality due to all-causes than urban Midwestern older men, and obviously, rural Midwestern older women (Meit et al., 2014).

The following portion will feature USDHHS Region Five, which consists of Wisconsin, Minnesota, Ohio, Indiana, and Illinois, and will detail information concerning the mortality rates (per 100,000 population) for the 10 leading causes of death and associated values for different age, sex, and urbanization classifications between 2011 and 2013. Region Five is particularly of interest since this study includes male subjects living in this portion of the Midwest.

The most noteworthy findings among 15 to 24-year-old males and females were that rural males and females had higher mortality rates from unintentional injuries and suicide (all values above the national averages) than urban males and females (only urban female suicide rates were above the national average). Of these two causes of death, rural males had much higher rates than rural females (unintentional injuries: 49.7 versus 20.5; suicide: 21.2 versus 5). Concerning deaths due to homicide, urban males and females had higher rates (both above national rates) than rural males and females

(both below national rates), with a particularly large difference between rural and urban men (3.2 versus 24.5). Rural and urban men and women had the same rates of death due to heart disease (3.0 for men and 1.4 for women), which was above the national average for men but below the national rate for women. Urban men and women also had the same death rates for cerebrovascular disease (0.4) and diabetes (0.4), which were all the same as the national rates except for diabetes death in urban men, which was below the national average. Among male cancer deaths, urban men had higher rates than rural men (3.9 versus 2.9) but among women, rural women had higher rates than urban women (3.9 versus 3); only rural female rates of cancer were above the national average. Rural women also had more deaths during pregnancy and childbirth than urban women (1.1 versus 0.9), and urban men had slightly more deaths from congenital defects than rural men (1.3 versus 1.2; which were both above the national average) and urban women (0.7). The following causes of death were not able to be measured in rural males and females due to extremely low numbers of death cases: cerebrovascular disease, diabetes, and flu and pneumonia, with congenital defects also unmeasurable in rural women. And lastly, flu and pneumonia deaths in urban men were more common than urban women (0.5 versus 0.4), with each value equal to national averages for each sex (Knudson et al., 2015).

For those aged 25 to 64 years, the first notable finding is that of men and women living in suburban counties, mortality rates for each of the top 10 leading causes of death were below the national averages. Additionally, suburban men and women had the lowest rates of death in their sex categories for all causes of death except suicide, homicide, and septicemia, which were still relatively low in comparison to the other urbanization classifications. Secondly, men in each urbanization classification had higher death rates than women, except for suburban men and deaths due to CRDs, which were 8.3 compared to 8.4 in suburban women. A third major finding was that the majority of mortality rates for men and women in each urbanization classification for each cause of death were above national averages, with the following exceptions (other than suburban men and women): inner

city men and CRDs and suicide; men in small metro and large and small rural counties and cerebrovascular disease and homicide; men in small rural counties and diabetes; men in large and small rural counties and liver disease; small metro and small rural men and septicemia; women in large rural counties and cerebrovascular and liver disease; inner city women and unintentional injuries; women in inner cities, as well as those in large rural areas and suicide; women in small metro and large and small rural counties and homicide; and women in small rural counties and deaths due to septicemia (Knudson et al., 2015).

Among the same population, men living in large and small rural counties had the highest cancer, CRD, unintentional injury, and suicide mortality rates, compared to men in the other urbanization classifications; the cancer mortality rates for men in large and small rural counties were 105.8 and 102.9, respectively; CRD rates were 13.7 and 13.4, respectively; rates of unintentional injury deaths were 64 and 67.9, respectively; and men in large rural counties had a suicide mortality rate of 30.1 and those in small rural counties had a rate of 34.8. Among rural women, a similar trend appeared, with women in large and small rural counties having the highest mortality rates for cancer, CRDs, and unintentional injuries; however, they did not have the highest mortality rates for suicide, which occurred in women in small metro counties (Knudson et al., 2015).

Finally, for those ages 65 years and above in Region Five, mortality rates sharply increased, with men having higher mortality rates than women within every urbanization classification for every disease except Alzheimer's disease (higher in women for all urbanization classifications) and cerebrovascular disease (higher in women for small metro and large and small rural counties). Of the 100 mortality rates reported for men and women in all five urbanization classifications for each of the 10 leading causes of death, men and women in Region Five were above national averages for 74 of those mortality rates, with the following exceptions below national averages: heart disease and suburban men; inner city men and women and CRDs, Alzheimer's disease, and unintentional injuries, as well as cerebrovascular

disease and flu and pneumonia for inner city women; flu and pneumonia and septicemia in suburban men and women, as well as heart and Alzheimer's disease and unintentional injuries in suburban men and cerebrovascular disease in suburban women; flu and pneumonia and septicemia in men and women in small metro counties; and only septicemia in men and women in large and small rural counties (Knudson et al., 2015).

Within the same population, men in large rural counties had the highest mortality rate for heart disease (1,444.0) compared to men in all other urbanization classifications, and men in both large and small rural counties had the highest mortality rates for cancer, at around 1,281.0 for each urbanization classification. Additionally, men in large and small rural counties had the highest mortality rates for CRDs (424.0 and 408.0, respectively), cerebrovascular disease (both close to 280.0), and unintentional injuries (150.0 and 148.0, respectively) compared to inner city and suburban men, as well as men living in small metro counties. Comparing all women within each urbanization classification, women in large rural counties had the highest mortality rates for heart disease (971.0), CRDs (306.0), and diabetes (130.0), and those in large and small rural counties had the highest mortality rates for cerebrovascular disease (285.0 and 282.0, respectively), flu and pneumonia (95.0 and 93.0, respectively), nephritis (90.0 and 91.0, respectively), and unintentional injuries, at 101.0 and 102.0, respectively. Rural men had the lowest mortality rates for septicemia compared to all other men, at 62.0 for those in large rural counties and 67.0 for those in small rural counties. Women in large and small rural counties also had the lowest mortality rates due to septicemia compared to all other women (54.0 and 53.0, respectively), while women in large rural counties tied for the lowest cancer mortality rate with suburban women at 817.0, with women in small rural counties just behind at 818.0 (Knudson et al., 2015).

Rural – urban healthcare accessibility and utilization.

Like the above mortality trends, between 2010 and 2011, those less than 65 years-of-age living in suburban counties were most likely to have health insurance, whereas those living in small rural

counties were the least likely, with those having below-poverty-level salaries at the highest risk of not having health insurance. In Midwestern states from 2010 to 2011 (which contains data prior to the major provisions of the PPACA of 2010), inner cities had the highest uninsured rate (for all incomes) at 16.2%, and rural counties were just behind at 15.2%. Those with salaries less than 200% of the federal poverty level had much higher uninsured rates for all urbanization classifications, and uninsured rates were the lowest for each urbanization classification when salaries were greater than 200% of the federal poverty level, with inner city and small rural counties having the highest uninsured rates, at 9.3% and 9.2%, respectively. Medicaid coverage in Midwestern and Northeastern states were higher in inner cities, but in Southern and Western states, Medicaid enrollment was higher in rural counties for 18 to 64-year-olds. Of this population insured by private or Marketplace plans, those with higher salaries generally had higher levels of private and Marketplace health insurance coverage. Thus, the inner cities of states in the Midwest and Northeast had the lowest rates of these types of coverages, and rural counties had the lowest rates of private and Marketplace insurance in the South and West. Among all regions of the U.S., those living in rural counties had the lowest rates of private insurance. Suburban counties had the highest rates of private insurance coverage among all regions of the U.S. and had the highest proportion of private insurance offered through employers, whereas, rural counties had the lowest rates of employer-sponsored health insurance for the entire U.S. and for Midwestern, Southern, and Western states (Meit et al., 2014).

The number of physicians was indirectly proportional to rurality in the U.S. in 2010, with fewer overall providers choosing to work in rural locations. Specifically, as rurality increased, several specialty providers (i.e., psychiatrists, anesthesiologists, and neurologists, OBGYN, pediatricians, and internists) decreased. This trend was most pronounced in the Midwest, whose states experienced the largest provider supply disparities between inner cities and small rural counties for all providers (515% more in inner cities), psychiatrists, anesthesiologists, and neurologists (1,132% more in inner cities), OBGYNs

(785% more in inner cities), and pediatricians (1,004% more in inner cities). There seemed to be a more equal dispersion of family and general providers among all classifications of urbanization. Dental care utilization and dentist supply followed similar trends to those of physician use and supply, with dental care usage and provider supply decreasing as rurality increased. Those in the South and Midwest had the lowest dental care utilization for small rural counties, at 25.2 and 32.7 per 100,000 population, respectively, in 2007 (Meit et al., 2014).

For those ages 18 to 64 years, in 2010 and 2011, inpatient hospitalizations for small metro and rural areas were higher than those living in inner cities and suburban counties. Men had fewer hospitalizations (per 1,000 population) than women for every urbanization classification. The average number of hospitalized days were highest in inner cities and men had longer hospital stays than women for every urbanization classification (Meit et al., 2014). Perhaps lower hospitalization rates yet longer stays in men highlights the argument of men delaying care until problems are very severe and require more intensive care. Admission rates (in 2010) for the treatment of substance abuse issues differed depending on the drug being abused. Finally, regarding treatment for substance abuse issues, patients in small metro and large rural counties typically were admitted more often for marijuana, alcohol, and stimulant problems than all other classes of urbanization. Cocaine-related admissions were the highest for inner cities and lowest in small rural counties, and opiate-related admissions typically decreased as rurality increased. Among specific sections of the U.S., Southern and Midwestern states' alcohol abuse admission rates were the highest in large rural counties for Midwestern and Southern states, in inner cities for Northeastern states, and small rural counties for Western states. In the Northeast, opiate-related admission was highest in small metro counties, and marijuana- and cocaine-related admissions were highest in the inner cities. The highest stimulant-related admission rate was in large rural Western areas (Meit et a., 2014).

The final important portion of Meit and colleagues' (2014) study describes information related to the mental health status of rural and urban women and men, ages 18 and above, in the U.S., from 2010 to 2011. Overall, those in the U.S. who reported having the most mental health issues in the previous year were women and men in Western states, while those reporting the lowest rates were those in the Southern states. Women in rural areas tended to have more mental health illness than those living in urban areas, but the differences between men were very small. Women reported higher levels of mental health illness in the previous year than men for every urbanization classification for every region of the U.S. (Meit et al., 2014), perhaps demonstrating men's reluctance to seek help for issues related to psychological health.

Severe mental illness was directly proportional to rurality, with the largest rural-urban differences for men in the Western states, and for women in the Northeastern states. The only U.S. region demonstrating an indirect relationship between severe mental illness and rurality were for Midwestern women. Men living in large rural areas of the West and Midwest experienced the highest rates of severe mental illness compared to men in all other regions and urbanization classifications in the U.S., at 5.5% and 4%, respectively (Meit et al., 2014).

Among the same population, major depression episodes most often occurred in men and women living in large rural areas, at 6% and 9%, respectively, with the lowest male and female rates occurring in the inner cities (men and women) and suburban counties (women). The highest rates of major depression episodes occurred in men and women living in large rural Western areas, and the greatest range within genders occurred in Western men and Midwestern women. Men reported lower levels of major depression than women across all regions and urbanization classifications, and Midwestern men living in rural areas had the second highest levels of major depression in men among all U.S. regions and urbanization classifications, only trailing men in rural Western areas. Major depression in adolescents seemed to follow similar trends to major depression in adults, with the

highest levels occurring in rural areas and all female rates being higher than all male rates in every U.S. region and for every urbanization classification. Southern boys living in large rural counties and Western girls in small rural counties experienced the highest rates of major depression, and the largest major depression rate ranges for boys and girls occurred in Western and Northeastern states, respectively (Meit et al., 2014). And lastly, men and women reporting severe psychological distress at the highest levels (among the same population) were men in small rural and women in large rural counties (both rates occurred in Southern region), while the lowest male and female rates occurred in suburban counties. The largest range of values for severe psychological distress rates occurred in the Southern states for men and Western states for females (Meit et al., 2014).

Rural masculinities.

In order to address the changing demographic, political, economic, social, cultural and environmental landscape in the Western world in the 1970s and 1980s, research in masculinities became an important (but not necessarily popular) area of academic concern (Campbell & Bell, 2000). Dating back to the 1950s and through the 1980s, Savran (1998) provided an account of the many facets of masculinities and femininities and their construction throughout U.S. history, as portrayed in a variety of media examples, which generally portrayed “ ‘organization man’ ” (Campbell, Bell, & Finney, 2006a, p. 8) as having an “ ‘identity crisis’ ” (Campbell & Bell, 2000, p. 533). Movements such as those related to Civil Rights, Women’s, Gay, and Lesbian Liberation, and even Black Power, were just a few countercultural processes challenging the traditional, monoracial, heteronormative, and hypermasculine world of men in the U.S., generally viewing men as the *issue*, but other efforts such as the Patriot movement, consisting of a number of groups like the Ku Klux Klan, the White Aryan Brotherhood, and the Southern White Knights, attempted to maintain and advance the traditional, dominant, hegemonic, and heteronormative culture of male masculinity, seeing men as *having issues* (Savran, 1998). Despite these efforts from the aforementioned movements and groups, Freud (1914) seemed to be accurate

when he said, “the concepts of ‘masculine’ and ‘feminine,’ whose meaning seems so unambiguous to ordinary people, are among the most confused that appear in science” (p. 1533).

Over about the last three decades, the understanding of masculinity has certainly expanded and is more fully understood as a socially (and not biologically or psychologically) formed and reformed phenomenon, with internal complexities, containing multiple versions, enacted in hierarchical fashion, with hegemonic practices defined as the exalted embodiment of the most traditional and dominant type of masculinity, and this entire process is dynamic and can fluctuate throughout the lifespan depending on the socio-historical and cultural context (Brod, 1987; Brod, Kaufman, & Men’s Studies Association [U.S.], 1994; Connell, 1995, 2005, 2015; Kaufman, 1987; Kimmel, Hearn, & Connell, 2005).

Just like many forms of masculinity can be practiced (Carrigan, Connell, & Lee, 1985; Connell, 1995, 1996; Connell & Messerschmidt, 2005), so too is that the case when conceptualizing *rurality* (Campbell & Bell, 2000), which signifies many “*rurals*” (Campbell et al., 2006b, p. 15). Thus, in order to recognize the complex nature of *rural masculinities*, it is appropriate to understand what Campbell and Bell (2000) referred to as “*the rural masculine*” and “*the masculine rural*” (pp. 539). These concepts deal with understanding the symbolism represented in “*the rural in the masculine*” and “*the masculine in the rural*,” with the former understood as “the way in which notions of rurality help constitute notions of masculinity” and the latter understood as “the various ways in which masculinity is constructed within what rural social scientists would recognize as rural spaces and sites” (Campbell & Bell, 2000, pp. 539, 540). Thus, studying masculine rural involves exploring how masculinity behaviors and beliefs occur in rural areas, whereas rural masculine involves the exploration of rural imagery, notions, and depictions and their impact on all masculinity practices (Campbell et al., 2006b). Throughout this process, one must acknowledge that these are two concepts are deeply complex and interrelated, and as Bell (2006) stated, “we live our lives at the intersection of the material [i.e., masculine rural] and the symbolic [i.e., rural masculine], no matter where we live and what texts we have at our disposal” (p. 178).

The masculine rural is well depicted in the “marked [visible]” and “unmarked [invisible]” masculinities of “salt-of-the-earth manual jobs” such as farming (Campbell & Bell, 2000, p. 540; Campbell et al., 2006b; Lobao, 2006, p. 268). For example, in a heterosexual marriage, the farmer is assumed to be the husband (i.e., marked as masculine rural), whereas the wife, despite playing integral roles in the agricultural process, is likely unseen, since “every farm typically has only one [male] ‘farmer’” (Campbell et al., 2006b, p. 5). On the other hand, the masculine rural can also be an unmarked concept, as in the case of having a successful farm operation due to the relentless, competitive, and individualistic practices of the farmer, which are traditionally masculine, yet largely invisible (Campbell & Bell, 2000).

The rural masculine is represented in more than just traditionally rural spaces and occupations (e.g., farming, fishing, ranching, coal mining, woodcutting, etc.), rather it explores how ruralities (e.g., notions, symbols, images, etc.) impact masculinities in rural *and* urban environments (Lobao, 2006). For instance, a metropolitan man’s leisure activities may involve weekend getaways with male friends to fish or hunt (Campbell et al., 2006b). Also, although New York City is a famous metropolitan area, on and after September 11, 2001, the firefighting occupation received a deeper sense of appreciation and reverence from society, a respect which has typically been reserved for the traditionally rural salt-of-the-earth jobs noted above (Lobao, 2006).

It is important to understand that the masculine rural and the rural masculine are not mutually exclusive concepts, rather they can happen concurrently (Campbell & Bell, 2006). For instance, the firefighters mentioned above, who worked to rescue innocent civilians on September 11, 2001, portrayed to rural- and urban-dwellers around the world a representation of how masculinity should be performed in a time of crisis. To a farmer living in Indiana, for example, perhaps he interpreted the firefighters’ actions and experiences as examples of traditionally-rural norms that he has seen or even experienced himself on the farm, examples such as enduring adversity at-all-costs, denying mental,

physical, and emotional pain and fatigue during times of extreme stress and chaos, and putting one's own health and safety at risk in the short- and long-term. This representation of the firefighters' efforts to rescue individuals in danger provides the masculine rural farmer a rural masculine example, and perhaps even an incentive, to enact and promote similar ideals in his life and in the lives of others (e.g., sons or grandsons) in the present and/or future.

An expanded portrayal of the masculine rural and rural masculine concepts was provided by Bell (2006) in his analysis of what he termed, "the *rural homosexual* and the *homosexual rural*" (p. 164), in order to reveal the interrelatedness and deep complexities of urban and rural gay men's sexuality, for "separating these two [i.e., the rural homosexual and the homosexual rural] is an act of oversimplification [as is the same for the masculine rural and the rural masculine]" (178). Thus, the homosexual male (used loosely to signify men who have sex with men) previously or currently living in a rural space (i.e., rural homosexual) and the wistful image of the "countryside" (i.e., rural) in the minds of both rural and urban gay men (i.e., homosexual rural) are inseparable concepts (Bell, 2006). Narrative research about the rural-urban migration patterns of gay men offers some insight into the relationship between the rural homosexual and the homosexual rural. Growing up, rural homosexuals in Annes and Redlin's (2012) study often fantasized about city life as a sort of "mecca" (p. 62) for gay men. However, this "homosexual urban" imagery, if you will, was offset by "pressure to conform to a particular hegemonic gay masculine identity," with homosexual urban ideas viewed by American men as shallow and French men as too traditionally feminine, views which spurred the return of these men (perhaps) to their homosexual rural spaces (Annes & Redlin, 2012, p. 65).

The previous information in this section highlights the complexities, multiplicities, and interconnectivities inherent in rural masculinities, and based on recent major works devoted to ruralities and masculinities (see Campbell et al., 2006a; Courtenay, 2011), Campbell and Bell (2000) still seem to be accurate when they stated that "the future looks good for research on rural masculinities" (533).

Farming definitions and demographics.

Before discussing farmers and masculinities (which appears later in this section), several key terms must be explained related to farming. The word *farmer* [emphasis added] is difficult to define. In fact, paragraph 614 of section 780 of the Fair Labor Standards Act (FLSA) of 1938, titled “Definition of a farmer,” begins with, “The Act does not define the term ‘farmer’ ” (p. 593). Rather, a farmer, considered as “individual persons, . . . an association, a partnership, . . . a cooperation or a farmers’ cooperative” (pp. 557, 593), is best understood through work-related actions related to “agriculture” (p. 549), described in paragraph 103 of section 780 of the FLSA (1938), which are the following:

the cultivation and tillage of the soil, dairying, the production, cultivation, growing, and harvesting of any agricultural or horticultural commodities . . . , the raising of livestock, bees, fur-bearing animals, or poultry, and any practices [including forestry or lumbering operations] performed by a farmer or on a farm as an incident to or in conjunction with such farming operations, including preparation for market, delivery to storage or to market or to carriers for transportation to market. (pp. 549-550)

The USDA and ERS (2017b) refer to a farmer as a *farm operator*, who “is the person who runs the farm, making the day-to-day management decisions,” and “could be an owner, hired manager, cash tenant, share tenant, and/or a partner” (para. 3). And the Internal Revenue Service (IRS; 2017) states that, “An individual is a *qualified farmer* . . . if at least two-thirds of his or her gross income from all sources . . . was from farming” (Qualified Farmer section, para. 1).

As far as what constitutes a *farm*, this is defined in paragraph 135 of section 780 of the FLSA (1938) as “a tract of [rural or urban] land devoted to the actual farming activities” (p. 559) described in paragraph 103 of section 780 of the FLSA of 1938, which is stated above. The USDA (2017) states that “A farm is defined as any place from which \$1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the year” (para. 2). Additionally, and similar to the definitions of the FLSA of 1938 above, a farm signifies profitably operating, managing, and cultivating a

variety of items, such as “livestock, dairy, poultry, fish, [and] fruit” in many different spaces, including “truck farms . . . plantations, ranches, ranges, and orchards and groves” (Department of the Treasury, IRS, 2016, p. 1). Truck farming, made successful as a result of U.S. railroad and refrigeration systems technology, originated in the Southern states after the Civil War. Here, farmers and railroad companies developed business relationships to supply perishable produce to largely urban areas of Northern states (McCorkle Jr., 1992, 1999), a practice which spread throughout farms across the U.S. (USDA, Bureau of Agricultural Economics, 1950).

One aspect of farming overlooked in all the above information were the 57,000 U.S. farms that generated renewable forms of energy for themselves and for selling to others, farms which have more than doubled in number from 2007 to 2012. Almost 64% of these farms produced energy via solar panels, and the other methods used were wind turbines, geoexchange systems, ethanol, biodiesel, and 10,000 additional farms leased their lands’ “wind rights” for tenants to produce wind energy (USDA, NASS, 2014, p. 4). California and Hawaii had the highest number of farms (5,845) and proportion of farms (18%), respectively, and three Midwestern states were in the top five for the highest total number of renewable energy farms, which were Illinois, Iowa, and Indiana, totaling 7,906 farms (USDA, NASS, 2014a, 2014b).

According to the U.S. Census of Agriculture in 2012, around 2.1 million ranches and farms made up 915 million acres of U.S. farmland, which totaled 40.5% of all U.S. land. Since 2007, overall farmland acreage decreased by seven million acres, and the number of ranches and farms has essentially been on a steady decline for decades, dropping by 17.5% since 1982 (USDA, NASS, 2014a, 2014b). In 1935, there were more than 6.8 million farms, the most in U.S. history, and in 1950, close to 1.2 billion acres of U.S. land was dedicated to farming, which was also the highest amount in U.S. history, and totaled 51.1% of all U.S. land (USDA, NASS, 2014a, 2014b; USDC, Bureau of the Census, 1978). Additionally, the largest

average size of U.S. farms was in 1992, where each farm averaged 491 acres (USDA, 2014a, 2014b; USDC, Bureau of the Census, 1994)

Despite the drastic decline in the number of farms and quantity of farmland since 1935 (USDA, NASS, 2014a, 2014b; USDC, Bureau of the Census, 1978, 1994), the total acreage of each farm in 2012 increased by 3.8% since 2007, from 418 acres to 434 acres (USDA, NASS, 2014a, 2014b). A total of just 8% of all farms had at least 1,000 acres; however, these larger farms made up 64% of all farmland, with 86% of this proportion made up of farms with at least 2,000 acres. Eighty-eight percent of all farmland was utilized for pasture (45.4%) and crops (42.6%), and woodlands made up 8.4%. Over 50% of all crops harvested were soybeans and corn (for grain), with total acres of harvested soybeans increasing by 19% since 2007 and corn (for silage) increasing by 20%. Nearly 29.5% of all U.S. farms were devoted to raising cattle for beef production, which totaled 619,200 farms and the highest proportion of all types of farms; however, this was 37,300 less beef cattle farms than in 2007. Of all the farmers, nearly 68% owned all their farmland (with each farmer having an average of 235 acres of farmland), 25% are partial landowners (922 acres per farm), and 7% rent all their farmland (588 acres per farm), but 63.2% of all farmland was operated by partial owners and tenants. Partial owners had yearly gross sales of more than \$393,500 per farm, tenants sold almost \$293,900 per farm, and full owners sold close to \$99,000 per farm. Close to 39% of all U.S. farmland was leased in 2012, with land in Illinois, Indiana, and Iowa for corn and soybeans ranking in the top five states in the U.S. for proportions of farmland being leased from other farmers, at 60%, 53.4%, and 53%, respectively. Additionally, although overall acreage of U.S. farmland and the total number of farms in the U.S. is decreasing, which is especially apparent in Midwestern and Southeastern states, 32% and 38% of states had increases in farmland acreage and total number of farms since 2007, respectively (USDA, NASS, 2014a, 2014b).

When breaking down U.S. farmland and farmer data into demographics for 2012, there were major disparities based on gender, age, number of principal operators, and race and ethnicity. First,

almost 13.7% of all farms were operated by women, but this accounted for just 6.9% of all farm acreage. Secondly, female-operated farms were only half the size (217 acres) of the average U.S. farm (434 acres) and received just 57% of the average annual government farm aid of \$9,925 per farm. Lastly, women accounted for just 3.3% of all sales of agricultural products and sold just 24% (\$44,742) of the average annual gross sales per farm, which was \$187,097 (USDA. NASS. 2015).

According to age and principal operator survey data from the Census of Agriculture, the highest number of farmers in 1920 was almost 6.5 million, the most in U.S. history, and the first time average age of all principal operators was calculated was in 1940, when the average age was the lowest in U.S. history at 48 years (USDA, NASS, 2014a; USDC, Bureau of the Census, 1956, 1994). In 2012, just a little more than 2.1 million individuals were principal operators, but only one million farmed as a primary occupation, and the average age of all principal operators was 58.3 years (USDA, 2014a).

As far as race and ethnicity, 96% of U.S. farmers were European American (non-Hispanic whites), who operated 96.5% of all farms, totaling 94.3% of all acreage. Of the nearly 395 billion dollars' worth of total products sold, non-Hispanic white farmers accounted for around 98% of sales. Non-Hispanic white operators farmed slightly less farmland than the national average (10 acres less) and received slightly more government farm aid (\$98 more), while selling \$3,534 above the national average gross sales per farm (USDA, NASS, 2014a, 2015).

Racial and ethnic minority groups made up a very small percentage of the overall farming contributions in the U.S. for 2012. Of the races and ethnicities surveyed, Hispanics and Latinos made up the largest proportions of minority farmers and total number of minority-operated farms at 41.2% and 42%, respectively. Of all minorities, American Indians or Alaska Natives farmed the highest proportion of acres of minority-operated farmland at almost 61% and had the largest average farm size of *all* races and ethnicities at 1,021 acres. African Americans had the smallest average farm size at 125 acres per farm, the lowest total annual sales of agricultural products at around \$1.3 billion, the lowest annual

gross sales per farm at \$36,052, and received the lowest amount of government assistance per farm at \$5,509. Hispanics and Latinos had the highest annual total sales of agricultural products for all farms of all minorities at almost \$16.2 billion, Asians had the highest annual gross sales per farm for *all* races and ethnicities at \$333,362, and Hispanics and Latinos received the highest amount of farm-related government assistance of all minorities, trailing non-Hispanic whites by just \$353 (USDA, NASS, 2014a, 2015).

Demographic farm data from Indiana reflects national data above in many respects, with some notable exceptions. When comparing women and men in 2012, just 9.8% of Indiana farms were principally operated by women, which totaled only 3.7% of the state's farmland. And although the average farm size in Indiana was 251 acres, the average female farm was 94 acres. Women also represented just 2.6% of all Indiana agricultural products sold, and sold \$51,277 of annual product per farm, while the average product value sold per farm was \$191,000. Additionally, women received just 4.5% of total government assistance, which was just 54.7% of the average per farm (\$4,558 versus \$8,331; USDA, NASS, 2017).

Of all races and ethnicities, non-Hispanic white individuals are largely in charge of farming in the state of Indiana. Whites accounted for 99.7% of principal operators, farmed 99.8% of all farms, which totaled 99.9% of all Indiana farmland, and averaged the highest acreage per farm of all races and ethnicities at 251 acres. Non-Hispanic whites sold 99.9% of all farm products, sold just slightly more products per farm than the state average, and received 99.9% of all government aid (USDA, NASS, 2017).

Among different racial and ethnic minority groups in Indiana, 47.6% of minority farmers were Hispanic or Latino, who farmed 47.6% of all minority-operated farms, which totaled 60.6% of all minority-operated farmland. Asians and African Americans accounted for the least amount of farmers, number of farms operated, and acres of land farmed. African Americans farmed just 5% of all minority-

operated farmland, with average farm sizes of just 94 acres, which was the lowest of all racial and ethnic groups. Hispanics or Latinos had average farm sizes of 233 acres, just 18 acres less than the state average. Considering the total value of products sold and government assistance received per farm of all racial and ethnic minorities in Indiana, Hispanics or Latinos had the highest annual sales per farm at \$272,078 and received the most government assistance (\$7,134), while African Americans had the lowest sales of \$60,190 per farm and received just \$2,699 of government aid, the lowest all of racial and ethnic groups in the state (USDA, NASS, 2017).

Farming politics.

If one were to simply base his or her judgment of Campbell and colleagues' (2006a) introductory quote from their book titled, *Country Boys: Masculinity and Rural Life*, on the 2016 U.S. presidential election results, it seems that "Country boys [still] rule the world" (p. 1). Indeed, there is relatively little doubt that U.S. President Donald J. Trump's victory was achieved largely via rural voters, especially non-Hispanic white men and women. For example, 62% of rural American counties voted for Trump, where he won 62% of rural non-Hispanic white women's votes and 72% of rural non-Hispanic white men's votes (Morin, 2016). In fact, among all rural voters, Trump won 46 out of the 50 states, with Candidate Hillary R. Clinton winning more rural votes than Trump in only Hawaii, Massachusetts, New Hampshire, and Vermont. Trump's rural victories in key "swing" and battleground states, such as Pennsylvania, Michigan, Iowa, Wisconsin, North Carolina, Florida, and Georgia, are major reasons why he became President of the U.S. (Frey, 2017; Scala & Johnson, 2017; Scala et al., 2015).

Certainly, many of the 1,821,039 U.S. male farmers from the USDA and NASS' (2014a) Census of Agriculture played a role in the 2016 election results. In fact, Scala and Johnson (2017) found that of the 443 U.S. rural counties most "dominated by farming" (p. 180), Trump received significantly more votes than Clinton. The trend of individuals living in farming-dominated counties being significantly more likely to vote for Republican presidential candidates was also seen in the 2000, 2004, 2008, and 2012 elections

(Scala & Johnson, 2017; Scala et al., 2015), perhaps due to the more conservative “old rural” style of economy practiced and preferred in farming communities, as opposed to “new rural” economic practices in rural counties who place greater emphasis on touristic and recreational amenities and tend to support Democratic candidates (Scala et al., 2015, p. 108). In general, small rural counties dominated by farming are especially likely of all the types of MSAs and non-MSAs to have conservative political ideologies and preferences, and these farming-dominated areas tend to also have lower levels of racial and ethnic diversity, less college-educated individuals, greater numbers of older adults, and higher percentages of practicing Evangelicals (Scala & Johnson, 2017). According to results from Kaufman’s (2016) study of political attitudes and voting behaviors of farmers from 1954 to 2008, there have been significant decreases (compared to the nonfarming general population) in democratic voters, liberal and moderate ideologies, trust in government, and external efficacy (i.e., the perception of “having a say” in the political process), while independent voters and conservatism have risen. Perhaps it is too soon to conjecture; however, it seems that some of the political attitudes and practices of farmers may also be reflective of how they enact masculinities and approach their own personal healthcare. The next portion of this section will explore male farmers’ gender constructions, health, and health-related beliefs and behaviors.

Male farming masculinities.

Stemming from Campbell and Bell’s (2000) discussion of the masculine rural and the rural masculine, Bell (2006) provided an account of a specific type of rural masculinity, one understood through the experiences, images, and representations of homosexuals and rurality. Termed the *rural homosexual* and the *homosexual rural*, Bell (2006) and Redlin (2012) provided illustrations of these concepts, portraying the homosexual rural as an “imaginative construction of the countryside as a particular type of ‘gay space’ ” (p. 169); whereas, such a space for the rural homosexual could have been the *only* location for gay relations (Bell, 2006). Such attention to underexplored ruralities and their

meanings warrants the consideration of other often understudied areas of rural masculinities, specifically one that Courtenay (2006/2011) referred to as “farm masculinities” (p. 183). The portion of this section that follows as well as subsequent sections will focus primarily on male farmers’ experiences, with the understanding that there are many different types of farmers, farming practices, and meanings of these concepts around the world. Thus, the author in no way wishes for the following farming conceptualizations to be regarded as universal, but only a starting point for the further understanding of a heterogeneous, complex, and often misunderstood community of individuals. As the author explores this area, it will be done with two processes in mind: understanding the *masculine in the farmer* and the *farmer in the masculine*, or better referred to as the *masculine farmer* and the *farmer masculine*. The former is defined as *the various ways in which masculinity is constructed within farmers* and the latter as *the ways in which notions of farming help constitute notions of masculinity*.

Farming and media.

Currently, country boys not only rule the political world (noted above) but also have strong influence through popular media channels such as TV and social networking sites. Evidence of this was particularly on display during the February 2, 2013 TV broadcast of Super Bowl XLVII on the Columbia Broadcasting System (CBS), which was the most watched and highest rated TV event of the year in the U.S., with nearly 108.7 million viewers in 53 million homes, while also performing better on Twitter than any other TV event of the year (Nielsen Company, 2013c, 2013d, 2013e). Additionally, it was the most promoted TV event of the year, with 462 hours and 18 minutes of football-related TV coverage during the two weeks before the official airing of the game (Nielsen Company, 2013b). With that said, the audience of the Super Bowl was certainly primed for the event, and once aired, nearly 46.4% of U.S. households were tuned into the action (Nielsen Company, 2013d). A very important element of the Super Bowl experience is its TV commercials, which can positively impact the affective nature and advertisement recall of their audience, especially when goods are promoted in ways that are interactive,

involving emotional elements and animals, while avoiding product quality declarations, and understanding that commercial length and exposure frequency increases recall (Kelley & Turley, 2004; Newell & Henderson, 1998). Furthermore, as shown in electroencephalograms (EEGs) of college students who viewed three of the most popular and three of the least popular Super Bowl XLVIII commercials of 2014, neural activation in the right and left hemispheres of the brain responded differently to top- and bottom-ranked commercials. More positive student responses to commercials were indicated in EEGs with greater neural activity in the left hemisphere, while more negative responses produced EEGs with enhanced neural activity in the right hemisphere (Randolph & Pierquet, 2015).

So, what does the above information have to do with country boys ruling the world of media? Well, of all the commercials aired during Super Bowl XLVII, Dodge Ram's pick-up truck commercial titled, "Farmer," ranked as the sixth most-memorable, ninth most-liked, and was at least twice as long as all the others in the top 10, clocking in at two minutes (Nielsen Company, 2013a). According to popularity rankings from USA Today's (2013) Ad Meter results, "Farmer" ranked third, and one Indiana grain farmer, Bob Dougherty, was particularly appreciative of the commercial, further depicting a farmer's life to USA Today (2013) by saying, "It's not an 8 to 5 job. It's 24 hours a day, seven days a week, especially when you have livestock. It's a lifestyle, it's not a job. A lot of people don't realize that" (para. 33). The Nielsen Company (2013a) referred to the advertisement as using "sentimental approaches . . . tugging at viewer's [sic] heartstrings by praising the power and spirit of American farmers" (para. 6), which Lee et al. (2014) found as a major theme of the commercial, according to an analysis of Tweets related to *Farmer*. As of May 2018, the video of this commercial has been viewed close to 23 million times on YouTube and liked nearly 92% of the time (Ram Trucks, 2018). The video has neither music nor special effects, only still photographs of "farm life," progressing one-at-a-time, every few seconds, to the pace of Paul Harvey's narration of his 1978 speech titled, *So God Made a Farmer* (Franke-Ruta, 2013). A book

of farm-related photographs of the U.S. are based on the speech and commercial's ideas and images titled, *The Farmer in All of Us: An American Portrait*, which was published by the National Geographic Society (Harvey, 2014). The next portion of this section will provide a short description and concurrent analysis of the commercial and speech, focusing on how farmers and masculinities are embodied in the imagery and discourse, as well as how farmers are embodied in masculinities (Bell, 2006).

Masculine farmer and farmer masculine in "So God Made a Farmer."

Constructed throughout the *Farmer* speech are themes representing the masculine farmer and the farmer masculine, accomplished via images and discourse depicting sprawling farmland, evangelical, moral, and ethical assumptions, simple living and fashion, survivalist and improvisational skills, practicality, physical and mental strength, resiliency and robustness, machoism, and the portrayal of power and toughness through large trucks, which are featured as the prized commodity (Corbett, 2013). From the author's point of view, other overarching themes of the advertisement that help clarify the masculine farmer and farmer masculine constructs are the portrayal of a farmer as a noble, righteous, and God-given occupation, suitable for only a predetermined few with the prerequisite characteristics. Such a person would need to display a tireless and unrelenting work ethic, adhering to a nearly impossible work schedule, an unmatched set of skills displaying almost magical resourcefulness and inventiveness, an unbendable integrity, uncanny physical and mental strength, measured and controlled emotional responses in times of grief, an ability and desire to continue working despite physical and/or mental fatigue, pain, and/or injury, devout patriotism and Christian faith, and deeply-rooted patriarchal sentiments in connection to the "passing-down" of the farm to his son(s). In accomplishing and enacting all of the above tasks and attributes, the farmer does so in a rather lonely and solitary, yet wide-open and spacious environment, largely void of human interaction but with potential animal contact (Ram Trucks, 2018).

As far as specific observations of the 35 photographs in the advertisement, there is only one person with an apparent smile, who seems to be an adolescent Latino male standing behind a table of produce and other food, as he sells these items at an outdoor farmer's market. The faces of the adult male farmers (all white except one African American) are generally neutral or even downtrodden, with tired eyes, and weathered, wrinkled, and leathery skin. Of the two adult female farmers and one preadolescent girl, none are smiling; however, they do not appear to be as physically and mentally exhausted and drained as the majority of the men in the photographs (Ram Trucks, 2018). Towards the end of the advertisement, a young boy is seen holding his cowboy hat over his heart and looking up with pride into the distance as the speech insinuates that this boy will one day "spend his life doing what Dad does" (Harvey, 2014, p. 21).

Additionally, hands are frequently captured in the photographs, appearing to be useful for mainly work and praying. Several photographs show male farmers' hands as dirty, worn, and damaged, while females' hands are either covered with work gloves, tucked in coat pockets, folded in prayer, or partially hidden due to folded arms across the chest. Also, in addition to the powerful and masculine machinery in the photographs, such as large white and black extended cab pickup trucks, giant modern-day tractors and combines, along with an antique tractor, mainly just large, powerful, and/or masculine animals are included, such as horses, cows, and dogs, although there is one photograph of a baby chicken and another of a flock of birds flying in the sky (Ram Trucks, 2018).

Masculine farmer discourse is depicted throughout *Farmer's* entirety, but the following line is particularly poignant:

God said, I need somebody willing to get up before dawn, milk cows, work all day in the fields, milk cows again, eat supper, then go to town and stay past midnight at a meeting at a school board. So, God made a farmer. (Harvey, 2014, p. 21)

Such a schedule implies a farmer only taking a break to eat dinner and sleep for a few hours, perhaps because the self-respect, sense of worth, and pride of farmers largely hinges on traditionally masculine farming practices associated with “good farming” (Bryant & Garnham, 2015). These practices include being a hard worker, being straightforward and truthful, having a lasting presence in one’s town, possessing extensive farming knowledge (Bryant & Pini, 2009, 2011; Chávez, 2005), and battling to survive amidst sociocultural, environmental, political, economic, and personal struggles, which allow farmers to fulfill their desire of cultivating and harvesting food for their community and nation, thus rendering them as types of “heroes” (Bryant & Garnham, 2015, p. 75; Liepins, 2000).

Harvey (2014) began his speech by stating that “on the eighth day, God looked down on His planned paradise and said, ‘I need a caretaker.’ So God made a farmer” (p. 21). Images connected with this discourse in *Farmer* (which represent the farmer masculine) are a small, white, evangelical church, and then a large, isolated farm homestead, placed in the middle of vast and perfectly-tilled farmland. The home(s) on the property have been strategically placed in order that the several barns, sheds, and trees (Ram Trucks, 2018) seemingly protect the farm family from the “urban [and nonfarming] others” on the outside, a people and area seen as impure and in direct conflict with the “rural idyll...well-organised [*sic*] pastoral-agricultural rural” population and space (Matthews, Taylor, Sherwood, Tucker, & Limb, 2000, p. 142), concepts that help distinguish the farmer masculine construct. Kraack and Kenway (2002) and Matthews et al. (2000) explained the construction of the rural idyll as a supreme living space, defined by simplicity, innocence, harmony, integration, and supportiveness, where residents are treated fairly and equally, “due to an assumption of traditional face to face [*sic*] social relations” (p. 147).

Despite the normalized symbolism of farmers and farm life, especially the masculine farmer and the farmer masculine constructs, as sort of a “Canaan-like” experience, there is what Kraack and Kenway (2002) referred to as a “geometry of multiple differences” (p. 154) for those living in farm and rural spaces, creating a less homogenous and more heterogeneous experience (Matthews et al., 2000). Such

differences, based on socioeconomic, racial, ethnic, sexual, gender, and age identities, play important roles in farming and rural communities, where traditional masculinities are challenged by contemporary and conventional masculinities due to a more diverse and globalized world (Kraack & Kenway, 2002).

A strong example of Kraack and Kenway's (2002) conclusions is in the case of recent immigrants settling in rural Australian areas, referred to as "the Bush" (Krivokapic-Skoko & Collins, 2016, p. 177). In a three-year longitudinal survey of 915 of these immigrants, naturally occurring and "manmade" or "constructed" rural idyllic "attractors," "retainers," and "detractors" were identified for these individuals (Krivokapic-Skoko & Collins, 2016, p. 168). The aspects most likely to attract and retain immigrants to the Bush were rural idylls such as employment opportunities, the flora and fauna, warm temperatures, nice and friendly residents, peacefulness, enhanced safety, cleanliness, and low traffic flow. However, rural idylls also acted as detractors for immigrants, such as the existing citizenry's narrow-mindedness, conservatism, and low tolerance for diversity related to language, culture, and "outsiders," as well as being socially isolated and surrounded with few options for accessing quality goods and services, such as public transportation, shopping, recreation, and other amenities related to art, culture, education, athletics, entertainment, etc. (Krivokapic-Skoko & Collins, 2016, p. 177). In this example, the rural idyll has positive and negative connotations depending on the population, and there seems to be a mixture of traditional and more conventional or contemporary rural preferences in the described population of immigrants.

Farmer Health

The independent, self-reliant, industrious, determined, and responsible American farmer "has contributed much to the social fabric of this country. . . . societal characteristics that are clearly desirable in modern America" (NCASH, 1989, p. 1). This powerful sentiment helped lay the foundation for the NCASH's (1989) "Agriculture at Risk: A Report to the Nation" conference summary, which would ultimately provide a forceful wakeup call to those with a stake in U.S. agriculture: *American farmers are*

suffering and paying a mighty price [emphasis added]. Considered one of America's most dangerous jobs, traumatic incidents leading to severe and/or permanent disability and/or death were recognized as the most urgent health concern of farmers. Farm tractor overturns (the primary culprit) and PTO, auger, grain wagon, grain bin, building structure, and animal handling accidents were the most notable events leading to traumatic injuries and/or death. Additionally, short- and long-term farm-related diseases were identified as playing major roles in the morbidity and mortality of farmers. Lung diseases (e.g., chronic bronchitis and asthma), certain types of cancer (e.g., brain, stomach, prostate, non-Hodgkin's lymphoma, Hodgkin's disease, multiple myeloma, leukemia, skin, and lip), skin disorders (e.g., dermatitis), musculoskeletal issues (e.g., lower back pain, arthritis of the knees, hips, and upper extremities, loss of hearing, mental health disease (e.g., depression), and toxic pesticide exposure (affecting the skin, lungs, and central nervous system) were the major health issues that had been affecting farmers' lives at the time. The sources of and rationale for the health concerns mentioned above (both injuries and illnesses) were vast, but most likely, protective measures (which were widely available) against these problems were not taken in many cases due to the "lack of hazard recognition [and] . . . economic constraints" of the farmers (NCASH, 1989, p. 19). The notable sources of farmer injury and illness from the report are noted as follows: machinery (namely, farm tractors), livestock, poor building structures and design, and environmentally and even socially hazardous exposures (e.g., dust, gas, fumes, oils, fuels, solvents, insects, plants, feed additives, nitrate, viruses, soils, ultraviolet radiation, pesticides, repetitive bodily vibration and noise from farm machinery, stress, social isolation, poor weather conditions, economic adversity, separation and/or divorce, domestic abuse, and drug and alcohol abuse; NCASH, 1989). Over a decade later, Rautiainen and Reynolds (2002) provided a follow-up to the NCASH (1989) report, further illustrating farming's continual nature as one of America's most dangerous, disabling, and fatal occupations, while also demonstrating farmers' persistent propensities

for experiencing and suffering from the same illnesses mentioned above, including several types of infections transmitted from animals.

Mental health.

Considering the overall health of farmers today, perhaps it is when some of the traditionally masculine farming behaviors of being independent, relying on oneself, and not recognizing and/or acknowledging and/or addressing work hazards are practiced and glorified, that the health of farmers becomes jeopardized. Beginning with mental health, Bryant and Garnham (2015) made a clear argument that suicidality in Australian farmers is a major issue, occurring in a variety of scenarios, possibly related to drought (Alston, 2012; Alston & Kent, 2008; Berry et al., 2011; Bryant & Garnham, 2013; Fragar, Kelly et al., 2008; Guiney, 2012; Hanigan et al., 2012; Hanna et al., 2011; Judd, Jackson, Fraser et al., 2006; Judd, Jackson, Komiti et al., 2006) and an increasingly conventional, industrial style of farming, based on neoliberal principles, where farmers' successes and failures are judged on skills related to economic decisions and abilities in managing a farm in a globalized, capitalistic market (Ramirez-Ferrero, 2005), rather than "agrarian" skills and practices (Bryant, 1999, p. 244). Distress related to climate and the economy can thus impact farming masculinities associated with being stoic, physically strong, and the household provider, resulting in increased suicidality, largely because farmers typically do not seek out mental healthcare services (Alston, 2012; King et al., 2009). In fact, in a qualitative study of South Australian male and female citrus farmers and their mental health, Staniford et al. (2009) found the following barriers to seeking help for mental distress: being self-reliant, being worried about one's image in society, having a difficult time identifying the issue and not knowing what resources are available, perceiving that doctors will not understand or be able to resolve his/her issues, being worried about losing anonymity, and living in remote, isolated areas.

Farmers considering death by suicide is not a novel concept, as seen above in the research of Australian farmers. A current report from Stone et al. (2018) found that overall, U.S. suicide rates have

increased significantly since 1999, with all states indicating increases (except Nevada), 44 of them in significant fashion, and white, non-Hispanics (83.6%), males (76.8%), and 45-64 year-olds (37.7%) making up the majority of suicide deaths, utilizing firearms (48.5%), asphyxiation due to hanging, strangulation, or suffocation (28.9%), and poisoning (14.7%) as the most common methods. Additionally, previous to all the suicide deaths reported in Stone et al.'s (2018) study, 37.5% had depressive moods, 35.8% had been treated at some point for disorders related to mental health and/or substance abuse issues, 42.4% had experienced a relationship loss/other issue, 48.9% had been dealing with some form of stress (e.g., physical health issues, financial hardships, school problems [for those ages 10-18 years of age], legal and criminality issues, home eviction, institutional release, etc.), 58% had left a suicide note (34.5%) or disclosed their intention to die by suicide (23.5%), 31.9% had a history of suicidal ideation, and 19.9% had a history of suicidal attempts. When stratified into levels of urbanization, those living in non-MSA rural U.S. counties have had higher suicide rates (per 100,000 population of those 10 years of age and older) than those living in both medium/small-MSA and large-MSA counties every year from 2001-2015 (Ivey-Stephenson et al., 2017). Overall, males have had much higher suicide rates across all three urbanization levels compared to women, and males living in non-MSA rural counties have the highest suicide rates among both sexes and all urbanization levels. Non-Hispanic white and non-Hispanic American Indian/Alaska Native individuals living in non-MSA rural counties have the highest suicide rates among all racial/ethnic groups for all three urbanization levels, and those living in non-MSA rural counties ranging in age from 35-64 years have the highest suicide rates compared to all other age groups (Ivey-Stephenson et al., 2017). And as far as methods used for committing suicide, those living in non-MSA rural counties used firearms and hanging/suffocation at the highest rates compared to all other urbanization levels (Ivey-Stephenson et al., 2017).

Occupationally, from 2003-2010, U.S. farmers, fishermen, and forestry workers had the second highest suicide rate of all occupations, at 5.1 suicides per 1,000,000 workers, just behind workers in

protective services (5.3 per one million workers), such as firefighters, police officers, those doing detective and private investigation work, etc. When broken down into specific occupations, farm managers and ranchers had the highest suicide rate of all jobs, at 10.0 suicides per one million workers. As far as gender and age, men and individuals 65 to 74 years had the highest suicide rates, at 2.7 and 2.4 per one million workers, respectively. The most common methods of suicide in farmers involved guns and measures such as asphyxia due to hanging (Tiesman et al., 2015). When examining suicide rates of farmers compared with all other occupations over a longer period, from 1992-2010, Ringgenberg et al. (2017) found farmers to have the highest suicide rates for every single year. Of the 230 deaths from suicide during this 19-year span, most cases were white, male, farmers/owners, over the age of 35, employing less than 10 individuals, and living in Western or Midwestern regions of the U.S.

Risk factors for suicide in farmers in the U.S. and around the world are vast and may include the following: having depressive symptoms, ongoing physical pain and discomfort, economic issues, being a widower, stress (Browning et al., 2008; Ringgenberg et al., 2017), being in debt, addictive behaviors, climate issues, low crop market values, family duties, being governmentally apathetic, having poor irrigation methods, farm chemicals, perceptions of crop failure, higher costs to cultivate, private moneylenders (Dongre & Deshmukh, 2012), being less open-minded, showing a reluctance to seek out help, “maleness” (Judd, Jackson, Fraser et al., 2006, p. 7), having low levels of social support, few close friends, working in solitude (Stark et al., 2006), acute pesticide-related illnesses (Stallones & Beseler, 2002), not taking the time off of work to get help (Routley & Ozanne-Smith, 2012), and having more convenient access to fatal means, such as firearms (Andersen et al., 2010; Browning et al., 2008; Hawton et al., 1998; Routley & Ozanne-Smith, 2012; Skegg et al., 2010). And although understanding suicide risk factors from farmers’ points of view is critical, data can be enhanced and enriched if farmers’ friends, coworkers, peers, family members, etc. are included in the research processes (Ringgenberg et al., 2017).

Physical illness and injury.

Along with farmers' extreme propensity for mental health issues, these individuals also experience very high incidences of job-related physical illnesses and injuries. In fact, 6.1 per 100 fully-employed workers in the agricultural, fishing, forestry, and hunting sectors experienced a job-related illness or injury in the U.S. in 2016, and 43.3 per 10,000 fully-employed workers experienced illnesses alone, which were the highest incidence rates of all private sector industries (USDOL, USBL, OSHA/Office of Safety and Health, 2017). Of the roughly 58,300 illnesses and injuries experienced by those in agriculture, fishing, forestry, and hunting, 93% were injury-related and 7% were due to illness. Among all occupational industries (private and public), some of the most common events leading to illness and injury were physically overexerting the body, tripping/falling/slipping, encounters with equipment or other objects, violent and injurious acts by other people or animals, and transportation-related incidents. Such events led to physical illnesses and injuries such as strains, sprains, and tears, pain and soreness, lacerated, punctured, or cut skin, bruised body parts, and broken bones (USDOL, USBL, OSHA/Office of Safety and Health, 2017).

Respiratory problems.

A variety of recent studies have examined many of the illnesses most common in farmers that were discussed in the NCASH (1989) report and Rautiainen and Reynolds' (2002) work. Of these conditions, respiratory problems have been reported as the second most commonly experienced issues among U.S. farmers (Alterman et al., 2008). Hoppin and colleagues' (2014) comparison of 2005-2010 respiratory outcomes among 43,548 Agricultural Health Study participants (almost entirely farmers [54.5%] and their female spouses [45.5%]) and 17,132 NHANES participants concluded that farmers had higher respiratory symptom prevalence rates but lower respiratory disease and smoking incidence and prevalence rates than the general U.S. population; however, when only non-smokers were analyzed, a higher proportion of farmers reported respiratory disease than the general U.S. population. Additionally, male farmers were more likely than males in the general U.S. population to report being in *very good*

and *excellent* health (Hoppin et al., 2014). Nordgren and Bailey (2016) reiterated that crop and animal production exposures, such as fumes, vapors, and dusts from animal confinements, barns, and grain, as well as pesticide inhalation, can lead to a variety of pulmonary symptoms (e.g., wheeze, phlegm, cough, and shortness of breath; Hoppin et al., 2014) and diseases (e.g., asthma, interstitial pulmonary disease, hypersensitivity pneumonitis, COPD, and lung cancer; Nordgren & Bailey, 2016). However, despite the potentially hazardous respiratory exposures and irritants farmers face, they are not necessarily keen on increasing the practice of utilizing protective respiratory measures, nor do they fully trust (in fact, they even may fear and doubt) the researchers working to enhance and improve farming safety measures. In fact, when U.S. Southern chicken farmers were asked about the idea of federally-funded academic research occurring on their farms, one farmer stated, “ ‘There is such a bad feeling between producers and liberal academia [*sic*] that we feel like they don’t understand us and never will [*sic*] and they are out to hurt us’ ” (Janssen & Nonnenmann, 2017, p. 125). According to 2011 data from the Farm Safety Survey, most farmers (over 62%) do not use respirators when performing farming activities involving pesticides, dust, and other inhalants (USDHHS, CDC, NIOSH, DSR, 2014).

Skin problems.

Skin disorders and diseases are another commonly experienced issue among farmers. Skin problems such as dermatitis (the most common occupational skin disorder), infection, injury, and cancer can occur via the following pathways: chemical (e.g., fertilizers and pesticides), physical (e.g., solar/ultraviolet radiation and dangerously hot/cold temperatures), mechanical (e.g., contusions, lacerations, and scrapes), and biological (e.g., animal, plant, parasitic, and microbes; USDHHS, CDC, NIOSH, Health Effects Laboratory Division, 2012). In McCall et al.’s (2005) study of 611 workers’ compensation claims of dermatitis for Oregon workers from 1990-1997, the farming, forestry, and fishing occupations had the highest claim rate per 100,000 workers for major occupations at 18.24, which was more than three times the average major occupational claim rate of 5.73. Despite having the

highest dermatitis-related claim rate for all major occupations, those in the farming, fishing, and forestry occupation had the lowest average total claim cost among all major occupations, with the average total claim cost for all major occupations nearly 8.4 times higher than that of the farming, fishing, and forestry occupations (\$3,552.00 versus \$424.86). Additionally, farmers, fishermen, and forestry workers took the third fewest days off from work for dermatitis-related claims compared to all other major occupations, with the overall claim rate being nearly 4.8 times higher than that of farmers, fishermen, and forestry workers (23.9 days versus five days; McCall et al., 2005). In their study of Iowan male farmers, Park, Sprince, Whitten, Burmeister, and Zwerling (2001) found that one significant factor in dermatitis cases is having a history of allergies and sensitivities to dust, pets and animals, molds, grasses, and pollen, with the majority of cases occurring on the hands, as well as the face, neck, and head, whereas the majority of U.S. farmers reported the feet, legs, and trunk as the most common sites of dermatitis. A survey of 1,493 Midwestern farmers among six U.S. states found that the use of PPE in general is very rare, and specifically, the use of heavy gloves when handling farm animals, grain, hay, and fodder is very low. The strongest influences for farmers to use PPE during farm-related activities were their own personal desires to avoid exposures and injuries and whether they had any current health issues (Carpenter et al., 2002). Carley and Stratman's (2015) comparison of Midwestern farmers and non-farmers found that farmers were more likely to believe they would get skin cancer ($p = .0107$), that their job placed them at a higher risk ($p < .001$), and farmers also demonstrated less knowledge in regards to cloudy days and harmful sun exposure ($p < .001$) and used sunscreen less often ($p = .0054$). Additionally, 63% of farmers reported "forgetfulness" as the greatest barrier to sunscreen utilization and were more likely than non-farmers to report wide-brimmed hats as a work hindrance ($p < .001$). Also, more farmers with a previous skin cancer diagnosis reported attending regular screenings for skin cancer compared to farmers without a previous history of skin cancer ($p < .001$). Finally, farmers without a previous skin cancer diagnosis were more likely to be referred to a specialist than their non-farmer

counterparts ($p = .0127$), and more farmers overall were given referrals for skin cancer specialists than non-farmers ($p = .0023$). Concerning the use of sunscreen, wide-brimmed hats, other special caps protecting the face, head, and neck, shirts with long sleeves, sunglasses, and gloves, Carpenter and colleagues' (2002) stated that "many [Midwestern farmers] rarely or never used any . . . protective measures to sun exposure" (p. 240). When comparing male and female farmers in California and their sunscreen use, Susitaival et al. (2004) found that significantly fewer male farmers (11%) utilized sunscreen than female farmers (42%), despite male farmers spending considerably more time outside performing farm tasks.

Musculoskeletal problems.

According to Alterman and colleagues' (2008) analysis of the 2000 Farm Operator Occupational Health Survey, musculoskeletal disorders were the most often reported health issues of U.S. farmers ($N = 5,697$), with 56.4% of farmers reporting any musculoskeletal issues. The lower back (36.5%), hands (29.5%), and knees (25.5%) were the most commonly affected bodily regions affected among all farmers (Alterman et al., 2008). Among a sample of U.S. Midwestern farmers ($N = 518$) participating in a study through the University of Iowa's Great Plains Center for Agricultural Health, Fethke et al. (2015) found that lower back problems were also the most common musculoskeletal issues (33.2%), as well as pain in the neck/shoulders (30.8%) and hand/wrist/elbow (21.6%). Significant adjusted associations were seen between lower back pain and average weekly hours performing equipment maintenance and repairs ($OR = 1.02$, 95% CI [1.00, 1.05]), neck and shoulder pain and hours milking animals ($OR = 1.05$ [1.00, 1.09]), maneuvering animals ($OR = 1.14$ [1.00, 1.30]), and completing paperwork/office work ($OR = 1.02$ [1.00, 1.08]), and pain in the hands/wrists/elbows and hours milking animals ($OR = 1.04$ [1.00, 1.09]) and manually maneuvering bags and containers ($OR = 1.10$ [1.03, 1.18]; Fethke et al., 2015). Carrying and lifting heavy loads, performing movements with repetition, and vibrations emitted to the body can also lead to the musculoskeletal symptoms and disorders noted above (Alterman et al., 2008). Osborne et

al.'s (2012) systematic review of musculoskeletal symptom risk factors among all types of farmers found that farmers were at a significantly higher risk for spine/lower back issues and upper extremity problems. Tonelli et al. (2015) found that U.S. Midwestern farmers ($N = 438$) were most likely to seek out help for musculoskeletal conditions when diagnosed with arthritis ($OR = 1.742 [1.024, 2.963]$), when others were available to assist with farm work operations ($OR = 2.162 [1.254, 3.727]$), and when upper back ($OR = 2.036 [1.204, 3.443]$) or hip pain ($OR = 2.959 [1.751, 5.001]$) were present.

Hearing problems.

Alterman and colleagues (2008) found that noise-induced hearing loss was the third most common health issue experienced by farmers, with more than a third of farmers experiencing any type of hearing loss. White farmers demonstrated the highest hearing loss prevalence, which was most likely due to using loud farm machinery and could also have been a result of exposure to power tool noise and working with animals. Carpenter et al. (2002) found that more than 60% of farmers had to scream in their work environments so they could be heard by others, yet hearing protection such as ear plugs and earmuffs and assistive devices (e.g., hearing aids) were scarcely used. The 2011 Farm Safety Survey of an estimated 2.81 million farmers found that more than one in three farmers (34.6%) worked around loud noises on a daily and/or weekly basis, yet more than 37% used protective hearing devices rarely or never (USDHHS, CDC, NIOSH, DSR, 2014). In a recent study of Midwestern farmers with large crop and/or animal production operations ($N = 280$), more than 56% reported mild to severe hearing loss, nearly 56% of those with mild to severe hearing loss did not have hearing aids, 12.6% had sought healthcare in the previous year for hearing issues, and 46.5% wore ear plugs or ear muffs when exposed to loud noises (Cramer, Wendl, Sayles, Duysen, & Achutan, 2017). Despite farmers' general understanding about the dangers of loud noise exposure and awareness of hearing PPE (i.e., ear plugs and ear muffs) as being effective hearing protection methods, the majority of farmers did not use hearing PPE due to forgetfulness, not liking these methods, lack of comfort, unavailability, location

inconvenience, and the fact that hearing PPE may only be necessary for brief amounts of time. Additionally, most of these farmers did not know that hearing PPE requires one to be properly fitted, that farm machinery is not the only source for loud noise on a farm, that animals also pose a significant hearing health threat, and oto-toxicants like antibiotics and pesticide and solvent exposures can increase the risk for loss of hearing (Cramer et al., 2017). Finally, the most common advice from these farmers for hearing protection was to “ ‘just use common sense [and] think before acting’ ” (Cramer et al., 2017, p. 355), while focusing educational interventions on younger populations, because “ ‘older farmers are already set in their ways’ ” (Cramer, 2017, p. 355).

Pesticide and chemical exposure problems.

Pesticide and chemical exposure are another significant threat (both short- and long-term) to farmers and their health, which can occur via dermal absorption (most common), lung inhalation, mouth ingestion, and through the eyes (Damalas & Koutroubas, 2016; Lorenz, 2009; USDL, OSHA, n.d.). Chronic pesticide exposure can lead to fetal development issues (e.g., birth defects and toxicity to the fetus), cancerous and noncancerous neoplasms, genetic mutations, and disorders affecting the blood and reproductive, nervous, and endocrine systems (Lorenz, 2009). Acute pesticide exposure can cause a variety of quick-onset symptoms, ranging from central nervous system disruption due to insecticide toxicity (most common acute pesticide-related illness), to symptoms related to herbicide ingestion (e.g., burning in the stomach, diarrhea, and muscle twitching) or fungicide exposure to the eyes or skin (Lorenz, 2009). The Farm Safety Survey from 2011 found that in the preceding year, nearly 39% of farmers had used pesticides (USDHHS, CDC, NIOSH, DSR, 2014), and according to all major U.S. occupations, those working in farming, fishing, and forestry made up 75.4% of acute pesticide-related illnesses in 2011, totaling 147 illness cases (USDHHS, CDC, NIOSH, SENSOR, n.d.). Calvert and colleagues’ (2016) comparison of U.S. agricultural versus non-agricultural occupations found the incidence rates of acute illnesses related to pesticides more than 37 times higher for those working in agriculture (18.6 per

100,000 full-time workers versus 0.5 per 100,000 full-time workers in non-agricultural occupations), which due to a variety of data surveillance complications, is most likely an underestimation of the actual incidence rates. Carpenter et al. (2002) reported that 53% of Midwestern farmers engaged in pesticide and chemical mixing and application, with around 22% of all farmers suspecting or definitely having skin sensitivities to pesticides and chemicals. As far as PPE used for pesticide and chemical exposures, despite the “fairly regular” use of protective gloves, very few farmers had decontamination stations and “rarely” used masks, aprons, coveralls, and special footwear protection (Carpenter et al., 2002).

Analyzing a sample of Agricultural Health Study pesticide applicators ($N = 25,166$), DellaValle, Hoppin, Hines, Andreotti, and Alavanja (2012) posited that farmers’ usage of PPE (i.e., chemically-resistant gloves, boots, coveralls, facial guards/shields, and respirators) when mixing, loading, and applying pesticides may be influenced by levels of risk-acceptance and/or risk-aversion personality characteristics. Around 20.6% of participants were classified as “risk-acceptors” based on responses to several questions assessing pesticide use and farming safety practices. Despite most risk-accepting participants believing that farming is a very dangerous job (93.7%) where accidents are going to occur and must be accepted (91.2%), almost 61% agreed with the following statement: “During a normal work week it’s common for me, while doing farm work, to experience a number of ‘close calls’ that under different circumstances might have resulted in personal injury or property loss” (DellaValle et al., 2012, p. 276). And nearly 87% of risk-acceptors agreed that “To make a profit, most farmers take risks that might endanger their health” (DellaValle et al., 2012, p. 276). Overall, risk acceptors were less likely than risk-aversers to be “never smokers,” and risk-accepting private and commercial pesticide applicators tended to express less use of PPE during pesticide-mixing, -loading, and -application, compared to risk-averting private and commercial pesticide applicators; however, risk-accepting private pesticide applicators tended to practice the least safe pesticide application practices of all groups in the study. Interestingly, risk-accepting and risk-averting pesticide-applying spouses (nearly all female) did not show

significant differences in PPE use while working with pesticides (DellaValle et al., 2012). Some potential reasons for risk-accepting private pesticide applicators' less use of PPE than commercial and spouse applicators could be feeling less pressure to conform to workplace safety guidelines (than commercial applicators), having less access to PPE knowledge and physical resources, perceiving pesticides as not hazardous, and having greater economic concerns and/or stress (DellaValle et al., 2012).

The most extensive and comprehensive study of U.S. farmers' health, farming practices, and lifestyle behaviors is the Agricultural Health Study, a longitudinal cohort investigation of 89,655 commercial and private pesticide applicators (4,916 and 52,394, respectively) and private applicators' spouses (32,345) from Iowa and North Carolina dating back to 1993. The private pesticide applicators are mainly white (97%), male (97%), farmers, with 59% not having more than a high school education and 99% involved in mixing and/or applying pesticides (Agricultural Health Study, n.d.). Some of the major overall research findings to date are the following: Morbidity rates for numerous diseases are lower for farmers compared to the general U.S. population, possibly due to their lower smoking and physical inactivity rates; cancer incidence in farmers seems to be higher for some forms of cancer (e.g., prostate) than the general U.S. population; pesticide exposure events can be drastically reduced (50 to 80%) with the proper gloves; Parkinson's disease is associated with paraquat and rotenone; insecticides containing organophosphates is linked with allergic asthma in both farmers and their spouses; high pesticide exposures can harm long-term health; and chemicals with organochlorine can increase the risk of thyroid disease and diabetes (Agricultural Health Study, n.d.).

A comprehensive literature review of peer-reviewed Agricultural Health Study research found significant and directly proportional dose-response associations and increased RRs/ORs for 12 U.S.-registered pesticides and a variety of cancer types for pesticide-exposed applicators versus those not exposed in the Agricultural Health Study (Weichenthal, Moase, & Chan, 2010). Of these 12 pesticides, seven were herbicides (i.e., alachlor, dicamba, S-ethyl-N,N-dipropylthiocarbamate [EPTC], imazethapyr,

metolachlor, pendimethalin, and trifluralin) and five were insecticides (i.e., aldicarb, carbaryl, chlorpyrifos, diazinon, and permethrin; Weichenthal et al., 2010). Cancer incidence rates for all cancers were significantly increased for farmers with the highest exposures to diazinon (Beane Freeman et al., 2005) and EPTC (van Bommel et al., 2008); five pesticides were linked with colon cancer (i.e., aldicarb, dicamba, EPTC, imazethapyr, and trifluralin; Kang et al., 2008; Koutros, Lynch et al., 2009; Lee et al., 2007a; Samanic et al., 2006; van Bommel et al., 2008), five with lung cancer (i.e., chlorpyrifos, diazinon, dicamba, metolachlor, and pendimethalin; Alavanja, Dosemeci et al., 2004; Lee et al., 2004a), two with all types of lymphohemopoietic cancers (i.e., alachlor and diazinon; Beane Freeman et al., 2005; Lee et al., 2004b), two with rectal cancer (i.e., chlorpyrifos and pendimethalin; Hou et al., 2006; Lee et al., 2007b), two with leukemia (i.e., diazinon and EPTC; Beane Freeman et al., 2005; van Bommel et al., 2008), two with pancreatic cancer (i.e., EPTC and pendimethalin; Andreotti, Freeman et al., 2009), and one pesticide was linked with melanoma (i.e., carbaryl; Mahajan, Blair, Coble et al., 2007), bladder cancer (i.e., imazethapyr; Koutros, Lynch et al., 2009), and multiple myeloma (i.e., permethrin; Rusiecki et al., 2006, 2009). A more recent Agricultural Health Study investigation compared all prostate cancer cases from 1993 to 2007 of pesticide-exposed and non-exposed participants, finding the following insecticides as significantly and directly associated with aggressive prostate cancer in exposed participants: malathion, fonofos, and terbufos (all organophosphates), and aldrin (an organochlorine). Additionally, total prostate cancer risk was substantially increased for those with a prostate cancer family history and increased exposure to aldrin and fonofos (Koutros, Beane Freeman, Lubin et al., 2013). Prostate cancer in farmers will be further explored in section f of this chapter. Since Weichenthal et al.'s (2010) review, several other Agricultural Health Study studies have found potential links between pesticides and cancer in male farmers, namely, atrazine and thyroid cancer (Beane Freeman et al., 2011), acetochlor and lung, colorectal, and pancreatic cancer, and melanoma (Lerro, Koutros, Andreotti, Hines et al., 2015), metolachlor and liver cancer and follicular cell lymphoma (Silver et al., 2015),

imazaquin, imazethapyr, and a variety of chlorinated pesticides and bladder cancer (Koutros, Silverman et al., 2016), parathion, pendimethalin, dieldrin, and chlorimuron ethyl and lung cancer (Bonner, Beane Freeman et al., 2017), alachlor and laryngeal cancer and myeloid leukemia (Lerro, Andreotti et al., 2018), and glyphosate and acute myeloid leukemia (Andreotti, Koutros, Hofmann et al., 2018).

Livestock-associated zoonotic diseases.

Other potential illnesses in U.S. farmers are LA zoonotic diseases (Klous et al., 2016), which are caused by bacteria, fungi, parasites, viruses, and prions, and transmitted via aerosols, fomites (i.e., inanimate objects), vectors (e.g., ticks, mosquitoes, and fleas), direct contact, and oral ingestion (Langley & Morgan Morrow, 2010; NASPHV, VICC, 2016). Some of the zoonotic diseases transmitted to humans by U.S. livestock (i.e., swine, poultry, goats, sheep, and cattle) are: anthrax, brucellosis (undulant fever, Bangs disease), campylobacteriosis, contagious ecthyma, coxiellosis (Q fever), cryptosporidiosis (crypto), dermatopytosis tinea (ringworm), enterohemorrhagic Escherichia coli, erysipeloid, influenza A, leptospirosis (Weil's disease), listeriosis (silage disease, circling disease), methicillin-resistant Staphylococcus aureus, avian psittacosis, rabies, salmonellosis, toxoplasmosis (toxoplasma), tuberculosis (bovine TB), vesicular stomatitis, and yersinosis (LeJeune & Kersting, 2010; USDHHS, CDC, NCEZID, 2015). In order to prevent the transmission of LA zoonotic diseases, those caring for farm animals are urged to practice standard precautionary behaviors and utilize the appropriate PPE when necessary. Routine and proper handwashing, using gloves, goggles, face shields, surgical masks, respirators, and wearing protective clothing (e.g., laboratory coats, nonsterile gowns, coveralls, aprons, smocks, and head covers), and footwear are some very helpful ways to prevent LA zoonotic disease transmission when working with and caring for livestock (NASPHV, VICC, 2016).

Fatalities.

Upon consideration of occupational fatalities in the U.S., self-employed full-time workers had a fatal work injury rate more than 3.6 times that of the all-worker fatal injury rate in 2016 (13.1 per 100,000 fully employed workers versus 3.6 per 100,000 fully employed workers). The agriculture,

forestry, fishing, and hunting sector had the highest fatal work injury rate per 100,000 fully employed workers in 2016 at 23.2. Furthermore, of the 5,190 total work injuries ending in fatality in 2016 in the U.S., 260 of those deaths (5%) were farmers, ranchers, and other managers of agriculture, which was the second highest proportion behind those working in the trucking and sales/driving sector (nearly 17.7%). Compared to the all-worker fatal work injury rate (provided above), the rate for farmers, ranchers, and agricultural managers was over 6.4 times higher, at 23.1 per 100,000 fully employed workers. Of the 260 total deaths due to job-related injuries of farmers, ranchers, and agricultural managers, 252 were white individuals, 250 were men, 53.5% were 65 years of age or older, and 80.4% of all deaths occurred on farm property (USDL, USBLS, OCWC/Office of Safety and Health, n.d.). Around 44.6% of fatalities (116) were due to transportation-related incidents, whereas about 40% of all fatal work injuries (2,083) in 2016 were due to transportation incidents (USDL, USBLS, Census of Fatal Occupational Injuries [CFOI], 2017). Of the 116 farmer, rancher, and agricultural manager deaths due to transportation incidents, 102 deaths (nearly 88%) occurred with tractor and PTO system injuries as primary causes (USDL, USBLS, OCWC/Office of Safety and Health, n.d.). Specifically, tractor overturns have been and continue to be the deadliest form of farm-related injury in the U.S. (Myers & Hendricks, 2010; Tinc et al., 2016; Tinc et al., 2015; USDHHS, CDC, NIOSH Science Blog, Division of Safety Research, 2009), despite the federal mandate for farmers to provide roll-over protective structures (ROPS) for all employee-operated tractors (of more than 20 horsepower) built after October 25, 1976 (Roll-Over Protective Structures, 1975) and retrofitting ROPS for all older model tractors (NCASH, 1989). The remaining proportion of major fatal job-related injuries of farmers, ranchers, and agricultural managers in the U.S. in 2016 were due to the following: contact with equipment and other objects (27.7%), violent acts by animals or other people (11.9%), trips, falls, and slips (8.5%), exposure to harmful environments or substances (4.2%), and explosions and fires (2.3%; USDL, USBLS, OCWC/Office of Safety and Health, n.d.).

Farmers' Healthcare-Related Help-Seeking and Utilization Beliefs and Behaviors

In general, lower proportions of men (among all major demographic categories) seek and utilize physical and mental healthcare than their female counterparts (Addis & Mahalik, 2003), despite men suffering far greater morbidity and mortality than women in the U.S. and around the world (CIA, 2017; KFF, 2016; Murphy, Kochanek, Xu, & Arias, 2015; Murphy, Kochanek, Xu, & Heron, 2015; UN, 2015; UNDP, HDRO, 2016; WHO, 2015e, 2016a). Why men may or may not seek help in certain healthcare-related contexts is largely dependent upon gender role and norm socialization and masculinity construction, practices, and attitudes, and perhaps not as much on healthcare and health insurance accessibility and affordability, income levels, and health status (Addis & Mahalik, 2003; Courtenay, 2006/2011). For example, suppose a middle-aged farmer suddenly notices blood in his urine. If he were to perceive this health issue as atypical, self-reliance as essential to his identity, and autonomy when making decisions as fundamental in his life, he would be very unlikely to seek out healthcare-related help for his issue. Additionally, help-seeking may also be very low if the farmer's opportunity to help others with similar conditions were not possible (e.g., none of his farming peers had experienced the issue) or if these same peers were proponents of practices such as "toughing things out" when one is sick or injured. Addis and Mahalik (2003) posited the following:

A man is least likely to seek help for problems that he sees as unusual, especially when he also perceives them as central to his identity. He is also unlikely to seek help if groups of men who are important to him endorse norms of self-reliance or other norms that suggest his problem is non-normative. Finally, help seeking is less likely to the degree that a man calculates that rejection from an important social group, as well as his view of himself as deviant, are costs too great to risk in relation to the help he might receive. This is especially true if he feels he will sacrifice his autonomy by seeking help. (p. 11)

In addition to gender, occupation and urbanization classification are also very important determinants of healthcare-related help-seeking and utilization behaviors and beliefs in men (Courtenay

2006/2011; Galdas et al., 2005). In a scoping review of rurality and men's health, Courtenay (2006/2011) found rural male farmers as practicing the most traditional and hegemonic masculinity forms and seeking and utilizing help for health care-related issues less often than other rural and non-rural men and women. The following information provides a review of research focused on rural male farmers' healthcare-related help-seeking and utilization behaviors and beliefs.

Health access.

According to *HP2020*, the two Leading Health Indicator objectives for increasing accessibility to health care are increasing the proportion of those less than 65 years of age with health insurance and increasing the proportion of all those living in the U.S. with a usual provider of primary health care (USDHHS, ODPHP, 2010, 2018), two measures which vastly improve overall health in the U.S. (USDHHS, ODPHP, 2018a). Furthermore, over 36% of the rural health stakeholders taking part in the *RHP2020* national survey (e.g., those working in rural health care administration, medicine, education, and research) cited "access to quality health services . . . as the *single* most important rural health priority for the decade" (Bolin et al., 2015, p. 330). As of 2014, a significantly higher prevalence of farmers, fisherman, and forestry workers (34.6%) in 17 U.S. states did not carry health insurance compared to the average of all other occupational groups (12.7%), and not surprisingly, self-employed workers had twice the uninsured rate (22.4%) compared to those employed for wages (11.2%), and more men were uninsured (15.5%) than women (9.5%). Other factors such as age, race/ethnicity, educational level, annual household income, marital status, and state Medicaid expansion also showed critical differences in uninsured rates, with the lowest uninsured rates being among 55-64 year-olds (6.8%), non-Hispanic whites (8.6%), college-graduates (3.4%), households making \$75,000 per year or more (3.0%), married individuals (6.8%), and those residing in states with Medicaid expansion programs (11.8%). Additionally, those living in rural counties had slightly lower uninsured rates (15.0%) than their urban counterparts (15.9%; Boal et al., 2018). Of the 2,031,660 family farms in the U.S. as of 2015, the Agricultural Resource

Management Survey (ARMS) of U.S. farmers' households estimated 72.7% of farmers to be 55 years-old and above, 86.5% to be non-Hispanic whites, 29% to be college graduates, average and median household incomes to be \$120,742 and \$76,740, respectively, and 78.9% as having a spouse, data which places farmers in nearly all favorable categories (with the exception of education level) for having health insurance (USDA, Economic Research Service [ERS], NASS, ARMS, 2016). According to 2015 U.S. data, 9.1% of all individuals reported not having health insurance coverage, which is equivalent to around 29 million people (Barnett & Vornovitsky, 2016), and 10.7% of farm family members reported no health insurance (USDA, ERS, NASS, ARMS, 2016). Nearly equivalent proportions of private, employer-sponsored health insurance made up most plans for both farm families (55.6%) and the general U.S. population (55.7%); however, a higher proportion of the general U.S. population carried public (government-provided) insurance (37.1%) than farm household members (28.2%). Direct-purchase private plans were carried at slightly higher rates among farm household members (17.6%) compared to the general U.S. population (16.3%; Barnett & Vornovitsky, 2016; USDA, ERS, NASS, ARMS, 2016). For U.S. households with a total income of \$100,000 or more, only 4.5% of individuals reported being uninsured (Barnett & Vornovitsky, 2016); however, despite farmer households having an average total income of \$120,742, uninsured rates remained at 10.7% (USDA, ERS, NASS, ARMS, 2016), which was also higher than the 9.6% of uninsured rural U.S. residents (Barnett & Vornovitsky, 2016; USDA, ERS, NASS, ARMS, 2016). When comparing 2015 annual per capita health expenditures, farmer household members had average health insurance premiums of \$3,066 and out-of-pocket costs of \$1,953 (USDA, ERS, NASS, ARMS, 2016), while the general U.S. population had average premiums of \$6,251 (Claxton et al., 2015) and out-of-pocket costs of \$1,059 (Kamal & Cox, 2017).

According to 2014 data from *HP2020*, a total of 76.4% of those living in the U.S. (all ages) had a usual provider of primary care, with 60.2% of 18-44-year-olds and 78.8% of 45-64-year-olds having a usual provider of primary care. Further stratified, the proportion of those with a usual provider of

primary care was highest among non-Hispanic whites (79.9%), women (79.3%), those with some college (75.5%), families with incomes at least 600% above the poverty level threshold (82.2%), children under the age of 5 years (93.4%), 75-84 year-olds (91.8%), those born in the U.S. (78.6%), and those with publically-funded health insurance policies (80.3%; USDHHS, ODPHP, 2018).

Furthermore, results from the 2014 and 2015 Medical Expenditure Panel Survey Household Component reported that for those under 65 years of age, 81% of rural individuals had a usual source of primary care, compared to 75% of urban individuals, which was a significant difference ($p < .05$). However, there was no significant difference in having a usual source of primary care for rural and urban residents ages 65 years and over (90% and 89%, respectively; Kirby & Muhuri, 2018). Of those under the age of 65 years, 11.5% of rural individuals and 10.3% of urban individuals reported not having any form of health insurance (Kirby & Muhuri, 2018), numbers which differ from those reported by Boal et al. (2018) above. Of the 88.5% of rural residents with some type of health insurance, 61.8% carried private plans and 26.7% carried public-only plans, whereas, of the 89.7% of urban individuals with health coverage, 69.1% had private plans and 20.6% of plans were public-only, rural and urban differences which proved to be statistically significant ($p < .05$; Kirby & Muhuri, 2018).

Despite a significantly higher proportion of rural individuals less than 65 years of age reporting having a usual source of primary healthcare than their urban counterparts (Kirby & Muhuri, 2018), nearly two-thirds of Primary Care *and* Dental Health Professional Shortage Areas (HPSAs) in the U.S. are considered rural or partly rural, with almost 62% of Mental Health HPSAs considered rural or partly rural areas (USDHHS, HRSA, Bureau of Health Workforce, 2018). In fact, as one's urbanization classification increases in the U.S. there is a statistically significant increase ($p < .05$) in the quantity of primary care physicians available, with an average availability of 39.8 primary care physicians per 100,000 population in rural areas compared to 53.3 per 100,000 population in the largest and most urban areas. Additionally, this effect, in turn, results in significantly higher ($p < .05$) proportions of rural primary care

physicians (65.5%) working alongside nurse practitioners and physician assistants than urban primary care physicians (41.9%; Hing & Hsiao, 2014).

In the only study to date (to the authors' knowledge) comparing having a usual source of primary care among farm and nonfarm rural populations in the U.S., Earle-Richardson et al. (2015) found farmers in rural regions of New York to be significantly less likely to have a usual source of primary care ($OR = 0.53 [0.39, 0.71]$), which turned out to be the most striking difference between the two rural populations among all the variables examined in the study. Because long-term health issues may signify stronger rationale for having a usual source of primary care, Earle-Richardson et al. (2015) also examined the rural farm and rural nonfarm individuals reporting no chronic health issues, finding that male farmers made up the smallest proportion of those reporting having a usual source of primary care (25.2%), compared to 28.6% of female farmers, 32.8% of male nonfarmers, and 36.7% of female nonfarmers.

Why male farmers seek help less often than virtually everyone else for health-related matters.

There is a paucity of empirical research, *especially in the U.S.* [emphasis added], explaining why male farmers tend to not seek help for health issues. Therefore, this portion of the text will explore male farmer help seeking, utilizing studies from several different countries.

As noted above, healthcare accessibility in U.S. rural areas is this decade's most crucial health agenda item, according to *RHP2020* (Bolin et al., 2015). However, despite the importance of having quality health insurance and a usual source of primary health care, there are perhaps stronger factors playing a role in male farmers seeking help. In a recent study of 32 Canadian male farmers (ranging in age from 27 to 63 years-old) and their help-seeking attitudes, perceptions, and practices in relation to personal stress and mental health issues, the *acceptability* [emphases added] of seeking formal healthcare services, rather than the level of accessibility of those services, emerged as a stronger determinant to seeking help. With more than 50% of the farmers not having had a formal encounter

with a mental health professional, pride was identified as the primary hindrance to help seeking, along with having less knowledge of the available services, in comparison to the other farmers in the study who had sought help for mental health issues, who tended to be younger (Roy et al., 2014).

In a similar and more recent study of mostly male dairy farmers and their female spouses and partners ($N = 30$) living in central New York State, the healthcare utilization decision-making process of male farmers was further explored and explained. One of the primary barriers to seeking help for health issues was the universal *farming identity* endorsement, characterized by being a hardworking, self-reliant, and resilient individual, traits perceived by farmers to be in direct contrast to help-seeking for health issues. Additionally, the money and time necessary for seeking and obtaining healthcare services were perceived as significant barriers to healthcare use, especially since farmers view these resources as vital to the preservation of the farm. Despite these strong barriers to help-seeking, farmers tended to seek care when their health issues were perceived as threats to the farm's survival. Symptoms viewed as unbearable, being prompted by others, and perceiving care-seeking as a resolution to health issues were the major driving forces in farmers' decisions to seek care (Drouillard et al., 2017).

A study utilizing a modified version of the Barriers to Help-Seeking Scale surveyed South Australian male and female farmers ($n = 45$) and nonfarmers ($n = 78$) about barriers to seeking support for mental health issues (Hull et al., 2017). Farmers were significantly more likely to report higher levels of agreement to statements in the "Need for Control and Self-Reliance" domain ($p < .001$). Thus, farmers associated mental healthcare seeking with shame, guilt, weakness, low self-esteem, a loss of pride and independence, a lack of stoicism, an inability to work, whining, submissiveness, and inferiority. Farmers were also more likely to report higher agreement scores in the domain of "Minimizing Problem and Resignation," indicating a stronger propensity (than nonfarmers) for downplaying the severity of health issues, delaying help-seeking, and associating help-seeking with self-pity and not being tough. Finally, farmers (24.4%) were also significantly more likely than nonfarmers (15.3%) to report difficulties in

understanding their healthcare providers ($p < .03$), as well as more likely to report not knowing how to speak with providers about mental healthcare issues (35.6% versus 16.7%; Hull et al., 2017).

Another study of Australian male and female farmers ($N = 63$) in Queensland and New South Wales examined suicidality and help-seeking attitudes, perceptions, and beliefs (Perceval et al., 2017). Focus group results indicated that those most often committing suicide were male farmers, and several factors emerged to assist in the explanation of male farmer suicidality: farming identity, the lonesomeness of farming, lifestyle habits, beliefs and perceptions of suicide, and a complex interplay of a variety of determinants (Perceval et al., 2017). For example, male farmers in Australia were prideful, yet private people, who found interpersonal communication challenging. Thus, if a male farmer's mental health started declining due to farm survival issues related to health and/or financial problems, a farmer's sturdy oak farming identity may be perceived by the farmer as compromised (among his farming peers and according to himself) if he asks or requests care for mental and/or physical health issues. Additionally, the isolated, lonely nature of farming (from an emotional and geographical standpoint) was noted as placing Australian male farmers at an increased risk of suicide, especially when farmers further withdrew from others. Also, certain behaviors related to work and lifestyle seemed to increase suicidality, such as extremely long workdays, unhealthy sleep schedules, lack of exercise, and substance use (Perceval et al., 2017). As far as beliefs and attitudes about why farmers die by suicide, farmers were generally at a loss for words, not able to come up with many concrete reasons other than some farmers "must get to a point where they see no other option and have lost all hope" (Perceval et al., 2017, p. 386). Despite the reason(s) for male farmer suicide in Australia, the theme of the study participants' responses was that suicidality is a result of a multifactorial (i.e., societal, environmental, interpersonal, and individual) process involving external and internal stressors, with one's personal characteristics related to resiliency, coping behaviors, and perceptions as affecting one's mental health and risk for suicide (Perceval et al., 2017).

Male farmers and preventive health screenings.

Quite applicable to this portion of the text, a male farmer, referred to as Harry, in Judd, Jackson, and Fraser et al.'s (2006) study of Australian farmers said the following when referring to farmers and their health prevention behaviors: " 'I believe it's one area that farmers lack bad [*sic*], they maintain their tractors, they maintain their pumps and everything [*sic*] but they don't maintain themselves' " (p. 7).

According to the U.S. Preventive Services Task Force (USPSTF; 2018), dozens of clinical health screenings exist for adult and older men. Based off the previously-described health issues commonly experienced by male farmers and men in general, some of the more notable screening procedures assess risk for high blood pressure, colorectal cancer, HIV, alcohol misuse, depression, obesity, abnormal blood glucose and type 2 diabetes mellitus, hearing loss, COPD, skin cancer, suicide risk, and prostate cancer (USPSTF, 2018). Empirical work is sparse when it comes to U.S. male farmers and their preventive screening practices and beliefs. However, based on the research reviewed thus far concerning help-seeking, it is probably safe to make the claim that male farmers most likely do not receive preventive screenings for a variety of health issues as regularly as their rural nonfarmer and urban counterparts. This statement may especially apply to cancer screening practices, namely for skin, colorectal, and prostate cancers, where rural individuals rank worse than urban individuals in their prevention efforts and death rates (Henley et al., 2017; USDHHS, ODPHP, 2018b).

For example, in Carley and Stratman's (2015) study of upper-Midwest farmers and nonfarmers, significantly more farmers were diagnosed with precancerous skin lesions ($p < .001$) and referred to a specialist for a follow-up examination ($p < .0023$). Additionally, only 6% of farmers who had never been diagnosed with skin cancer reported receiving skin cancer evaluations on a regular basis, compared to 64% of farmers with a history of skin cancer ($p < .001$; Carley & Stratman, 2015). These findings which are consistent with a previous study of Michigan farmers, which concluded that those with a history of skin cancer were eight times more likely to have been examined for skin cancer in the past year (Mullan,

Gardiner, Rosenman, Zhu, & Swanson, 1996). In a similar study of farmers ($N = 397$) attending a North Carolina farm show, 54.6% of farmers had never been examined by a healthcare provider for skin cancer, despite only 7.4% of them being uninsured (Kearney et al., 2013).

Nationally, lower proportions of rural individuals (ages 50 and over) have reported practicing routine preventive screenings for colorectal cancer (i.e., colonoscopies and fecal occult blood tests) than those living in urban areas (Coughlin & Thompson, 2004). Among a simple random sample of male farmers ($n = 388$) and rural male nonfarmers ($n = 4,228$) of central New York state, farmers obtained fewer preventive screenings for all the screening variables measured, but showed a significantly lower likelihood of obtaining a colonoscopy in the previous five years compared to rural male nonfarmers ($OR = 0.55 [0.37, 0.84]$; Earle-Robertson et al., 2015). A previous study by Park et al. (2002) found that although Iowa male farmers obtained colonoscopies at similar rates to those of Iowa rural male nonfarmers and urban men, male farmers were significantly less likely to have had a blood stool examination for colorectal cancer in the previous 12 months ($OR = 0.41 [0.17, 1.00]$).

There are certainly disparities between rural and urban individuals when it comes to prostate cancer screening and outcomes, as depicted in a recent meta-analysis of 91 studies of mostly developed nations, which found that rural men tend to receive PSA testing less often, and when diagnosed with prostate cancer, have higher rates of late-stage disease, lower survival rates, and increased death rates (Baade et al., 2015). These results are consistent with other U.S.-based studies (Henley et al., 2017; Jemal et al., 2005) showing rural men as obtaining less PSA testing, being diagnosed with higher rates of late-stage disease and having increased death rates.

In Muldoon et al.'s (1996) simple random sample of Iowan farmers ($n = 578$) and rural nonfarmers ($n = 504$), farmers aged 50 and above (40.7%) were much less likely ($OR = 0.70 [0.50, 0.99]$) than their rural nonfarmer counterparts (49.3%) to have received a prostate examination in the

preceding 12 months. More recently, farmers in New York State have reported receiving PSA testing less often than rural nonfarmers (Earle-Robertson et al., 2015).

Prostate Cancer

Global incidence, mortality, and trends.

Worldwide, nearly 1.3 million new prostate cancer cases and 359,000 prostate cancer deaths were predicted to occur in 2018, yielding (among both sexes combined) cancer incidence and mortality rates of 7.1% and 3.8%, respectively, and placing prostate cancer as the fourth most common cancer (behind lung [11.6%], female breast [11.6%], and colorectal [10.2%]) and the eighth deadliest cancer (behind lung [18.4%], colorectal [9.2%], stomach [8.2%], liver [8.2%], female breast [6.6%], esophageal [5.3%], and pancreatic [4.5%]). Considering male cancers only, prostate cancer makes up 13.5% of all new cancer diagnoses and 6.7% of deaths, ranking second (behind lung [14.5%]) and fifth (behind lung [22%], liver [10.2%], stomach [9.5%], and colorectal [9%]) for incidence and mortality, respectively. Prostate cancer is the most common cancer diagnosis in almost 57% of all countries (105 of 185), particularly, Northern (e.g., U.S.), Central, and South America, Western and Northern Europe (e.g., Ireland, Norway, and Sweden), Australia/New Zealand, and Sub-Saharan Africa, and the number one cause of male cancer deaths in almost 25% of all countries (46 of 185), predominantly in the Caribbean (e.g., Haiti, Barbados, and Jamaica) and Sub-Saharan Africa (e.g., Zimbabwe, Benin, Zambia, and South Africa; Bray et al., 2018).

Globally, age-standardized incidence and mortality rates (per 100,000 people) for prostate cancer were 29.3 (ranking second behind lung [31.5]) and 7.6 (ranking sixth behind esophageal [8.3], colorectal [10.8], stomach [11.7], liver [12.7], and lung [27.1]), respectively. The continents with the highest age-standardized incidence rates were Oceania (79.1), North America (73.7), Europe (62.1), and Latin America and the Caribbean (56.4) and lowest in Africa (26.6) and Asia (11.5), while age-standardized mortality rates were highest in Africa (14.6), Latin America and the Caribbean (14.2), Europe (11.3), and Oceania (10.7) and lowest in North America (7.7) and Asia (4.5). The countries with

the highest prostate cancer age-standardized incidence and mortality rates were Guadeloupe and Barbados, respectively, while the countries with the lowest prostate cancer age-standardized incidence and mortality rates were Bhutan (1.1) and Yemen (0.68), respectively (Ferlay et al., 2018).

Differences over the last several years in prostate cancer incidence and mortality between and within countries seems highly associated with the rate of uptake of PSA testing for detecting asymptomatic prostate cancers, as well as via prostate biopsies during prostate surgery or autopsy, particularly in westernized countries (Bray et al., 2018; Taitt, 2018). Despite prostate cancer rates in Australia, Canada, Denmark, Finland, Iceland, Norway, Sweden, and the U.S. increasing between the 1980s and 1990s, due to the rapid uptake of commercially accessible PSA testing, these rates are now stable in Norway and decreasing in all the other countries mentioned (Center et al., 2012; Jemal et al., 2015; Kvale et al., 2007; Taitt, 2018; Zhou et al., 2016), perhaps due in part to the U.S. Preventive Services Task Force (USPSTF) recommending against routine PSA screening in 2012, despite now recommending the choice be left up to individual patients (Grossman et al., 2018). Incidence rates have been increasing in countries in Europe, namely the UK, Brazil, Costa Rica, Japan, and Thailand, due to increased PSA testing and screening practice understanding (Bray & Piñeros, 2016; Center et al., 2012; Mottet et al., 2017; Zhou et al., 2016), as well as other factors, such as unhealthy diet and exposure to ultraviolet radiation (Mottet et al., 2017). Additionally, prostate cancer incidence rates are increasing in African countries, particularly in Kampala, Uganda and black men living in Harare, Zimbabwe; however, since only urban areas are included in the data, it is hard to decipher whether these upward trends are related to increased risk or increases in PSA testing and medical advancements (Chokunonga et al., 2013; Wabinga et al., 2014).

Globally, prostate cancer incidence is predicted to increase over time, where by the year 2040, nearly 2.3 million men are predicted to be newly diagnosed, with the lowest incidence predicted in Europe and the highest occurring in African, Latin American and Caribbean, and Asian countries (Ferlay

et al., 2018). Overall, the fact that men are living longer lives appears to be contributing to the increased incidence rates. Among countries that are considered developing, the increased rates seem to be attributed to increased healthcare accessibility and improvements in the recording and documenting of new prostate cancer occurrences (Rawla, 2019). Additionally, the adoption of westernized health behaviors, such as unhealthy diets and decreased physical activity, may also explain the increased prostate cancer incidence rates in developing nations where PSA testing is still not regularly utilized (Baade et al., 2009).

Mortality rates due to prostate cancer have been decreasing among several countries, including Northern and Western Europe, North America, Oceania, developed Asian countries (Baade et al., 2009; Bray & Piñeros, 2016; Center et al., 2012; Taitt, 2018; Wong et al., 2016), and the U.S., perhaps reflecting more effective early diagnosis and enhanced treatment procedures (Collin et al., 2008; Etzioni et al., 2008; Lim, Sherin, & the American College of Preventive Medicine Prevention Practice Committee, 2008), which has resulted in significant delays in death from advanced prostate cancer (Brawley, 2012). Interestingly, Andriole and colleagues' (2009) randomized controlled trial of U.S. men showed no significant association between PSA testing and reduced mortality from prostate cancer; whereas, Schroeder and colleagues (2009) found that PSA testing could reduce prostate cancer deaths by as much as 20% in European men. Countries such as Russia, Belarus, Bulgaria, Cuba, Brazil, and the Philippines, which show increasing prostate cancer death rates, could be explained by these men having less treatment accessibility and an increase in Westernized health behaviors (Bray & Kiemenev, 2017; Center et al., 2012).

Racially/ethnically, despite having higher overall incidence and mortality rates from prostate cancer than all other races/ethnicities, African American men have shown greater decreases in mortality than their white male counterparts in recent years, particularly from 2001-2015 (Negoita et al., 2018; Noone et al., 2018), justified perhaps by more effective and novel approaches to detection and

treatment, specifically prostate cancer considered treatment-resistant and/or metastatic (Negoita et al., 2018).

By the year 2040, a projected 738,000 prostate cancer deaths will occur around the world, with the lowest mortality rates in Europe and the highest in Africa and Asia (Ferlay et al., 2018). The higher mortality rates in developing countries is most likely a result of having fewer resources for prostate cancer screening, detection, and treatment, coupled with lower healthcare accessibility, all leading to increased risk of being diagnosed in later stages of the disease (Rawla, 2019).

U.S. incidence, mortality, and trends.

In the lifetime of U.S. men, around 11.2% (one in nine) will be diagnosed with prostate cancer and roughly 2.44% (one in 41) will die of the disease (ACS, 2019a, 2019b), making prostate cancer (outside of squamous cell or basal cell skin cancers and carcinoma in-situ, except in the urinary bladder) the most-often diagnosed cancer (around 174,650 new cases predicted in 2019), in front of lung and colorectal cancer, as well as the second-deadliest form (around 31,620 deaths predicted in 2019), trailing just lung cancer (ACS, 2019a). Due to unclear reasoning, black men have 60% higher prostate cancer incidence rates, when compared to white men. Additionally, prostate cancer will make up one-fifth of new male cancer cases in 2019 and one-tenth of male cancer deaths. Prostate cancer incidence and mortality rates (per 100,000 men) in the U.S. are 109.2 and 19.2, respectively, with Washington, D.C. having both the highest incidence (154.1) and mortality rates (31.0) of all the U.S. states, and Arizona and Hawaii having the lowest incidence and mortality rates, respectively, at 78.6 and 13.9 (ACS, 2019a).

As a result of the 1986 approval of PSA testing for men with prostate cancer by the U.S. Food and Drug Administration (FDA), incidence rates for prostate cancer increased significantly in the latter portion of the 1980s and especially the early part of the 1990s, from virtually no men being tested in 1987, to nearly a quarter of men 50 years-old and above being tested at least once by 1992 (ACS, 2019a;

Negoita et al., 2018). As a result of increased PSA testing from 1987-1992, prostate cancer incidence rates increased significantly between 1988 and 1992, which coincided with a dramatic drop in late-stage incidence from 1991-1994. PSA testing for men never having been tested reached its peak from 1991-1992, when a prevalence of one out of 10 men were tested (Negoita et al., 2018).

Since the beginning of this century, incidence rates have been on the decline, largely due to decreased PSA testing rates, which have been decreasing for all races (except African Americans ages 75 and above) and ages since 2008. Compared to 2010, survey data from 2013 revealed that PSA testing rates have decreased for all races combined and white men between 50 to 74 years-old. Since 2007, incidence rates for prostate cancer have decreased 6.5% and 6.8% annually for all races combined and white men, respectively, and 5.9% annually for African American men, since 2009 (Negoita et al., 2018). In recent years, incidence rates have been declining by around 7% annually (ACS, 2019a).

Among all age groups, most prostate cancer diagnoses are considered as having a low risk of recurrence (PSA levels under 10 ng/mL). Compared to men ages 50 to 74 years of age, those ages 75 years and above are less likely to have low-risk prostate cancer diagnoses. The peak incidence rate for low-risk prostate cancer in those 75 years and above peaked sooner (in 2007) than those ages 50 to 74 years of age (in 2009). For prostate cancer with a high risk of recurrence (PSA levels above 20 ng/mL), incidence rates declined continuously through 2012, although now showing a leveling off, except for men ages 50 to 74 years of age, who showed steady declines up until 2014 (Negoita et al., 2018).

Between 2004 and 2014, incidence rates for aggressive prostate cancer (i.e., with Gleason scores of 9 to 10) remained unchanged for all ages combined. During the same time period, continual (slight) decreases for aggressive prostate cancer incidence cases occurred for those aged 75 and above, with this population also showing decreases in prostate cancer tumors with Gleason scores of two through six from 2004 (293 per 100,000) to 2014 (89 per 100,000). In 2010, the most common prostate cancer Gleason score was 7, totaling 40% of cases, which increased to 41% of cases by 2014.

Percentages of new prostate cancer tumors with Gleason scores of two through six have declined since 2010. However, the percentage of patients with prostate cancer diagnoses having tumors with aggressive Gleason scores has increased, specifically for men ages 50 to 74 years, where almost 9% of new prostate cancer diagnoses in 2014 had Gleason scores of 9 to 10 (Negoita et al., 2018).

As measured since 2004, most prostate cancer tumors were diagnosed as confined to just the prostate gland (clinical T1 [cT1] or T2 [cT2]); however, the incidence rates for cT1 and cT2 tumors has continually decreased since 2007 for men 50 to 74 years, those ages 75 years and above, and all ages combined. Continuous, yet slower decreases for cT3 and cT4 (clinical extraprostatic extension) tumors have also occurred for the above age groups as well (Negoita et al., 2018).

The prostate cancer death rate was at its highest for all races combined and African Americans in 1993, at 39.3 and 81.9, respectively, and for white men in 1991, at 36.5 (Negoita et al., 2018). The rate (for all races combined) decreased by 51% over the next 23 years, to a rate of 19.4 as of 2016 (ACS, 2019a). African Americans have seen steeper death rate declines during this century than white men, with the death rate of white men and for all races combined leveling off since 2013 (Negoita et al., 2018). This death rate leveling off for white men and all races combined is a likely result of a decline in the use of PSA screening, which has led to increases in advanced-stage prostate cancer cases (Negoita et al., 2018). However, the substantial death rate decrease since the early 1990s is likely a result of detecting disease in its early stages via PSA screening, as well as treatment improvements and advancements, especially for advanced-stage and castration-resistant prostate cancer (ACS, 2019a; Etzioni et al., 2008; James et al., 2017; Poorthuis, Vernooij, van Moorselaar, & de Reijke, 2017; Shore, Heidenreich, & Saad, 2017).

Survival.

Despite a high number of men being diagnosed with prostate cancer throughout the world, most diagnoses occur in early or localized stages of disease, when the cancer has not spread outside of

the prostate (Rawla, 2019). In the U.S., nine out of 10 cases of prostate cancer cases are considered localized or regional diagnoses, which have nearly a 100% five-year survival rate. However, this rate drops dramatically for distal cases, to a rate of 30%. When combining all stages of diagnoses, the 10-year survival rate for prostate cancer is 98% (ACS, 2019a). In Europe, the average five-year survival rate is 83% (Crocetti, 2015), with Eastern countries having the lowest rate at 76% and Southern and Central countries with the highest rate at 88%. The rate of survival has increased for all European countries over time, with Eastern countries showing the greatest increases (De Angelis et al., 2014).

The CONCORD-3 program, which tracked five-year prostate cancer survival rates among 62 countries, found that survival was anywhere from 70-100% for most countries. For those with prostate cancer diagnoses from 2010-2014, men had nearly 100% survival rates in the U.S., Puerto Rico, and Martinique; at least 90% survival rates in New Zealand and Australia; Portugal, Italy, and Spain (south Europe); France, Austria, Germany, and Belgium (west Europe); Lithuania, Finland, Ireland, Iceland, Norway, Sweden, and Latvia (north Europe); and Japan, Israel, Korea, Canada, Costa Rica, and Brazil; survival rates from 80-89% in Ecuador, Argentina, and Uruguay; the UK, Estonia, and Denmark (north Europe); Switzerland and the Netherlands (west Europe); Slovenia, Malta, and Croatia (south Europe); the Czech Republic (east Europe); Taiwan (eastern Asia); Turkey and Kuwait (western Asia); and Singapore and Penang, Malaysia (southern Asia); survival rates close to 80% in Cluj, Romania, Poland, and Russia; Slovakia had survival rates less than 80%; countries with survival rates less than 70% were Thailand, Mauritius, China, and Bulgaria; and Karunagappally, India had survival rates less than 50% (Allemani et al., 2018).

Considering prostate cancer five-year survival rate changes from 1995-1999 to 2010-2014, most countries have shown increases. Turkey, Canada, Ecuador, Brazil, China, Portugal, New Zealand, and Austria had survival rate increases between 5-10%. Survival increased more than 10% in Thailand, Taiwan, Israel, and Australia; the Netherlands, France, Switzerland, and Germany (west Europe); Iceland,

Sweden, Norway, and Finland (north Europe); and Spain, Italy, and Malta (south Europe). And finally, countries with survival rate increases of more than 20% were the following: Penang, Malaysia, Korea, and Japan; Ireland, Denmark, the UK, Lithuania, Estonia, and Latvia (north Europe); Slovenia (south Europe); and Poland, Bulgaria, and the Czech Republic (east Europe; Allemani et al., 2018).

Etiology and risk factors.

Despite a variety of studies linking certain risk factors with prostate cancer, the causes of this disease are still relatively unknown (Rawla, 2019). However, many well-known (non-modifiable) risk factors for total prostate cancer have been established, which are being older in age, living in the U.S. or Caribbean and being of African descent, having a family history/genetic predisposition, and being taller in stature (MacInnis & English, 2006; Pernar, Ebot, Wilson, & Mucci, 2018; Rawla, 2019; Rebbeck et al., 2013).

Despite being quite rare in men under 40 years of age, prostate cancer incidence in the U.S. increases in significant linear fashion for all races combined and white men until age 74 and until age 69 in African American men. Additionally, incidence rates for men ages 65 and above is dramatically higher for all races combined, white men, and African American men, compared to rates for these same racial categories under the age of 65 (Howlader et al., 2019). According to a recent analysis of nearly all U.S. prostate cancer cases, from 2010-2014 significant increases in distant prostate cancer incidence occurred in men aged 50 to 64 years, those 75 to 84 years of age, in white men, and in non-Hispanics. Further research is necessary to discern if the increase in distant prostate cancer incidence was due to decreased PSA testing (Li et al., 2018). Prostate cancer death rates in the U.S. significantly increase as men age, with those ages 85 and above being most likely to die of the disease, for all races combined, white men, and African American men (Howlader et al., 2019).

As noted above, men in the U.S. or Caribbean of African descent have the highest incidence and mortality for prostate cancer around the world. Additionally, those living in sub-Saharan Africa tend to

be diagnosed with the most advanced forms of prostate cancer and represent the highest number of total deaths from the disease (Rebbeck et al., 2013). In the U.S., the overall incidence and mortality rates for prostate cancer for all races combined are 109.5 and 19.2, respectively. African Americans have the highest incidence and mortality rates at 176.7 and 38.9, respectively. At 55.4, American Indians/Alaska Natives have the lowest incidence rate, and Asians/Pacific Islanders have the lowest mortality rate at 8.6. The second-lowest incidence rate belongs to Asians/Pacific Islanders (55.6), then white Hispanics (86.8), Hispanics (93.4), and white non-Hispanics (104.5). American Indians/Alaska Natives have the second-lowest mortality rate at 14.2, followed by Hispanics (15.8), white Hispanics (16.5), and white non-Hispanics at 18.1 (Howlader et al., 2019). The disparity between African Americans and all other races for prostate cancer incidence and death is associated with several factors, particularly related to biological, genetic, and ancestral predispositions, social situations, culture, behavior, environmental exposures, and healthcare equity issues (Rebbeck, 2018).

Three decades ago, Steinberg and colleagues (1990) reported that prostate cancer risk significantly increases as the number of first-degree relatives with prostate cancer increases, such that one is at twice the risk of getting prostate cancer when having one first-degree relative diagnosed with prostate cancer, five times the risk with two first-degree relatives diagnosed, and 11 times the risk with three first-degree relatives diagnosed. The ACS (2019a) reports that 5-10% of prostate cancer cases are due to having a strong family history. Prostate cancer has been noted as one of the most heritable cancers, with twin studies showing heritability as high as 58% (Hjelmborg et al., 2014; Mucci et al., 2016), meaning 58% of prostate cancer variability in populations may be due to genetic differences among individuals (USDHHS, NIH, National Library of Medicine, Lister Hill National Center for Biomedical Communications, 2019). Recently, a population-based study in Sweden found that most men with a family history of prostate cancer (i.e., at least one brother) had anywhere from a 30 to 60% higher likelihood of developing any prostate cancer by age 75, with the probability increasing as the number of

brothers with prostate cancer increased (Bratt et al., 2016). Even more recently, Barber and colleagues (2018) found that a man's family history of prostate cancer and breast cancer independently impacts his risk of total and lethal prostate cancers. In fact, having a family history of breast cancer increases a man's risk of total and lethal prostate cancer by 21% and 34%, respectively, and a family history of prostate cancer increases a man's risk for total prostate cancer by 68% and for lethal prostate cancer by 72%. When having both a history of breast and prostate cancer, a man's risk for total prostate cancer is increased by 61% but not significantly increased for lethal prostate cancer. The risk for prostate cancer increased if relatives were diagnosed with breast and/or prostate cancer before the age of 60 and with increasing numbers of relatives diagnosed with breast and/or prostate cancer (Barber et al., 2018).

For men with a family history of prostate cancer, there have been several predisposing genes that have been discovered as increasing one's susceptibility for the disease (Colloca & Venturino, 2011). In fact, of the substantial amount of genome-wide association studies performed, over 100 SNPs have been identified as associated with prostate cancer risk (Al Olama et al., 2015; Chen et al., 2015), with most of these SNPs estimated to account for a familial risk of prostate cancer of around 33% (Al Olama et al., 2014). The mutations with the strongest associations with prostate cancer are the G84E mutation in HOXB13 and the BRCA2 mutation (Lynch et al., 2015), with the BRCA2 gene being the most likely DNA damage repair gene to have mutations for those with advanced prostate cancer, and many times these mutations are present when patients have no family history of prostate cancer (Nombela et al., 2019). A recent study has found significant links to prostate cancer stage, Gleason scores, and lymph node involvement for 48 different genes (Zhao et al., 2019).

Modifiable and other risk factors for prostate cancer have also been identified, with some of the most recently researched factors being obesity, unhealthy dietary and nutrition practices, alcohol consumption, cigarette smoking, insulin and insulin-like growth factor, sex hormones, chronic prostate inflammation, vasectomies, STIs, and certain carcinogenic environmental exposures (see Rawla, 2019).

Prevention and early detection.

Considering that prostate cancer can take several decades to form, lifestyle intervention measures, such as practicing healthier eating habits through consuming more vegetables and fruits rich in antioxidants, less animal fat, red meat, and refined carbohydrates, as well as becoming more physically active, quitting or not starting smoking, and consuming only moderate amounts of alcohol (Parsons, 2019; Rawla, 2019), could be viable and cost-effective ways of slowing down prostate cancer's growth and progression (Rawla, 2019). Lin et al. (2019) recommend that in order to help prevent and/or manage prostate cancer, a healthy body weight and dietary approach are advised. Specifically concerning diet, men are encouraged to consume the following: more plant- and soy-based protein and less animal protein and red meat; more fish; more fiber, nutrient-rich whole grains, and fewer refined carbohydrates; more omega-3 fatty acids and less saturated fat; more green tea and an herb mix known as zyflamend; more tomato products; and more fruits and vegetables rich in antioxidants (Lin et al., 2019). The Men's Eating and Living (MEAL) intervention study examined the impact of a diet rich in vegetable consumption on prostate cancer disease progression in men who were undergoing active surveillance (Parsons et al., 2018a). This was the first-ever study of its kind, which delivered a telephone-based dietary behavior modification intervention to men with low-risk prostate cancer on active surveillance, encouraging the consumption of more daily fruits and vegetables. Despite the MEAL intervention not significantly impacting prostate cancer clinical progression, participants did show statistically significant increases in consumption of all vegetables, lycopene, crucifers, and carotenoid, over a two year-period (Parsons et al., 2018b; Parsons, 2019). The ESCAPE study, a promising dietary intervention for men with localized prostate cancer undergoing active surveillance, showed that consuming broccoli soup enriched with high amounts of glucoraphanin can suppress genetic expression in prostate cancer, thus showing a reduction in cancer progression (Traka et al., 2019).

Selenium and both alpha-tocopherol (present in vitamin E supplements) and gamma-tocopherol (vitamin E typically consumed via diet) have been studied for their anticancer properties, particularly in

the SELECT study, with some evidence supporting significant reductions in prostate cancer risk, particularly with increased plasma levels of gamma-tocopherol taken alone and along with selenium and alpha-tocopherol (Helzlsouer et al., 2000). More recent findings from the SELECT study did not show significant prostate cancer risk reduction with selenium and vitamin E (all rac-alpha-tocopherol acetate) supplementation, whether taken alone or in combination (Lippman et al., 2009), and a follow-up of SELECT participants actually revealed a 17% increase in prostate cancer incidence in those taking receiving daily vitamin E (Klein et al., 2011).

Toremifene (U.S. brand name Fareston), an antiestrogen drug similar to tamoxifen, used primarily in the treatment of postmenopausal, estrogen receptor positive, metastatic breast cancer (USDHHS, NIH, NCI, n.d.), showed some promise in significantly decreasing prostate cancer incidence in men with HGPINs (Price et al., 2006). However, a more recent clinical trial did not show lower prostate cancer incidence with toremifene treatment for men with HGPINs (Taneja et al., 2013). In the REDEEM study, dutasteride (U.S. brand name Avodart), a 5-alpha-reductase inhibitor blocking male sex hormone production by not allowing 5-alpha-dihydrotestosterone to be converted from testosterone, and typically used for prostatic hypertrophy (USDHHS, NIH, NCI, n.d.), was administered to low-risk prostate cancer patients undergoing active surveillance, and upon one-and-a-half and three-year follow-ups, those receiving dutasteride were less likely to have Gleason score and grade progressions, less likely to have undergone initial treatment, and more likely to have no detectable evidence of disease upon prostate biopsy (Fleshner et al., 2012). A more recent study of men with HGPIN, a major precursor to prostate cancer, found that those taking dutasteride did not have significant postponement of prostate cancer at three years follow-up, compared to those undergoing active surveillance (Milonas et al., 2017).

The efficacy of another 5-alpha-reductase inhibitor, finasteride (U.S. brand name Proscar; USDHHS, NIH, NCI, n.d.), initially examined for seven years among men without prostate cancer in the Prostate Cancer Prevention Trial (PCPT) study, was found to reduce the risk of prostate cancer by almost

25%, despite increasing the risk for high-grade prostate cancer (Thompson et al., 2003), which subsequently lead to recommendations not to use finasteride for prostate cancer prevention (Goodman et al., 2019). Future PCPT studies would find finasteride as effective in decreasing prostate cancer risk, while also improving disease diagnosis of low- and high-grade prostate cancers by enhancing performance of PSA testing, tumor grading, DRE, biopsy, while also decreasing prostate size (Andriole et al., 2005). Eventually, after controlling for biases due to detection and biopsy-related sensitivities in men who were administered finasteride in the PCPT study, there was a 27% reduced incidence of high-grade prostate cancer diagnoses in men taking finasteride (Redman et al., 2008). A later study of PCPT participants found that low-grade prostate cancer risk for those taking finasteride was nearly 43% less than those in the placebo group. And despite finasteride-treated participants having increased incidences of high-risk prostate cancer, an 18-year follow-up showed no substantial discrepancies in overall or prostate cancer-related deaths (Thompson et al., 2013). Some of the most recent PCPT data, providing an 18.4-year follow-up, shows that although not statistically significant (due to the small number of prostate cancer-related deaths), participants treated with finasteride had a 25% reduced risk of prostate cancer-related death, compared to the placebo group (Goodman et al., 2019). Also, a 16-year follow-up of PCPT participants found that finasteride provided a 21.1% reduced incidence of prostate cancer (Unger et al., 2018). Another study by Stapff and Palm (2019), retrospectively compared men who took finasteride with those who took tamsulosin (U.S. brand name Flomax), an inhibitor of alpha-1-adrenoreceptors used for prostatic hypertrophy (USDHHS, NIH, NCI n.d.), and they found that finasteride as more effective in decreasing prostate cancer risk.

Rawla (2019) explores a variety of other preventive measures for prostate cancer, noting that more research is needed to determine whether statins or vitamin D are effective in prostate cancer prevention. However, he determined that sufficient evidence supports the notion that aspirin and NSAIDS may be useful in helping prevent prostate cancer. Wilson and colleagues (2011) found that high

coffee consumption (i.e., more than six caffeinated and/or decaffeinated cups per day) significantly lowered the risk for advanced and deadly prostate cancers. Finally, according to a longitudinal analysis of 31,925 men in the Health Professionals Follow-Up Study, those reporting the highest frequency of monthly ejaculations (at least 21 ejaculations per month) displayed significantly reduced low-risk prostate cancer incidence (Rider et al., 2016).

Due to the increased potential for over-diagnosis, false-positive outcomes, as well as the possibility of severe treatment side effects, regular screening for prostate cancer for average-risk men is not currently suggested by any health organization in the U.S. Instead, the decision to be screened for prostate cancer for average-risk men should be a personal one (ACS, 2019a; Grossman et al., 2018). The USPSTF suggests that those ages 55 to 69 years make an informed personal decision about getting PSA-tested after balancing the pros and cons with their healthcare provider and considering their personal preferences and beliefs, but this organization does not advise PSA testing for those men not showing a preference for the test nor for those ages 70 and above (Grossman et al., 2018). The American Academy of Family Physicians (2012) echoes the recommendations of the USPSTF. According to ACS (2019a) guidelines, average-risk men with no prostate cancer symptoms, who are also expected to live at least 10 more years, should begin an informed decision-making process with their healthcare provider at age 50, regarding whether or not to undergo PSA testing with or without DRE. Higher-risk men (e.g., African Americans and those with a brother or father diagnosed before 65 years of age) should begin this process by age 45, and those having had more than one family member with prostate cancer under the age of 65 should begin this decision-making process starting by age 40. Individuals with no prostate cancer symptoms not expected to live at least another 10 years (e.g., due to health conditions and/or age), should not undergo screening for prostate cancer. Around 50% of 75-year-old men are expected to live at least 10 or more years, and men in this population with accompanying disease(s) are not expected to experience the benefits of prostate cancer testing. Younger populations of men with life-

threatening disease (e.g., end-stage kidney failure, advanced dementia, severe congestive heart failure, advanced COPD, or terminal cancer) are also not likely to experience the benefits of prostate cancer testing (Wolf et al., 2010). The recommendation of the American College of Physicians is to have healthcare providers discuss the significant harms and slight benefits of PSA testing with patients who are 50 to 69 years-old. The ultimate decision for a patient to undergo PSA testing in this age category is based on an informed decision-making process between the patient and healthcare provider, considering the patient's overall health status and life expectancy, and the personal preferences of the patient. PSA testing should also not be performed in patients who prefer not to be screened, as well as men at average-risk under 50 years of age, those aged 70 and above, and those who are not expected to live 10 to 15 more years (Qaseem et al., 2013). Finally, the American Urological Association recommends the following: men under 40 years-old should not be PSA-tested; those 40 to 54 years-old should not receive routine PSA testing; shared and informed decision-making processes between the patient and the healthcare provider for men ages 55 to 69 years-old, considering preferences and values of the patient; for those undergoing routine PSA testing, doing so every two or more years and not annually; and for men ages 70 and above, who are not expected to live at least 10 to 15 more years, routine PSA testing is not recommended (Carter et al., 2013).

Signs, symptoms, and diagnosis.

Symptoms are unlikely in many prostate cancer cases, and a large proportion of men do not know they have the disease unless they are screened. In fact, in studies of deceased men who died of something other than prostate cancer, over one out of five 50 to 59-year-olds and greater than one out of three 70 to 79 years-old had evidence of prostate cancer upon autopsy (Jahn, Giovannucci, & Stampfer, 2015). Indeed, in the early stages of prostate cancer, patients may not exhibit symptoms, and the cancer, many times, is slow-growing or indolent (Rawla, 2019; USDHHS, NIH, NCI, n.d.). Most often, for patients displaying symptoms, typically because of a larger than normal prostate, symptoms will

manifest as urinary issues, particularly difficult and frequent urination, including at night. More distant and advanced stages of prostate cancer present more severe symptoms, such as not being able to fully empty the bladder during voluntary urination (i.e., urinary retention; Rawla, 2019; Serlin et al., 2018) and pain in the back, one of the most likely locations for the spread of disease (Rawla, 2019).

Nearly seven in 10 prostate cancers originate in the peripheral zone of the prostate gland (McNeal, Redwine, Freiha, & Stamey, 1988) and only lead to symptoms when large enough to cause urethral compression or problems with the sphincter (Michael & Pandha, 2013). Prostate cancer symptoms most often coincide with tumor stage, with T1 tumors being asymptomatic, T2 tumors only recognized during DRE, and T3 and T4 tumors showing clinical symptoms, mostly via LUTS, which are patient-defined and not utilized as a formal tool for diagnosis, since other more common prostate conditions, such as BPH (Berry et al., 1984; USDHHS, USPHS, NIH, NIDDKD, 2012), are more likely to cause LUTS (Michael & Pandha, 2013).

There are three major categories of LUTS symptoms including, issues with urine storage, problems with voiding, and difficulties occurring after voiding (i.e., post-micturition). Frequent day- and nighttime urination, as well as having an urgency to urinate are the most common symptoms associated with urine storage issues. Difficulties with micturition, namely having a urine stream moving slowly or erratically, having dribbling issues, having a hard time beginning urination (i.e., hesitancy), and feeling a need to strain, are all symptoms linked to voiding problems. And finally, sensations that one's bladder is not entirely empty after voiding, as well as having uncontrollable dribbling upon the completion of urination, are post micturition issues that are possible. Urethral discomfort or the passing of blood are not common LUTS symptoms (Abrams et al., 2003).

Sexual dysfunction issues may also occur in prostate cancer patients, mostly as a result of cancer-related treatment (Mercadante, Vitrano, & Catania, 2010). However, sexual dysfunction may be present prior to treatment, especially for those with more advanced prostate cancer, as a result of LUTS,

fatigue, and having pain in the pelvic region, and on very rare occasions, blood in the semen (i.e., hematospermia) may be present (Han et al., 2004). For those with more advanced prostate cancer, signs of metastasis such as feeling tired, losing weight, not having an appetite, and pain in the bones (e.g., hips, pelvic region, and back) may occur before LUTS (Michael & Pandha, 2013). Another common sign that prostate cancer has spread is when patients present with spinal cord compressions of which back pain is the most likely symptom (Osborn et al., 1995; Rosenthal et al., 1992). Additionally, pain in the pelvic and perineal regions can occur as symptoms of prostate cancer metastasis (Rigor, 2000).

In order to diagnose prostate cancer, a needle biopsy of prostatic tissue and its subsequent analysis is necessary (Litwin & Tan, 2017). The NCCN Guidelines for Prostate Cancer Early Detection provides a helpful roadmap for patients and healthcare providers in determining the patients who may benefit the most from a transrectal ultrasound (TRUS)- or transperineal-guided biopsy of the prostate. In general, those aged 45-75 years with a serum PSA level of less than 1 ng/mL and a normal DRE (if performed) should be PSA-tested every two-to-four years. Those in the same age category should receive PSA screenings every one-to-two years when PSA levels range from one-to-three ng/mL and DRE is normal (if performed). A 45 to 75 year-old with a PSA level greater than 3 ng/mL and/or a DRE that is very suspicious should have a repeat PSA test as well as a DRE (if it was not done on the previous screening), with prostate biopsy being recommended for consideration when repeat PSA levels are above 3 ng/mL, although other factors must also be taken into consideration, such as the patient's race, age, family history, health status, preferences, and PSA kinetics. Those in this category opting to not have a biopsy should have follow-up PSA-testing and DRE within six-to-12 months, and biopsy is recommended for those with substantial and steady increases in PSA levels (Carroll et al., 2019).

For those above the age of 75 years, only extremely healthy patients are recommended to undergo PSA testing, and biopsy consideration should be examined with care. Among this population, when age and/or other illnesses are likely to prevent a benefit to being diagnosed with prostate cancer,

PSA testing is not recommended. For those above 75 years of age who do undergo evaluation for early detection of prostate cancer, those with PSA levels less than 4 ng/mL and a normal DRE (if performed) are recommended to undergo future testing every one-to-four years. When PSA values are 4 ng/mL or higher or there is a very suspicious DRE, biopsy should be considered, if repeat PSA tests are greater than or equal to 4 ng/mL (Carroll et al., 2019).

In general, before proceeding to a biopsy, testing for more specific biomarkers is recommended for consideration when repeat testing for PSA levels are greater than 3 ng/mL. These biomarker tests include: the 4Kscore, prostate health index (PHI), and percent-free PSA (%f PSA). ConfirmMDx, PCA3, and the biomarker tests are also possibilities before patients undergo a follow-up biopsy for one that was previously benign. Multiparametric MRI is also useful in each of the instances described in this paragraph. Also, the use of MRI targeting, in addition to TRUS- or transperineal-guided biopsy, should be considered for all patients (Carroll et al., 2019).

After undergoing a prostate biopsy, several outcomes are possible, including benign results, HGPIN, atypia (suspicious for cancer), and cancer. For those with a benign biopsy, repeat PSA testing and DRE is recommended between six months and two years later, and according to results, a repeat biopsy may also be considered, after also considering biomarker testing. Targeted and multiparametric MRI, in addition to more specified biopsy procedures are also options for analyzing the patient. Biopsies reflecting atypia either mean 1) tissue in the prostate are normal but “distorted by artifact,” or 2) “prostate cancer that does not meet the histologic criteria for a diagnosis of prostate cancer” (Carroll et al., 2019, p. MS-30). Thus, repeat biopsies should be considered, along with increased specimen collection in the abnormal location, as well as biomarker testing and multiparametric MRI (Carroll et al., 2019). HGPIN, despite having similar cellular characteristics to cancerous prostate tumors, distinguishes itself by having “a basal layer on the acini” (Carroll et al., 2019, p. MS-30). For HGPIN considered *multifocal*, patients should heed the same recommendations as those with atypia. Patients with HGPIN

considered *focal* should abide by the same recommendations as those patients with benign biopsies. And finally, when biopsy results are positive for prostate cancer, the NCCN Guidelines for Prostate Cancer provide a care management plan (Carroll et al., 2019; Mohler et al., 2019). In general, a repeat biopsy is not recommended for these patients, unless, for example, the cancer is thought to be more aggressive than what appeared on the original biopsy or if individual has the possibility of undergoing active surveillance as part of their treatment plan (Carroll et al., 2019).

A biopsy positive for prostate cancer malignancy is assigned to a risk group based on a process involving TNM staging, Gleason grading, DRE, radiography, and PSA level (AJCC, 2017; Mohler et al., 2019). Once a patient is assigned to a risk group, a treatment plan can be determined, which will be explained in the next section (Mohler et al., 2019). The most recent system for grading prostate cancer was developed by Epstein and colleagues (2016) at the 2014 ISUP Consensus Conference, which developed five different groups based on Gleason scoring: Grade group one contains prostate cancer patients with Gleason scores of six or less; grade group two signifies a 3+4=7 Gleason score; grade group three contains those with a 4+3=7 Gleason score; grade group four contains those with 4+4=8 and 5+3=8 Gleason scores; and grade group five patients have Gleason scores of nine or 10 (Epstein et al., 2016).

In order to offer the most effective treatment options, the NCCN considers several prostate cancer disease characteristics in order to describe each patients' risk related to their prostate cancer (Mohler et al., 2019). Prostate cancer considered to be *very-low-risk* must meet all of the following criteria: T1c staging (tumor is not detectable via DRE and may be in both sides or just one side of the prostate), Gleason score of 6 or less (grade group one), PSA level below 10 ng/mL, PSA densities under 0.15 ng/mL/g, cancer present in two or less biopsy cores, and 50% or less of each cancerous biopsy is composed of prostate cancer. *Low-risk* prostate cancer patients are in grade group one, with PSA levels under 10 ng/mL, and have a tumor clinically staged anywhere from T1 (tumor cannot be felt or clinically

identified) to T2a (palpable tumor comprised in 50% or less of one side of the prostate). Those patients considered to be at *intermediate-risk* contain zero *high-* or *very-high-risk* characteristics (see below), and have at least one intermediate risk factor (IRF), which include a T2b (palpable tumor comprised in more than 50% of one side of the prostate) to T2c (palpable tumor in both sides of the prostate) clinically-staged tumor, being in grade group two (Gleason score of 3+4=7) or three (Gleason score of 4+3=7), and having a PSA level anywhere from 10-20 ng/mL. Two sub-categories of intermediate risk exist, which are *favorable-* and *unfavorable-intermediate risk*. Those considered at favorable intermediate risk include patients with either a T2b to T2c clinically-staged tumor or PSA level from 10 to 20 ng/mL, as well as belonging to grade group one or two, and having less than half of the cores obtained from biopsy considered malignant. Patients with a T2b to T2c clinically-staged tumor and a PSA level somewhere from 10-20 ng/mL, and/or belonging in grade group three, and/or having at least 50% malignant biopsy cores are considered at unfavorable intermediate risk. *High-risk* patients are those with any of the following disease characteristics: tumor clinically-staged as T3a (tumor extends beyond one or both sides of the prostate), belonging to grade group four or five, or having PSA levels above 20 ng/mL. Those considered as having *very-high-risk* disease will have a tumor clinically-staged anywhere from T3b (invasion of seminal vesicle(s) by tumor) to T4 (a fixed tumor or one invading nearby tissue or organs other than the seminal vesicles like the rectum, the wall of the pelvis, the external sphincter, levator muscles, and/or bladder), a value of five for primary Gleason pattern, or more than four biopsy cores considered as grade group four or five (Mohler et al., 2019).

Additional aspects of diagnosis and staging of prostate cancer include imaging procedures, germline genetic testing, and molecular and biomarker tumor analysis. There is no indication of whether imaging is recommended for very-low- and low-risk patients. However, pelvic +/- abdominal imaging is recommended for both intermediate-risk groups, as well as high- and very-high-risk groups, when there is more than a 10% chance of involvement of lymph nodes, as predicted from a nomogram. Bone

imaging is recommended for high- and very-high-risk groups, as well as for unfavorable-intermediate-risk groups with T2 tumors and PSA levels above 10 ng/mL, although it is not recommended as part of the staging process for favorable-intermediate-risk groups. If cancer has spread in intermediate-, high-, or very-high-risk groups, whether regional or distant metastasis, germline testing is recommended, and patients should also consider undergoing molecular and biomarker tumor analysis, specifically “testing for homologous recombination gene mutations and for microsatellite instability (MSI) or mismatch repair deficiency (dMMR)” (Mohler et al., 2019, p. PROS-9). There is also a recommendation for germline testing in very-low-, low-, and intermediate-risk groups who either have a family history of prostate cancer or intraductal cancer. And as far as molecular and biomarker tumor analysis, there is no indication for testing for those considered as being very low risk; however, low- and favorable-intermediate-risk groups should consider testing if they are expected to live at least another 10 years. Although, molecular and biomarker tumor analysis is not usually a recommendation for unfavorable-intermediate-, high-, and very-high-risk groups (Mohler et al., 2019).

Treatment.

The ACS (2019) explains that the choice of a patient to undergo treatment for prostate cancer be guided by the counsel of the healthcare provider as well as the preferences and beliefs of the patient. In general, for older patients with less aggressive and earlier-stage disease, active surveillance is a common practice. However, in cases where active surveillance is not appropriate, and the cancer is more advanced, treatments may include surgical options or radiation therapy (i.e., external beam or brachytherapy), as well as hormonal therapy. In cases where the cancer has metastasized to distant locations, radiation, chemotherapy, hormonal therapy, surgery, and/or additional treatments may be most appropriate. The tumor growth of advanced prostate cancer may be controlled for extended amounts of time with hormonal therapy, which helps to decrease disease symptoms and/or pain. Chemotherapy can be administered with or without hormonal treatment but is typically an option when

hormonal therapy is no longer deemed to be working. Additionally, advanced prostate cancer that is unresponsive to hormonal therapy may also benefit from a cancer vaccine, which encourages the destruction of prostate cancer cells via immune system stimulation. More advanced prostate cancer may also be targeted with newer hormonal treatment options, and there are also drugs specific to prostate cancer that has metastasized to bone. In any case, the patient and provider must also consider the potential side effects of prostate cancer treatment procedures, which may include issues such as urinary problems and erectile dysfunction. In order to potentially avoid issues related to the over-treatment of prostate cancer, innovative biomarker testing of prostate cancer tumors may provide some benefit to patients in order to distinguish between less-aggressive and more-aggressive disease (ACS, 2019).

The NCCN-recommended treatments for prostate cancer are based on patient risk classifications determined by the AJCC (2017) TNM staging and the most recent ISUP report (Epstein et al., 2016). For prostate cancer patients at very low risk, those expected to live at least 20 more years have the options of active surveillance, EBRT or brachytherapy, or radical prostatectomy, which may involve EBRT (with or without six months of ADT) if there is an adverse pathologic report, which may include: a specimen without clean margins, cancer invading the seminal vesicle(s), cancer extending into the extracapsular area, or a PSA level that can be detected. Active surveillance, the preferred initial therapy, typically involves having PSA testing every six months, DRE every year, and repeat biopsy and multiparametric MRI every year, with more rigorous follow-up recommended for younger men. If disease progresses, curative treatment typically begins. Disease progression is typically identified via repeat biopsies, which would show biopsies with Gleason grades of four or five, and/or a higher number of biopsies will have cancer, and/or the cancer represents a larger proportion of the biopsy. Some potential benefits of undergoing active surveillance are that about two out of every three men will be able to avoid prostate cancer treatment, side effects related to treatment can be avoided, and the patient's overall quality of

life and usual activities are less impacted. Some potential disadvantages associated with active surveillance are: possibly missing a chance for curing the disease, one out of three patients tend to eventually require treatment (despite rates of cure not being affected by delays in treatment), and repeat biopsies and multiparametric MRI are performed periodically. Active surveillance is also recommended for men at very low risk who are expected to live another 10 to 20 years. And for men at very low risk who are expected to live less than 10 more years, it is recommended these individuals choose observation, which involves monitoring the disease every six months without performing repeat biopsies. Observation involves the continued monitoring of the cancer until changes occur upon examination or symptoms begin or are about to begin (i.e., when PSA reaches levels above 100 ng/mL), and then androgen deprivation therapy (ADT) is typically delivered as a palliative therapy. Patients undergoing observation may avoid the harmful side effects of curative treatment and ADT. However, urinary retention issues and potential bone fractures are possible disadvantages of observation, especially for patients with no disease symptoms or alarming PSA levels (Mohler et al., 2019).

Observation is also the recommended treatment for patients with low-risk prostate cancer who are expected to live less than 10 more years. However, for those with low-risk prostate cancer who are expected to live at least 10 more years, the preferred method of treatment is active surveillance, although brachytherapy or EBRT or radical prostatectomy possibly involving EBRT (with or without six months of ADT), if there is an adverse pathologic report, are other possibilities for treatment (Mohler et al., 2019).

Prostate cancer patients considered as favorable intermediate risk and expected to live at least 10 more years have the treatment options of radical prostatectomy and pelvic lymph node dissection (PLND), if the spread to the lymph nodes is predicted to be at least 2%, EBRT, brachytherapy, or active surveillance, although choosing active surveillance should be done cautiously, involving a decision-making process that is informed, as well as monitoring patients closely for the progression of disease.

The preferential treatment for those in this same risk category but who are expected to live between five to 10 more years is observation; however, other options include EBRT or brachytherapy.

Observation is also the preferred treatment method for those at a favorable intermediate risk who are expected to live no more than five more years. For those undergoing radical prostatectomy with or without PLND, EBRT (with or without six months of ADT) should be considered if there is no cancer that has spread to the lymph nodes, but an adverse pathologic report exists. When lymph node metastasis exists upon a radical prostatectomy with PLND, ADT should be considered with or without EBRT (Mohler et al., 2019).

If there is PSA persistence/recurrence or cancer is detected via a DRE in those who received EBRT or brachytherapy in the favorable-intermediate-risk group and the patient also meets the following criteria for local therapy: having an initial clinical cancer stage of T1-T2, NX, or NO, being expected to live more than 10 more years, and having a current PSA level below 10 ng/mL, the patient's cancer should be assessed with a PSA doubling time (PSADT) test, a prostate MRI, bone scans, a TRUS-guided biopsy of the prostate, and a CT scan of the chest, a CT scan or MRI of the abdomen and pelvis, and C-11 choline or F-18 fluciclovine PET/CT or PET MRI should be considered. When a TRUS-guided prostate biopsy is positive for cancer but negative for distant spread, the following options are available: observation, radical prostatectomy with or without PLND, cryotherapy, high-intensity focused ultrasound (HIFU), or brachytherapy. When a TRUS-guided prostate biopsy is negative for cancer and metastasis, observation or ADT are recommended. And when cancer has metastasized, patients should be treated for either castration-naïve or castration-resistant prostate cancer (appearing later in this section). For patients not meeting the criteria for local therapy (seen above), bone imaging should be performed. If imaging reveals bone metastasis, ADT is the preferred treatment, although observation is also an option. If the cancer continues to progress and spreads to visceral sites (i.e., brain, lungs, liver, peritoneum, and/or adrenal glands), patients should be treated for metastatic castration-resistant

prostate cancer (CRPC), which is seen later in this section. For those who received a radical prostatectomy and who have PSA persistence/recurrence, the patient's cancer should be assessed with PSADT testing and bone imaging, CT or MRI scans of the abdomen and pelvis, a CT scan of the chest, a C-11 choline or F-18 fluciclovine PET/MRI or PET/CT scan, and a biopsy of the prostate bed should all be considered. When tests indicate no metastasis to distant sites, EBRT with or without ADT or observation are available options. And if the cancer proceeds to progress, the patient should be treated for either castration-naïve or castration-resistant disease that has not spread. If the above-mentioned tests indicate metastasis to distant sites, observation is one option or the cancer can be treated as castration-naïve disease (Mohler et al., 2019).

For prostate cancer patients at an unfavorable intermediate risk and who are expected to live no more than five more years, observation is the recommended initial therapy. Additionally, for those in this risk category who are expected to live between five and 10 more years, the preferential treatment is observation, although EBRT (with or without four months of ADT) and EBRT and brachytherapy (with or without four months of ADT) are other options. Along with these radiotherapy and ADT options, men at an unfavorable intermediate risk and expected to live at least 10 more years also have the option of radical prostatectomy and PLND, if the spread to the lymph nodes is predicted to be at least 2%. The adjuvant treatment for those undergoing a radical prostatectomy with or without PLND is the same as those with a favorable intermediate risk. The subsequent testing and treatment for those with PSA persistence/recurrence who at unfavorable intermediate risk is the same as the protocol outlined in the previous paragraph for those at favorable intermediate risk (Mohler et al., 2019).

Those prostate cancer patients in high- or very-high-risk groups, who are expected to live no more than five more years, who are not showing symptoms, but who expect metastasis or hydronephrosis in the next five years, have ADT or EBRT as treatment options. Other high- or very-high-risk patients expected to live no more than five more years and who do not meet the other criteria

mentioned above are advised to undergo observation. For high- or very-high-risk patients expected to live more than five more years options include EBRT and ADT (for 1.5 to three years), EBRT and brachytherapy with ADT (for 1.5 to three years), or radical prostatectomy and PLND, especially for healthy and young men. The adjuvant treatment for those undergoing a radical prostatectomy with PLND is the same as those with a favorable or unfavorable intermediate risk. The subsequent testing and treatment for those with PSA persistence/recurrence who at high or very high risk is the same as the protocol for those at favorable and unfavorable intermediate risk (Mohler et al., 2019).

For patients whose prostate cancer has spread to regional lymph nodes and who are expected to live more than five years, EBRT and ADT is the preferential treatment. However, other options include EBRT, ADT, and abiraterone and prednisone, or EBRT, ADT, and abiraterone and methylprednisolone, or ADT with or without abiraterone and prednisone, or ADT and abiraterone and methylprednisolone. For patients with regional lymph node involvement, no symptoms, and an expectation to live no more than five more years, observation or ADT are the recommended treatments (Mohler et al., 2019).

For those with castration-naïve prostate cancer (i.e., ADT was not being used at the onset of disease progression) that has not spread to distant sites, potential options for treatment include the surgical excision of the testicles, ADT and an LHRH agonist (with or without an antiandrogen or LHRH antagonist), or observation until symptoms are about to start or have already begun. Patients with castration-naïve prostate cancer that has spread to distant sites and who are expected to live more than five more years have the following options for treatment: ADT and six cycles of docetaxel at 75 mg/m², ADT and abiraterone with prednisone, ADT and EBRT to the primary tumor for metastasis considered low-volume, ADT by itself, or ADT and abiraterone with methylprednisolone. For those with metastatic castration-naïve prostate cancer, who are expected to live no more than five more years, and without symptoms, observation or ADT are the recommended treatments (Mohler et al., 2019).

Castration-resistant prostate cancer (CRPC) occurs when disease has advanced upon clinical examination, imaging, or biochemical testing, even when castrate levels of serum testosterone are below 50 ng/mL. Observation of disease or the use of a secondary hormone can be considered for patients with CRPC if no spread to distant sites has occurred and when PSADT is over 10 months. If PSADT is no more than 10 months in CRPC without metastasis, hormonal treatment options of apalutamide, enzalutamide, or another secondary hormone are recommended (Mohler et al., 2019).

Patients with metastatic CRPC should consider having a biopsy of the metastasized cancer as well as biomarker testing for MSI-high (MSI-H) and dMMR tumors. Upon positive tests for either MSI-H or dMMR, patients should be referred to a genetic counselor, in order to examine the patient's risk for Lynch syndrome. Further genetic testing is warranted for specific homologous recombinant genes (i.e., FANCA, ATM, PALB2, BRCA1, and BRCA2) and any possible mutations, which could provide valuable information to the patient and his genetic counselor and in determining whether to administer platinum chemotherapy or undergo a clinical trial study. Patients who have CRPC with distant metastasis are also urged to keep castrate levels of serum testosterone under 50 ng/mL through the sustained use of ADT. Patients with CRPC that has spread to the bone may also undergo bone antiresorptive therapy with denosumab (a preferred method) or zoledronic acid, palliative radiation therapy where bone pain is present due to metastasis, or immunotherapy with sipuleucel-T (Mohler et al., 2019).

In patients with metastatic CRPC who have small cell/neuroendocrine prostate cancer, treatment options should include cisplatin/etoposide, carboplatin/etoposide, or docetaxel/carboplatin chemotherapy or inclusion in a clinical trial (Mohler et al., 2019). Small cell/neuroendocrine prostate cancer is rarer and more fatal than prostate adenocarcinoma (Aggarwal et al., 2018). For those with metastatic CRPC adenocarcinoma without spread of disease to visceral locations, many treatment options exist. Initial therapies to be considered are abiraterone with prednisone, abiraterone with methylprednisolone, docetaxel, enzalutamide, radium-223 (if cancer is present in bone), clinical trials, or

some form of secondary hormone. A variety of options also exist for second-line and subsequent treatments for these patients. Second-line therapies for patients treated with abiraterone or enzalutamide for initial therapy include pembrolizumab (for MSI-H or dMMR), docetaxel, radium-223 (for metastasis to the bone), sipuleucel-T, enzalutamide (if treated with abiraterone for initial treatment), abiraterone with prednisone (if treated with enzalutamide for initial treatment), abiraterone with methylprednisolone (if treated with enzalutamide for initial treatment), clinical trials, or another secondary hormone. If the patients were treated with docetaxel for initial therapy, second-line options include enzalutamide, pembrolizumab for MSI-H or dMMR, cabazitaxel, abiraterone with prednisone, abiraterone with methylprednisolone, radium-223 (for bone metastasis), sipuleucel-T, mitoxantrone with prednisone, clinical trials, another secondary hormone, or another docetaxel treatment. If disease continues to progress after a second-line therapy, patients may be treated with the following (if they did not receive these treatments previously): mitoxantrone with prednisone, cabazitaxel, enzalutamide, radium-223, pembrolizumab for MSI-H or dMMR, abiraterone with prednisone, or abiraterone with methylprednisolone. Participation in a clinical trial, being retreated with docetaxel, or being administered a secondary hormone are also options when the cancer has progressed after second-line therapy (Mohler et al., 2019).

Initial treatment options for those with metastatic CRPC adenocarcinoma with spread to visceral locations include docetaxel, mitoxantrone with prednisone, abiraterone with prednisone, abiraterone with methylprednisolone, enzalutamide, participation in a clinical trial, or a secondary hormone. If initial therapy included abiraterone or enzalutamide, second-line options includes pembrolizumab for MSI-H or dMMR, docetaxel, cabazitaxel, enzalutamide (if not received in initial therapy), abiraterone with prednisone (if not received in initial therapy), abiraterone with methylprednisolone (if not received in initial therapy), participation in a clinical trial, or a secondary hormone. Patients receiving docetaxel for initial therapy have the following second-line options: pembrolizumab for MSI-H or dMMR, cabazitaxel,

enzalutamide, mitoxantrone with prednisone, abiraterone with prednisone, abiraterone with methylprednisolone, another treatment with docetaxel, participation in a clinical trial, or a secondary hormone. If disease continues to progress after a second-line therapy, patient options may include the following (if they were not received for initial or second-line treatments): pembrolizumab for MSI-H or dMMR, cabazitaxel, enzalutamide, mitoxantrone with prednisone, abiraterone with prednisone, or abiraterone with methylprednisolone. Additionally, one may participate in a clinical trial, be retreated with docetaxel, or undergo treatment with a secondary hormone (Mohler et al., 2019).

Farmers.

Across the world, despite those living in rural areas generally having lower prostate cancer incidence rates, these individuals tend to get PSA-tested less often, demonstrate less treatment accessibility and usage, have lower survival rates, tend to be diagnosed with more advanced disease, and have higher death rates, when compared to men living in more urban areas (Dasgupta et al., 2019). Similar patterns exist in the U.S. for prostate cancer and geographic location, with lower incidence and higher mortality rates in rural counties, compared to urban and large central counties (Henley et al., 2017). Rural noncore areas represent the highest prostate cancer mortality rates in the U.S., with rural noncore areas of the Western region of the U.S. having the highest mortality rate of all U.S. regions. The only U.S. region in which rural noncore areas do not make up the highest mortality rate for prostate cancer is the Midwest, where large central areas represent the highest mortality rate (Callaghan et al., 2018). A previous study documented pain and fear of testing results as barriers to getting PSA checked and/or a DRE (Oliver et al., 2011). And once a diagnosis is made, particularly for less-advanced prostate cancer, those living in rural areas are less likely to undergo definitive therapies (i.e., EBRT and/or brachytherapy or radical prostatectomy) compared to their urban counterparts (Baldwin et al., 2013). Farmers and farm-dependent communities make up a much larger portion of the U.S. labor force in

rural counties, or non-MSAs, compared to MSAs, or more populated areas (USDA, ERS, 2017a, 2017c), and a variety of research exists regarding farmers and prostate cancer.

More than four decades ago, via the Third National Cancer Survey Interview Study, U.S. farmers were reported as experiencing excessive cases of prostate cancer, compared to many other occupations (Williams et al., 1977). Over the next several years, farmers and their increased risk of prostate cancer, compared to nonfarmers, was reported in many places around the world (Blair, Dosemeci et al., 1993; Blair, Zahm et al., 1992; Davis et al., 1993), including: Iowa (Burmesiter, 1981), especially among the oldest farmers (Burmeister et al., 1983), British Columbia (Gallagher et al., 1984), North Carolina, but only for those under 65 years-old (Delzell & Grufferman, 1985), Wisconsin, with positive associations between prostate cancer and the sale of dairy products (Saftlas et al., 1987), Illinois (Mallin et al., 1989), Missouri (Brownson, Chang et al., 1988; Brownson, Reif et al., 1989), New Zealand (Reif et al., 1989), Alberta (Fincham et al. 1992), farmers above the age of 70 years in the Netherlands (van der Gulden et al., 1992), younger farmers (i.e., born in 1930 or after) in northeastern Italy (Franceschi et al., 1993), and Kansas (Frey, 1996; Frey & Chen, 1996). Throughout this time, very few studies found a reduced risk of prostate cancer incidence and mortality in farmers versus nonfarmers, which were for farmers in Iceland (Gunnarsdottir & Rafnsson, 1991), Italy, and Denmark (Ronco et al., 1992).

Although the reasons for farmers' excessive risk for prostate cancer was not known early on, Blair and Malke et al. (1985) suggested that lack of screening and later subsequent diagnoses were two possibilities. Additionally, Blair and Zahm et al. (1992) and Davis et al. (1993) urged subsequent studies to identify potential reasons for farmers' increased prostate cancer incidence and mortality risks, focusing specifically on workplace environmental agents such as fertilizer and pesticide use and exposure to dust (inorganic and organic), exhausts from engines and fuels, UV light, solvents, and zoonoses.

A variety of studies would follow the calls to action in the previous paragraph, linking prostate cancer risk among farmers to several different factors. Morrison et al. (1993) identified herbicides as one significant factor increasing the likelihood of prostate cancer death in Canadian farmers. A strong relationship between prostate cancer and wheat farming was found in Central Italian farmers (Forastiere et al., 1993). In a study of Illinois farmers, those producing beef and hay had a higher risk of prostate cancer (Keller & Howe, 1994). In a review study of farmers and prostate cancer risk, pesticides and other commonly-used chemicals in agriculture revealed some associations with prostate cancer incidence and mortality (van der Gulden & Vogelzang, 1996). A meta-analysis by Keller-Byrne et al. (1997) posited that a significant reason for farmers' increased risk of prostate cancer was due to excessive consumption of dietary fat containing herbicide contaminants.

Farmers have shown consistently lower mortality rates than nonfarmers for all cancers combined, as well as for lung, esophageal, other respiratory, buccal (other than lip), liver, and bladder cancer, perhaps due to farmers' tendency to consume less alcohol, to smoke fewer cigarettes, and to accumulate more physical activity (Blair, Malker et al., 1985; Blair, Zahm 1992; Cerhan et al., 1998; Pearce & Reif, 1990). Yet, Cerhan et al. (1998) found that Iowan farmers' increased risk of prostate cancer versus nonfarmers remained, with proportional mortality ratios increasing over time, perhaps due to farmers' increased likelihood to consume more overall calories, more calories from fat and meat products, and fewer calories from fruits and vegetables, as well as engaging in less physical activity, likely due to increased mechanization of farming, larger farms, and fewer livestock farmers. However, after adjusting for lifestyle risk factors, such as dietary and alcohol consumption, as well as smoking, farmers in Iowa had a 70% increased risk of prostate cancer, compared to nonfarmers, suggesting exposure to occupational hazards as a likely culprit to increased risk (Parker et al., 1999). In the same study, increased risk for prostate cancer was evident in those ages 70 and above, and when less-advanced and aggressive prostate cancer cases were excluded from the study, farmers showed an

increased risk, explaining farmers' historically-higher mortality from prostate cancer and suggesting that farmers are typically diagnosed with more advanced and aggressive forms of prostate cancer or the diagnoses of their disease is delayed (Parker et al., 1999).

Going into the new millennium, studies would continue examining farmers and their increased prostate cancer incidence and mortality, but a stronger emphasis was now being placed on finding potential reasons for farmers' increased risk of this disease. In a study examining prostate cancer risk and occupation of deceased individuals from 24 U.S. states, only animal farmers were found to be at an increased risk (Krstev, Baris, Stewart, Hayes et al., 1998). However, in another study, Krstev, Baris, Stewart, and Dosemeci et al. (1998) found farmers to be at an increased risk for prostate cancer, particularly crop farmers and those who had been employed less than five years. A study of adult male deaths taking place over a 34-year period in British Columbia showed farmers and farm managers having a higher risk of prostate cancer death (Buxton et al., 1998). In two studies of Florida farmers with licenses to apply pesticides, these individuals were found to have significantly increased prostate cancer incidence and mortality (Fleming et al., 1999a, 1999b). In a Swedish study comprised of data over a 19-year span, farmers were at a significantly elevated risk of prostate cancer, and the authors stressed the importance of future studies obtaining accurate measurements of occupational exposures and lifestyle risk factors to explain this increased risk (Sharma-Wagner et al., 2000).

At this point, with years of research dedicated to prostate cancer and occupation, displaying farmers' slightly higher risk of prostate cancer, Parent and Siemiatycki (2000) stated that "the study of farmers and their exposures should be of top priority" (p. 141). Thus, studies would continue in the effort to pinpoint specific reasons for farmers' increased risk of prostate cancer. A main finding of a study of Italian farmers showed that those who applied pesticides and those growing fruit (who frequently apply insecticides) had increased risk for prostate cancer (Settimi, Comba et al., 2001). In a Swiss study of cancer and occupation, a significantly positive correlation between socioeconomic status

(SES) and prostate cancer was found, perhaps explained by increased screening among these individuals. However, after adjusting for SES, farmers also revealed a high risk (Bouchardy et al., 2002). Among a large sample of U.S. crop and animal farmers from 26 different states, mortality from prostate cancer was significantly elevated for 15-64-year-olds for both types of farmers, as well as for animal farmers ages 65 and above and all ages combined. Overall, animal farmers had a higher likelihood of prostate cancer mortality than crop farmers, suggesting that animal farmers face greater dangers due to cancer-causing occupational exposures (Lee et al., 2002).

Among Italian crop farmers, Settimi and Masina et al. (2003) found prostate cancer to be more common in farmers applying pesticides containing organochlorine compounds, particularly DDT (1,1,1-trichloro-2,2-di-(chlorophenyl) ethane) and dicofol (2,2,2-trichloro-1,1-di(chlorophenyl)ethanol, with risk increasing as years of dicofol exposure increased. One of the initial Agricultural Health Study investigations examining prostate cancer incidence and pesticide use among private (mainly white farmers) and commercial applicators found all subjects to be at about a 14% increased risk of disease, with commercial applicators at a higher risk than private. Prostate cancer incidence was also higher in white applicators from Iowa, compared to white applicators from North Carolina. Age and family history were significant factors in prostate cancer incidence as well. When adjusted for age and family history, applicators over the age of 50 and use of eight no-longer-approved chlorinated pesticides revealed statistical significance with prostate cancer. For those with the greatest exposure to methyl bromide, a halogenated fumigant, significant prostate cancer increases were also evident. Additionally, there was a significant increase in prostate cancer risk for those with a family history who had also applied five common insecticides (i.e., permethrin, coumaphos, phorate, chlorpyrifos, and fonofos) and butylate, an herbicide (Alavanja, Samanic et al., 2003). At the time, Potti, Panwalkar, and Langness (2003), posited that pesticides may lead to prostate cancer by altering the biomarkers her-2/neu, vascular endothelial growth factor (VEGF), and urokinase plasminogen activator-receptor (UPA-r), and Ejaz and colleagues

(2004) suggested pesticides be considered risk factors for all cancers considered hormone-dependent, which would include prostate cancer.

A subsequent study of Agricultural Health Study subjects found both private and commercial applicators to be at elevated risks of prostate cancer (i.e., excess risks of 26% and 37%, respectively); however, only the private applicators had an increased risk considered statistically significant (Alavanja, Sandler et al., 2005). Also, when examining pesticides, Agricultural Health Study participants exposed to phorate with a family history of prostate cancer showed an increased incidence of prostate cancer (Mahajan, Bonner et al., 2006). Similar results were found for Agricultural Health Study participants with a family history of prostate cancer and who had been exposed to fonofos (Mahajan, Blair, Lynch et al., 2006) and dichlorvos (Koutros, Mahajan et al., 2008), and associations also exist with terbufos and prostate cancer (Bonner, Williams et al., 2010). When examining meat preparation and consumption practices among Agricultural Health Study participants, overall consumption of well-done and very-well-done pan-fried and/or grilled meat was significantly associated with an increased risk of overall, incident, and advanced prostate cancer (Koutros, Cross et al., 2008), perhaps due to genetic issues occurring via exposure to heterocyclic amines (Koutros, Berndt, Sinha et al., 2009).

In general, farmers continue to show increased prostate cancer risk around the world (Ragin et al., 2013). In South Carolina, those who have ever farmed were at a higher risk of prostate cancer than nonfarmers. Other factors related to higher prostate cancer rates among South Carolina farmers were farming less than five years, having last farmed prior to 1960, mixing or applying pesticides, not picking cotton, and being White (Meyer, Coker, Sanderson, & Symanski, 2007). In a study of prostate cancer patients living in several communities in Southwestern Nigeria, nearly 47% of the patients were farmers (Badmus et al., 2010). In British Columbian farmers, those exposed to a variety of pesticides (i.e., DDT, lindane, simazine, endosulfan, dicholine, carbaryl, malathion, dinoseb amine, 2,4-D, and 2,4-DB) showed significantly higher rates of prostate cancer, compared to those not exposed (Band et al., 2010). Another

study of Canadian farmers found those with considerable exposure to pesticides to be twice as likely to have prostate cancer compared to unexposed farmers (Parent et al., 2009). Among a sample of prostate cancer patients in Pakistan, farmers had significantly higher risk of prostate cancer, with red meat and dairy consumption positively associated with prostate cancer (Mahmood et al., 2012). A study of Australian farmers found them to experience significantly higher mortality from prostate cancer compared to the general Australian population (Fragar, Depczynski et al., 2011). The AGRICAN study in France found higher prostate cancer incidence among farmers compared to the general population (Lemarchand, Tual, Levêque-Morlais et al., 2017), particularly among cattle and hog farmers, haymakers, fruit growers, and potato and tobacco farmers via the use of pesticides with these animals and crops (Lemarchand, Tual, Boulanger et al., 2016). In the CanCHEC study, prostate cancer risk was increased among Canadian farmers, particularly those working with livestock (Kachuri et al., 2017). An Australian study found those living on farms to have similar advanced prostate cancer risk as those living in more urban areas; however, both farm and urban residents had higher advanced prostate cancer risk compared to rural nonfarm residents. Additionally, the study noted that having private health insurance was inversely related to advanced prostate cancer but having a higher household income was directly related to advanced prostate cancer. Furthermore, despite similar health screening behaviors, farmers were not as likely as nonfarm residents to visit a primary healthcare provider (Depczynski et al., 2018).

Despite several of the above studies providing support for increased rates of prostate cancer incidence and mortality in farmers compared to nonfarmers, a recent review of several articles demonstrated weaker evidence of these findings. Specifically, farmers had significantly higher prostate cancer incidence and mortality rates in only 22% and 40% of the studies, respectively, and almost 50% of the studies found farmers to be at reduced risk, although these rates were not significant (Depczynski & Lower, 2014). A study of prostate cancer patients in Canada found farmers to be at a reduced risk of prostate cancer (Sauvé et al., 2016). Additionally, even though a great deal of previously mentioned

research has linked prostate cancer in farmers with pesticide exposure, a review of more than a dozen studies concluded that claiming causation between pesticides and prostate cancer was not feasible (Mink et al., 2008). In fact, Ragin and colleagues' (2013) review even found pesticide exposure in farmers and prostate cancer to be inversely related.

In recent Agricultural Health Study research, participants were identified as having significantly higher prostate cancer incidence (Koutros, Alavanja et al., 2010) and mortality, after adjustments for the participants' lower overall death rate (Waggoner et al., 2010). Furthermore, Agricultural Health Study participants exposed to four insecticides (i.e., fonofos, malathion, terbufos, and aldrin) had increased rates of aggressive prostate cancer compared to those not exposed to these pesticides (Koutros, Beane Freeman, Lubin et al., 2013). Overall, participants in the Agricultural Health Study have continued to display significant positive associations between exposures to pesticides and prostate cancer, specifically among participants with a family history of prostate cancer (Lewis-Mikhael et al., 2016).

Koutros, Beane Freeman, and Berndt et al. (2010) found a variety of pesticides, especially many organophosphate insecticides, to play a role in modifying chromosome 8q24 and increasing risk of prostate cancer in Agricultural Health Study participants. Research in the Agricultural Health Study has continued to produce a variety of efforts aimed at identifying the interactions between pesticides, genes, and prostate cancer (Andreotti, Koutros, Berndt et al., 2012; Barry, Koutros, Andreotti et al., 2011; Barry, Koutros, Berndt et al., 2012; C. H. Christensen et al., 2016; Karami et al., 2013; Koutros, Andreotti et al., 2011; Koutros, Berndt, Hughes Barry 2013), as well as genetic regions susceptible to prostate cancer (Berndt et al., 2015; Dadaev et al., 2018; Matejic et al., 2018; Mancuso et al., 2018; Schumacher et al., 2018; Wang et al., 2012). The most recent Agricultural Health Study on cancer incidence found both private and commercial pesticide applicators to have significantly higher risk of prostate cancer compared to the general population, with behavioral and environmental exposures most likely explaining this disparity (Lerro, Koutros, Andreotti, Sandler et al., 2019).

Model of Pathways to Treatment and Time to Presentation

This section aims to explore the appraisal and help-seeking intervals of the *model of pathways to treatment* (see Appendix D), which is a framework devoted to improving patient outcomes by promoting prompt disease diagnosis and treatment (Scott et al., 2013). This model builds upon several previous patient care-seeking models (Andersen, Cacioppo, & Roberts, 1995; Kadushin, 1958; Safer, Tharps, Jackson, & Leventhal, 1979; Suchman, 1965).

History and background.

For patients seeking out a psychotherapist, Kadushin (1958) proposed a five-step decision-making process: (a) recognizing an emotional issue exists, (b) exposing the emotional issue to one's social network, (c) deciding to seek medical help, (d) selecting an institution or profession for help, and (e) selecting a specific healthcare professional for help. Placing particular emphasis on the stage involving the recognition of the existence of an emotional issue, Kadushin (1958) described four common pathways for realizing one has an emotional issue: (a) The issue is brought to the patient's attention by someone else before the patient notices or admits to having an issue, (b) The patient feels they have an issue because of feeling some type of physical pain or discomfort, (c) The patient has conflict in their marriage, and (d) The patient realizes that they have issues due to not feeling happy and being unable work or do things they enjoy.

A few years later, an updated care-seeking decisional framework was proposed by Suchman (1965). In stage one, the patient decides that an issue exists based on his/her physical, cognitive, and emotional experiences and interpretations. During stage two, the patient realizes he/she is ill and requires care from a health professional. The patient will likely require social validation of his/her condition, while also seeking out ways to decrease illness symptoms. In the third stage, the patient searches for and consults with a healthcare provider, resulting in a diagnosis and any potential treatment. Suchman (1965) argued that stage three may best predict future patient health outcomes, since it establishes a foundation for future care and patient actions. It is not until the fourth stage that

the individual with illness becomes a true “patient,” meaning he/she has relinquished control to the healthcare provider, and he/she has agreed to abide by the healthcare provider’s treatment protocol. A variety of potential patient barriers (e.g., social, physical, emotional, and/or administrative) may affect the patient’s willingness and desire to follow treatment procedures, especially the patient-provider relationship. Finally, the patient will enter stage five, where dismissal or withdrawal from active treatment occurs. During this stage, the patient may be released without any need for follow-up care, or perhaps he/she will require periodic or even continual, long-term treatment (Suchman, 1965).

In Safer and colleagues’ (1979) three-stage model, closely reflecting the first three stages of Suchman’s (1965) model, an examination of decision-making factors related to care-seeking and care-delay takes place. *Appraisal delay* (stage one) considers the time (measured in days) from when the patient notices a symptom to when he/she recognizes this symptom as a sign of illness. *Illness delay* (stage two) considers the time from when the patient determines he/she is ill to when he/she makes the decision to seek care. *Utilization delay* (stage three) considers the time from when the patient decides to seek care to when he/she appears at a healthcare facility and utilizes its services. Finally, *total delay* (not considered a stage) considers the time from when the patient notices his/her first symptom to when he/she appears at a healthcare facility and utilizes its services. Safer et al. (1979) found a variety of determinants to impact delay within each stage and across the entire model, which included factors related to physical perceptions/sensations, strategies used for symptom assessment and coping, making illness predictions, conceptual beliefs, emotions, imagery, situation, and sociodemographics. Specifically, appraisal delay was much shorter for patients in a lot of pain and for those not reading about their symptom. Imagining grave consequences of one’s illness and having old symptoms were predictive of longer illness delay. Predictors of a short utilization delay period existed for patients not worried about treatment costs, with significant pain, and who were confident in a cure for his/her symptom. Total

delay was shortest for patients with pain and those without other recent personal life events, changes, or competing issues not related to his/her symptom (Safer et al., 1979).

Expanding on the work of Safer et al. (1979), a four-stage general model of total patient delay was proposed and tested by Andersen and colleagues (1995) with women recently diagnosed with gynecological cancers (i.e., cervical, endometrial, vulvar, ovarian, and vaginal) as well as women seeking a diagnosis for breast symptoms. The first two stages and total delay are defined in the same way as Safer et al. (1979); however, stages three and four help more specifically outline the care-seeking process. *Behavioral delay* (stage three) represents the number of days between the patient deciding to seek medical care and making an appointment with a healthcare provider, and *scheduling delay* (stage four) represents the numbers of days between making an appointment and being seen by a healthcare provider for the first time (Andersen et al., 1995).

In order to measure the psychological and behavioral determinants playing a role in the appraisal delay interval of the female subjects in Andersen et al.'s (1995) study, several principles (i.e., one, three, and five through seven) from the psychophysiological comparison theory (PCT; Cacioppo, Andersen, Turnquist, & Tassinari, 1989) were incorporated and evaluated. Principle one posits that individuals have a motivation to understand his/her symptoms, and principle three denotes that this motivation is related to various symptom characteristics and its potential consequences. Principle five asserts that individuals interpret and understand symptoms based on learned associations, known as *illness prototypes*, which are acquired over a lifetime and allow individuals to link specific symptoms with others having similar signs, certain conditions, and treatment protocols. Principle six assumes that individuals will typically attach his/her symptom(s) with less severe rather than more severe conditions, which is known as *optimistic bias*. The seventh principle predicts that as one's symptoms become more confusing, symptom interpretation by the individual is more likely to fluctuate and be inaccurate (Andersen et al., 1995).

Not surprisingly, for each group of females in Andersen et al.'s (1995) study, the interval with longest delay occurred during the appraisal stage, where individuals are trying to detect bodily changes and interpret whether or not an illness is present. Among the newly-diagnosed gynecological cancer patients, the average total delay was 97 days, with 77 of those days (almost 80%) occurring during the appraisal stage. The patients presenting with breast symptoms had a total delay time of 46 days, with 27 days (nearly 60%) spent in the appraisal stage.

Concerning the assessment of the PCT principles and newly-diagnosed cancer patients, there were several interesting findings. Andersen et al. (1995) found that as symptoms increased, so did the patients' reasons for the symptoms, with more than 93% of these reasons related to normal life occurrences, benign issues and non-life-threatening disorders, and side-effects. Patients having less certainty in her symptom rationale tended to generate additional reasons for the symptoms, which also increased feelings of depression. As feelings of depression, anxiousness, and fear increased, patients showed greater motivation to assess her symptoms. Patients' motivation to assess symptoms also increased as the obviousness and potential consequences of symptoms increased. Normal life occurrences were more likely to be reasons for symptoms than cancer; however, as patients spent more time in the appraisal stage, they became more likely to attribute her symptoms to cancer, which also increased her motivation to seek a diagnosis. Finally, as the specificity of symptoms decreased, the patient was more likely to develop additional reasons for symptoms, which in turn, were more likely to be inaccurate.

Among the patients seeking a diagnosis for breast symptoms, there were also a number of similar, although not identical findings to newly diagnosed patients, in regard to the PCT principles. Symptom reasons in those seeking a diagnosis tended to increase as her certainty of symptoms decreased. Nearly 40% of these individuals expressed cancer as a reason for her symptoms, with other reasons related to having benign issues, regular changes in breast tissue, trauma, normal life

occurrences, and side-effects. Patients showed higher motivation to seek a diagnosis with increasing levels of depression, anxiousness, and fear. Additionally, the motivation to seek a diagnosis increased as the obviousness of disease increased. As the time in the appraisal stage increased, patients became more likely to attribute her symptoms to cancer, which also increased her motivation to seek a diagnosis (Andersen et al., 1995).

Walter et al. (2012) reviewed and critiqued several studies focused on applying Andersen et al.'s (1995) model to cancer diagnosis and treatment initiation, while also proposing an updated and revised framework called the model of pathways to treatment. Concerning Andersen et al.'s (1995) model, Walter et al. (2012) found substantial evidence supporting the importance and incorporation of the appraisal stage in a model for those seeking a cancer diagnosis. However, less support was found for retaining the illness, behavioral, and scheduling stages, largely due to their lack of clear and accurate definitions. Additionally, Walter et al. (2012) recommended that the term *interval* be used in place of *delay*, mainly because delay can vary greatly across the research and may not exist or be very small in some cases. Thus, Walter et al. (2012) proposed a new framework, containing four main intervals: appraisal (a combination of the appraisal and illness delay stages), help-seeking (a combination of the behavioral and scheduling delay stages), diagnostic, and pre-treatment. The *appraisal interval* represents the time elapsed from first noticing a bodily change to acknowledging it as a symptom and a reason to talk with a healthcare provider. The *help-seeking interval* represents the time elapsed from acknowledging the symptoms as a reason to talk with a healthcare provider to the first appointment with the provider concerning the symptoms. The *diagnostic interval* represents the time elapsed from the first appointment with a healthcare provider to the receipt of an official diagnosis, which may include a complex process of events. The *pre-treatment interval* represents the time elapsed from receiving an official diagnosis to the beginning of treatment (Walter et al., 2012).

Walter et al. (2012) made it clear that this model may not always result in linear paths, but rather, there may be times when the patient must re-appraise and/or re-schedule after initially consulting with a healthcare provider. Additionally, an individual may not always begin the process in the appraisal interval, as is the case for cancers detected at routine screenings, which would automatically place the patient in the pre-treatment interval. Overall, the model of pathways to treatment provides a more well-defined framework for studying delays in care-seeking.

Description.

Based on several studies noting the flaws in Andersen et al.'s (1995) model (Petrie & Weinman, 2003; Scott & Walter, 2010; Scott et al., 2013; Walter et al., 2012), the model of pathways to treatment was created (Walter et al., 2012). The model consists of time intervals, defined above, as well as processes and events that may occur prior to possible treatment. Another important aspect of the model are the factors contributing to interval duration; these factors are important in understanding delay related to detection, presentation, diagnosis, and treatment. In addition to describing the model and its constructs in this section, a particular emphasis will be placed on examining patient factors impacting the appraisal and help-seeking intervals, as well as *time to presentation*, which will also involve the incorporation of two additional theories: Leventhal, Meyer et al.'s (1980) common-sense model of illness self-regulation and Bandura's (1986, 1997) social cognitive theory (Scott et al., 2013).

The model of pathways to treatment contains five events that occur throughout cycle of the framework, with four time intervals, specific processes occurring within each time interval, and factors that can contribute to these processes and the duration of each time interval. The first of the five events occurring throughout the model are when an individual notices a bodily change, whether it be a physical feeling, such as being nauseous, or visibly identifying something, such as bloody stools. The second event occurs when an individual acknowledges his/her somatic change as not being normal, but rather as a symptom, while also believing there is a reason to seek care from a healthcare provider. The first

visit (i.e., presentation) to a healthcare provider, whether it be for perceived symptoms or routine preventive screening, marks the third event. The fourth event represents once an official diagnosis has been established. The fifth event signifies when a patient has started treatment, whether it be curative or palliative. A variety of possible scenarios exist for the patient concerning treatment, such as: (a) having additional symptoms after treatment, (b) not obtaining symptom relief after treatment, (c) not being offered treatment, (d) treatment may not be available, (e) symptoms may subside prior to treatment, and/or (f) opting to forego treatment. Depending on the situation, the fluid nature of the model allows for non-linear progression/regression (Scott et al., 2013).

The model also contains intervals, which represent the time elapsed between the above events. The appraisal interval signifies the time period between events one and two. The time elapsed between the second and third event represents the help-seeking interval. The time from event three to event four signifies the diagnostic interval, and the pre-treatment interval represents the time period between the fourth and fifth event. *Time to presentation* is a term representing the time elapsed between the first and third events. *Time to diagnosis* represents the time elapsed between the first and fourth events, and *time to treatment* signifies the time interval from event one to event five (Scott et al., 2013).

During each interval, specific actions related to cognitions, emotions, behaviors, organizations, and structures, may occur, which are termed *processes*. *Patient appraisal and self-management* define the processes occurring throughout the appraisal interval. Once somatic issues are assessed, the individual may attempt to manage his/her issue in several ways (e.g., active monitoring, self-medicating, making lifestyle changes, or searching for layperson assistance). Throughout the self-management process, sociocultural factors are extremely relevant, especially assistance from family members and friends. Referred to as the *decision to consult HCP (healthcare professional) and arrange appointment*, these processes occur during the help-seeking interval. Despite an individual believing there may be a reason to consult with a healthcare provider, this does not mean the individual will decide to seek help,

nor does it mean he/she wants or intends to seek help. Additionally, things like employment, responsibilities related to caring for others, healthcare expectations, and healthcare convenience play important roles in the help-seeking process (Scott et al., 2013).

HCP appraisal, investigations, referrals and appointments define the processes occurring during the diagnostic interval. During this interval, the healthcare provider first assesses the patient to decide about the potential diagnosis, which may also involve further testing and/or referrals to other healthcare providers. The eventual outcome of this diagnostic process has the potential to be inaccurate, incomplete, or dismissed. Additionally, the patient may need to attend multiple appointments and/or have further testing, a process that relies on the healthcare institutions' organization and availability, as well as the patients' views and acceptance (Scott et al., 2013).

Finally, during the pre-treatment interval, the processes occurring are termed *planning and scheduling of treatment*. During this process, discussions about treatment options occur, with subsequent treatment planning and scheduling. The healthcare institutions involved, as well as the patients' views and desires, are important in this process. Additionally, when treatment is not warranted or desired, the pathway of the model would not proceed to treatment initiation (Scott et al., 2013).

Influencing and mediating the above processes and intervals are *contributing factors*, specifically known as *patient factors, healthcare provider and system factors, and disease factors*. Individual patient characteristics, accompanying illnesses, prior experiences, and sociocultural and psychological factors are related to the patient. Elements related to how healthcare is accessed, delivered, and legislated concern healthcare provider and system factors. How a disease is assessed, both clinically and physiologically (e.g., location, growth, and development), represent disease factors. The three major categories of contributing factors impact the model of pathways to treatment prior to the first event and beyond the fifth event, while also influencing the way individuals move through the model, such as the direction and rate. To further understand contributing factors and how they impact the processes

and intervals of the model of pathways to treatment, two health behavior theories, the common-sense model of illness self-regulation (Leventhal, Meyer et al., 1980) and the social cognitive theory (Bandura, 1986, 1997) will be applied into the appraisal and help-seeking intervals and described next (Scott et al., 2013).

The common-sense model of illness self-regulation is most applicable to the appraisal interval of the model of pathways to treatment. Regarding the common-sense model of illness self-regulation, once an individual detects a somatic change, he/she immediately assesses the impact of the change. Expected changes not interfering in the life of the individual are typically dismissed as normal; however, unexpected changes which do interfere in the life of the individual are usually deemed an abnormal symptom. Once a bodily change is recognized as a symptom, a variety of rules (i.e., heuristics) are utilized to form illness representations, which can be cognitive and/or emotional, and impact the individual's decisions in seeking care (Scott et al., 2013).

The efforts of the individual to respond to the cognitive and emotional symptom(s), such as self-treating or getting help, are part of the coping processes in the common-sense model of illness self-regulation. Coping strategies are typically utilized to control the actual symptom(s), known as danger control; however, fear control is another coping technique, which aims to decrease the negative feelings towards the symptoms. Assessing the effectiveness of coping strategies is an important part of the self-regulation process occurring in this model. For example, deciding that help is needed may take place when appraising the coping strategies as not alleviating symptoms. Important to this self-regulation process are one's social network of influence (Scott et al., 2013).

In order to understand the processes taking place throughout the help-seeking interval of the model to pathways to treatment, the social cognitive theory (Bandura, 1986, 1997) provides an important theoretical framework (Scott et al., 2013). *Self-efficacy*, the primary construct of the social cognitive theory, can be defined in terms of the model of pathways to treatment and its help-seeking

interval as an individual's perceived ability to consult with a healthcare provider about his/her symptoms. Personal and institutional barriers can impact one's self-efficacy to seek help (Scott et al., 2013).

Another key construct from the social cognitive theory impacting help-seeking in the model of pathways to treatment are *outcome expectations*, which represent one's perceived consequences of acting in a certain way (Bandura, 1997; Scott et al., 2013). Physical, social, and self-evaluative outcome expectations are related to beliefs that can impact one's decisions to seek or not seek help (Scott et al., 2013). *Physical outcome expectations* represent beliefs about how help-seeking may improve or not improve physiological and/or emotional symptoms. *Social outcome expectations* relate to beliefs about how one's social network will respond and react to and perhaps sanction the behaviors of either seeking or not seeking help for abnormal symptoms. *Self-evaluative outcome expectations* represent how an individual reacts to his/her decision to either seek or not seek help. In this case, decisions that breed feelings of increased self-worth and self-satisfaction are most likely to occur (Bandura, 2004; Scott et al., 2013).

Application and use during cancer symptom appraisal, help-seeking, and time to presentation.

Since the introduction and description of the model of pathways to treatment (Scott et al., 2013; Walter et al., 2012), several studies have applied the model to research related to cancer. Rarely do individuals, especially men, older individuals, and those of lower SES, appraise serious symptoms as cancer (Whitaker, Scott, & Wardle, 2015; Whitaker, Scott, Winstanley, Macleod, & Wardle, 2014). Cultural and spiritual beliefs, as well as social network influence and knowledge of patients and healthcare professionals can lengthen the appraisal of cancer symptoms as well, as seen in a study of women from Ghana diagnosed with advanced breast cancer (Bonsuid & Ncama, 2019). In the case of a cancer such as melanoma, having patients illustrate the appearance of the lesion(s) may assist in the symptom appraisal process (Scott et al., 2015). A recent study found heuristics as playing important

roles in symptom interpretation/misinterpretation for several different cancers (i.e., prostate, colorectal, breast, pancreatic, oral, lung, and melanoma), especially for symptoms that increase and/or worsen and last for prolonged periods of time. Specifically, for individuals with symptoms of prostate cancer, heuristics providing support for symptom interpretation/misinterpretation were the following rules: rate of change, duration, chronology, severity (of interference), novelty, age-illness, similarity, location, and optimistic bias (Kummer et al., 2019).

Similar to the appraisal interval, a variety of factors can impact the help-seeking interval. In a study of men and women presenting to several healthcare providers with symptoms of colorectal cancer, the desire to maintain a “normal” life via symptom rationalization, viewing colorectal symptoms as private matters, not wanting to waste a healthcare provider’s time, and symptom expectations played key roles in the help-seeking process, along with sociocultural, psychological, biological, and contextual influences (Hall et al., 2014). For those presenting with a variety of symptoms indicative of cancer, qualitative results showed help-seeking was positively influenced by ongoing symptoms, instinctual personal perceptions, the input and advice of others, fearing cancer, and awareness programs. Rationalizing symptoms as benign, being stoic, fearing cancer and its subsequent impact, not wanting to waste a healthcare provider’s time, and lacking trust in the healthcare system were factors resulting in help-seeking delays (Whitaker, Macleod, Winstanley, Scott, & Wardle, 2015). A follow-up quantitative study by Whitaker, Smith, Winstanley, and Wardle (2016) found that of patients presenting with cancer symptoms, help-seeking was the most likely result when symptoms were perceived as concerning and interfering in one’s daily life, such as having an inexplicable, unusual lump and/or ongoing, unusual pain. Being older, living with a spouse/significant other, and not working were also predictors of quicker help-seeking. Delays in help-seeking are also common in individuals who have previously received an “all-clear” diagnosis for cancer symptoms, which can increase the patients’ likelihood of normalizing future cancer symptoms as benign and also feeling a lack of support and/or

concern by healthcare providers (Renzi, Whitaker, & Wardle, 2015; Renzi, Whitaker, Winstanley, & Wardle, 2016).

In a review of studies dealing focused on help-seeking among men, delays were typical due to men having relationship and communication issues with healthcare providers, minimizing symptoms as unimportant or minor, being unwilling to share emotions and/or appearing vulnerable, and feeling fearful, anxious, distressed, and/or embarrassed about the utilization of healthcare services (Yousaf, Grunfeld, & Hunter, 2015). Quality of life is another factor impacting help-seeking among individual with symptoms of cancer. When compared with individuals seeking guidance on lifestyle behaviors to decrease risk of cancer, those with cancer symptoms tend to have a lower psychological and physical quality of life prior to consulting with a healthcare provider. Additionally, the extent to which physical cancer symptoms impact one's quality of life seem to be a key factor in predicting help-seeking (Gartland, Long, & Skevington, 2019).

A variety of studies have reported on time to presentation, which combines the appraisal and help-seeking intervals. Feelings of worry and fear in those with cancer symptoms seemed to act as motivators and deterrents for consulting with a healthcare provider (Balasooriya-Smeekens, Walter, & Scott, 2015). Among populations of lower SES who have cancer symptoms, McCutchan, Wood, Edwards, Richards, and Brain (2015) found that time to presentation appeared to be longer for those lacking knowledge related to symptoms, those expressing fear and negative beliefs about cancer, and those with additional barriers (e.g., being embarrassed to undergo particularly private procedures, feeling worried about wasting a provider's time, and struggling to access and schedule appointments). Time to presentation was generally shortened with prolonged and/or new symptoms, as well as when revealing symptoms to family and/or friends. Among a sample of primarily white, high SES women, with symptoms indicative of gynecological cancer, factors which lengthened time to presentation were the normalization of symptoms, the attribution of symptoms to previous medical experiences, the dismissal

of cancerous symptoms as benign, self-managing symptoms, obtaining advice and guidance from a social network of friends and family, having other competing life priorities, being worried about wasting a healthcare provider's time for short-term and/or "non-serious" symptoms, having issues with appointment scheduling, and having a male healthcare provider (Low, Whitaker, Simon, Sekhon, & Waller, 2015). Among newly-diagnosed cervical cancer patients in Uganda, time to presentation was longer for those misattributing severe symptoms as normal physiological changes (e.g., menopause or aging), as sexually transmitted infections or HIV/AIDS, because of hormonal contraceptive use, having a low perceived susceptibility to cervical cancer, being misdiagnosed or mistreated by a healthcare provider, and/or having competing life demands (Mwaka, Okello, Waginga, & Walter, 2015). A study of South African females recently diagnosed with breast cancer found that low knowledge and risk perception, misinterpretations of symptoms, negative community beliefs and attitudes, low healthcare accessibility, and various life commitments, all played important roles in longer times to presentation (Moodley, Cairncross, Naiker, & Momberg, 2016).

An analysis of cancer patients in England found that nearly a quarter of patients presented to a healthcare provider with abdominal symptoms, which were most often related to colorectal, esophageal, ovarian, or pancreatic cancers. Time to presentation was longest (i.e., a median of 30 days) for those having a hard time swallowing and those with bowel habit changes, while it was the shortest (i.e., a median of 7 days) for those with pain in the abdomen or those suffering from vomiting/nausea (Koo et al., 2018). A study of patients in the UK with symptoms indicative of colorectal or lung cancer found that time to presentation was shortest (i.e., less than one week) in those with pain and bleeding symptoms, while the longest time to presentation (i.e., more than two months) occurred for those with a wider variety of more symptoms, seen as more progressive in nature. Like several of the studies in this section, time to presentation was mediated by individuals' previous experiences with illness, hazardous exposure episodes, and/or family history, as well as one's social network, relationships with healthcare

providers, daily responsibilities, social status, and exposure to public health awareness messages (Dobson, Russell, Brown, & Rubin, 2018).

The study that most reflects the topic of this paper is by Emery et al. (2013), which quantitatively and qualitatively assessed the appraisal and help-seeking intervals of the model of pathways to treatment, as well as time to diagnosis, for 66 rural Australian individuals with either prostate, breast, lung, or colorectal cancer. The appraisal of prostate cancer symptoms was longer than those with lung cancer symptoms, and time to diagnosis for prostate cancer was longer than breast cancer. Symptom appraisal and help-seeking were influenced by symptom characteristics and interpretation, risk perception, everyday duties and tasks, and attitudes and beliefs about the healthcare system. Time to presentation was shorter in those experiencing more acute, severe symptoms, such as trouble breathing, pain, a lump in the breast, and blood in the urine. Symptoms such as bloody stools, coughing up blood, as well as not having pain and/or having only one symptom, were associated with extended times to presentation. Misinterpretation and normalization of symptoms also resulted in longer times to presentation, as well as patients displaying lower perceived risks for specific cancers. Patients viewing themselves as healthier than they really were showed an increased likelihood towards rationalizing symptoms as benign and less severe. Excessively optimistic perceptions about one's health also resulted in increased propensities for macho and stoic behaviors, especially in men, who tended to portray high degrees of traditional rural masculinities. Time to presentation was also prolonged when everyday responsibilities were not interrupted or negatively disrupted by symptoms. Patients with fearful and/or embarrassing feelings towards cancer diagnostic and treatment procedures, especially those with prostate, breast, and colorectal symptoms, showed delayed times to presentation as well. Confiding in one's social network resulted in both shorter and longer help-seeking intervals, depending on these individuals' abilities to motivate or prolong help-seeking. Finally, actual and perceived issues with the healthcare system impacted timely help-seeking. Shortages of healthcare

providers, patient worries related to wasting healthcare providers' time, issues with healthcare continuity, and living long distances from healthcare providers, were all detrimental to help-seeking and timely presentation (Emery et al., 2013).

Among prostate cancer patients in Emery et al.'s. (2013) study, time to presentation was delayed due to factors such as rationalizing/normalizing symptoms by talking with others who had/have similar issues, being fearful of medical procedures, practicing macho and stoic behaviors, not wanting to sacrifice work time, and having symptoms that did not interrupt work time. For example, one patient demonstrated being fearful of having a DRE while also showing machismo by saying, " 'I didn't want to go to the doctors [*sic*], I didn't want to go and get a finger shoved up me bum. . . . I feared it. And, for that reason and talking to all the blokes at work . . . they said they'd never get that done' "(Emery et al., 2013, p. 298). Another patient indicated how working as a farmer took precedence over prostate cancer symptoms by stating the following:

I've worked for myself 90 percent of my working life. And you don't take time off 'cause you're crook [*sic*]. . . . You just don't do it. . . . You could be bloody dead on your feet. You know, I've been, you know, spikes in my legs, I've been knocked over by cattle and can't . . . walk but you've got to keep working. (Emery et al., 2013, p. 298)

Perceiving oneself as robust and youthful, misattributing symptoms as less severe based on friends' experiences and accounts, and not having work disruptions due to symptoms (e.g., being able to urinate often outside behind a shed), played other important roles in later times to presentation for prostate cancer patients in Emery et al.'s. (2013) study.

In order to help decrease the times to presentation and diagnosis for cancer patients in rural Western Australia, Emery et al. (2017) developed, implemented, and evaluated the Improving Rural Cancer Outcomes (IRCO) randomized controlled trial. To the author's knowledge, this is the only recent intervention in the literature that has targeted rural individuals with prostate, breast, lung, or colorectal

cancer, while also utilizing the model of pathways to treatment framework. The IRCO trial, delivered two types of interventions for a little more than two years, with one intervention focused on community cancer awareness and the other intervention taking place with general practice medical facilities. Each intervention was designed and tailored to particularly address the issues of machismo and stoic attitudes towards help-seeking for cancer symptoms. Surprisingly, of the 1,358 prostate, breast, lung, and colorectal adult patients participating in the study, there were no significant effects of the interventions on patients' times to presentation, referral, or diagnoses, when compared with their corresponding community and general practice control groups.

Moustakas and Transcendental Phenomenology

This section provides an overview of Moustakas' (1994) book titled, *Phenomenological Research Methods*. In this work, Moustakas (1994) details a transcendental phenomenological model, highly influenced by Edmund Husserl (Welton, 1999), describing and demonstrating the various steps and processes involved in this approach. While transcendental phenomenology shares many commonalities with other qualitative methods, there are distinct differences. First, transcendental phenomenology involves the Epoche process, where in order to collect information from participants about phenomena in the most open, nonjudgmental manner possible, the researcher attempts to separate preconceived notions, personal knowledge, and beliefs about the specific phenomenon being studied. For researchers to depict and convey the essences of others' experiences, transcendental phenomenology also relies on the intuitiveness and self-reflective nature of the participants, in order that emotional, physical, cognitive, and perceptual aspects of the experiences are evoked (Moustakas, 1994).

Moustakas (1994) defined transcendental phenomenology as "a scientific study of the appearance of things, of phenomena just as we see them and as they appear to us in consciousness" (p. 49). Many critical concepts form the foundation for Moustakas' (1994) approach to transcendental phenomenology. *Intentionality* concerns the intentional relationship between acts and objects (real or

imaginary) of consciousness, inherently combining both noema and noesis, which constitute external and internal perceptions, respectively (Gurwitsch, 1967; Husserl, trans. 1931). One's *consciousness* focuses on *objects* in an intentional way, and *signitive* (i.e., empty) and *intuitive* (i.e., full) *acts* of consciousness are the *intentional experiences* shaping the meaning and themes of phenomena (Brentano, trans. 1973; Husserl, trans. 1970b; Moustakas, 1994). *Perceptions*, also referred to as *horizons*, include the limitless intentions and feelings of the individual regarding the object and experiences (Husserl, trans. 1970b; Moustakas, 1994). *Noema* relates to various meanings (i.e., noematic phases) of the *textures* of what one experiences, while *noesis* relates to the various meanings of the *structures* of how one experiences something (Husserl, trans. 1931; Ihde, 1977; Keen, 1975; Moustakas, 1994). Intuition is important as one proceeds through the process of noema, as this provides a solid first impression of intentional experiences (Blom, 1977; Husserl, trans. 1931; Moustakas, 1994), but noesis incorporates more profound thinking, judgement, imagination, and reflecting to derive essences and meanings (Moustakas, 1994). During phenomenological studies, a shifting occurs from initially noematic, intuitive, and textural perceptions of phenomena to deeper noetic and structural self-reflections, which ultimately integrates ones' perceptions in order to provide layers of meaning and richness to conscious experiences of phenomena (Moustakas, 1994). *Intersubjectivity* is another component of transcendental phenomenology that underscores the value of practicing empathy in learning about others. In striving to discover truths about others, one must not forget the importance of his/her own individual perceptions and knowledge (Husserl, trans. 1970a), for "in the end only self-evident knowledge enables us to communicate knowingly with each other" (Moustakas, 1994, p. 58).

In addition to the above concepts inherent in transcendental phenomenology, there are several important processes to follow when researching phenomenologically. First, one must engage in the Epoche process, which involves a purification of conscience, whereby the researcher sets aside all prejudices, stereotypes, biases, and preconceptions about a particular phenomenon, in order to

authentically and naively hear, listen, see, think, feel, and imagine the phenomenon, as if it were the first time (Moustakas, 1994). Secondly, one must complete the steps involved in *phenomenological reduction*. The first step, known as *bracketing*, involves the researcher placing the research topic and questions in brackets, while setting aside all other aspects. *Horizontalization* is the next step, which treats each statement by research participants as equal. Next, statements not pertaining to the research topic and questions are omitted, which results in a retainment of *horizons*, or meaningful textural descriptions of phenomena. The final two steps involve grouping horizons in order to establish themes and then establishing horizons and themes into meaningful textural explanations (Moustakas, 1994).

A third major process in transcendental phenomenology is *imaginative variation*, which requires the researcher to employ imaginative and creative interpretation in order to develop structural descriptions of experiences. Four steps are involved in imaginative variation:

1. Systematic varying of the possible structural meanings that underlie the textural meanings;
2. Recognizing the underlying themes or contexts that account for the emergence of a phenomenon;
3. Considering the universal structures that precipitate feelings and thoughts with reference to the phenomenon, such as the structure of time, space, bodily concerns, materiality, causality, relation to self, or relation to others; [and]
4. Searching for exemplifications that vividly illustrate the invariant structural themes and facilitate the development of a structural description of the phenomenon. (Moustakas, 1994, p. 99)

The final phenomenological reduction process involves synthesizing textural and structural descriptions into clear, integrated essences that summarize the complete phenomenological experience (Moustakas, 1994).

After extensive literature searches by this author over several different databases, there are no studies which have utilized Moustakas' (1994) phenomenological model of data collection and analysis to study time to presentation for farmers with prostate cancer. However, one study (a master's thesis) does utilize qualitative approaches, naturalistic inquiry (Lincoln & Guba, 1985) and grounded theory (Strauss & Corbin, 1998), to explore six rural Canadian farmers' lived experiences after being diagnosed and treated for prostate cancer (Gronvold, 2004).

Summary

On average, men live close to five years less than women globally and in the U.S., with NCDs such as CVD, cancer, CRDs, and diabetes as the primary culprits of disease and death, which tend to be associated with several modifiable risk factors (i.e., smoking tobacco, unhealthy diet, physical inactivity, alcohol abuse, obesity, and high blood pressure, glucose, and cholesterol). In the U.S., men have significantly more of these risk factors than women, also with higher overall risk for disease, disability, injury, and death.

Gender is the most important determinant of men's health, with traditional and hegemonic masculinity characteristics playing pivotal roles in men's riskier and less healthy beliefs, behaviors, and attitudes. Considering demographics, rural men demonstrate more traditional, hegemonic, and rural masculinity characteristics, which tend to result in worse morbidity and mortality outcomes, when compared to men and women living in more urban areas.

Of men living in rural areas, farmers enact the most traditional, hegemonic, and farming masculinity characteristics. The concepts, masculine farmer and farmer masculine, may help depict how masculinity is formed and demonstrated in farmers and how farming helps depict characteristics and conceptions of masculinity, respectively. Two factors, such as voting behaviors and media portrayals of farmers further demonstrate how farming masculinities may be regarded as some of the most traditional and hegemonic in U.S. society.

Farming is considered one of the most dangerous, debilitating, and deadly jobs in the U.S. The suicide, illness, and physical injury and death rates of farmers are higher than all other occupations. Some of the most common health issues among farmers are related to respiratory, skin, musculoskeletal, hearing, and pesticide exposure conditions, with farmers displaying a severe lack of PPE and overall safety use. Two of the most common farming injuries resulting in debility and death are due to tractor overturns and PTO accidents.

Although men tend to suffer higher rates of morbidity and mortality than women throughout the world, they remain much less likely to seek out help for mental and physical health problems. Masculinity beliefs and practices, as well as occupation and urbanization levels, impact the level of help-seeking among men, even more so than healthcare accessibility, affordability, income level, and overall health status. Those who seek help the least for health issues, as well as those who practice the most traditional and hegemonic forms of masculinity tend to be farmers.

Male farmers are generally in favorable positions for having healthcare coverage, since most are non-Hispanic whites, 55-64 years of age, married, and have household incomes greater than \$75,000. Even though rural U.S. residents tend to have higher rates of a primary care provider than urban residents, male farmers are significantly less likely to have a primary care provider than female farmers and rural nonfarming men and women. Thus, there are stronger factors, other than having health coverage and a primary care provider (e.g., hegemonic, traditional, and farming masculinities), influencing the help-seeking beliefs and behaviors of farmers.

The research shows that farmers tend to view help-seeking for mental and physical health issues as unacceptable, shameful, embarrassing, and detrimental to the farm's operation. Rather, when experiencing mental and/or physical health issues, farmers prefer to embrace traditional and hegemonic masculinity characteristics such as being self-reliant, independent, and stoic, in order to appear as a "sturdy oak."

Farmers' adoption and practice of traditional and hegemonic masculinity traits seems to result in receiving fewer preventive health screenings, particularly for colorectal, skin, and prostate cancer. Studies of U.S. farmers show lower PSA testing rates when compared to rural male nonfarmers, which can result in more late-stage diagnoses and fatality due to prostate cancer.

Prostate cancer is the most common form of cancer in most countries in the world, including the U.S., where one in nine men are predicted to be diagnosed in a lifetime. Also, prostate cancer is the second-deadliest cancer in the U.S. Black men are significantly more likely to be diagnosed and to die from prostate cancer than white men. Prostate cancer incidence rates have been declining for the past 20 years, despite the increases in aggressive forms of disease and distal diagnoses in white, older men.

Prostate cancer survival rates in the U.S. are very high, especially when localized or regional. Considering all stages of disease, prostate cancer has a 10-year survival rate of 98% in the U.S. Only when the disease has metastasized to distal locations, does the survival rate decrease significantly. Globally, survival rates range anywhere from 70-100%.

Although specific causes of prostate cancer are not well-known, there are various non-modifiable and modifiable risk factors influencing susceptibility to disease. Age, being of African or Caribbean descent and living in the U.S., having a family history, and being tall, are all uncontrollable factors increasing risk of prostate cancer. The highest prostate cancer incidence death rates in the world are typically seen in U.S. or Caribbean men of African descent and those living in sub-Saharan Africa, likely due to genetics, ancestral history, and a variety of other sociocultural, behavioral, environmental, and healthcare factors.

The most common modifiable risk factors for prostate cancer are obesity, unhealthy diet smoking tobacco, consuming alcohol, carcinogen exposures, STIs, vasectomies, prostate inflammation, sex hormones, and insulin-like growth factor and insulin. Controlling some of these factors, such as

eating a healthy diet, consuming less alcohol, not smoking, maintaining a healthy weight, and practicing safe sex are some ways to decrease risk of prostate cancer.

No major health organizations recommend average-risk men getting regularly screened for prostate cancer. However, average-risk men are urged to undergo an informed decision-making process with his healthcare provider, in order to make the most beneficial decision about getting screened. Urinary symptoms are the most typical prostate cancer symptoms, with LUTS being most common for more advanced disease, although LUTS are possible for benign prostate issues. Advanced disease and/or metastasis may also occur before the presence of LUTS, with sexual symptoms, bone pain, especially in the back, hips, pelvis, and the perineum, loss of appetite, weight loss, and extreme tiredness.

In order to officially diagnose someone with prostate cancer, a needle biopsy must be performed. With a normal DRE and PSA level under 1.0 ng/mL, men ages 45-75 are advised to undergo PSA testing every two-to-four years. With a normal DRE and PSA level between 1.0 and 3.0 ng/mL, PSA testing should occur every one-to-two years for 45-75-year-olds. PSA levels above 3.0 ng/mL and a concerning DRE should result in repeat-testing for PSA levels, and a biopsy is encouraged for those with PSA levels above 3.0 ng/mL. Before a biopsy, healthcare providers should consider the age, race, family history, health status, preferences, and PSA kinetics of the patient. Men ages 75 and above should only have PSA testing when they are considered very healthy, and they should be screened every one-to-four years when PSA levels are less than 4.0 ng/mL and DRE is normal. When PSA levels are above 4.0 ng/mL and there is a concerning DRE, PSA testing should be repeated, and a biopsy should be considered if the repeat PSA levels is above 4.0 ng/mL. For all ages of men with troubling repeat PSA levels, other biomarker tests and MRI should be considered before proceeding to biopsy.

After a prostate cancer diagnosis is made, the patient should be placed into a risk group, which is based on TNM staging, Gleason grading, DRE, radiography, and PSA level. The appropriate treatment is established once the cancer is properly classified and characterized. Active surveillance, surgery,

radiation, hormonal therapy, chemotherapy, and vaccination are some of the most common treatments for prostate cancer. Active surveillance is a typical option for older individuals with less-aggressive, earlier-stage cancers; whereas surgery, radiation, chemotherapy, and/or hormones are more suitable for more aggressive cancers that may have spread. Prostate cancer that does not respond to hormonal therapy may also be treated with vaccination.

Rural men in the U.S. and throughout the world have lower prostate cancer incidence than urban men, but higher prostate cancer mortality rates. Small, non-core rural areas account for the highest rates of prostate cancer mortality in the U.S., except in the Midwest, where large central region rates are the highest. Rural populations are also less likely to receive curative treatments than urban populations.

Although farmers have consistently shown decreased incidence and death rates for all cancers combined and several other types of cancer (i.e., esophageal, respiratory, mouth [other than lip], liver, and bladder), findings indicating increased risk of prostate cancer incidence and death in farmers extends back at least four decades, with few studies concluding otherwise. The infrequency of obtaining prostate cancer screenings and being diagnosed at later stages are potential factors in farmers' increased risk. Over time, studies revealed that various types of farming and related environmental exposures, namely pesticides, and behavioral factors could be associated with increased prostate cancer incidence and death.

The primary aim of this study is to describe and understand Indiana farmers' lived experiences with appraising and seeking help for prostate cancer symptoms, and being diagnosed and treated for prostate cancer, while also exploring masculinity beliefs. Using the model of pathways to treatment, time to presentation, diagnosis, and treatment will be studied using a transcendental phenomenological approach for data collection and analysis methods.

Chapter Three: Research Methods

The Qualitative Paradigm

Creswell and Creswell (2018) referred to paradigms as worldviews, which are philosophies researchers embrace that are typically determined by the researchers' academic fields of study, mentor influences, and previous experiences and exposures to research. Postpositivism, constructivism, transformatism, and pragmatism are the four most common research worldviews (Creswell & Creswell, 2018). In this proposal, the researcher embraces the constructivistic worldview.

A (social) constructivistic worldview is common in qualitative research, especially phenomenology, whereby the researcher is concerned with obtaining a deeper knowledge of others' lived experiences. The varied, subjective, and essentially limitless meanings research participants attach to their experiences are then interpreted by the researcher, who place extreme importance on the participants' views of the issue being discussed. Typically, via interviews between researchers and participants, open-ended and general questions are asked, so that participants can best derive meanings from experiences. Sociohistorical and sociocultural factors impact the meanings participants attach to experiences, thus researchers typically explore the interactions participants have with others in a variety of contexts. The individual experiences of the researcher also impact and shape his/her interpretations of participants' meanings, which the researcher acknowledges and embraces, with the intention of best conveying others' meanings of the world. Via a constructivistic worldview, researchers use induction to generate theories (Creswell & Creswell, 2018; Creswell & Poth, 2018).

Three major assumptions are associated with a constructivistic worldview. First, an interaction with the world must occur for humans to construct meanings and interpretations of experiences. Via the use of open-ended prompts and questions, qualitative researchers can best arrive at participants' views. Second, qualitative researchers understand that individuals' meanings of experiences are constructed by sociohistorical and sociocultural factors and contexts. Thus, importance is placed upon understanding participants' settings through the qualitative researcher personally collecting data in these contexts. The

researchers' interpretations of these data are guided by his/her own sociohistorical and sociocultural contexts. The third assumption of a constructivistic worldview is that all meanings of experiences are rooted in human social interaction. Therefore, meanings are constructed as data and collected in specific contexts, allowing the qualitative researcher to generate theories inductively (Crotty, 1998).

Qualitative Methods

Qualitative research methods are considered emergent, meaning the aim of the researcher is to allow information to emerge from the participants throughout the process of collecting data. Interviews with open-ended questions, observations, documents, and other audiovisual materials can produce qualitative data. From this data, images and text can be analyzed, categorized into themes, and then interpretations are made about themes (Creswell & Creswell, 2018).

The main approach of this study was qualitative and employed a phenomenological design, which has philosophical and psychological underpinnings, where the researcher was concerned with describing the lived experiences of individuals about a shared phenomenon as portrayed by the research participants. Descriptions of these lived experiences were then interpreted into essences for the research participants experiencing the phenomenon (Creswell & Poth, 2018; Giorgi, 2009; Moustakas, 1994; van Manen, 1990). Rooted within phenomenology are key philosophical bases, which are: a) emphasizing a return to the traditional philosophical objective of searching for understanding, b) suspending all prejudices and stereotypes about what one may think is real, c) understanding and embracing intentionality, and d) accepting only what an individual perceives as real (Stewart & Mickunas, 1990).

Two major types of phenomenology exist in the literature (Creswell & Poth, 2018). Van Manen (1990) proposed hermeneutical phenomenology, which focuses on interpretations of the lived experiences of others. Although no set guidelines or rules exist to this approach, the researcher must possess a strong interest in and desire to investigate a phenomenon, be able to identify and describe

key themes, and write an interpretive portrayal of the phenomenon (van Manen, 1990). Moustakas' (1994) transcendental/psychological phenomenology, the design used in this study, differs from van Manen (1990) in that more emphasis is placed on research participants' experiential descriptions and meanings and less on the researcher's interpretations of these experiences. Additionally, the practice of Epoche is of utmost importance; Epoche forces the researcher to set aside preconceived notions and judgements about a phenomenon. Once a phenomenon of study has been selected and Epoche has occurred, data is collected from a variety of individuals experiencing the same phenomenon. Data analysis involves finding themes by categorizing important quotes of the research participants. Finally, the researcher provides descriptions of *what* the research participants experienced (i.e., textural), descriptions of *how* they experienced it (i.e., structural), and combines textural and structural descriptions to provide a general essence of the phenomenon (Moustakas, 1994).

In addition to the above qualitative design, this study also incorporated a quantitative approach by administering the 21-item MRNI-SF questionnaire (see Appendix E) to the research participants, in order to assess overall beliefs related to TMI, as well as AoF, NTSM, SRMS, T, Dom, IoS, and RE. These constructs are related to traditional masculine norms in Western society. The MRNI-SF contains strong psychometric properties and can be completed rather quickly by research participants (Levant et al., 2013). Permission from the author for using the MRNI-SF was necessary in order to access and use the instrument, so please see Appendix F for the completed permission form.

Data Collection and Recruitment Procedures

The research participants of this study were either members or had affiliations with members of two Indiana churches or were regular patrons of an Indiana deli and convenience store and also identified as farmers who had been diagnosed with prostate cancer. The phenomenon of study was primarily time to presentation, diagnosis, and treatment for prostate cancer, which assessed the appraisal, help-seeking, diagnostic, and pre-treatment intervals of the model of pathways to treatment

for farmers with prostate cancer, as well as the participants' experiences with treatment. Participants' levels of endorsement of beliefs related to traditional masculinity were also examined via the MRNI-SF.

In order to launch this transcendental phenomenological study, the author first underwent the Epoche process, where he set aside all preconceived notions, biases, stereotypes, and judgements about the phenomenon. The aim was to approach the phenomenon with a naïve, open, and pure mind. Next, the researcher performed the first step of phenomenological reduction, known as bracketing. This involves placing the research topic and questions in brackets and placing all other items outside and away from the topic and questions of the study (Moustakas, 1994).

Phenomenological data collection usually relies on extended, in-depth, open-ended, and multiple interviews with three to as many as 25 research participants who have experienced the same phenomenon (Creswell & Creswell, 2018; Moustakas, 1994; Polkinghorne, 1989). In addition to interviews, qualitative data from other texts, images, audiovisual materials, and observations can be collected (van Manen, 1990); however, interviews are the most common method of collecting phenomenological data (Creswell & Poth, 2018; Moustakas, 1994). Regarding interviews, even if the researcher develops a set of questions prior to conducting the interviews, these questions may be changed, omitted, and/or varied, depending on the research participants' account of the experiences related to the research questions. A general interview guide, with broad questions, may help to evoke rich responses from the research participants. Some topics to include in this question guide, in order to obtain deeper information about the experiences with the phenomenon, would include the following: important people and events connected to the experiences; how the experiences changed him/her and/or other important people in his/her lives; and what thoughts, feelings, and/or physical changes occurred as a result of the experiences. Most importantly, interview questions should relate to the research participants' experiences with the phenomenon and different circumstances or settings

impacting these experiences, which will ultimately produce textural and structural descriptions of the experiences (Creswell & Poth, 2018; Moustakas, 1994).

In order to develop rapport between the researcher and research participant and to provide a relaxing and trustworthy environment, a conversation or reflective activity often occurs at the beginning of the interview. Next, the research participant is encouraged to take some time to concentrate on the experience, its pivotal moments, and then to completely explain the experience. The researcher must create an atmosphere that promotes honesty and complete, comprehensive responses (Moustakas, 1994).

This study aimed to understand the meaning of farmers' lived and conscious experiences of appraising and seeking help for prostate cancer symptoms, as well as being diagnosed with prostate cancer, deciding on treatment, and the various impacts of treatment. The research participants identified as farmers with a history of prostate cancer. Each research participant engaged in one in-depth, semi-structured, audio-recorded interview, and they also completed the MRNI-SF questionnaire. During each interview, the interviewer took notes, and each interview was also transcribed verbatim by this researcher, with the assistance of NVivo Transcription software. The interviews lasted anywhere from 36-to-115 minutes and focused on the time period from the first evidence of prostate cancer symptoms to the first medical appointment with a healthcare provider for these symptoms. The interviews took place with 11 research participants, who were members or had affiliations with members from two Indiana churches or who regularly attended an Indiana deli and convenience store. The interviews occurred at the participants' residences. Although the questions pertained largely to the appraisal and help-seeking portions of the model of pathways to treatment, participants talked in great detail about their prostate cancer diagnoses, treatments, and impacts of treatment. Thus, the entire model of pathways to treatment was engaged and discussed in subsequent chapters of this study.

Before beginning the interviews, each participant was administered the MRNI-SF, and they completed it prior to beginning their specific interview. The MRNI-SF contains 21 items related to traditional masculine norms in Western society, with each item on a seven-point Likert scale of agreement. Additionally, the researchers added eight demographic questions consisting of age, gender, race, ethnicity, level of education, employment and marital statuses, and annual household income. It typically took each participant no more than 10 minutes to complete the entire survey.

The research participants identified as farmers who had a history of prostate cancer. For recruitment at the two churches, those attending and/or affiliated with those attending the churches were recruited via posted flyers at each church and announcements in each of the church's bulletins, newsletters, and/or emails. Those viewing the flyer and/or announcement and interested in participating in the study contacted the study investigator to enroll. Each participant was provided a recruitment letter and study information sheet by the study investigator prior to the interviews taking place. For recruitment at the deli and convenience store, flyers were delivered to the store, and those viewing the flyers and interested in participating in the study contacted the study investigator to enroll. They would also be provided a recruitment letter and study information sheet prior to the interviews as well. To recruit at the two rural health clinics, potential participant information was known via access to the electronic medical where they were patients. These clinics are part of a larger nearby health system, and the individuals accessing the electronic medical record were employees of organizations within this health system. The practice manager of the clinics contacted the information technology staff of the health system in order to have them run the relevant electronic medical record report. This report identified and generated a list of all the potential research participants meeting the criteria for the study. This list was then sent to another staff member working for an organization of the health system, and this individual mailed recruitment materials containing a letter, flyer, and study information sheet to each of the potential research study subjects. The recruitment materials instructed the potential

research participants to contact the study investigator to enroll. Unfortunately, none of the potential participants from either of these two health clinics reached out to the study investigator to participant. Research participants completing the interview and survey each received a \$25.00 Visa gift card. To view the recruitment letters, flyer, study information sheet, and church announcement, please see Appendices G-J.

In order to determine how many interviews will be completed, the researcher used a data saturation model (Saunders et al., 2018), seeking to obtain “informational redundancy,” (Sandelowski, 2008, p. 875), or what Grady (1998) described as data that repeats what has already been collected. The data saturation model “relates to the degree to which new data repeat what was expressed in previous data” (Saunders et al., 2018, p. 1897) and is determined during the process of data collection. The researcher acknowledges that there may be no set point in time when saturation is achieved, but rather, new data is always possible to emerge from additional interviews, adding to the richness and meaning of the data (Saunders et al., 2018; Strauss & Corbin, 1998). Therefore, interviews stopped once the data from participants was regarded as not contributing rich and/or meaningful information to the overall study (Strauss & Corbin, 1998).

Data Analysis

Once all the research participants’ interviews were conducted, transcribed verbatim, and organized by the researcher, the data analysis process began. Moustakas (1994) proposed two methods of analysis, hereafter described. The first method of analysis modifies the work of van Kaam (1959, 1966) and contains seven main steps. The sequence of steps includes the following: 1) horizontalization; 2) the determination of horizons (i.e., invariant constituents); 3) the grouping of horizons to derive core themes and the validation of themes and horizons; 4) the construction of textural descriptions (with example quotations) of the experiences for each participant; 5) the construction of structural descriptions of experiences for each participant; 6) the construction of textural-structural descriptions of

essences and meanings of experiences for each participant; and 7) the construction of a final description of essences and meanings of experiences of the entire study participant population (Moustakas, 1994).

In a second method of analysis, Moustakas (1994) modified methods previously posed by several other researchers (Colaizzi, 1973; Keen, 1975; Stevick, 1971). First, the researcher should record and transcribe his/her personal experiences related to the phenomenon. Second, using the transcription, he/she should perform all the steps of analysis mentioned in the previous paragraph. Third, the researcher should work through each of the steps mentioned in the previous paragraph utilizing all the study participants' transcriptions. Finally, a universal description of the essences and meanings of the experiences of the entire study participant population should be constructed (Moustakas, 1994).

This researcher utilized aspects of Moustakas' (1994) modified version of van Kaam's (1959, 1966) data analysis method and NVivo 12 Plus software to organize and analyze the data of this study. During this method, the researchers first listed and grouped statements that best related to the study questions and topic, a process known as horizontalization. Once these key statements or horizons were established, they were either retained or eliminated from the analysis based on the following criteria: Was the horizon essential for understanding the experiential moment, and can it be summarized and labeled? If the answer is yes to the entire question, the horizon is retained; however, horizons were eliminated if they did not satisfy these criteria. Horizons were also eliminated if they repeated, were not clear, or overlapped. The retained horizons were then referred to as invariant constituents. Similar and related invariant constituents were then grouped and categorized into major themes of experience (Moustakas, 1994).

After establishing core themes, each invariant constituent and its associated theme were assessed against the research participants' entire transcription. In order to retain the invariant constituent and theme, each must have been explicitly addressed in the transcription, and if they were

not, they must at least had been compatible with each other. Lacking compatibility or explicitness in the transcript signified a lack of relevance to the study, and they were eliminated. Data analysis was finally initiated and completed using only the valid and relevant invariant constituents and themes and verbatim statements from the transcription, in order to describe the essences and meanings of the participants' experiences.

Rather than the quantitatively-loaded term of *objectivity*, Lincoln and Guba (1985) suggest using the term *confirmability*, which implies qualitatively demonstrating the value of a study's data. In order to best establish confirmability in the data, the study must undergo an external audit, typically performed by someone not affiliated with the study. While auditing the study process, this consultant should evaluate the study's results and conclusions against the collected data, which demonstrates a study's interrater reliability (Lincoln & Guba, 1985). This study was not externally audited but was reviewed extensively by several members of the research team.

The primary statistics reported for the MRNI-SF were descriptive, focusing on overall mean values for TMI, AoF, NTSM, SRMS, T, Dom, IoS, and RE. To calculate TMI, Levant et al. (2013) recommended calculating the overall mean for all of the 21 items of the questionnaire. Each of the remaining constructs had three specific items from the questionnaire related to them. Thus, in order to calculate the overall mean value for each of these constructs, the overall mean value was calculated using the three items related to that particular construct. For example, to calculate the mean value for AoF, items four, eight, and 10 were used. The mean for NTSM was calculated using items one, five, and 13. The mean for SRMS was calculated using items six, seven, and 14. For T, the mean was calculated using items 17, 19, and 20. The mean for Dom was calculated with items two, three, and 12. The mean for IoS was calculated using items nine, 11, and 18, and the mean value for RE was calculated using items 15, 16, and 21. When mean values were above 3.5, this indicated a general endorsement or agreement of the participants with that particular traditional masculine construct, and when mean

values fell below 3.5, this represented a tendency to not endorse that particular construct. In addition to the reporting and interpretation of mean values, frequency data was calculated and shared by reporting percentages of levels of agreement and disagreement to specific items and overall constructs, in order to provide a deeper understanding and interpretation of the data.

The Researcher's Role

The researcher plays an integral, sustained, and intense role in qualitative research, as he/she is concerned with interpreting the lived experiences of others. The duties of a qualitative researcher present inherent personal, strategic, and ethical challenges (Locke, Spirduso, & Silverman, 2013). Reflecting on these concerns, the researcher should acknowledge their own personal experiences and background, values, and other preconceptions that impact study interpretations. Additionally, the researcher's role involves the obtaining of access to the study site and ethical considerations throughout the study (Creswell & Creswell, 2018).

One specific role of the researcher is to explain his/her connection to the study and why he/she has interest in the topic and research participant population. As the researcher describes his/her demographic characteristics, work-related and/or academic experiences, race/ethnicity, SES, culture, and experiences in a similar setting to the research study, the reader of the research can better understand and appreciate the study and its importance to the researcher. The researcher must also be very clear about his/her study interpretations being potentially influenced and shaped by his/her own experiences and traits related to the study setting and participant population. Study themes and concluding ideas may be impacted to support the viewpoints of the researcher (Creswell & Creswell, 2018).

The researcher must also speak to any connections or affiliations he/she has with the study site and/or research participants (Creswell & Creswell, 2018). This is especially important when researchers perform "backyard" research (Glesne & Peshkin, 1992), which involves research participants from

his/her workplace, organization, and/or circle of friends. Research of this nature has the potential to compromise the study, as far as the sharing of accurate information and causing power inequities between the researcher and participants. If a study must include backyard data, the researcher must denote how he/she will avoid harming participants and compromising the overall study. Additionally, the researcher must ensure he/she is obtaining accurate information via validation processes (Creswell & Creswell, 2018).

The role of the researcher is to also demonstrate that research participants' rights are protected. This is done through obtaining IRB approval, explaining how approval was obtained, and attaching the IRB approval letter as an appendix. The researcher must further outline the process of obtaining study site access and describing how permission was granted to access the research participants (Marshall & Rossman, 2011). During this process, connecting with and obtaining approval via study site gatekeepers is important. A short study proposal may be necessary to submit to gatekeepers for review. This document would include the reasons for choosing the study site, the activities that will take place at the site, whether the study will disrupt the site, the way results will be communicated, and the benefits of the study to the gatekeeper (Bogdan & Biklen, 1992). The proposal must also include information regarding ethical issues about the study and how these issues will be addressed. For instance, when a study topic is considered sensitive, the researcher is responsible for providing pseudonyms for specific locations, people, and activities (Creswell & Creswell, 2018).

Before beginning the IRB approval process for this study, the author first reached out to gatekeepers affiliated with two Indiana churches, an Indiana deli and convenience store, and two rural health clinics in Indiana and Illinois, in order to inquire about options for research participants and study site access. After several telephone and email conversations and face-to-face meetings, the gatekeepers determined that their locations would be appropriate and accessible, and they were willing to provide potential research participants and sites for this study.

Once the study site and research participant pool were determined and approved by the appropriate individuals, the author completed the IRB approval process by submitting the necessary documents. This author obtained IRB approval through Indiana University (IU) as an exempt study (see Appendix K), a process which took almost two months. During this process, the author first submitted all necessary IRB documents to IU's IRB committee for review and received feedback around two weeks later. After making the required revisions, the author then resubmitted the IRB protocol (see Appendix L) and was granted approval as an exempt study after a second review. The study was later granted an amendment, so please see Appendices M and N for the most recent IRB protocol and amendment approval, respectively.

The author was interested in this study topic and research population based on a personal experience of witnessing his Grandfather, a farmer in Indiana, battle prostate cancer and die from its complications. Having also seen other farmers diagnosed with prostate cancer over the last several years, understanding that male farmers are often the least likely to seek help for health-related issues, particularly when compared to rural and urban nonfarming males, and with a strong interest in phenomenological research, the author decided to explore more about this topic and population via in-depth interviews.

The author will now disclose information that demonstrates his interest in the topic and research participant population, while also describing personal characteristics, previous experiences, preconceived notions, values, and other sociocultural factors that may influence his study findings, interpretations, and conclusions of the study.

The author, a white, non-Hispanic, heterosexual male, coming from an upper-middle-class family, grew up on a farm in Indiana. In addition to the author's Grandfather, his Father was also a farmer. To be more precise, the author's Grandfather and Father were farm co-operators. Although not directly performing substantial farm-related duties and work during his childhood and adolescence, the

author witnessed what life was like for a male farmer via observing and sometimes participating in the work lives of his Father and Grandfather.

Through the author's personal observations of his Grandfather, but particularly his Father, working on the farm, a variety of characteristics/themes describe their roles as farmers. Although this is not an exhaustive account, the author will describe the main themes he observed and remembers for life as a male farmer.

First, there did not seem to be set work hours, especially during busy times of the year (e.g., planting, pesticide application, and harvesting). Farm activities such as planting and harvesting crops were often seen as a "race" involving which farmer in the community would finish first. Therefore, many important health-promoting behaviors, such as healthy eating, exercise, adequate sleep, and stress prevention, were not prioritized or practiced at all, and a "work 'till you drop" mentality was demonstrated. Also, the author observed his Father and Grandfather put other social activities (e.g., parties, celebrations, holidays, important events, etc.) on hold in order to perform jobs on the farm. Sometimes, this meant that they would miss or only partially experience important moments in the lives of their family and friends, in order to continue working on the farm. The author also witnessed his Father and Grandfather continue working on the farm, despite (at times) dealing with serious physical and/or mental injuries and illnesses. Whether the health issues were chronic or acute, running the farm and performing the related duties took precedence over tending to physical and/or mental health issues, which often resulted in denial of physical pain and mental suffering in order to perform farm work. The author remembers his Father verbalizing feelings of guilt, shame, and embarrassment when seeking help for psychological reasons.

The author also recalls the uncertainty and unpredictability of life as a farmer, especially concerning the weather and economy. Droughts, floods, frosts, and other climate-related issues impacting crops seemed to be a cause of anxiety, nervousness, and stress for the author's Father and

Grandfather. Throughout most of the year, the author remembers his Father having a hard time getting very far away from the farm for much time for special occasions or vacations, largely due to the worries associated with the weather and how it could impact his crops. The fluctuating prices of the grain market and other economic issues, such as trade, also seemed to invoke similar negative emotional and psychological reactions in the author's Father.

Competitiveness was another theme observed by the author in regard to life as a male farmer. There was a perceived pressure to continue expanding one's farm through the acquisition of more farmground, in order to compete with others' expanding farm operations. As land acquisition increased for the author's Father, there seemed to be increased demands, responsibilities, and stress. The expansion of the farm for the author's Father also meant the possibility of having additional landlords, which depending on the relationships, could mean increased stress.

The author's final characteristic indicative of being a modern male farmer is that of loneliness. Having a relatively large farm operation without additional full-time employees, the author's Father and Grandfather worked alone a good portion of their lives. This time alone was spent driving tractors for several hours in large fields, repairing equipment, and tending to other related duties. Many of these activities are performed at all hours of the day, including early in the morning and late at night, which are times when the majority of others are not generally outside of the house. Thus, the author's Father and Grandfather spent a lot of working time in isolation from others, lacking sufficient social support in the workplace.

The author also acknowledges some of the values obtained throughout his life via experiences growing up on a farm and having a Father and Grandfather as farmers. First, the author recognizes resiliency as an important characteristic in a farmer. Due to the variety of issues and events that can seemingly go wrong in a farmer's life, as well as typically demonstrating high levels of hegemonic and

traditional farm masculinities, which in many cases can lead to risky behaviors and health issues, having the ability to recover and thrive as a result of these episodes and life periods is important.

Another important value acquired by the author based on his experiences growing up on a farm and observing his Father and Grandfather as farmers is devotion to family. Although farmwork could sometimes supercede any other event or experience happening at the same time, the author realizes how important it was for his Father and Grandfather to witness, experience, shape, and participate in the lives of their family members, which mainly included wives, children, and grandchildren. In general, great efforts were made by both the author's Father and Grandfather to be fully present at important family events and occasions.

The final value the author wishes to address is that of having faith in something greater than one's self. Throughout his entire life growing up on a farm, the author remembers his Father and Grandfather practicing and demonstrating a strong religious faith. Despite appearing to be extremely self-reliant, robust, and independent in dealing with issues related to physical and mental health, or work-related problems, each of these men still sought help spiritually, without embarrassment, guilt, or shame.

In acknowledging his personal characteristics, experiences, preconceptions, and values related to growing up on a farm and having a Father and Grandfather who were farmers, the author demonstrates the way his findings, interpretations, and conclusions of the study could be influenced and oriented. However, the author performed Moustakas' (1994) Epoche process prior to each interview conducted in this study. Being able to disconnect from preconceived notions, judgements, stereotypes, and other biases allowed the author to approach each interview with an open, naïve mind, resulting in less possibilities for influencing the research participants' responses.

Data Sources

The data sources most-often utilized in phenomenological studies are in-depth, and many times, multiple interviews with each research participant. Typically, with as many as 10 research participants in a study, the interviews should assist the researcher as he/she depicts the meanings of experiences for a small group of people who have all experienced the same phenomenon (Creswell & Poth, 2018).

Of the various types of interviewing methods available, this author engaged in one-on-one interviews. This type of interviewing method is best suited for research participants who are willing to communicate his/her ideas freely, without hesitation or reluctance. Appropriate recording devices are also recommended, which can best capture and record the research participant and researcher's statements in the clearest manner possible (Creswell & Poth, 2018). The author used an audio-recording device for each interview.

An interview protocol is another recommended item, which contains several open-ended questions, spaced sufficiently apart to allow for researcher notes. The interview questions, developed from the study's main question and associated subquestions, contains initial questions helping the participant to talk openly and freely. The conclusion of the interview typically involves the researcher asking the participant if he/she knows others with information about the phenomenon, as well as the researcher displaying thanks for the participants' time and efforts in the study (Creswell & Poth, 2018).

Other important steps for interviewing include finding an appropriate interviewing location. A distraction-free, quiet space, where the research participant can be audio-recorded is necessary. Once the researcher reaches the interview location, he/she should obtain consent from the research participant, review the aims of the study, discuss the time needed for the interview, and explain how the results will be used. Once the final study report is finished, each participant should be offered a copy (Creswell & Poth, 2018). For this study, the author conducted interviews at the participants' residences. Upon meeting, the author reviewed the study's objectives, explained the timeframe of the interview,

and described how the data would be used and conveyed. At the completion of the study, the author sent each participant a copy of the final study write-up.

As the researcher interviews the research participants, he/she should remain true to the interview questions, the interview timeframes, display respect and courtesy, not provide advice, and ask limited questions. Effective interviewers should focus on active listening throughout the interview and avoid speaking too often. Another helpful reminder for the researcher is to remember to take notes throughout the interview, in the event of a malfunctioning audio-recording device. In case of such an event, the researcher must remember that these notes may not contain all the participants' information, based on the difficulties associated with asking questions and taking notes simultaneously (Creswell & Poth, 2018).

As previously mentioned, in order to represent and measure beliefs about traditional masculinity, the participants completed the 21-item MRNI-SF, which is derived from the 57-item MRNI (Levant, Hirsch et al., 1992) and MRNI-Revised (MRNI-R), which contains 39 items (Levant, Rankin et al., 2010; Levant, Smalley et al., 2007). The benefits of using the MRNI-SF is that it measures many validated and reliable constructs of masculinity beliefs (Levant et al., 2013) in a short amount of time.

Questions Used for Data Collection and Theory Connection

Focused on the appraisal and help-seeking intervals of the model of pathways to treatment (Scott et al., 2013), a semi-structured interview was created, consisting of several open-ended questions in relation to the research participant population and the phenomenon being explored. The interview guide for this study was based on interview protocols from two similar studies, both examining appraisal and help-seeking within Andersen et al.'s (1995) framework (de Nooijer, Lechner, & de Vries, 2001; Oberoi, Jiwa, McManus, & Holder, 2015).

The question guide for the interview (see Appendix O), contained two parts. Part one contained items related to the appraisal interval of the models of pathways to treatment for prostatic issues and

prostate cancer symptoms, and part two contained items related to the help-seeking interval of the model of pathways to treatment for prostate cancer symptoms (Scott et al., 2013). Part one specifically contained questions related to prostate issues and prostate cancer symptoms and what actions were taken in response to these issues and symptoms. Part two aimed to explore the participants' perceptions and understandings of help-seeking and healthcare utilization.

The semi-structured interview questions related to constructs from three theories: the model of pathways to treatment (Scott et al., 2013), the common-sense model of illness self-regulation (Leventhal, Meyer et al., 1980), and the social cognitive theory (Bandura, 1986, 1997). The social cognitive theory suggests that one's behavior is the result of the complex interaction of environmental, behavioral, and personal factors (Kelder, Hoelscher, & Perry, 2015). The help-seeking interval of the model of pathways to treatment involves constructs from the social cognitive theory (Bandura, 1986, 1997; Scott et al., 2013). The appraisal interval of the model of pathways to treatment contains constructs from the common-sense model of illness self-regulation (Leventhal, Meyer et al., 1980; Leventhal, Phillips et al., 2016; Scott et al., 2013). Table 1 presents the relationships between the interview questions, health behavior theories, and their associated components, concepts, and constructs.

Table 1: Questions Applied to Health Behavior Theories and Theoretical Constructs		
Question	Theory	Components, Concepts, and Constructs
1	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: detection of bodily changes • Interval: appraisal • Process: patient appraisal and self-management • Contributing factors
	Common-sense model of illness self-regulation	<ul style="list-style-type: none"> • Cognitive representation: timeline and identity
2	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: perceives reason(s) to discuss symptom(s) with a healthcare professional • Interval: appraisal • Process: patient appraisal and self-management • Contributing factors

	Common-sense model of illness self-regulation	<ul style="list-style-type: none"> • Heuristics • Cognitive representations: timeline, consequences, identity, control/cure, and cause • Coping: danger and fear control • Social context
3	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: perceives reason(s) to discuss symptom(s) with a healthcare professional • Interval: appraisal • Process: patient appraisal and self-management • Contributing factors
	Common-sense model of illness self-regulation	<ul style="list-style-type: none"> • Heuristics • Cognitive representations: consequences
4	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: detection of bodily changes and/or perceives reason(s) to discuss symptom(s) with a healthcare professional • Interval: appraisal • Process: patient appraisal and self-management • Contributing factors
	Common-sense model of illness self-regulation	<ul style="list-style-type: none"> • Coping: danger and fear control • Social context • Self-management
5	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: detection of bodily changes and/or perceives reason(s) to discuss symptom(s) with a healthcare professional • Interval: appraisal • Process: patient appraisal and self-management • Contributing factors: patient factors
	Common-sense model of illness self-regulation	<ul style="list-style-type: none"> • Heuristics • Cognitive representations: timeline, consequences, identity, control/cure, and cause • Coping: danger and fear control • Social context • Self-management
6	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: detection of bodily changes and/or perceives reason(s) to discuss symptom(s) with a healthcare professional • Interval: appraisal • Process: patient appraisal and self-management • Contributing factors: healthcare and disease factors

	Common-sense model of illness self-regulation	<ul style="list-style-type: none"> • Heuristics • Cognitive representations: timeline, consequences, identity, control/cure, and cause • Coping: danger and fear control • Social context • Self-management
7	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: detection of bodily changes and/or perceives reason(s) to discuss symptom(s) with a healthcare professional • Interval: appraisal • Process: patient appraisal and self-management • Contributing factors
	Common-sense model of illness self-regulation	<ul style="list-style-type: none"> • Cognitive representations: cause
8	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: perceives reason(s) to discuss symptom(s) with a healthcare professional <ul style="list-style-type: none"> ○ Triggers and barriers to seeking help • Interval: help-seeking • Process: decision to consult healthcare professional and arrange an appointment • Contributing factors
	Social cognitive theory	<ul style="list-style-type: none"> • Self-efficacy <ul style="list-style-type: none"> ○ Sociostructural barriers and opportunities • Outcome expectations <ul style="list-style-type: none"> ○ Physical, social, and self-evaluative • Competing priorities
9	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: perceives reason(s) to discuss symptom(s) with a healthcare professional <ul style="list-style-type: none"> ○ Triggers and barriers to seeking help • Interval: help-seeking • Process: decision to consult healthcare professional and arrange an appointment • Contributing factors
	Social cognitive theory	<ul style="list-style-type: none"> • Self-efficacy <ul style="list-style-type: none"> ○ Sociostructural barriers and opportunities • Outcome expectations <ul style="list-style-type: none"> ○ Physical, social, and self-evaluative • Competing priorities
10	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: perceives reason(s) to discuss symptom(s) with a healthcare professional <ul style="list-style-type: none"> ○ Triggers and barriers to seeking help • Interval: help-seeking

		<ul style="list-style-type: none"> • Process: decision to consult healthcare professional and arrange an appointment • Contributing factors
	Social cognitive theory	<ul style="list-style-type: none"> • Competing priorities
11	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: perceives reason(s) to discuss symptom(s) with a healthcare professional <ul style="list-style-type: none"> ○ Triggers and barriers to seeking help • Interval: help-seeking • Process: decision to consult healthcare professional and arrange an appointment • Contributing factors
	Social cognitive theory	<ul style="list-style-type: none"> • Competing priorities
12	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: perceives reason(s) to discuss symptom(s) with a healthcare professional <ul style="list-style-type: none"> ○ Triggers and barriers to seeking help • Interval: help-seeking • Process: decision to consult healthcare professional and arrange an appointment • Contributing factors
	Social cognitive theory	<ul style="list-style-type: none"> • Outcome expectations <ul style="list-style-type: none"> ○ Physical outcome expectancies
13	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: perceives reason(s) to discuss symptom(s) with a healthcare professional <ul style="list-style-type: none"> ○ Triggers and barriers to seeking help • Interval: help-seeking • Process: decision to consult healthcare professional and arrange an appointment • Contributing factors
	Social cognitive theory	<ul style="list-style-type: none"> • Outcome expectations <ul style="list-style-type: none"> ○ Social outcome expectancies
14	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: perceives reason(s) to discuss symptom(s) with a healthcare professional <ul style="list-style-type: none"> ○ Triggers and barriers to seeking help • Interval: help-seeking • Process: decision to consult healthcare professional and arrange an appointment • Contributing factors
	Social cognitive theory	<ul style="list-style-type: none"> • Outcome expectations <ul style="list-style-type: none"> ○ Physical, social and self-evaluative
15	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: perceives reason(s) to discuss symptom(s) with a healthcare professional <ul style="list-style-type: none"> ○ Triggers and barriers to seeking help • Interval: help-seeking • Process: decision to consult healthcare professional and arrange an appointment

		<ul style="list-style-type: none"> • Contributing factors
	Social cognitive theory	<ul style="list-style-type: none"> • Self-efficacy <ul style="list-style-type: none"> ○ Sociostructural barriers and opportunities • Outcome expectations <ul style="list-style-type: none"> ○ Physical, social, and self-evaluative • Competing priorities
16	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: perceives reason(s) to discuss symptom(s) with a healthcare professional <ul style="list-style-type: none"> ○ Triggers and barriers to seeking help • Interval: help-seeking • Process: decision to consult healthcare professional and arrange an appointment • Contributing factors
	Social cognitive theory	<ul style="list-style-type: none"> • Self-efficacy <ul style="list-style-type: none"> ○ Sociostructural barriers and opportunities • Outcome expectations <ul style="list-style-type: none"> ○ Physical, social, and self-evaluative • Competing priorities
17	Model of pathways to treatment	Incorporates potentially all components, concepts, and constructs from all three theories
	<ul style="list-style-type: none"> • Common-sense model of illness self-regulation • Social cognitive theory 	
18	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: perceives reason(s) to discuss symptom(s) with a healthcare professional <ul style="list-style-type: none"> ○ Triggers and barriers to seeking help • Interval: help-seeking • Process: decision to consult healthcare professional and arrange an appointment • Contributing factors
	Social cognitive theory	<ul style="list-style-type: none"> • Self-efficacy <ul style="list-style-type: none"> ○ Sociostructural barriers and opportunities • Outcome expectations <ul style="list-style-type: none"> ○ Physical, social, and self-evaluative • Competing priorities
19	Model of pathways to treatment	<ul style="list-style-type: none"> • Event: perceives reason(s) to discuss symptom(s) with a healthcare professional <ul style="list-style-type: none"> ○ Triggers and barriers to seeking help • Interval: help-seeking • Process: decision to consult healthcare professional and arrange an appointment • Contributing factors
	Social cognitive theory	<ul style="list-style-type: none"> • Self-efficacy

		<ul style="list-style-type: none"> ○ Sociostructural barriers and opportunities ● Outcome expectations <ul style="list-style-type: none"> ○ Physical, social, and self-evaluative ● Competing priorities
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Results Validation Strategies for Assuring Accuracy and Consistency

Validation strategies refer to acknowledged methods of demonstrating accurate study results.

The closeness of the researcher and research participant relationship, the amount of time spent together collecting data, and the richness of the data all positively impact the study’s accuracy (Creswell & Poth, 2018). Of the 29 qualitative validation strategies outlined by Whittimore, Chase, and Mandle (2001), eight are commonly used in qualitative research studies: prolonged engagement and persistent field observation, triangulation, peer debriefing, negative case analyses, clarification of researcher biases, member checking, thick and rich descriptions, and external auditing. Creswell & Poth (2018) recommend using at least two of the verification strategies per study and state that triangulation, thick and rich written descriptions, and member checking are perhaps the easiest, most cost-effective methods.

In this study, the researchers performed triangulation, clarification of biases, member checking, and thick and rich descriptions. During triangulation, themes and interpretations are corroborated with various sources of evidence. When a researcher clarifies his/her biases, a statement is provided in the manuscript of the various ways in which his/her study approach and conclusions have been formed, including biases, viewpoints, and previous experiences (Creswell & Poth, 2018). Considered one of the most important validation strategies for establishing credible results (Lincoln & Guba, 1985), member checking involves allowing each research participant to view the research study data, results, and conclusions, in order to assess the information’s credibility and accuracy. Creswell and Poth (2018) recommend having a focus group of the research participants reflect on the researcher’s written analyses of the study’s themes and descriptions, providing feedback on the accuracy of the information.

Providing thick and rich descriptions of the research participants and the study location affords readers the opportunity for transferability (Erlandson, Harris, Skipper, & Allen, 1993; Lincoln & Guba, 1985; Merriam, 1988), which in this case signifies the detailed accounts can be applied to other settings (Erlandson et al., 1993).

Consistency increases in studies where the researcher has obtained high-quality audio-recordings, transcribed them, and taken detailed notes. Additionally, computer programs (e.g., NVivo) and the utilization of several coders are also helpful to reliably record and analyze the data (Creswell & Poth, 2018; Silverman, 2005). The method of intercoder agreement is a flexible approach, but researchers must make decisions about what this process really means to the study (Creswell & Poth, 2018).

The following is an example of establishing intercoder agreement described via an experience by Creswell (2007). Using Nvivo for assistance, four independent individuals coded information related to HIPPA and a large hospital system. To begin, each person coded a few transcripts, and subsequently met with each other to construct a codebook, which contained definitions of the primary codes and their corresponding passages. Individuals then coded a few more transcripts and met to compare codes and passages, with the primary aim of 80% agreement between the designations of specific code words to specific passages, based on the codes' definitions in the codebook (Miles & Huberman, 1994). Themes were then determined based on the codes, and at least 80% agreement was needed in pairing themes with specific passages. After reviewing and discussing several more transcripts, the coders updated the codebook and repeated the above process, in order to obtain higher levels of agreement (Creswell, 2007).

In determining the overall quality of a qualitative study, both Polkinghorne (1989) and Creswell and Poth (2018) present important criteria when judging a phenomenological study. Polkinghorne's (1989) standards relate to obtaining the experiences of the participants as they actually happened.

Quality of the study increases when the interviewer does little to influence the responses of the participants, when transcripts are accurately recorded, when the researcher has exhausted all possible conclusions, when structural descriptions and accounts presented in the transcriptions match, and when structural descriptions are generalizable to other settings.

Creswell and Poth (2018) delineate their own criteria in judging the quality of a phenomenological study. First, it is important that the author displays a strong knowledge of phenomenological concepts. The author must also identify and concisely describe a specific phenomenon of study. Quality of the study also increases as the author demonstrates the utilization of a phenomenological data analysis strategy. It is also important that the author describes the composite essence of the participants' experience, making sure to also describe the experience and contextual setting where it took place. Finally, the author must demonstrate introspective and reflective writing throughout the study.

Ethical Considerations

Sensitivity towards ethical issues in qualitative research is critical throughout all facets of a research study. With the amount of involvement, time, and self-disclosure research participants offer in a study, the researcher must address ethical issues throughout the entire study process (Creswell & Poth, 2018). This includes before conducting the study, at the beginning of the study, during data collection and analysis, and when reporting, sharing, and storing data (Creswell & Creswell, 2018).

Before conducting a study, the researcher must submit the materials in order to obtain IRB approval. The researcher should also identify and contact key locations and stakeholders to obtain site approval. These sites should be locations that avoid power disparities with the researcher. Also, the order of authors should be established for publications in the future. Once a study begins, the researcher should identify the research problem and participants via an informal needs assessment. The researcher's participants should be contacted and informed of the study purpose, and if informed

consent is required, participants should not be pressured into signing documents. Participants should be respected with regard to demographic and cultural characteristics. Respect should also be conveyed to the study site, focusing on as little disruption as possible (APA, 2010; Creswell, 2013; Creswell & Creswell, 2018; Lincoln, 2009; Mertens & Ginsberg, 2009; Salmons, 2010).

During data collection, the researcher will make sure he/she explains the study purpose and data use, in order to avoid deceiving participants. To avoid power disparities and exploitive practices, the researcher should not ask leading questions or share personal impressions. Also, sensitive information should not be disclosed, and participants should be engaged as study collaborators. In order to not take advantage of participants, their time and efforts should be rewarded. Additionally, to prevent the collection of damaging information, researchers should not vary from the questions included on an interview protocol (APA, 2010; Creswell, 2013; Creswell & Creswell, 2018; Lincoln, 2009; Mertens & Ginsberg, 2009; Salmons, 2010).

During data analysis, the researcher should avoid taking sides with participants by reporting multiple viewpoints of an issue. The researcher should also disclose all findings, whether positive or contrary. Also, in order to respect and maintain the privacy, confidentiality, anonymity of the participants, pseudonyms or aliases should be assigned, while developing composite descriptions of participants. When reporting and sharing data, the researcher must avoid plagiarism and the falsification of findings and conclusions. Also, composite profiles of participants should be conveyed, in order to avoid participant identification. Communication and language should be appropriate, unbiased, and clear for the research audience. In order to share the data with others, copies of the final research report should be given to the research participants, key study stakeholders, and other researchers. Additionally, the researcher should consider distributing the report via a website and in multiple languages. Research should not be duplicated or piecemealed for future publications. Also, state any conflicts of interest by disclosing research funders. As far as data storage, make sure raw materials and

data are stored for a period of several years. Also, credit data ownership to the researcher, his/her advisors, and the researcher participants (APA, 2010; Creswell, 2013; Creswell & Creswell, 2018; Lincoln, 2009; Mertens & Ginsberg, 2009; Salmons, 2010). Essential data storage practices should be followed by the qualitative researcher: a) computer backup files are necessary (Davidson, 1996), b) audio-recording devices should be high-quality, c) the information types gathered should be listed on a master list, d) the data should not contain research participants' names, and e) a matrix of the data should be developed in order to find and identify the study information (Creswell & Poth, 2018).

Only the researchers affiliated with this study and the research participants have access to the interview audio recordings, interview transcripts, and author notes, and these recordings and documents will be destroyed three years from the date of the study closure with the IRB. As far as storage of data, every participant was given a number and only that number will be associated with recordings and transcripts. A codebook (e.g., a sheet of paper) with participants' names and corresponding numbers will be kept in a bank safe deposit box, separate from the recordings and transcripts, once number assignments have been made. Recordings, transcripts, and notes will be stored in a locked facility/room and in encrypted, password-protected computer files. Participants' names will never be used in reports and publications (i.e., articles); for humanizing purposes, pseudonyms were used; however, all names will be different from any names in the participant pool. The 11 participants have 11 completely different names.

Chapter Four: Research Findings

Introduction

Nearly all men in almost every country in the world experience higher rates of disease, disability, injury, and death, when compared to their female counterparts (CIA, 2017; UNDP, HDRO, 2016; WBG, WB, 2017b). A large percentage of men's increased morbidity and mortality results from NCDs (Murphy, Kochanek, Xu, & Arias, 2015; WHO, 2016a), which can be highly connected to several modifiable risk factors, specifically, tobacco use, unhealthy diet, physical inactivity, alcohol abuse, elevated blood pressure, glucose, cholesterol (WHO, 2016a, 2016d), and obesity (Danaei et al., 2009; Kung et al., 2008; WHO, 2016e). It is posited that perhaps one of the primary determinants of men's health, especially for those in the U.S., is gender (Courtenay, 2011).

When largely traditionally and hegemonically masculine gender practices are embraced and enacted, men tend to place their health at risk (Courtenay, 2000b/2011). Research shows that rural men may demonstrate the most traditional and hegemonic beliefs and behaviors of all other groups, including nonrural men and rural women. Furthermore, of the rural population, male farmers may demonstrate their gender in the most traditional and hegemonic ways, especially when focusing on help-seeking and healthcare utilization (Courtenay, 2006/2011).

U.S. farmers are mainly white, non-Hispanic, older, heterosexual, less-educated, Evangelical men (Scala & Johnson, 2017; USDA, 2014a; USDA, NASS, 2014a, 2015), who represent important roles in many areas of society, including politics and media. Politically, farmers tend to vote for conservative and Republican candidates (Kaufman, 2016). In media, farmers are largely portrayed as extremely mentally and physically tough, practicing high degrees of self-reliance, independence, stoicism, religion, and patriotism (Ram Trucks, 2018).

Research continues to show farming as a dangerous, debilitating, and deadly occupation, particularly due to unintentional accidents, hazardous exposures, and risky behaviors, which tend to result in increased susceptibilities for physical and/or mental health problems (NCASH, 1989; Rautiainen

& Reynolds, 2002). Farmers die by suicide at extremely high rates (Ringgenberg et al., 2017), an outcome that is typically associated with a variety of farm-related stressors (Browning et al., 2008; Dongre & Deshmukh, 2012; Jackson, Fraser et al., 2006; Ringgenberg et al., 2017; Routley & Ozanne-Smith, 2012; Stallones & Beseler, 2002; Stark et al., 2006) and easy-access to guns (Andersen, Hawgood, Klieve, Kolves, & De Leo, 2010; Browning et al., 2008; Hawton, Fagg, Simkin, Hariss, & Malmberg, 1998; Routley & Ozanne-Smith, 2012; Skegg, Firth, Gary, & Cox, 2010).

Farmers are at increased risk for prostate cancer, but little is definitively known about the various factors that may play a role. Such factors especially relate to care-seeking behaviors and masculinity beliefs. Some studies have identified farmers and rural men as being less likely to get routine prostate cancer screenings (Baade et al., 2015; Earle-Richardson et al., 2015; Jemal et al., 2005; Muldoon et al., 1996); however, research is lacking as far as exploring farmers' care-seeking behaviors for prostate cancer and overall masculinity beliefs.

In order to better understand the prostate cancer experiences of U.S. farmers, this study examined care-seeking behaviors and TMI among farmers who have/have had prostate cancer. In order to assess TMI and its seven associated constructs (i.e., AoF, NTSM, SRMS, T, Dom, IoS, and RE), each participant completed the 21-item MRNI-SF (Levant et al., 2013). Due to a small sample size, only descriptive statistics related to the demographic information and the 21-items of the questionnaire are explained and displayed.

Prostate cancer care-seeking was examined by using in-depth, semi-structured interviews, in order to assess the various factors associated with the model of pathways to treatment (Scott et al., 2013), the common-sense model of illness self-regulation (Leventhal, Meyer et al., 1980), and the social cognitive theory (Bandura, 1986, 1997). A transcendental phenomenological approach was applied (Moustakas, 1994), and aspects of Moustakas' modified version of van Kaam's (1959, 1966) data

analysis technique were utilized to assess the data, along with assistance from NVivo Transcription and NVivo 12 Plus software programs.

Results and Findings

Descriptive statistical analysis of MRNI-SF.

Besides the 21-item MRNI-SF questionnaire measuring overall TMI and seven related constructs (i.e., AoF, NTSM, SRMS, T, Dom, IoS, and RE), eight demographic questions were added: age, gender, race, ethnicity, education, work and marital status, and annual household income. Participants' demographic information is provided in Table 2 on the following page. Pseudonyms were assigned to each participant to maintain their privacy, anonymity, and confidentiality.

The 21-item MRNI-SF questionnaire had a seven-point Likert scale; Levant et al. (2013) recommend reporting the overall TMI by calculating the overall mean from each of the 21 items of the questionnaire. Additionally, means of the seven related constructs must be reported. Of the 21 items, a total of three each were related to each of the seven constructs. Of the 11 study participants, the average age was 71.5, and all were white males not of Hispanic or Latino or Spanish origin. In regard to education, five of the participants completed a high school degree or equivalent, three completed a trade or vocational school program, one completed a bachelor's degree, and two completed master's degrees. As far as work status, six of the participants were retired, three were self-employed, one was unable to work, and one reported being employed full-time (i.e., 40+ hours per week). Pertaining to marital status, eight were married, one was in a domestic partnership, one was divorced, and one was widowed. And finally, regarding annual household income, four participants made \$25,000 - \$50,000, two made \$50,000 - \$100,000, two made \$100,000 - \$200,000, one made more than \$200,000, one made less than \$25,000, and one preferred not to say.

Table 2
Demographic Information of Participants

Subject	Age	Gender	Race	Ethnicity	Education	Work Status	Marital Status	Income
Paul	84	Male	White	Not Hispanic or Latino or Spanish Origin	High School Degree or Equivalent	Self-employed	Widowed	\$25,000 - \$50,000
Bob	76	Male	White	Not Hispanic or Latino or Spanish Origin	High School Degree or Equivalent	Retired	Married	Prefer not to say
Arthur	72	Male	White	Not Hispanic or Latino or Spanish Origin	High School Degree or Equivalent	Retired	Married	\$100,000 - \$200,000
Glenn	75	Male	White	Not Hispanic or Latino or Spanish Origin	Master's Degree	Retired	Married	\$50,000 - \$100,000
Tom	83	Male	White	Not Hispanic or Latino or Spanish Origin	Master's Degree	Retired	Married	\$25,000 - \$50,000
Craig	65	Male	White	Not Hispanic or Latino or Spanish Origin	High School Degree or Equivalent	Retired	Married	\$50,000 - \$100,000
Ray	56	Male	White	Not Hispanic or Latino or Spanish Origin	Trade or Vocational School	Employed full-time	Married	More than \$200,000
Ernest	82	Male	White	Not Hispanic or Latino or Spanish Origin	High School Degree or Equivalent	Self-employed	Married	\$25,000 - \$50,000
Dale	63	Male	White	Not Hispanic or Latino or Spanish Origin	Bachelor's Degree	Unable to work	Divorced	Less than \$25,000
Leroy	72	Male	White	Not Hispanic or Latino or Spanish Origin	Trade or Vocational School	Retired	In a Domestic Partnership	\$25,000 - \$50,000
Mike	59	Male	White	Not Hispanic or Latino or Spanish Origin	Trade or Vocational School	Self-employed	Married	\$100,000 - \$200,000

To find the mean value for AoF, the total scores from items four, eight, and 10 must be used; for the mean of NTSM, use items one, five, and 13; for the mean of SRMS, use items six, seven, and 14; for the mean of T, use items 17, 19, and 20; for the mean of Dom, use items two, three, and 12; for the mean of IoS, use items nine, 11, and 18; and for the mean of RE, use items 15, 16, and 21. In addition to calculating and sharing the means for the overall TMI and the seven related constructs, the percentage breakdown of responses is explained for average level of agreement for these eight constructs as well.

The next portion will report the mean values and other descriptive statistics for TMI and its related seven constructs. Note: The interpretation of the mean values is based on Levant's (n.d.) MRNI-SF research through the University of Akron. Refer to Table 3 on the following page for a summary of the MRNI-SF data for mean values and average levels of agreement for TMI and the seven related constructs and each specific item from the questionnaire.

First, the overall TMI for the 11 participants was 4.06. This score indicates that the entire group of participants scored above the scale's midpoint, which means that the participants generally feel that men should practice traditional masculinity norms. These norms include avoiding femininity, feeling negativity toward sexual minority groups, placing a high value on being self-reliant through mechanical skills, practicing toughness and dominance, making sex an important priority, and expressing restrictive emotionality. As far as level of agreement of the participants for the 21 items of the questionnaire, 6% strongly agreed, 13% agreed, 26% slightly agreed, 21% had no opinion, 9% slightly disagreed, 16% disagreed, and 8% strongly disagreed. Overall, 45% expressed some level of TMI endorsement, and 33% expressed some level of disagreement with TMI endorsement.

Of the seven related constructs within the 21 items, the participants scored above the scale's midpoint for AoF, NTSM, SRMS, T, and IoS and below the scale's midpoint for Dom and RE. This next portion provides interpretations of what those values may indicate. As noted above, the participants' average percentage of agreement to these constructs will also be shared.

Table 3

Mean Values and Levels of Agreement for MRNI-SF Overall Factors and Specific Items

MRNI-SF Factors	Mean Values	Average Levels of Agreement (%)						
		Strongly Disagree	Disagree	Slightly Disagree	No Opinion	Slightly Agree	Agree	Strongly Agree
TMI	4.06	8	16	9	21	26	13	6
AoF _(overall)	4.39	3	6	12	30	27	18	3
AoF4 _(football games)	4.00	0	9	18	45	18	9	0
AoF8 _(action movies)	4.18	0	9	18	36	18	18	0
AoF10 _(trucks)	5.00	9	0	0	9	45	27	9
NTSM _(overall)	4.85	6	12	0	24	18	9	30
NTSM1 _(homosexual marriage)	5.36	9	9	0	9	18	0	55
NTSM5 _(homosexual bars)	4.00	0	27	0	45	9	9	9
NTSM13 _(homosexual kissing in public)	5.18	9	0	0	18	27	18	27
SRMS _(overall)	4.39	9	12	6	15	24	27	6
SRMS6 _(home improvement)	5.09	9	9	0	0	18	55	9
SRMS7 _(fix most things)	4.55	9	9	0	18	36	18	9
SRMS14 _(repair car)	3.55	9	18	18	27	18	9	0
T _(overall)	4.15	12	6	9	18	36	18	0
T17 _(risk-taking)	3.64	27	9	0	18	27	18	0
T19 _(get tough)	4.73	0	9	9	18	27	36	0
T20 _(tough even if not big)	4.09	9	0	18	18	55	0	0
IoS _(overall)	3.91	6	24	9	15	27	15	3
IoS9 _(always like sex)	4.64	9	9	9	0	36	27	9
IoS11 _(not turn down sex)	3.73	9	27	0	18	36	9	0
IoS18 _(always ready for sex)	3.36	0	36	18	27	9	9	0
Dom _(overall)	3.30	9	24	18	27	18	3	0
Dom2 _(male President)	3.55	9	18	18	27	18	9	0
Dom3 _(male leaders)	3.09	9	27	18	36	9	0	0
Dom12 _(male boss)	3.27	9	27	18	18	27	0	0
RE _(overall)	3.39	9	30	9	18	30	3	0
RE15 _(never admit hurt feelings)	3.64	9	18	18	18	27	9	0
RE16 _(emotionally detached)	3.09	9	45	0	18	27	0	0
RE21 _(not telling others they care about them)	3.45	9	27	9	18	36	0	0

Note. Each mean value in bold signifies an overall endorsement of that particular masculinity belief measurement. Higher bolded mean values signify stronger endorsements of that belief. Lower non-bolded mean values signify stronger non-endorsements of that belief.

The mean for AoF was 4.39, which demonstrated the participants' general endorsement of avoiding anything related to femininity. For example, the participants generally agree that men should watch football games over soap operas (mean = 4.00), prefer action movies over reading romantic novels (mean = 4.18), and boys should prefer playing with trucks over dolls (mean = 5.00). The average

level of agreement of the participants to the three items related to AoF were as follows: 3% strongly agreed, 18% agreed, 27% slightly agreed, 30% had no opinion, 12% slightly disagreed, 6% disagreed, and 3% strongly disagreed. Overall, 48% expressed some level of AoF endorsement, and 21% expressed some level of disagreement with AoF endorsement.

The mean for NTSM was 4.85, demonstrating the participants' strong declaration of their heterosexuality and rejections of deviations from it. Therefore, the participants generally viewed sexual minority groups, such as men identifying as gay, bisexual, and/or transgender, in negative manners. For example, the participants tended to believe homosexual men should not get married (mean = 5.36) nor kiss in public (mean = 5.18). Additionally, the participants tended to believe that all homosexual bars should be closed down (mean = 4.00). The average level of agreement of the participants to the three items related to NTSM were as follows: 30% strongly agreed, 9% agreed, 18% slightly agreed, 24% had no opinion, 0% slightly disagreed, 12% disagreed, and 6% strongly disagreed. Overall, 57% expressed some level of NTSM endorsement, and 18% expressed some level of disagreement with NTSM endorsement.

The mean for SRMS was 4.39, indicating the participants' general belief that men should rely on themselves by means of their mechanical skills. Thus, the participants believed men should possess skills related to home improvement (mean = 5.09), be able to repair most things around the house (mean = 4.55), and know how to fix his broken down car (mean = 3.55). The average level of agreement of the participants to the three items related to SRMS were as follows: 6% strongly agreed, 27% agreed, 24% slightly agreed, 15% had no opinion, 6% slightly disagreed, 12% disagreed, and 9% strongly disagreed. Overall, 57% expressed some level of SRMS endorsement, and 27% expressed some level of disagreement with SRMS endorsement.

The mean for T was 4.15, indicating the participants' general belief that men should possess physical toughness, be aggressive, and have a willingness to be a risk-taker. Participants believed in the

importance of men taking risks, even if getting injured or hurt was a possibility (mean = 3.64). The participants also believed that toughness is important and that when the going gets tough, men should get tough (mean = 4.73). Also, the participants endorsed the belief that young men should attempt to be physically tough, even if they are not big (mean = 4.09). The average level of agreement of the participants to the three items related to T were as follows: 0% strongly agreed, 18% agreed, 36% slightly agreed, 18% had no opinion, 9% slightly disagreed, 6% disagreed, and 12% strongly disagreed. Overall, 54% expressed some level of T endorsement, and 27% expressed some level of disagreement with T endorsement.

The fifth construct also measured above the scale's midpoint was IoS, with a mean of 3.91. According to this construct and the questionnaire results of the participants, men endorsed the belief that sex should be an overriding priority in their life. Of the three items related to IoS, the participants believed that men should always like having sex (mean = 4.64) and that men should not turn down sex (mean = 3.73). However, the participants' did not tend to believe that men should always be ready for sex (mean = 3.36). The average level of agreement of the participants to the three items related to IoS were as follows: 3% strongly agreed, 15% agreed, 27% slightly agreed, 15% had no opinion, 9% slightly disagreed, 24% disagreed, and 6% strongly disagreed. Overall, 45% expressed some level of IoS endorsement and 39% expressed some level of disagreement with IoS endorsement.

The two constructs scoring below the scale's midpoint were Dom and RE. The mean for Dom was 3.30, indicating the participants' general rejection of the idea that men should always be the leader or boss. Of the three items related to Dom, the participants tended to reject the notion that men should be the leader in any group (mean = 3.09) or that the boss should always be a man (mean = 3.27). However, participants did tend to believe that the U.S. President should always be a man (mean = 3.55). The average level of agreement of the participants to the three items related to Dom were as follows: 0% strongly agreed, 3% agreed, 18% slightly agreed, 27% had no opinion, 18% slightly disagreed, 24%

disagreed, and 9% strongly disagreed. Overall, 21% expressed some level of Dom endorsement, and 51% expressed some level of disagreement with Dom endorsement.

The mean for RE was 3.39, indicating the participants' rejection of the belief that men should restrict their emotional expressions. Thus, participants generally did not believe a man should be emotionally detached in charged situations (mean = 3.09). Participants also tended to not endorse the belief that men should not be too quick to tell others that they care about them (mean = 3.45). However, participants did tend to believe that men should never admit when others have hurt their feelings (mean = 3.64). The average level of agreement of the participants to the three items related to RE were as follows: 0% strongly agreed, 3% agreed, 30% slightly agreed, 18% had no opinion, 9% slightly disagreed, 30% disagreed, and 9% strongly disagreed. Overall, 33% expressed some level of RE endorsement, and 48% expressed some level of disagreement with RE endorsement.

Qualitative data analysis.

The main research question of the study was: What meaning to farmers ascribe to their times to presentation, diagnosis, and treatment for prostate cancer? In order to answer this question, the following four procedural sub-questions were examined one-by-one, and major themes for each question were stated and analyzed in detail, utilizing participants' interview data to support and provide evidence for the various themes:

- How do you describe the major processes and contributing factors impacting the events leading up to a farmer's first consultation with a healthcare professional for prostate cancer symptoms?
- How do you describe the major processes and contributing factors impacting the events leading up to a farmer being told he has prostate cancer?
- How do you describe the major processes and contributing factors impacting the events leading up to a farmer receiving his first treatment for prostate cancer?

- How do you describe the contributing factors impacting farmers' experiences with prostate cancer treatment?

Processes and factors impacting the events leading up to a farmer's first consultation with a healthcare professional for prostate cancer symptoms.

Theme one: The body as an occasional guide for prostate cancer detection.

Considering event one of the model of pathways to treatment, detecting bodily changes related to the prostate occurs, five of the eleven participants mentioned noticing some type of issue or change. Four of these five participants mentioned noticing that they were getting up several times a night to urinate. Leroy and Paul both described having to urinate more at night with Leroy saying, "I have had slowly an increase of signs of an enlarged prostate, due to getting up at night, having to urinate." Dale provided more specific information stating that "at roughly a year and a half after my last physical, I started having problems urinating, being able to empty my bladder. I was peeing a lot. I'd get up during the night probably at least six times to pee, if not more." Glenn also expressed having to get up at least six times a night to urinate. Although not experiencing the increased urination, Arthur did mention noticing blood in his urine some mornings after having sex:

Well, I'm not sure that it concerned prostate, probably, but there was a couple of times after intercourse, like the next morning, and that when I would urinate, there was a little tint of blood or one time there was even a little bit like a little string a drop of blood or something.

For event two of the model of pathways to treatment, which is perceiving a reason to speak with a healthcare professional about the issue, a few of the individuals who experienced initial bodily changes described when the issues seemed to become abnormal symptoms of something more serious. Leroy explains that his excessive urination became a symptom when he began having issues urinating stating, "I would sometimes pee on my pants and things like that. So, that was probably the start of it." Glenn conceived his issue as more serious when he noticed blood in his semen when he said, "I guess when I saw the blood in the semen, the ejaculate, that didn't seem normal." He also mentioned that his

urine flow issues were also a cause for concern, an issue also experienced by Arthur. Dale recalled more severe and abnormal symptoms upon noticing lower back pain and issues with urination. He illustrated this by saying, “The back pain and just with the urinating, especially during the day, having to urinate so much, I thought my stream wasn't real good. And I thought something really seems to be going on here.”

During the time to presentation for the five individuals that experienced issues and symptoms related to the prostate, the actual times elapsed from event one to three (i.e., the first visit with a healthcare professional for prostate symptoms) is not clear for all of the participants; however, some did provide estimated timeframes. When asked how long it took him to visit a healthcare professional after noticing blood in his urine Arthur responded with, “I would say easily six seven years really.” Dale, having experienced more severe symptoms, due to having urine flow issues, voiding problems, and lower back pain, guessed that it took him “probably four or five months” to finally visit a healthcare professional for the symptoms. After Glenn noticed blood in his semen, he stated that he went to a urologist, but he did not indicate the time elapsed between noticing the issues and actually visiting the healthcare professional. Paul and Leroy did not provide clear timelines on the time elapsed from noticing prostatic issues to first visiting a healthcare professional. However, Leroy did say that pertaining to his urinary issues, “I've been retired now going on 14 years. So, this has been ongoing for well before that.” He continued to say that, “I have been seeing a urologist for possibly 20 years. And they've checked my prostate probably every time.” So, one would assume that Leroy's urinary issues were assessed by a healthcare professional not too long after they began. Paul did not indicate when his urinary issues began nor when he first saw a healthcare professional to have a prostate examination.

Paul, Arthur, and Dale each described some of their prostatic changes as maybe related to getting older. In reference to having a weak urine flow, Arthur said, “But you know as you get older, I think that's part of it. Everything that was up here is down here.” When referring to issues related to

excessive urination, Paul said, "I don't know whether that's always a sign of prostate cancer, I think it's just part of the normal process of aging. You know that's the way I looked at it at least." And Dale, who may have had the most severe initial prostatic issues of all those experiencing changes said, "I just kind of honestly, I accepted it as being something from being old." Another individual, Craig, although not acknowledging that he experienced any prostatic changes or symptoms did say, "Course when you get this age you're not going to be able your urine stream is not going to be out like a six year old where they shoot across a semi or you know what I mean but that's just old age."

Arthur, Glenn, and Dale each expressed concern about the consequences of their prostatic issues being experienced. As far as functionality, Arthur's issues were just mildly affecting him, "On a count from one to 10 probably a three." Glenn's consequences of his prostatic issues seemed to be more social in nature, particularly for his issues related to excessive urination and flow. He said the following:

If the stream was slow, it slowed the job down that I was on, 'cause I had to take time to do that. Sometime also, and I don't know if this was a cause for this but some time it want to dribble after I was thought I was done. My younger years it shut off; you were done. So, I was getting to where it didn't want to completely empty. I'd get some dribble and that's embarrassing when that you're in public that shows up on your pants and what have you. So, that was a distraction. So, I had to try to be extra careful. The other thing is, you know if you get up that many times at night to go to the bathroom, whether you wake the wife every time that you get up and distract her was another concern of mine, that I wasn't causing her undue stress, because I had to get up. But I think she's adjusted to that it doesn't bother her at this point, because that's been doing it for several years now.

Glenn also expressed some embarrassment about his urinary issues, especially during times of their possible exposure to his co-workers on the farm. He described having to urinate at times when co-

workers were with him and waiting on him, sometimes for long periods of time, which caused him frustration and made him feel like a distraction. He said when it “takes you longer [to pee] and the person who's driving the vehicle like to get going, you certainly have to make excuses then, ‘Well it's taking me a little longer to get this thing done.’”

Dale’s prostatic issues seemed to affect primarily his functionality. His urinary troubles were causing interruptions during his day. He stated, “It's not like I had to get up from my desk and go to the bathroom or something like that. So, I mean, it was a pain in the butt that I had to stop doing what I was doing, you know, and pee.” Dale also expressed concerns with getting enough sleep at night by saying, “The other thing that it affected the having to get up so much during the night was getting rest. You know, because I'd have to get up six or seven times to go to the bathroom. So, it was hard to get a good night's rest.” Perhaps Dale’s most difficult functional issue was related to severe back pain. He said the following about his back pain:

I didn't have the back pain all the time, but there at the end of the day, a lot of times, I'd just have to come in and sit down on the couch and just to deal with the pain. I mean, I was able to deal with the urination and stuff, you know, but when the back pain came, at first there was kind of like, well, this is something new, let's see if it's just something that just sporadic that happened one time or if it's going to continue to take place. And after about two or three weeks of it happening once or twice a week, I decided I needed to go see a doctor.

In reference to noticing blood in his urine a couple times after having intercourse, Arthur said, “I thought it was just from over exerting and not taking care of myself. I just dismissed it, really.” Paul felt that his excessive urination at night was due to having an enlarged prostate. Referring to the issue of having blood in his semen and also having to urinate often during the night, Glenn said the following:

I was riding four wheelers to check fields and things like that, and he [the urologist] attributed that to straddling that seat bouncing around in fields and what have you. So, I never gave it a

thought, but I was concerned, and I guess one of the things the C word. My mother died of breast cancer. And so, that was back in 1958, I was 13 years old. So, it's always been on my mind that cancer could be a viable option for me as well, but never dwelling on it just when situations like that arise, when you see blood in an area that you don't expect it, you think you know I better have it checked. If it's a bruise or if it's something else, fine, but you know if it relates to cancer that's something else too. But then when he diagnosed it with the way he did that it was probably from riding this ATV and putting stress on that area, then went through the medication and forgot about it really for a long time. So, between the first doctor, and what I was concerned with, the blood, and he said that it probably was irritation from riding an ATV, till he said, "we better have it checked," I had never really given it a lot of thought. If your flow is a bunch, like you get up a bunch of times during the night, I was always attributing that to the water pill, rather than maybe to the prostate problem.

In regard to his prostatic issues of excessive urination Dale said, "I was drinking a lot of Diet Cokes and stuff like that. So, I was used to urinating a lot. Not so much getting up during the night and having to do it." Dale also expressed, "Behavior-wise, I mean, I no, not really. So, I mean, I don't know whether or not you get into it with other guys, but I mean, you know, I had a son and was raising him, and I didn't date that much. So, sexually, I wasn't doing very much you know."

In regard to managing his symptoms Glenn said the following:

The only thing I really did was to watch more closely if that blood appeared again on a regular basis, or if it was just a few times, the medication was supposed to take care of it. And there was, after that through the years, there was kind of well it wasn't deep red, but it was kind of a brownish like maybe a staining red that would appear, but not on a regular basis. So, but it never alarmed me, I thought you know I just was cognizant of the fact that it was there, and I never really thought much about it, as long as I felt good and could keep going with what I

was doing. I guess if I came across an article to read on why there would be blood appearing, I would check it out to see what maybe advice there was in that article.

Dale was the only participant who expressed a personal barrier that may have impacted his self-efficacy to seek help. He did not seek help immediately upon experiencing his symptoms, and he expressed that he may have been trying to not believe that he had a problem. He stated, "While they [his symptoms] were actually taking place, you know, I'm sure there was some denial in there."

Physical outcome expectancies were the most relevant of the major outcome expectations in this study among the participants. Only one individual, Dale, expressed some type of thought related to seeking out help to assess his prostate cancer symptoms. Dale had severe urinary issues and back pain and felt that his symptoms were very abnormal, and the back pain really forced him to contact and schedule an appointment with his healthcare professional, in order to get these physical issues addressed. He described this help-seeking process by saying, "I called to get the blood work done about a week or so before my actual appointment was, because I told them I thought something might be wrong. I was concerned. And I wanted to be able to when I went in to get my physical, I wanted to have the results of my blood work, so we could deal with that right then and there."

Theme two: Routine checkups serving as the primary method of prostate cancer suspicion.

Bob, who did not experience any prostate issues or symptoms said he went to the doctor for a regular physical examination and to get his medication prescriptions renewed. He said, "I think the reason why I went to doctor you got to every so often you got to go 'cause renew your pills. And that's probably what sent me to the doctor." He also said his doctor typically examines him every six to 12 months, a process that started when he was in his 60s. Tom, who also did not experience prostatic issues or symptoms said he also attends routine appointments with his healthcare professional every six months, and that is how his prostate problem was discovered. Leroy said his healthcare professional

would always call him for a routine exam once or twice per year. He said, "The doctor actually was the one that diagnosed it, and he had reached out to me for my annual or biannual visit."

Other participants that were notified of their prostate issues via a routine check-up with a healthcare professional and not because of seeking out help for symptoms were Paul, Ernest, Mike, Craig, and Ray. Paul said, "They called me. I didn't initiate the process. I was called in on a regular appointment. And so, I went in I had a regular appointment and then it was brought to my attention that my numbers had changed." Ernest said that he would always get a PSA test at his yearly checkup, and Mike was actually at a checkup with his urologist for chronic kidney stone issues when his prostate was examined. Similar to some of the other participants, Craig said, "I didn't have any symptoms. This was caught on a routine physical." Another one of the participants, Ray, mentioned that his prostate issue was also discovered on an annual physical. In addition to being a farmer, Ray is also a full-time firefighter, so he said that he had been getting prostate examinations and PSA tests since he began working for the fire department at age 31. Arthur's wife was the one who urged him to schedule a physical examination with his healthcare professional, and after the examination, he was notified of some abnormal PSA results.

Tom, who also had no indications of prostate issues or symptoms, initially cancelled an appointment to have an examination of his prostate. He essentially felt that he did not need to be seen, nor did he want to go to the doctor, especially to have his prostate examined. Pertaining to this experience he said,

In fact, I had an appointment to have my prostate checked, and I canceled the first appointment. That's because I didn't have any you know any feelings about that. And then the doctor found out that I didn't go canceled the appointment, and she got on me pretty heavily that you need to do this. So, I did, and I went in and had was checked and they said that I had, what I want to say, stage four, stage four prostate cancer, which that was pretty alarming to me

and pretty and a little scary because I didn't know anything about it. So, I went in and went through the process of having it checked.

Dale indicated that he routinely went to the doctor for annual physicals up until August of 2015. Unfortunately, he decided to not schedule a physical in 2016, largely because he did not want to (yet again) be lectured by his doctor to quit smoking. He was simply not ready to stop this practice, and due to his previous years' experiences of being told to quit smoking, he simply decided to avoid that experience altogether. He explained his specific reasoning for not going for a period of two years in the following:

I actually I would go to the doctor every year and get a physical. And I smoked and he kept wanting me to quit smoking, and I got to a point that I wasn't ready to quit smoking and I thought, I'm just not going to go. So, for two years, I didn't go to get a physical.

Processes and factors impacting the events leading up to a farmer being told he has prostate cancer.

The first part of this section will describe the general diagnoses for the participants of the study. Bob and Ernest did not provide information related to the severity of their prostate cancer diagnoses; however, Bob was diagnosed on March 14, 2019, and Ernest's diagnosis occurred in June 2018. Two participants, Craig and Ray were each diagnosed with low-risk prostate cancers, each with Gleason six scores. Ray was notified of his specific diagnosis during the first week of December of 2019, and Craig received his diagnosis in the fall of 2019. Glenn was also diagnosed in the fall of 2019, and he explained his diagnosis in the following way:

They explained to me that there were three levels that you would fall into. There's a beginning level the lower level, then the middle level and they're on continuance. So, that you could be the upper side of the first level, you could be the lower side of the second level. But I'm on the upper side of the second level but not quite in the third level. So, it's still in the prostate level. It's not gone on outside of that. So, still in the second level.

Paul was diagnosed in early May of 2019 with high risk prostate cancer. Referring to his diagnosis he said, "Mine was high risk. It was farther along than it should've been allowed to go, you know." Leroy was diagnosed with aggressive prostate cancer in December of 2019, with primarily Gleason scores of eight for his biopsy cores. Tom, who was diagnosed a few years ago with stage four prostate cancer said, "I went in and was checked and they said that I had stage four prostate cancer, which that was pretty alarming to me and a little scary, because I didn't know anything about it." Mike was diagnosed in March of 2009, and his doctors told him the cancer was slow growing with only 10% of the prostate gland affected. However, after having a surgery in August of that same year, the cancer was actually very aggressive, and it affected 90% of the prostate gland. The most severe diagnosis of all the participants was Dale, who was diagnosed with stage four prostate cancer with metastasis to the bones in August of 2017. His cancer had a Gleason score of nine.

The DRE is one investigation that several of the participants referenced in their prostate cancer diagnosis process. Leroy actually stated that the "urologist I have now, he calls it the urologist handshake. Which is sort of funny." However, the DRE performed on Leroy in late 2019 would result in the discovery of a lump. Glenn explained the DRE process and some findings in a fairly effective manner:

And so, he tested or checked it, the finger test, and that it was showing some enlargement. And so, that was kind of a justification too then that that would affect the flow. Since the urethra goes through the prostate that if it swells or gets bigger it could affect the flow and so forth.

Theme three: PSA-testing as a powerful predictor of prostate cancer.

Another clinical investigation tool utilized for all the participants in helping diagnose their prostate cancer was the PSA test and other related blood tests. For those who were not already seeing a urologist, the PSA test can be performed at an appointment with a general practitioner. Not all participants provided specific information related to their PSA numbers during their diagnosis; however, many of them did, and those that did not at least gave an indication that the PSA number had

experienced concerning increases. It is important to note that those who had the PSA-testing done with a general practitioner were referred to a urologist in order to further assess those concerning numbers.

Arthur did not provide specific PSA numbers during the interview, but the indication that something was wrong was when they noticed his PSA had doubled within a year. Upon learning of this occurrence, Arthur grew worried and concerned and knew something was wrong. The rapid doubling of his PSA was a strong indication that prostate cancer was highly likely. The indication of prostate cancer for Paul's general practitioner was when they recognized that his PSA had significantly increased as well.

More than 10 years ago, at age 49, Mike's PSA increased from 2.2 to 2.6 within a six-month period of time. Although this did not seem like a large change to Mike and most individuals, his doctor felt otherwise and performed further testing to check for prostate cancer. Mike's doctor basically told him they would not have found his prostate cancer if Mike "would have been stubborn and not gone and had a regular at least yearly PSA for a track record of what's normal for you, not worry about what the 4.0 or anything, it's what's normal for you." Mike continued on by explaining what the PSA test means to him with the following:

Even if you have nothing else wrong, you need to have a PSA test. I am just a firm believer of that just because of what had happened to me. Because if I wouldn't have, I wouldn't have known it. I probably would have not caught it, wouldn't have thought I needed it. Don't even know if I'd had known anybody'd know why I died then unless they did a autopsy, I guess because, hell, I'd have been basically 53.

At its highest level, Ray's PSA was 5.93 in the spring of 2019, and his number had been showing a steady incline over the past couple years. He commented about how the PSA number can fluctuate depending on certain factors by saying, "I understand I mean even having sex can affect it, having diarrhea can affect it, sometimes some different food intakes to the time of your draw can affect your PSA level slightly." His PSA actually did decrease slightly when he had another draw in the fall of 2019.

At the time of his diagnosis, Craig's PSA number was 6.87. With PSA levels remaining in the twos and threes over the last 10-15 years, Glenn's number increased to a little over seven in the spring of 2019 and crept up to above eight in the fall of 2019. Ernest mentioned that his PSA had increased from 4.5 to five to 8.5 in a one-year period, which alerted his healthcare professional to perform further testing, especially since he said, "it'd been running along about three or three and a half or something like that for a long time." Ernest explained some strong feelings he has with the general medical community as far as PSA-testing recommendations are concerned by saying:

If there's one problem with the medical community, I think it's the fact that they don't a lot of general practitioners do not encourage men to continue getting PSA tests done after they're in their late 70s or hit 80. And I don't think that's right, because people are living longer. Well, they always say, "well, you'll outlive it." Well, maybe you will. They don't know how long you're gonna live. So, you know, that's kind of putting a finger on you like where you're only gonna live to be 82 or 84 or something like that. So, and they don't know that. So, you almost I've talked to several people that said, "Well, my doctor said, I don't need a PSA test." I've talked to several people that have asked about me at church, and they say, "Well, my doctor says, I don't need a PSA test anymore," and I think okay, I mean, you know, but and like my brother was told he didn't need a PSA test. When now here he is fighting for his life, and he's a very active person. I mean he's you know. So, it's not like he was sitting around doing nothing before this happened. And yeah. So, I kinda if I have a problem it's with the medical community not encouraging. It's kind of like doing mammograms and stuff. And I know a friend of my wife had asked when she could stop getting mammograms and they said, "ten years before you die." You don't know when...That's an unknown. It just kind of appalled me when I've talked to different people and they said, "Well, my doctor says I don't need it anymore." And I think, well, maybe if you don't

have a strong family history. But I think mine was caught early because I did know that I needed to keep track of it because of the family history.

Leroy expressed getting PSA tests for around 14 years and remarked that his PSA tests had always been low. Once his numbers began increasing and got to their highest point, he also began experiencing serious symptoms related to trouble urinating. He explained the increasing trend of his PSA in the following way:

When it started increasing in 2017, it was two point something two point four I believe, I have the exact figures here, and then in 2018 it went up to 4.6. Now, in 2019, it increased to 10.2.

Unfortunately for Dale, who was diagnosed with metastatic prostate cancer, his rose from 2.8 in August of 2015 to 1,200 in August of 2017. Although he did not necessarily understand what the PSA number really meant at that time, he knew this was a serious issue. Based on his experiences with having prostate cancer he stated the following information about the PSA level:

From talking to the doctors and from my own experience is they look at the doubling time of your PSA. What is that two weeks or is that three months, six months or whatever? But the shorter that period of time is, then the more they're concerned about it. Because that means that it's just taking off on you.

Typically, after enough indication that the PSA is too high or changing too significantly or quickly, a prostate biopsy is performed to check for prostate cancer. During the prostate biopsy, the majority of the participants had anywhere from 10 to 13 biopsy sample cores removed and checked for prostate cancer. Leroy had his biopsy on December 10, 2019, with 12 cores biopsied and many of them cancerous. Of the cores removed from Arthur, seven of them were malignant. Ray, who had his biopsy on October 30th, 2019, had one of 12 cores revealing cancer, and Craig also had only one core of the 12 removed show malignancy from his fall 2019 biopsy. After Glenn's fall 2019 biopsy, four of 12 cores were cancerous. Dale's fall 2017 biopsy revealed cancer in eight out of the 10 cores biopsied. Paul did

not indicate how many cores were biopsied; however, his biopsy took place on April 23, 2019, and his diagnosis indicated a high-risk cancer. Tom had 13 cores biopsied a couple years ago, but he did not indicate how many were cancerous, although his cancer was stage four.

Theme four: Prostate biopsy as somewhat of a necessary bugaboo for prostate cancer diagnosis. Upon meeting with a urologist for concerning PSA levels, decisions were eventually made by the urologists to perform a prostate biopsy to further assess the issue. A few of the participants did indicate some concerns with the prostate biopsy. Glenn expressed his reservations about the biopsy procedure prior to having it done with the following statement:

One fella worked for us a year ago, and so, we would have opportunity to talk and he's younger than I am by maybe 15 years or better. But anyway, he had his out and they were monitoring whether the cancer was back or not. But anyway, he kind of gave me a horror story on the biopsy, that that was not a fun procedure. And so, I kind of dreaded that thinking that when that day comes that I have to do that, that may be the bugaboo that I'm going to say, "Whew, I don't know we're gonna do this." And but it is very uninvasive. I mean as far as pain, he led me to believe that like being snapped with a rubber band in that sensitive area and jumping to the ceiling with the click of that when they went for the sample. And I thought, "Oh, holy cow!" So, that was my biggest dread, when the doctor finally said, "I think we ought to get a biopsy." And the fellow that I went to then at [specific location name] reassured me that there should not be any pain to go along with that. And I thought, "Man, if they could think of a better way to test that in that area because it is such a sensitive organ that would be wonderful." Well, there was no pain in the biopsy.

So, despite his concerns going into the biopsy, Glenn ended up having a pleasant experience with minimal issues or side effects from the procedure. Tom also expressed worries and apprehensions about the biopsy, and he revealed this nervousness and impatience during the procedure as well. It

seems that he was not quite prepared for what to expect. He explained his feelings during the procedure in the following way:

He had a needle that he stuck in the prostate 13 times. And after he did about three, I said, "Well are you about?" I mean it didn't hurt, but you could definitely feel the needle going in. I said, "Are you about there, are you about finished?" And he said, "No, we've got, we're gonna do 13." And I thought, "Wow, 13!" I was checking after three, so I thought well I can't take a nap, but I need to relax here for a little bit.

Even though nervous and apprehensive during the procedure and having a general fear of needles, when asked whether his fears affected him coming to his biopsy procedure Tom said, "Well, no because I knew if I had a problem, I needed to get it taken care of. So, whether it hurt or whether it didn't it needed to be done."

Despite being a strong advocate and supporter of the prostate biopsy as a critical diagnostic tool, Ray's experience after the procedure was not as good as the other participants in the study, perhaps because he felt that he was not told exactly how he might feel by the healthcare professionals after the procedure. Ray talked about his experiences post-biopsy in the following way:

I know that biopsy is not something I want to have to do, but I'll do it because I need to. It's not I mean those were the kind of and my expectations don't candy coat it to me, tell me straight up what it is. And I'll work with it, and I won't be blindsided, and gosh I'm telling you I was blindsided and walk around two days feeling like you'd been kicked in the in the groin. And it's like dude you and I went back in there that next day for my follow up so many weeks later after the results came back. And Dr. [last name] is good about it, but he's probably in his I think mid-30s mid to late 30s pretty good bedside manner with it and I said, "Dude, you you blindsided me," I said, "That was a kick in the nut sack." And I said, "It lasted for a couple days." Well, that's when he started asking questions. "Did you have any like what we talked?" I said, "No, you're

going away from the issue. You didn't tell me all that was supposed." He said, "Really we're not you know our true path is not to give you the full impression, because people won't come in and do for fear." I said, "Well, this wouldn't have scared me out of it," but I said, "I sure wasn't expecting it you know." But he said, "That's statistically, we tell you the whole picture, statistically people don't do it. People don't come back in for the follow up."

Different types of medical imaging procedures may also assist in the diagnosis process for prostate cancer, and these tests typically occur after cancer is determined from the prostate biopsy. Leroy had both a radioactive bone scan and CT scan performed to check for possible metastasis of his cancer, and luckily the results were negative. Dale, having such a high PSA number at 1,200 and severe lower back pain, said the doctors "were concerned that it was outside of my prostate," and upon receiving the results, he said the doctors "essentially said that I had cancer and spread out through my whole body in my bones. It was kind of peppered in my bones over my whole body." One other participant, Ray, despite having a slow-growing, Gleason six prostate cancer, underwent an MRI in March of 2020 to confirm his diagnosis and as he stated, "get more honed in on that specific area to see that that truly was what was taken from biopsy."

Theme five: The prostate cancer diagnosis putting psychological health on display.

Upon the participants being told that they had prostate cancer, specific contexts of these participants' lives would be impacted, as they dealt with the diagnoses and disclosed it to others. Perhaps the dimension of wellness most-impacted by a prostate cancer diagnosis was that of social wellness. A variety of thoughts, feelings, actions, and exchanges occurred in the social lives of the newly diagnosed participants. Some found out that prostate cancer was actually a common issue for men, and that provided a certain degree of relief and support. Some participants were willing to discuss and share their experiences with others soon after diagnosis, even acting as advocates for getting regular check-

ups and finding social support after a diagnosis. Arthur expressed his views of the importance of finding social support by saying the following:

If people find out that they have a dreaded disease, I think they should find some organization or somebody to talk to and that, because myself included, when the first initial shock hits you, I think it's very easy to go into a depressed state. And I think if you seek help whether that be from clergy, or friends, or family, or whatever, but don't keep it all inside and that say, "I got cancer, you know anybody else that's got it?" Or you know, "I want to talk to somebody."

Leroy thought by telling others about his condition, that it might raise some awareness of the issue and help others. Leroy said, "I'm not embarrassed to talk to people and say, 'Hey, I had these symptoms, now I have prostate cancer, and I think you ought to get checked out.'" Dale said, "I've been willing to talk to people about it, you know, it's not that I just shut up and don't say anything."

Participants also mentioned the very positive and supportive responses of family, friends, and others upon being notified of their condition. Glenn said, "People are very supportive, very supportive, prayers, we're thinking about you, just very very supportive, concerned." Leroy echoed those sentiments by saying, "Everybody has been very positive. . . . Actually, any kind of support I would need they would be helpful."

Some of the participants indicated a reluctance of wanting to share their diagnosis with others. Some of the participants did not share the diagnosis with close relatives. Paul had just lost his wife, and he worried about adding more emotional burden on his sisters by them knowing about his diagnosis. He said, "It just gives them something else to have on their mind or maybe worry a little bit. And since you had just lost Gene you know why add more, I guess reason to worry you might say?" Ray, who was officially diagnosed in December of 2019, chose not to tell anyone of his diagnosis, including his wife of 37 years, until after receiving an MRI of the prostate in March of 2020. He explained this choice by saying, "Christmas is coming, I don't need her worrying about that over Christmas. I've not told her. . . .

Waiting for a confirmation and affirmation for that in this MRI." Thus, avoiding sharing bad news before the holidays and also wanting to have as much information as possible were his motives for not disclosing the diagnosis. Craig spoke about his reservations of sharing his diagnosis with others when he said, "I guess, first of all, . . . I didn't want a whole lot of people to know. But now I really don't care. I mean just there's a lot of people that have a lot of things."

Having a spouse or partner was another factor mentioned that may impact the social context of the participant dealing with a cancer diagnosis. Paul, a widower, said, "I guess the spouse if you got a wife living with you why maybe they need to be a little more attentive to how you are." Dale, who had been divorced twice, also spoke of how a spouse or partner could be supportive in the following:

I think it'd be easier, it'd be someone I could talk to at night. Someone to go to appointments with, so to speak. So, I mean, when you when I go in there, I mean, I've always kind of been a loner in a way, you know. I'm comfortable with myself. You know, going and doing stuff by myself isn't an issue for me. You know, but you know about everybody in there's got somebody, you know.

The stigma of having cancer was expressed by Ray, and that perhaps, was another reason he had not shared his diagnosis with others. He also mentioned several times about wanting to have more information about his particular cancer before telling loved ones and friends, in order to perhaps not cause panic in others and to have some control over the disclosure of his illness, in order to not be judged in a certain manner. He expressed these sentiments in the following way:

What I want to do is be more informed because you know everybody's stigma is cancer, "Oh, somebody's put an expiration date on you somewhere." That's not the way I feel about this, but that's people's first jump to conclusion I guess you know, "How long you got? Or the good Lord put you out with an expiration date on you somewhere? If not, you've got one now." It's not

that way. . . . I don't have a expiration date stamped under my foot anywhere. So, you're gonna judge me based on what I'm gonna tell you what I'm going through? That's not fair.

The prostate cancer diagnosis also invoked various feelings and reactions in terms of the emotional wellness of the participants. Some individuals were not concerned with diagnosis, nor did they want others to be. Paul, who had just lost his wife, felt that he did not need more sympathy from loved ones and others. Craig and Ray, each with non-aggressive, Gleason six prostate cancers, both expressed that they were not worried about their condition. Ray said the following:

There's no need to worry now. I mean it's it is what it is. And to go forward and be on a plan, and it's not being aggressive, it's just kind of a wait and see. Statistically, the odds are stacked in my favor. There's high percentages of men go their whole life that have the Gleason six that never they die from other complications or other things later on in life and may or may not even knowing they had it in the first place.

Craig mentioned feeling a little concerned the first couple days after diagnosis; however, those worries waned, and he also felt that it was important to not display feelings of sadness or despair in front of his family, especially his grandchildren. He stated, "I mean can you imagine . . . they see their grandpa's all slumped over crying and bawling and sayin' 'the world is over.' And, I mean you know what's that say to a little thing?" Craig also felt, when compared to others' problems, his condition was not something that he nor others should be concerned with. He said the following:

I didn't have people pray for me in church or anything like that, but because I didn't think it was that serious enough when you see other people in there, they have so many problems. I mean real serious problems that this is. This is I mean it's nothing compared to what they're going through.

Other participants expressed opposite emotions related to a diagnosis of "the C-word." In reference to his diagnosis, Arthur said, "When they say cancer and say the C-word it just it hurts. It just

kind of blows you away.” Bob shared his perceptions about cancer’s uncertainty by saying, “You know cancer's cancer. . . . You never know about it.” Glenn also expressed his daily concerns with the C-word, largely based on his family history of having a mother die at a young age of breast cancer.

While a few participants may have communicated concerns about having cancer, others were more eager to move forward with remedying the issue via treatment. Ernest said, “You know, it’s just, if you’ve got it . . . you better take care of it.” After Glenn was notified of his diagnosis, his first reaction was, “What’s the next step? Where do we go from here?” And Ray said in regard to a diagnosis of prostate cancer in general, “If it’s an issue or problem, you gotta dig in and get right after it.” Craig also expressed the common sentiment of “just dealing with it.”

From a spiritual perspective, several of the participants indicated that having faith in a higher power brought them comfort and relief after their diagnosis. Arthur said, “We’re not holy holy, but we both have a strong religious belief, and I think that helps.” Even when alluding to death, several expressed how their faith alleviated those fears. Ray said, “Life or death . . . that doesn’t . . . scare me, . . . it’s not my plan.” While Craig stated, “Trust the good Lord and say, ‘You know what, . . . 65 is not old, but 65 is a lot better than a lot of people had it.’” Finally, Glenn said the following in regard to his diagnosis and future outlook:

So, I don't know, if you're a person of faith, I think you can handle those, you know a lot of people may go off and cry their eyes out or what have you. But no no. If that's my lot in life, that's where I'm going to be. And it's in the Lord's hands and whatever happens happens. And if I'm to my life is ended here because of prostate cancer and I have whatever time left, that's fine, because the rest of my eternity's going to be with the Lord and that'll be better yet. So, that's where I'm at.

Processes and factors impacting the events leading up to a farmer receiving his first treatment for prostate cancer.

The participants of this study receiving some type of prostate cancer treatment (other than those under active surveillance) seemed to begin treatments fairly soon after the prostate cancer diagnosis, typically within one to three months, depending on any additional health or logistical issues. Ernest said, "I think that I saw him in May, and they got the biopsy done a few weeks later. And then by the end of July, I was starting treatments." Glenn, who had experienced some other health issues during his prostate cancer diagnostic interval explained his pathway to treatment in the following manner:

Oh, the dates seem like were we in August that I went up to have the consultation. Then we had to do the colonoscopy in September. Then I killed another three weeks to get it done. Then we did the biopsy, and then he said, "We're going to start the procedure." And I had to have 44 of them. So, I don't even know if I've got it on the calendar, but it was like from probably August end of July August to October to get the first radiation treatments, in that time frame. So, it was real short order as far as trying to get everything going. And I'd a had the biopsy sooner had it not been the colonoscopy standing in the way.

The only participant that elected to postpone his treatment, in order to plant his crops and perform some other farm-related duties was Mike. He was adamant about making sure he would get a specific amount of farming completed before having his surgery. He also seemed to have confidence in that he was told that his cancer was not very aggressive. He described his decision to postpone his treatment in the following way:

That's when they told me, this was in March, me being a dumb farmer, I'm not taking said, "care of it till I plant my corn," because everything I'd heard of, it's slow growing and it ain't gonna kill . . . you. So, I said, "I'll wait till later to have it worked on." That's when after they removed it then in August, they said, "We have good news and strange news," because they told me through a biopsy after they checked that it came back was supposed to be 10 percent affected

and slow growing. It ended up being 90 percent affected and very aggressive. I would not have been alive in three years.

Theme six: Healthcare professional characteristics and others' experiences reign paramount in treatment decisions.

Acting as one of the major determinants in making a treatment decision for prostate cancer among the participants were their perceptions and beliefs that their healthcare professionals were knowledgeable, experienced, truthful, proactive, actually cared about them, and based decisions on the latest research. Finding a healthcare professional meeting these standards rarely happened by chance, rather, many of the patients recalled being referred to a specific healthcare professional.

Arthur explained some of the characteristics of his healthcare professional, which helped him make his decision about treatment with this individual. He essentially described an individual that would hold all of the credentials related to their medical field, while also having a demeanor and personality that seemed ordinary and down-to-earth. He explained how he made his decision on a healthcare professional in the following:

What come up on the computer and his résumé and everything was just outstanding. People come from across the ocean seeking him. He is the head of the urology department. . . . He sat us down and talked. And we took along the biopsy, and they had all that information on the wall. And he asked me, "Have you seen this?" And I said, "No." And we actually got to see the prostate and the different results from that. They did not I mean I was comfortable. They don't do it to scare you, I didn't think he did. I mean it wasn't a scare tactic or anything. He had it on the wall and this is cancer, and this is not, and this is cancer. And a doctor . . . will not tell you what to do. You can ask him and ask him and they still but what he told us and he's very knowledgeable man and very humble man for being as intelligent and the level of expertise that he has. I can talk to him just like I can talk to you. And he says, "There is no dumb questions. And that if you want to know, ask me, you might not like the answer, but I will tell you." But I mean

he was just that so common ordinary person that was so easy to talk to. There is nothing pushy or biggie about him. I mean you would think he's a country farm boy. . . . When we met [him], we just knew this is the guy that's gonna do it. I mean that if I gotta pick somebody it's going to be him.

In addition to having a pleasant personality, taking time to listen, and being a likeable individual, Paul appreciated that a healthcare professional was truthful and honest with him about performing prostate surgery. He appreciated that a doctor would tell him the detriments of performing such a procedure on someone of his age and with his co-morbidities, and not just advocate for him to have the surgery to make more money. Paul said the following:

He was very honest and upfront. . . . He says, "We can do it if you really want to. But I'd advise you not to because of all the complications you might have to deal with." So, you've got to respect them that they're, they're not out there just trying to get a job. You know they're they look at the realistic part of it and advise you that way.

Glenn noted his desire to have a knowledgeable and trustworthy healthcare professional treating him, who would not "feed me a line," as he said. Craig's best advice for finding the most suitable healthcare professional was "Make sure you get a good one. . . . Somebody that cares."

Ray expressed his desire to have a healthcare professional with a lot of specialized experience, who also based decisions on the latest scientific evidence. He said the following:

Had a urologist retire and start in with a fairly young, pretty respectable doctor, that's been at it for several years in the same urologist doctors, and he's been good to work with. Been very informative. Bases it off of national statistics. I want to be a player in that because national statistics for Gleason six are in pretty good shape, but it's not saying that something can't develop. . . . And . . . go get a second opinion. If you're not happy with the first go get a second, . . . and most insurances allow that second opinion one time, but make sure you're going to the

right person. Go instead of somebody that sees five to a thousand people a year, go to somebody that seeing two to three thousand a year. I think their statistics will probably be a little firmer on what they're seeing in the industry than locally.

The second major factor in the participants' treatment decisions was based on their knowledge and understanding of others' experiences with prostate cancer treatment. Leroy, who had yet to decide his treatment plan at the time of the interview, mentioned talking to a farmer who had just finished his radiation treatments and said, "I spoke with him at church and he told me his results from it, and it sounds positive." Additionally, another patient he spoke to recommended he not have surgery, which Leroy's doctor also recommended, largely based on the possible complications that could result because Leroy is a smoker. Based on his brother's negative experience with dying from advanced lymphoma, Arthur highlighted his preference for having surgery by saying the following:

I think that was one reason I wanted it cut out, you know. I seen what cancer done to my baby brother, and I wanted it out of my body, cut it out, put it in a trash can, get it out of here.

Ernest's motivation for pursuing prompt treatment was largely based on the fact that his father had died of prostate cancer, and his brother had an advanced form of the disease and was receiving chemotherapy. According to Ernest, his brother's "doctor let him down and didn't check him." Additionally, because of having knowledge of others' negative experiences at a local hospital, Ernest sought care outside of his hometown, at a place where others had had some good results from care. Dale also recalled hearing about as well as having some negative experiences with a local clinic, and thus, attended an institution outside of his hometown as well.

Glenn consulted various individuals about their treatment experiences as they related particularly to surgery, radiation, and hormone shots. His final choice of healthcare professional for his treatment was based on a recommendation from a trusted individual, and he shared his story in the following manner:

I had this friend, who I had their kid in school, and we were very it was very good set of parents. And he was the one who they found it on here about two and a half three years ago. And it had already metastasized into ready to go out of the prostate. And so, I talked to them. And I said, "Which doctor did you go to?" And they gave me the name of the doctor. . . . And they said he was very good, very thorough, and very understanding. And he they went to him as a second opinion doctor. And so, that was I went directly to him, and they took me in, and I didn't even try another doctor then. I was satisfied with what I saw. The confidence level that they gave me from him of him was sufficient for me. And I was very well pleased with how he dealt with that and got me through it, and I mean we just moved right along.

An interesting example of utilizing others' experiences to make a treatment decision was in Mike's case. Mike's father had his prostate surgically removed due to prostate cancer around the age of 62 or 63, without having the need for further treatment. And when Mike was diagnosed at the age of 49 he said the following:

I'd already made up my mind because of being a dumb farmer this is the way I told the doctor, I said, "When we have a pig that has a bad spot in it, like an abscess, you cut it out. Get rid of it. I said you're taking mine out." They did that to dad. I don't want it in the way.

So, Mike's decision to ultimately have a radical prostatectomy was based on his father's previous experience with having his prostate removed surgically, as well as on his experiences raising pigs and performing procedures on them, such as removing strange or abnormal growths at times, in order to perhaps rid the pig of further issues and disease.

Factors impacting a farmers' experience with prostate cancer treatment.

Before presenting the major theme related to prostate cancer treatments and their various outcomes, information will be provided about the types of treatments participants elected to undergo for their prostate cancer cases. Craig and Ray, each with similar diagnoses of slow-growing, Gleason six

prostate cancers, elected to participate in active surveillance with their healthcare professionals. Therefore, each of them will be closely monitored and examined frequently in order to track their cancers. Craig described the general protocol for monitoring his condition by saying, "What we're going to do is monitor it every six months with my PSA and then every year do another biopsy, and then like if I bump up another notch then we'll have to . . . address the issue." Concerning his initial discussion of treatment with his healthcare professional, Craig said, "He gave me a lot of options. He said most people freak out and want to have it removed right away, but I didn't really want to go and start wearing Depends. Because there's a loss of control." Thus, perhaps one factor in Craig's decision to select active surveillance was his fear of having urinary issues.

Only two subjects, Mike and Arthur, underwent surgery for their prostate cancer. Both Mike and Arthur had their prostates removed without requiring further treatment. Mike explained the surgical procedure in the following way:

After removing it with the DaVinci; that thing cuts five holes in you. They sit there and the doctor plays video game basically on a screen. And they take a trash bag in, they cut it out, stick it in the trash bag, and sew you up. I told them, don't leave their trash. And anyhow. That's what keeps it from spreading, I guess. By doing it that way, my father had prostate surgery the other way where he had a big scar, look like a C-section of a woman almost. But that was the old-style way.

In justifying his decision to undergo surgical removal of the prostate, Mike referred to his time spent caring for pigs. He mentioned removing growths from pigs in his following justification for undergoing prostate cancer surgery:

The dumb farmer in me, you got a bad spot in a pig, you cut it out. I assumed and it worked that way is they cut it out and do it in time, then you're done messing with it.

In a previous section, Arthur made it clear that based on his brother's experience with having advanced lymphoma and dying before ever receiving treatment, he wanted to have the cancer out of his body via surgery, possibly to avoid having to undergo chemotherapy or other drug therapies. So, with his doctor's approval and guidance, Arthur also had robotic surgery to remove his prostate.

The most common treatment approach for the participants was radiation. Glenn, Bob, Ernest, Tom, and Paul each underwent radiation treatments for close to nine consecutive weeks. Essentially, each of these individuals had radiation Monday through Friday for a total of around 45 consecutive treatments. Tom explained his treatment decision and the actual treatment process in the following way:

They said I could either have treatment or operation. Well, that was pretty easy for me, because I don't even like a shot. And then if you're talking about a knife compared to a shot, that was a no brainer. So, I had treatment. I went 45 days straight in at the hospital. . . . The thing goes over you for about 11 minutes.

Glenn had a similar protocol to Tom. He explained his radiation treatment regimen in the following manner:

They recommended 44 treatments, one every day, five days a week, and then when we had Thanksgiving break, they wanted to do one on Sunday. So, I went in Sunday after church here before Thanksgiving and got four in, and then the following Monday picked up again with five.

Two participants who underwent radiation, Paul and Bob, also received hormone injections. Paul explained his hormone injections as acting as sort of extra protection against his cancer's growth. He explained the rationale for having hormone injections in addition to radiation in the following way:

The shots are kind of a backup you know. And . . . my oncologist told me that even after I'm done with radiation, I need to have shots. Which I'll have, now I don't know whether you have those indefinitely or not, but at least for a while.

The only participant undergoing chemotherapy and clinical trial chemotherapy for his prostate cancer was Dale, who (as previously mentioned) had aggressive, metastatic cancer. With stage four prostate cancer having spread throughout his bones, chemotherapy/clinical trials were the most appropriate treatment option for Dale. Since being diagnosed in the early fall of 2017, Dale's first chemotherapy drug treatment ended in February of 2018. He then began a clinical trial drug in the summer of 2018 for around seven months, and at the end of trial drug one, he began a second clinical trial drug for seven more months. Dale then took a different chemotherapy drug for roughly six weeks, and after meeting with his doctor, he decided on trying a different chemotherapy drug, which he was taking at the time of this interview. So, Dale was essentially on his fifth different chemotherapy drug regimen for his cancer at the time of this interview. Also, at the time of his interview, Leroy was still in the process of making a treatment decision and had not undergone any type of curative or palliative care.

Theme seven: Prostate cancer treatments invoking physical concerns and side effects.

One common feeling among the participants was their concerns of the effects related to having a radical prostatectomy. As mentioned above, Craig said he feared having to wear male diapers due to loss of bladder control. Dale, upon exploring treatment options, had heard others who had surgery for their prostate cancer, and he stated the following:

Lot of people, they took their prostate out, you know, and listening to what the some of the side effects were of that, you know, I mean, to me, that would affect a lot of masculinity issues with a man, depending on how bad the side effects were with that, you know, if you lost control of

your urination or whatever, you know, and have to wear a diaper all of the time. . . . I didn't know if I wanted to go through my life having to wear a diaper.

The two participants that did have surgery for their prostate cancer indicated having urinary issues after the procedure. Arthur gave examples of having a lack of control urinary control and needing protection to guard against unwanted accidents. He explained his urinary troubles in the following way:

I have to wear a pad all the time, so if I do happen to have a leakage that it's taken care of. And immediately after surgery that was kind of a problem. And that upsets a lot of men, not being able to control or wearing a catheter for a while and a bag, and now quote I'm just to the dribble stage or whatever, but like I say if I happened to cough or exert myself and that and especially if you're wearing dress slacks or light slacks why it's better to have the assurance in front of you than to stain your britches. . . . My wife thinks that I had a little bit of trouble going into the pharmacy and picking up my own men's shields, bladder shields. She was doing that for me for a long time, and then I have started to do that myself now. But she thinks that was hard for me to pick that up and go to the register and buy that.

Arthur also mentioned having large pads that he places on his mattress, in the case of any urinary accidents. Mike also mentioned some of the urinary side effects of his surgery by saying, "I have to wear what I call splash guards, made by Depends." He goes on to say that, "I will leak when I get tired, because my urinary tract is not as tough as it was after that surgery. But if you wear those little Depends guards in the front, you usually will take care of that."

Some of the other concerns and effects of having surgery for prostate cancer were related to sexual function. By talking with others who knew about some of the issues related to surgery for prostate cancer, Dale said the following in regard to sexual function after the surgery:

I know another guy that I've been friends with for a long time, and he had his prostate taken out about a year ago, a year and a half ago. And he said, "I don't know if I'd ever do it again."

Because of dealing with the symptoms. My neighbor, you know, he's talked to a lot of guys, and I mean, he knew one guy that I mean, of course, you know, sexual activity completely changes. You know, there isn't any sex, you know. He had a wife that wanted to get a divorce, and I think he was becoming suicidal from the whole thing. So, you know, there's a lot of, I don't like what I've had to go through, but I guess I've been blessed that I haven't had to deal with that, at the same time. Yeah, and everything that comes along with that.

After making his decision to have surgery for his prostate cancer, Arthur described what his doctor said to him by saying, "And he point blank told me, 'Some things were going to cease if they cut all the muscle wall' and that I had to more or less give up sexual activity. And that happened." Arthur remembered thinking to himself, "Well, that's the part that's not supposed to quit." He also explained his feelings after having his prostate removed in the following way:

Initially, it's like something's being taken away from you. That, to me, that's kind of your first thought. Well, you know, "I don't deserve this." You know, and that I mean you know, "I was a good boy and now I can't have sex. I waited you know I didn't do this in my high school years I was a good boy, God, now what are you? And I didn't do it in Vietnam either."

Mike said that his doctor told him that having the "old-style way" of surgery would, "put bluntly, make you impotent." However, he expressed uncertainty about whether the DaVinci or robotic surgery technique would result in those effects. Mike also said he was not concerned about the sexual effects that the surgery may invoke, despite others expressing these worries to him. After talking with two other gentlemen who were concerned about sexual issues related to the surgery Mike explained his thoughts about this issue in the following way:

I got two guys, one guy that's going through this now that he is old enough to be my father. He's in the 80s. He refuses to do the surgery because, "What do I do about sex?" I'm thinking that I'd rather live a better life than worry whether I have sex one or two times. . . . If I really, really

wanted between the Viagra and stuff, or they can even go as a thing and this would amaze me more than anything that anybody would spend that kind of money. There is actually a contraption that has a air pump on it with a ball and a valve. And you would pump yourself up if that was that important to you. At this point in time, that is not even that important to me, cause like I said, to me, functioning the rest of the life, I think there's too much worry. I don't know whatever you want to say. I'm just different and I never worried that much about manhood and that stuff. I worried about I count manhood more about being here for your kids, grandkids, and everything else, than I do worrying about whether I can function physically properly.

The majority of the participants spoke about concerns and issues related to side effects from having radiation treatments. Leroy, although not yet beginning his treatments at the time of the interview, said that his doctors told him his symptoms would actually worsen for a while after undergoing radiation. He said, "He told me that during the radiation treatments, my symptoms would get worse at first and it might even be a year before I had positive results from the radiation treatment."

Mike, who had surgery for his prostate cancer, expressed his concerns about having radiation, which were based on information gathered from his healthcare professional, as well as a neighbor who had radiation for prostate cancer. He said the following:

There's two types of radiation . . . that I was told of. . . . One of them is the radiation pellets that they implant, which I had a neighbor did that and that was a disaster. He got scars from it and trouble urinating. And he said, "I wished I had done what you did." But they talked him into doing that, so he didn't have to have the surgery. But the doctor assured me that if I ever did radiation as far as cooking it like a microwave radiation, it cooks it, it burns it, but you can never operate on it again. So, they suggest that you did surgery first and then follow it with chemo or radiation if you need it. That's why I kept saying I never needed any of that. But if you choose to

do the radiation first, there is no going back to have the operation like I had as far as cutting it out.

Arthur mentioned that his doctors essentially convinced him that having radiation would damage healthy cells around his prostate, making surgery more difficult to perform subsequently, which he shared with a friend from his church, who was in the treatment decision-making process for prostate cancer. And after this friend asked his doctors about some of his treatment options, Arthur said the doctor told his friend, "Oh yeah, we can be more specific right now with our surgery and what we remove than after we damage cells, then it kind of becomes a guessing game." In terms of radiation damaging healthy cells, Paul demonstrated some concerns about radiation leading to damage of other healthy cells. He expressed these ideas in the following:

I think they treat it with the radiation a little broader than just the prostate. I think they try to widen the field a little bit. But they still don't want to widen it too much, because you don't wanna, see you damage some good cells when you do that, so it's not something you take lightly.

Dale, who had undergone many types of chemotherapy drugs for his cancer, also explained some of the concerns of radiation, based on information from a doctor and also another patient undergoing radiation treatments. The concerns he expressed were related to radiation seed therapy, as opposed to external beam radiation, like all of the participants had in this study. He stated the following:

I do know when we talked to the head of urology up there at [name of medical center, he said, "If it would come to it," he said, "Sometimes when you put those seeds in there, they have a tendency of floating a little bit." And he said, "If you got to have your prostate taken out," he said, "It can be an issue sometimes. Make it a little bit more complicated."

In regard to a friend of Dale's who was receiving radioactive seed therapy, Dale said,

He's still got some side effects. He's got some which I haven't heard anybody having any issues with that. But I hadn't talked to that many people about the seeds. But his they've I think those seeds, they told him because he was just up for Monday the other day and they think the radiation is working on some nerves 'cause his penis is numb.

Of the participants who received radiation treatment for the prostate cancer in this study, all noted some additional type of side effect(s) and symptoms from their treatment procedure. Once common side effect was fatigue and lack of energy. Bob was worn out from the treatments, and it disrupted his ability to work as much as he would have liked. He said, "The work was when I started my radiation, and it just knocked the crap out of my damned ol' energetics. . . . But there was no sign of this coming on." The radiation also affected Paul's energy and ability to work as much. He explained his experience with fatigue from radiation in the following way:

But that radiation I had a few days where it really, I wouldn't say knocked me out for the day, but it knocked me out for a half a day. There's several days I came home and boy I just felt like it really hits you. Now whether it was from the treatment that day or maybe the day before. You know you wouldn't think it'd do it that quick really. . . . You just felt like you wanted to lay down and didn't have any energy. And I kept workin' most of the time. I'd come home and I'd maybe rest a while, get something to eat, and go out and work the rest of the day. But I think I could tell that it took a little bit of toll. I mean it took some of the energy or strength out of me.

Ernest mentioned just some mild tiredness from the treatments, as did Tom which he thought was related to being retired for so long and not having a set schedule each day. However, Glenn actually had more prominent effects on his energy levels. He said the following:

I've been able to work, and I get tired quicker now, which disgusts me. . . . So, but with these treatments I've done some of that, because they said it would tire me. And I thought, "Well, I'll wait till that happens." Well, I've felt it several times different times. Today, I felt it a little

bit. I might have exceeded my thing a little bit longer going today pushing myself. And I probably should have quit a little quicker.

Other concerns or effects from the radiation were also present in a couple of the participants. In terms of urinary symptoms, Bob said, "Now, since I had that, . . . I got to go more often a lot more during the night." Glenn explained some of the physical discomforts of his radiation treatments in the following way:

The other thing is the treatments, like the radiation treatments, the symptoms there, you want to talk about symptoms. I can feel that area where they're shooting that ray, and I asked the doctor and he's saying, "You shouldn't be able to feel that." Well, my body, I can feel it. And you know he said, "Maybe," well my family doctor said, "Well, your bunghole will be sore," and there's a little bit of that, but not like if I have hemorrhoids. Boy then wow, you know if I lift and have hemorrhoids for a few days that's not pleasant. But I can feel where that radiation has been and something like it's just hard to explain. It's uncomfortable, I can't say that it's painful. It's just uncomfortable. It's kind of like somebody in there pushing or squeezing something and you just you know where it's at, but you can't get to it you know to rub it or anything like that. So, I think that there are the radiation has some symptoms to it.

None of the participants experienced major effects from having hormone injections; however, one participant, Glenn, who although did not end up receiving injections, expressed some initial concerns of some of their possible side effects based on information shared with him from a friend.

Referring to his friend's experience with hormone shots, Glenn said following:

The only thing is they gave him hormone shots with his radiation. And he was having sweats as a result, unpredicted sweats. He might get up in a sweat and a kind of hot flashes or what have you, similar to what a lady may have in menopause. But anyway, he said that was a distraction he really had.

Dale was the only participant in the study who underwent chemotherapy treatments for his prostate cancer. He initially expressed worry and fear about having to have chemotherapy and what physical side effects may result. He shared some of his feelings related to chemotherapy in the following way:

I guess I was more worried when I found out how bad it was and that I knew I was gonna have to go through chemo, you know. I was more worried about side effects from that, how it was going to affect me physically, whether or not I was going to be able to work anymore, since I did physical work, you know. That was my biggest concern, you know, kind of fear, of where, you know, what was gonna happen, how I was going to be when I got done.

Throughout his treatment journey, Dale had been on five different chemotherapy regimens, and he was currently going into the third round of the fifth drug at the time of the interview. The main issue he had faced with each of the drugs was a PSA level that would rise at the completion of his chemotherapy protocol, indicating a failed drug. He also has struggled with increasing physical symptoms related to anemia, which has caused him severe weakness and fatigue on several occasions. He explained some examples of these occurrences in the following depiction:

There have been some times because of being anemic that I'd wake up in the morning, take a shower, go out and start my car, get dressed, go out, start my car, so it would warm up, come back in the house, and I'd get winded. I'd be fine until I went out there and came back. And I'd drive myself to the hospital, and I'd get inside the doors, and I'd have to sit down, because I couldn't walk from the parking lot all the way to where oncology was, cancer center was. And there was probably three or four times that after I got in there and I sat down the first time, I couldn't hardly walk a straight line to get back there to the cancer center because I was so anemic. So, they'd have to end up, I kind of resisted letting them help me, but after about the third time, I mean, they'd end up helping me get back here. So, and it was just getting scary,

because I was wondering whether or not, I'm still not through the woods yet, so to speak. But it was getting concerning to me that how long is this going to keep up?

Another major concern of Dale's is that his cancer has been unresponsive to so many different drugs. He expressed worries about the future and what other treatments would even be available for him if his cancer continues not responding to the drugs he takes. He provided the following thoughtful narrative to demonstrate these feelings:

My biggest concern is just the fact that, I mean, reality of the whole thing. They've only got so many ways to treat prostate cancer. But just say there's eight, you know, I don't know exactly how many there is, but just say there're eight ways to deal with it. Now, you don't know that every single one of 'ems going to work on your cancer. And I've already been, I'm on my fifth one right now. You know, I went through one chemo, went through two different pills up there, went through another chemo here already, and now I'm doing another one. So, my options of getting this treated have been depleted as far as a resource to deal with it, unless they come up with a new one, which they every three to five years they come out with a new one. So, if I've only got two or three left, question is whether or not it would work when I need it, and I've only got two or three left, you know. And if it comes back every five to six months, I've only got three left, that's essentially a year and a half. I mean, that's how I look at.

Summary of Results and Findings

This section contains a summary of the quantitative and qualitative data described in the previous sections. The first part of this section will explain results from the MRNI-SF questionnaire, and the second portion of this section will provide the themes from the interviews and their descriptions and overviews.

MRNI-SF overview.

According to demographic information gathered in the MRNI-SF, this study involved 11 participants, all non-Hispanic, white men, with an average age of 71.5 years. The majority of these

individuals (i.e., eight) completed either a high school, trade, or vocational school education, with three others indicating the completion of bachelor's or master's degrees. Additionally, six of the participants were retired, with four others indicating either self-employment or full-time work statuses, with another being unable to work. Eight of the participants reported being married, with the remaining three reporting either being divorced, widowed, or living in a domestic partnership. And finally, as far as annual household income, nearly all the participants reported earnings above \$25,000, with four earning up to \$50,000, two earning between \$50,000 and \$100,000, two earning between \$100,000 and \$200,000, and one earning more than \$200,000. Only one participant reported earning less than \$25,000.

The responses to the 21-item MRNI-SF questionnaire provided interesting insights into the participants' beliefs and attitudes about traditional masculinity in Westernized society. Overall, the average TMI of the participants indicated their general endorsement of traditional masculinity practices and beliefs. Around 45% of participants generally agreed with the 21 items of the questionnaire, with each item containing a statement demonstrating some type of traditionally masculine practice or belief. In addition to overall TMI, seven related constructs were measured and reported in the analysis. The average values of five of the constructs showed the participants' tendencies for the following: avoiding practices considered feminine (AoF), rejecting sexual practices not considered heterosexual (NTSM), relying on themselves through mechanical skills (SRMS), displaying physical toughness, aggressiveness, and having a willingness to take risks (T), and believing sex to be a significant priority (IoS). The averages of two of the constructs revealed participants' general rejection that men should always be the boss or leader of a group (Dom) and that men should restrict or not reveal their emotions to others (RE).

Based on the overall averages of the seven different constructs, the participants' strongest masculinity norms endorsement was for the rejection of homosexuality, and their strongest rejection of masculinity norms was for men always being the leader or boss. When considering the mean values of

each of the 21 items of the questionnaire, the participants' most strongly agreed that homosexuals should never marry (NTSM1), and they most strongly disagreed with the following statements: Men should be the leader in any group (Dom3), and men should be detached in emotionally charged situations (RE16).

Upon consideration of the highest and lowest general levels of agreement and disagreement for overall scores of the seven constructs, interesting findings emerged. For the highest overall general level of agreement, an average of 57% of the participants generally endorsed the rejection of homosexual practices (NTSM), as well as an average of 57% of participants generally agreeing that men should rely on themselves through mechanical skills (SRMS). The lowest overall average of general agreement was for the belief that men should always be the boss or leader at 21% (Dom). The highest overall average level of disagreement was the belief that men should always be the boss or leader at 51% (Dom). The lowest overall average level of disagreement was for men's rejection of homosexual practices at 18% (NTSM).

Finally, some interesting results emerged regarding the highest and lowest average general levels of agreement and disagreement for the specific values of the seven constructs. The highest average level of general agreement was for the belief that men should have home improvement skills (SRMS6) at 82%. The lowest average level of general agreement was for the belief that men should be the leader in any group (Dom3) at 9%. The highest average level of disagreement was the same among four items, all at 54%: men should be the leader in any group (Dom3), a man should always be the boss (Dom 12), men should be detached in emotionally charged situations (RE16), and a man should always be ready for sex (IoS18). Lastly, the lowest average level of disagreement was tied at 9% for two items: Boys should prefer to play with trucks rather than dolls (AoF10), and homosexuals should never kiss in public (NTSM13).

The analysis of the 11 interviews produced an interesting assortment of rich information and themes (as detailed in the previous section) related to farmers' experiences with prostate cancer times to presentation, diagnosis, and treatment, as well as their experiences after starting treatment. The final portion of this chapter will briefly summarize and describe these seven themes.

Theme one: The body as an occasional guide for prostate cancer detection.

Of the 11 participants actually detecting some type of prostatic issue or change, only five mentioned something during the interviews. The other six essentially did not have any detection of issues or symptoms before presenting to a healthcare professional for a prostate examination. Thus, the reason for the word *occasional* in the theme's title. Of those who actually experienced the first event in the model of pathways to treatment, the most common issue detected were urinary-related, especially excessive urination. One also noted some blood in the urine a couple times after having intercourse the night before. Event two in the model of pathways to treatment was also experienced by some of those who experienced event one, with the primary prostatic symptoms related to trouble with urination, blood in the semen, and lower back pain. The time to presentation for those experiencing event one and/or two were not clear for everyone; however, one individual took close to five months to finally see a healthcare professional for his issues, and another took closer to seven years before he presented to a healthcare professional and mentioned the prostatic symptoms.

During the patient appraisal and self-management process of the model of pathways to treatment, several experiences occurred related to constructs from the common-sense model of illness self-regulation. A few individuals who had experienced some type of prostatic issue and/or symptom mostly attributed the condition to old-age, which fits the heuristic of the common-sense model of illness self-regulation known as the age-illness rule. Among the cognitive representations present in the common-sense model of illness self-regulation, some of the participants explained the causes of their condition and the consequences resulting from their prostate issues. Some of the causes were linked to

over-exerting one's self sexually, riding ATVs around the farm checking fields, drinking a lot of Diet Coke, and not being very sexually active for many years. The consequences resulting from the issues were mainly social and functional in nature, such as having the embarrassment of dribbling urine on one's pants or disrupting one's rest due to excessive urination at night. Self-management was not common among the participants; however, one individual mentioned monitoring his issue more closely.

During the process of deciding to consult a healthcare professional and scheduling an appointment, which occurs between events one and two of the model of pathways to treatment, constructs from the social cognitive theory are involved and highlighted with some of the individuals. One individual cited denial as a personal barrier to seeking help, which is part of self-efficacy. This same individual also demonstrated that his physical symptoms were severe enough that they essentially forced him to contact his healthcare professional, which is part of physical outcome expectancies of the social cognitive theory.

Theme two: Routine check-ups serving as the primary method of prostate cancer suspicion.

The main reason the majority of the participants presented to a healthcare professional for a prostate examination was through a routine check-up with a general practitioner or urologist. These routine appointments assisting them to seek help are known as socio-structural opportunities, and they enhance one's self-efficacy for help-seeking by providing opportunistic times for discovering issues. Several participants recalled seeing their doctors for annual physicals and routine check-ups, and at these visits is where the suspicion of prostate cancer began. One individual saw his doctor in order to get his medication prescriptions renewed. Some individuals actually had "put off" going to the doctor or cancelled a routine appointment. The one who cancelled his routine appointment was actually contacted soon after the cancellation by his doctor and urged to come be seen, which he obliged. The other participant who had put off his annual appointment actually ended up having severe urinary and lower back pain symptoms and eventually contacted his healthcare professional.

Theme three: PSA-testing as a powerful predictor of prostate cancer.

Via the check-ups mentioned in the previous theme and during the diagnostic interval of the model of pathways to treatment, the process of healthcare professionals appraising, investigating, and referring the patient for prostate symptoms emerged. During the process of seeking a prostate cancer diagnosis, the PSA test becomes extremely important. Many participants provided information describing how their PSA level is what led to a prostate biopsy and eventual diagnosis. Information about the rate and overall changes occurring in the PSA levels of the participants over time were provided. A variety of PSA changes among the participants may have helped the healthcare professionals predict what was transpiring. The majority of participants' PSA levels showed steady increases over time, usually with a significant jump that alarmed the healthcare professional to examine the issue more closely with a biopsy. However, one participant's PSA level doubled in a year, whereas another participant's increased on by four tenths in a six-month period. Another participant's PSA level increased in a two-year span from 2.8 to 1,200. Needless to say, the major sentiment of the participants was that PSA testing is very important, even regardless of age and current national, medical recommendations.

Theme four: Prostate biopsy as somewhat of a necessary bugaboo for prostate cancer diagnosis.

The biopsy of the prostate is how an initial diagnosis of prostate cancer is made, and some of the participants explained concerns, worries, and unfortunate experiences with the procedure. One participant recalled a "horror story" shared with him by a co-worker who had undergone the procedure and expressed a desire for finding a different way of examining and testing the prostate for cancer. Another participant, who already had a fear of needles, had issues with relaxing during the procedure and demonstrated some nervousness and impatience while the doctor performed the biopsy. Importantly, although apprehensive about having the procedure done, each participant expressed no issues or problems upon its completion. A third participant recalled his negative experience with the

procedure, mainly because he had been given the “candy-coated” version of how the biopsy procedure would go. Instead, this participant experienced pain for a couple days and even said to his doctor at a follow-up appointment in reference to his biopsy effects, “That was a kick in the nut sack!” The negative expectations and/or actual issues experienced by some of the participants before, during, and/or after the biopsy are the primary reason for the title of this theme.

Theme five: The prostate cancer diagnosis putting psychological health on display.

Being told one has prostate cancer can be a challenging circumstance to deal with, and it tends to bring about situations, thoughts, and experiences that further engage one’s social, emotional, and spiritual aspects of life. Socially, some participants were willing to discuss and share information about their condition with others without much problem or reluctance. The positive support of family, friends, and others was also a common experience by several of the participants. Other participants indicated a reluctance of sharing the news with others and were hesitant to even tell close family members and/or friends. One participant explained his rationale for not wanting to share his diagnosis with others because he had some fear of the stigma others may place on him, as if he may have some type of “expiration date” stamped under his foot somewhere.

Emotionally, some participants did not feel much worry or anxiety about a prostate cancer diagnosis, and they also did not want others to feel worry or sympathy for them. A couple individuals expressed little worry largely because their cancer was slow-growing and not aggressive, although one did mention feeling some worry the few days after the diagnosis. Other participants did express negative emotions upon being told of a cancer diagnosis, with some feeling hurt, scared, and even indicating worry about the unpredictability of cancer. And a few others did not have really any emotional response to the diagnosis and instead had the attitude of “just dealing with it” and moving on to treatment.

As far as spiritual health, the participants expressed a general belief in a higher power and how their faith helped them deal with any negative aspects of having prostate cancer. Many of them even stated how their faith alleviated their fears of dying from their condition because of a belief in going to heaven after death.

Theme six: Healthcare professional characteristics and others' experiences reign paramount in treatment decisions.

The selection of the healthcare professional for prostate cancer treatment was of extreme value and priority to the participants of the study. Several participants explained some of the most important traits of a healthcare professional and also shared some of their experiences to highlight these characteristics and to justify their decision for choosing a particular individual. The major features of a healthcare professional that make them desirable for a patient were primarily an individual who exemplifies the following attributes: displaying a high level of intelligence, experience, and specialization, basing decisions on the most current research and evidence; honestly expressing all information and news he/she shares with his/her patients; being an active and patient listener; and being a down to earth individual who actually cares about his/her patients.

Another factor in the treatment decision-making process that demonstrated significant importance to several of the participants were the experiences of other people who had undergone treatments for prostate cancer or who had experienced other forms of cancer. One participant was drawn to have surgery based on the fact that he had a sibling die of untreated advanced lymphoma, and this participant just "wanted it out" of his body. Other participants expressed that family members' and friends' negative experiences of having prostate cancer and treatments at certain clinics or hospitals as a major reason for finding another treatment facility for their care. Others conversed with individuals who had undergone various procedures and based their decisions of treatment and healthcare facilities on trusted friends' opinions and advice. Another individual based his treatment decision partly on his

experience working with pigs on the farm, and he chose surgery as a result of these perceptions and experiences.

Theme seven: Prostate cancer treatments invoking physical concerns and side effects.

The final theme depicts and demonstrates participants' experiences and perceptions related to specific treatments for prostate cancer, with physical issues being of primary concern. Several of the participants expressed the worries and embarrassment of having bladder control effects following radical prostatectomy and the risk of having to wear diapers. Prostate surgery also evoked fears and negative thoughts related to loss of sexual function. One participant recalled a very unfortunate situation in which an individual's experience of having prostate removal led to his divorce and eventual suicidality. Another participant recalled his doctor telling him that he would no longer be able to have sexual intercourse, and that indeed ended up being the outcome for him, even though he expressed that having sexual intercourse was no longer a priority in his marriage. Another participant undergoing surgical removal of his prostate recalled other individuals who worried for his loss of sexual function; however, this participant also said that sex was not of high importance in his marriage.

A larger number of participants actually expressed having or expecting physical side effects from having radiation treatments. One participant still deciding on the most appropriate treatment was told by his doctor that radiation would increase his prostatic symptoms at least for about a year. A participant who opted for surgery was told by his doctors that radiating the tumor first would no longer allow for a subsequent surgery, if necessary. And the other participant of this study who had surgery for his prostate cancer recalled his doctors telling him that radiation of the cancer would also increase the damage of healthy cells, which was one reason (among a few others) why he chose the surgery. The issue of radiation damaging healthy cells was also an issue raised by another participant, whose doctor also said that could be a possibility, depending on how "wide the area was" that they were treating. Another participant talked about issues that could occur from having radioactive seed therapy, such as

having numbness in the penis or having the seeds “float around” and making a surgical procedure more difficult.

Every participant undergoing radiation therapy for their prostate cancer noted some type of physical side effect from the treatments, from increased urination, to fatigue, to discomfort in the radiated area of the body. The most apparent and common symptom from the treatments was the increased tiredness and fatigue, with participants describing how their energy and strength levels seemed to decline.

Of the remaining treatments that participants had, hormone injections and chemotherapy, only one participant expressed the potential effects from having the hormone injections and based it on a friend’s experiences with having “hot flashes” and breaking out in sweats. The one participant undergoing chemotherapy for his prostate cancer may have had the most troubling physical symptoms and side effects of all the participants undergoing some type of treatment for their prostate cancer. Upon being diagnosed and realizing he would be doing chemotherapy for his prostate cancer, he expressed concern and fear of the physical side effects the treatment may cause. Due to having such an aggressive form of prostate cancer, this participant had completed several different chemotherapy treatments and was currently on his fifth different drug at the time of the interview. His PSA level eventually ended up increasing after each treatment with four different drugs, indicating to the doctors that his prostate cancer was not under control and needed to be targeted differently. At the time of the interview, the main physical health effect of his treatments and cancer were related to being severely anemic, with incredibly low platelet counts, issues which had caused him several times to have problems with extreme fatigue and energy loss. Additionally, this participant demonstrated that his biggest concern and worry was whether new treatments would continue to be available for treating his cancer, which has continued on a trajectory of eventually not responding to particular drugs.

Chapter Five: Discussion, Conclusions, and Suggestions for Future Research

Introduction

Men have shorter life expectancies than women in nearly every country worldwide (CIA, 2017; UNDP, HDRO, 2016), primarily due to four NCDs (i.e., CVD, cancer, CRDs, and diabetes) typically caused by tobacco use, unhealthy diet, physical inactivity, alcohol abuse, elevated blood pressure, glucose, cholesterol (WHO, 2016a, 2016d), and obesity (WHO, 2016e). Gender is predictably one of the strongest determinants for men's increased likelihood for injury, disability, disease, and death, compared to women (Courtenay, 2011). The practice of traditional and hegemonic masculinities seems to be particularly detrimental and deleterious to men's health, despite being the most celebrated forms of masculinity in most societies (Courtenay, 2000b/2011). Rural men tend to more strongly endorse traditional forms of masculinity compared to nonrural men and rural women, with male farmers perhaps having an affinity for the most traditional masculinity practices and beliefs, particularly for healthcare-seeking (Courtenay, 2006/2011). Farmers pay the price physically and mentally for their masculinity behaviors and beliefs.

Considering all cancers worldwide, prostate cancer ranks second for incidence and is the fifth most fatal (Bray et al., 2018). In the U.S., prostate cancer is the most common and second deadliest (ACS, 2019a), with a variety of potential modifiable and non-modifiable risk factors (see Rawla, 2019). For those at average risk, regular screenings for prostate cancer should be determined by an informed decision-making process occurring between the patient and his healthcare professional by age 55 (American Academy of Family Physicians, 2012; Grossman et al., 2018). Unless PSA-tested, many individuals may not know they have prostate cancer (Jahn et al., 2015), due to an absence of signs and symptoms (Rawla, 2019). If symptoms are present, those that are most common would involve urinary issues (Rawla, 2019; Serlin et al., 2018), and in the case of more aggressive cancer, back pain (Rawla, 2019). Although farmers have a generally lower risk of all cancers combined, they have consistently shown a higher risk for having and dying of prostate cancer, compared to nonfarmers, which has been

primarily linked to pesticide use and exposure. U.S. farmers may be less inclined to undergo routine PSA-testing for prostate cancer compared to nonfarmers (Muldoon et al., 1996; Earle-Richardson et al., 2015).

Due to farmers' increased likelihood of developing and dying from prostate cancer, their lower propensities for healthcare seeking, and stronger endorsements and enactments of traditional and hegemonic masculinities, this study aimed to describe the factors and processes impacting the events during time to presentation, diagnosis, and treatment for prostate cancer. The study also explored the factors affecting the treatment experiences as well as TMI and its sub-constructs of AoF, NTSM, SRMS, T, Dom, IoS, and RE.

The overall research question of this study was, "What meaning do farmers ascribe to their times to presentation, diagnosis, and treatment for prostate cancer?" The four procedural sub-questions related to these central concerns were:

(a) How do you describe the major processes and contributing factors impacting the events leading up to a farmer's first consultation with a healthcare professional for prostate cancer symptoms?

(b) How do you describe the major processes and contributing factors impacting the events leading up to a farmer being told he has prostate cancer?

(c) How do you describe the major processes and contributing factors impacting the events leading up to a farmer receiving his first treatment for prostate cancer?

(d) How do you describe the contributing factors impacting a farmer's experience with prostate cancer treatment?

Additionally, descriptive statistics and information were provided from the MRNI-SF questionnaire, which assesses TMI and several other sub-areas concerning beliefs about masculine norms in Western society.

Study results yielded several interesting findings from the MRNI-SF and the qualitative data collected from interviews with 11 farmers. Several of the factors from the MRNI-SF were noteworthy, particularly TMI, AoF, NTSM, SRMS, T, and IoS, which were all generally endorsed by the participants. Only for Dom and RE was there a tendency of the participants to not endorse traditional masculine norms associated with those two constructs. The strongest overall endorsement of the participants was for NTSM, with the weakest endorsement being for Dom.

Interview results yielded seven major themes: (theme one) the body as an occasional guide for prostate cancer detection, (theme two) routine checkups serving as the primary method of prostate cancer suspicion, (theme three) PSA-testing as a powerful predictor of prostate cancer, (theme four) prostate biopsy as somewhat of a necessary bugaboo for prostate cancer diagnosis, (theme five) the prostate cancer diagnosis putting psychological health on display, (theme six) healthcare professional characteristics and others' experiences reigning paramount in treatment decisions, and (theme seven) prostate cancer treatments invoking physical concerns and side effects.

Interpretation of MRNI-SF Results

MRNI-SF results revealed that the farmers in this study tended to generally endorse and prefer beliefs and practices that are representative of traditional masculine norms in Western society, particularly for TMI, AoF, NTSM, SRMS, T, and IoS. However, farmers did demonstrate tendencies against the endorsement of two other constructs (i.e., Dom and RE). When considering all of the mean values for each of the 21 items of the questionnaire, the farmers endorsed traditionally masculine norms for 16; for only five of the items did they not endorse beliefs aligned with traditional masculinity. Since essentially all of the items of the MRNI-SF are supported by previous research, this portion of the discussion focuses on interpreting farmers' results for those five items in which traditional masculine norms were not endorsed.

Two items related to Dom that farmers did not endorse were the beliefs that men should always be the leader of a group (Dom3) or boss (Dom12), which are considered more progressive ideological stances, particularly when focusing on previous literature related to the workplace and gender. For example, men constitute more than three-quarters of the farming, ranching, and agricultural management workforce, and in general, men make up the vast majority of individuals working in the U.S.' most dangerous and fatal jobs (USDL, USBLS, DIMS, 2017; USDL, USBLS, OCWC/Office of Safety and Health, 2016). Men also tend to overwhelmingly be the leaders or bosses of the most powerful and prestigious jobs in the U.S., such a chief executive officers, lawyers, general and operations managers, judges and magistrates, physicians, etc. (USBL, USBLS, DIMS, 2017; USDL, USBLS, Division of Occupational Employment Statistics [DOES], 2017). Women tend to work in occupations seen as traditionally feminine, such as speech-language pathologists, nursing, preschool and kindergarten teachers, teacher assistants, secretaries and administrative assistants, etc., which typically are positions of lower wages and power.

Studies focused on gender in the media also provide strong support of men being portrayed as dominant figures and women more submissive and subordinate (Wood & Fixmer-Oraiz, 2017). In a study investigating TV and radio advertisements over a period of more than thirty years, men were more likely to be in positions of authority, power, and leadership (Eisand, 2010). Perhaps one of the most popular media portrayals of farmers in recent history occurred during Super Bowl XLVII, one of the most popular TV events of that year. The *So God Made a Farmer* advertisement provided a poignant image of what it means to be a farmer in the U.S. Based on the commentary and images of the advertisement, farming is a male-dominated field, with only two adult female farmers appearing throughout the 35 photographs presented in the two-minute presentation. Moreover, the commentary only referred to a farmer as a man, as evidenced in the narrator's use of male pronouns (Ram Trucks, 2018). Therefore, the results of

the MRNI-SF questionnaire in regard to Dom3 and Dom12 were somewhat surprising, and do not necessarily reflect the current workforce population or media representations of men.

Two other items from the MRNI-SF that the farmers from this study did not tend to endorse were the beliefs that men should be detached in emotionally charged situations (RE16) and that men should not be too quick to tell others that they care about them (RE21). Each of these constructs exemplifies the idea that men should restrict and not display or profess their emotions to others. Historically, Bem (1974) and Spence et al. (1975) demonstrated that men traditionally are less likely to show and express their emotions to others, which is actually seen as more of a stereotypically feminine characteristic. Beginning at infancy, boys tend to be taught that sensitivity, emotional expression, responses to vocal cues, and vocal modeling from other men (i.e., fathers) are less common than from women, namely mothers (Bigelow et al., 2010; Braungart-Rieker et al., 2001; Grossman, Grossman et al., 2008; Johnson et al., 2014). As children get older, fathers become less tolerant of emotional expressions related to pain and sadness than mothers, and sons tend to restrict their feelings (Zeman & Garber, 1996). Fathers also speak with sons less often about feelings of fear and sadness, compared with daughters (Fivush et al., 2000). Fathers also display their love to their sons and daughters with less physical affection and touch than do mothers (Kilicgun, 2016).

Athletics also shape and form the beliefs and behaviors of boys and men, in regard to expressing emotions and feelings to others. Sports sometimes teach men to deny physical and/or mental pain, to ignore friendships or bonds one may have with other athletes, especially those they are competing against (Kidd, 1987; Messner, 1987), to accumulate man points (de Visser & McDonnell, 2013), and to essentially win no matter the cost (Adams et al., 2010). In the *So God Made a Farmer* advertisement, among the many images of adult male farmers, not one of them is smiling or showing positive affect. Rather, they either have downtrodden or neutral expressions and are mostly solitary. In the

commentary, a farmer is portrayed as an individual that must move on quickly from tragic situations, without taking too much time to reveal emotions of sadness or despair (Ram Trucks, 2018).

Practicing RE is also evident in the literature pertaining to farmers' mental health, which indicates alarmingly high rates of suicides (Ringgenberg et al., 2017; Stone et al., 2018; Tiesman et al., 2015). Perhaps when one strongly endorses the farming identity, he is less likely to show and express his emotions to others (Drouillard et al., 2017). Also, building on the evidence provided in another study of mental help-seeking, farmers may consider the expression and sharing of emotions as antithetical to the characteristics of a farmer (Hull et al., 2017). For one who strongly holds to the traditional identities associated with being a male farmer, emotional expressions and reactions to others are not likely occurrences (Perceval et al., 2017). Considering the evidence provided in support of a farmer not expressing and displaying emotions to others, it is an interesting finding that farmers in this study did not endorse these traditional masculine norms. Perhaps this is a sign of the farming identity transforming and becoming more accepting and open to how one feels both physically and mentally.

The final item from the MRNI-SF that was not endorsed by the farmers of this study was for the belief that a man should always be ready for sex (IoS18). According to the author's understanding, this item essentially means that whenever presented with the opportunity to engage in sexual behaviors with someone, the farmer should be ready to act, without hesitation, regardless of any issues he may be facing at that time.

Previous research does show males masturbate more often and tend to view casual sexual encounters more positively than women (Hyde, 2005). In a study of the highest-grossing movies over more than a five-decade period, men represented nearly 70% of the main roles, and sexual scenes were present in 80% of the films (Bleakley et al., 2012). Another study found that viewing sexually explicit types of media (e.g., internet or via sexting) was associated with risky sexual behaviors for young people (Smith et al., 2016). So, perhaps when boys and men are exposed to certain levels of media portrayals of

men engaging in sexual acts, they may feel that they also should be ready for any sexual encounter that may be presented to him.

No information is available helping to explain the traditional masculine norm of men always being ready for sex; perhaps this helps demonstrate why the farmers in this study did not endorse this belief. That each of the individuals expressed some type pre- or after-treatment prostate symptoms, typically related to urinary or sexual health, may have made them feel less strongly about always being ready for a sexual encounter. Additionally, the majority of the participants expressed that sex was no longer a priority or important factor in their lives, especially if they were married.

Interpretation of Themes

The next portion of the interpretation of results focuses on the seven themes. The research literature is utilized to help demonstrate the alignment of results with previous findings. Thematic points that do not agree with previous findings are denoted.

Theme one, the body as an occasional guide for prostate cancer detection, represents the idea that one's somatic awareness of prostatic issues and/or symptoms may act as a useful method in sensing and/or suspecting that something may be wrong with one's prostate, before actually being seen or waiting to be seen by a healthcare professional. Nearly half of the farmers in this study indicated some type of issue or symptom related to the prostate occurring at some point in their lives. The most common prostatic issues and symptoms were related to urinary and sexual function, with more severe symptoms manifesting as severe lower back pain. The urinary issues and symptoms consisted mainly of excessive urination, particularly noticed at night, and trouble with urination (e.g., issues voiding and stream/flow concerns, such as dribbling). The sexual issues and symptoms mentioned were related to having blood in the semen, blood in the urine after intercourse, and not being able to get an erection and have sex. And in one very serious case, lower back pain became an extremely concerning symptom.

The symptoms experienced by the farmers in this study seem to corroborate with the literature. Prostate cancer symptoms are typically uncommon (Jahn et al., 2015), particularly for early-stage disease (Rawla, 2019; USDHHS, NIH, NCI, n.d.) located around the periphery of the prostate gland, which is where nearly 70% of all prostate cancers originate (McNeal et al., 1988). Symptoms typically only present as a result of a prostate that is bigger than usual, which may compress the urethra and/or disrupt the urinary sphincter (Michael & Pandha, 2013), making excessive urination possible, especially at night, with later-stage disease potentially leading to urinary retention issues (Rawla, 2019; Serlin et al., 2018) and/or pain in the back (Rawla, 2019).

Although the time to presentation (Scott et al., 2013) was not clearly identified for all of the farmers experiencing symptoms, one individual took about five months (150 days) to present to a healthcare professional for his symptoms and another estimated that took as long as seven years (2,520 days). In a similar study of prostate cancer patients, the average time to presentation for a small group of patients was 320 days (Emery et al., 2013).

Several of the farmers expressed age as being a primary reason for their prostatic issues and symptoms, most likely due to an enlarged prostate and not prostate cancer. Out of the non-modifiable risk factors, age is an established risk factor for prostate cancer (MacInnis & English, 2006; Pernar et al., 2018; Rawla, 2019; Rebbeck et al., 2013). The mortality rate for prostate cancer is also highest among those ages 85 and above. That farmers of this study were white, non-Hispanic, with an average age of 71.5 is consistent with data from 2010-2014 showing significant increases in distant prostate cancer incidence rates for the following groups: 50 to 64-year-olds, 75 to 84-year-olds, and white and non-Hispanic men (Howlader et al., 2019).

For excessive urination issues and symptoms, one farmer first thought that this may have been due to his high consumption of Diet Coke. Another thought he was urinating more often perhaps due to a water pill he was taking for a kidney condition. Certainly, diuretics are plausible explanations for more

frequent urination; however, it is hard to really know if the prostate or diuretics were causing the symptoms in these two individuals. Although, for the farmer who mentioned he was consuming a lot of Diet Coke, the excessive urination of this individual was due to prostate cancer and not high soda consumption, simply because upon diagnosis, this individual had a very aggressive cancer that had already spread to his bones.

One of the farmers who mentioned being a single father for many years and not engaging in much sexual activity over that time also mentioned his lack of sexual activity as a potential cause for his prostate cancer. One study of 32,000 men actually demonstrated a significant (i.e., 20%) reduction in low-grade prostate cancer cases for those men ejaculating at least 21 times per month (Rider et al., 2016). Although most likely not knowing about this particular research, this farmer obviously had some knowledge and/or feelings pertaining to sexual activity and prostate cancer etiology.

Another farmer attributed the blood that he noticed in his urine after having intercourse to potentially overexerting himself during the sexual activity. No research supports this theory; however, blood in the urine is an uncommon symptom of prostate cancer (Abrams et al., 2003). Another farmer indicated that he thought the blood he noticed in his semen, which occurred 20 years ago, was related to riding ATVs to check the crops on his farmland, and his doctor also suggested this as the cause at that time. This likely was not the cause currently, as previous research shows blood in the semen to be a rare symptom of prostate cancer and typically only present with more advanced cases (Han et al., 2004).

Some of the farmers identified the social effects of having various issues and symptoms. Those dealing with post-micturition issues expressed the embarrassment of having urine dribble on one's pants after urinating. Also, some felt embarrassment because of how long it took to empty their bladder. Additionally, some farmers expressed worries with getting enough rest, due to the excessive urination at night, and they were also concerned with their spouse getting enough sleep. Finally, urinary issues and back pain were also recalled as disrupting one's workday and impacting one's quality of life,

which eventually led this individual to schedule blood testing prior to even seeing his healthcare professional, just so that everyone would have a clearer picture of what was going on prior to being examined.

Previous research does not address farmers or men in general feeling embarrassment due to urine dribbling on one's pants, or due to others having to wait on them to finish urinating, nor does it talk about the sleep deprivation consequences (for the patient and his spouse) of having to excessively urinate at night. However, research does support the increase in seeking help promptly when symptoms begin interfering with one's work, when the pain is unusual, inexplicable, and/or painful (Whitaker, Smith, Winstanley, & Wardle, 2016), and when quality of life is impacted (Gartland et al., 2019).

One of the farmers mentioned denial as a reason he did not seek help right away for his urinary troubles and back pain symptoms. For those with cancer symptoms, research shows that help-seeking is delayed when patients try to rationalize and normalize symptoms (Emery et al., 2013; Low et al., 2015; Whitaker, Macleod, Winstanley, Scott, & Wardle, 2015). Also, help-seeking is delayed when patients minimize and downplay symptoms, viewing them as insignificant or mild (Yousaf et al., 2015).

Theme two, routine checkups serving as the primary method of prostate cancer suspicion, was an experience shared by the majority of the 11 farmers in this study. Six individuals did not express or acknowledge noticing any prostatic issues or symptoms prior to attending a regularly scheduled appointment with their healthcare professional, which is where the main suspicion of prostate cancer began, typically through a PSA test and/or DRE. It is important to note that not all of the five farmers who did acknowledge issues and/or symptoms considered their initial problems as being related to prostate cancer, thus their initial appointment with their healthcare professional may have also been the first time prostate cancer was suspected by that patient as well.

Despite the majority of the farmers indicating that they were being routinely monitored by a general practitioner and/or a urologist, three of the participants shared some differing experiences. One

farmer had actually cancelled his initial routine prostate checkup, although he would attend his appointment soon after, due to his doctor urging him to come be examined. Another farmer, who had been receiving annual physical examinations for several years, actually skipped having a physical examination one year, mainly because he was tired of the doctor telling him to quit smoking, and he was not yet ready to stop. Unfortunately, he would present himself to his doctor almost exactly two years from his last physical examination with severe symptoms of prostate cancer. And a third farmer was actually encouraged by his spouse to schedule a complete physical examination with his general practitioner, and he obliged. Thus, of all the farmers in the study, nine presented to a healthcare professional for a routine visit or checkup, some were visits to a urologist while others were appointments with general practitioners. Only two of the 11 farmers actually sought care specifically because of prostate symptoms. Therefore, the routine checkup seems to act as the first way of knowing if the farmer has some type of prostate cancer concern.

Overall, rural men in the U.S. and around the world are less likely to undergo routine prostate cancer testing than their urban counterparts, are usually diagnosed with more advanced disease, and also have higher mortality rates due to prostate cancer (Baade et al., 2015; Henley et al., 2017; USDHHS, ODPHP, 2018b). Two particular studies of farmers in Iowa and New York revealed that when compared with their rural nonfarmer counterparts, the farmers were less likely to have undergone routine PSA-testing (Earle-Robertson et al., 2015; Muldoon et al., 1996). In the current study, it seems that the majority of participants did not have major issues with attending routine checkups and getting PSA-tested on a regular basis. Therefore, the help-seeking behaviors of participants in this study, were generally inconsistent with those of participants in previous studies indicating that farmers are less likely to go to the doctor and get examined for prostate cancer. However, as already noted, some of the farmers in the current study had issues with attending a routine checkup (e.g., due to cancelling, not scheduling, or having to be coerced by a spouse to attend).

Theme three, PSA-testing as a powerful predictor of prostate cancer, refers to the importance of a blood test that helps identify the level of PSA in the blood. Each of the farmers in the current study either received a PSA test at their general practitioner or through their urologist, and upon a general practitioner noticing concerning levels, he/she referred the farmer to a urologist for further diagnostic procedures and examinations. These farmers indicated several situations and experiences with PSA-testing that helped lead the urologists to pursue further diagnostic investigations for prostate cancer. Each farmers' individual case and PSA-level history were helpful indicators for the doctors in making diagnostic decisions. One participant in particular expressed some very poignant and passionate feelings related to PSA-testing policies and national recommendation guidelines, demonstrating his extremely strong frustrations with doctors who do not recommend or encourage PSA-testing once men get in their 70s and beyond. He argued that since people are living longer now, and there is no way of predicting how much longer an individual will live, that PSA-testing should not just be an optional thing to be taken lightly. This farmer also based his argument on the fact that he has a strong family history, with two first-degree relatives having advanced prostate cancer.

To the contrary, both the USPSTF and the American Academy of Family Physicians (2012) recommend against PSA-testing for average-risk patients under the age of 55 and those 70 and above. For those 55-69 years of age, each organization advises that patients make an informed decision with their healthcare professional about whether or not PSA-testing is right for them, with the American Urological Association concurring with these recommendations as well (Carter et al., 2013). The ACS (2019a) and the American College of Physicians both recommend that average-risk men begin the informed decision-making process by age 50 and up until 70 years-old (Qaseem et al., 2013).

Perhaps more helpful and specific guidelines to follow are from the NCCN Guidelines for Prostate Cancer Early Detection, which have more specific protocols for prostate cancer screening. According to their guidelines, those ages 45 to 75 years-old should receive PSA-testing, and the patients'

PSA-levels and/or DRE will determine how often they are screened and what follow-up tests/procedures may be needed (e.g., biopsy). PSA-testing is only recommended to men ages 75 and above who are determined to be very healthy (Carroll et al., 2019).

The farmers of this study, especially those in their 70s and 80s, would most likely agree that having some clearer information about PSA-testing guidelines would be helpful, especially pertaining to those not within the recommended range for testing. The farmers of this study generally embraced and positively accepted the PSA test as critical in their prostate cancer journey. Thus, it may be beneficial to have better defined, more universal guidelines, making sure those of all ages feel included and that their lives matter.

Theme four, prostate cancer biopsy as somewhat of a necessary bugaboo for prostate cancer diagnosis, represents the clinical significance of the prostate biopsy as the gold standard in diagnosing prostate cancer. It is recommended that patients undergo several biomarker tests and even the multiparametric MRI procedure before the biopsy is performed (Carroll et al., 2019). All 11 farmers who underwent the biopsy procedure were diagnosed with cancer; none of them said that they had had the procedure previously. Two individuals' prostate cancers were considered very-low-risk, two were most likely diagnosed with favorable-intermediate-risk prostate cancer, and three were in the high-risk category; the remaining four farmers were most likely part of the very-high-risk category for their cancers.

This theme also alludes to some of the fears, apprehensions, anxieties, and eventual symptoms the procedure may stoke; farmers in this study expressed concerns, fears, and even issues they experienced related to the biopsy. Hearing friends' negative experiences seemed to create fear of having the test, with one individual wishing medicine could figure out a different way of doing the test in order to avoid poking and prodding such sensitive and private regions of the body. Another farmer, who already had a fear of needles, expressed some impatience and anxiety throughout the procedure,

showing that he had a difficult time waiting for the urologist to extract the 13 core samples. The strongest reaction to the procedure was one of the farmers who actually experienced pretty severe discomfort after the biopsy, and he was frustrated and perturbed with the urologist and his staff for giving what he called the “candy-coated” version of the procedure’s possible side effects. Based on these experiences, it seems that providing patients with better education prior to the procedure would have been helpful. Additionally, for those fearing the procedure, perhaps additional psychological support would have been beneficial in mentally preparing them for the procedure.

Theme five, the prostate cancer diagnosis putting psychological health on display, signifies how upon being told that one has cancer, the farmers in this study displayed a variety of coping strategies, primarily related to social, emotional, and spiritual health. Socially, the prostate cancer diagnosis helped display two general coping reactions and strategies, one of an openness and willingness to disclose the diagnosis and speak with and share with others, and another of reluctance, hesitance, and fear in disclosing one’s diagnosis to others. Emotionally, there were feelings across the spectrum among the farmers upon being told they had prostate cancer. Some of the individuals expressed very little concern or worry about their diagnoses. Additionally, there was also a sentiment among these participants that they did not want additional sympathy, or maybe in their view, “pity” from others. Farmers also demonstrated an unwillingness or strong rejection of allowing an emotional reaction to their diagnoses, and rather, were more concerned with moving on to the next step in the process of dealing with the issue. Others demonstrated more fear, uncertainty, and concern with their diagnoses. From a spiritual perspective, the farmers in this study generally expressed how their faith in a higher power helps them cope with having cancer. Many fears of having cancer and possibly dying of the disease were mitigated as a result of having a religious belief in God and heaven.

Previous research does not provide any information or evidence directly related to the findings among the fifth theme of this study; however, several earlier studies focused on farmers' psychological health, which may help explain some of the psychological health behaviors of the farmers in this study. For those who tended not to seek out social and emotional support after their prostate cancer diagnoses, perhaps some reasons stem from farmers' general tendencies of having few close friends and overall levels of social support, as well as being accustomed to being alone, as they many times are when farming (Stark et al., 2006). Moreover, farmers may be less open-minded and more reluctant towards seeking help for mental health issues (Judd, Jackson, Fraser et al., 2006), characteristics that may be acting as factors impacting how one copes with a cancer diagnosis. Not wanting some type of support to get in the way of one's work (Routley & Ozanne-Smith, 2012) may also help explain why some farmers of this study did not actively seek out support after their prostate cancer diagnosis. Overall, perhaps the farmers of this study who did not seek out social support nor express much of an emotional response to their diagnosis were also demonstrating and enacting a type of farm masculinity, which may place traditionalism, patriarchy, and dominance at the forefront, especially for seeking out help from others (Courtenay, 2006/2011).

Other factors potentially mediating the psychological health and coping of farmers in this study could be pride and the acceptability of getting support from others, talking about one's diagnosis, and/or openly expressing emotions related to the diagnosis. Also, perhaps when the farming identity was strongly embraced, an identity featuring traits like self-reliance, resilience, and working hard (Drouillard et al., 2017), perhaps psychological health becomes unimportant or is ignored completely. Hull et al. (2017) found that farmers are likely to view psychological support seeking as weak and shameful, as if one is whining about problems, wanting pity from others.

Additionally, farmers tend to be private individuals, sometimes struggling with interpersonal communication and the sharing of feelings concerning personal details and information with others.

Therefore, if one is to seek out support from others or express his emotions related to a prostate cancer diagnosis, this could potentially disrupt the stoic and sturdy identity which he embraces and tries to enact regularly (Perceval et al., 2017). Therefore, the farmers of the current study who coped with their diagnoses in more antisocial manners, with less emotional expression and awareness, perhaps did so due to their identity as a farmer and man in their particular social context.

Regarding spirituality, rural areas where farming is a major industry tend to have an Evangelical population that are proportionally higher than other less-rural areas (Scala & Johnson, 2017). Additionally, popular media has portrayed farmers as having a deep religious faith, as seen in the *So God Made a Farmer* advertisement (Ram Trucks, 2018). The finding that the farmers in this study seemed to cope with their diagnosis in a spiritual and religious manner was not surprising, since most of them were recruited from two Christian churches.

Theme six, healthcare professional characteristics and others' experiences reigning paramount in treatment decisions, is representative of the high value farmers place on the quality of the person/people who care for them, as well as the prostate cancer treatment outcomes of those they know. It seems that the farmers of this study prefer a healthcare professional who can walk the delicate line of being an extremely intelligent, skilled, experienced, truthful, and caring physician, while also being perceived as "the person next door." In order to find this type of individual, many of them recall getting additional opinions of their prostate cancer and/or being referred to particular places and/or people. These findings are consistent with past acknowledgement that final treatment decisions for prostate cancer ultimately depend on a healthcare professional's guidance and the patient's values and preferences (ACS, 2019).

Another important determinant of the treatment decisions of the farmers in this study were the cancer treatment experiences of others. Both positive and negative or unfortunate treatment outcomes of others were motivating factors in the farmers' ultimate selection of treatment. It seems that negative

experiences that others had with cancer treatments and with particular healthcare professionals or entities played stronger roles than the positive experiences of others for the farmers in this study making their ultimate healthcare professional and treatment choices. Additionally, some farmers also based their treatment decisions on negative experiences they had with certain healthcare professionals and/or institutions.

Existing literature indirectly supports some of these interpretations. One factor in this decision could be that smaller, more rural areas tend to have fewer healthcare providers, specialists, and facilities (Douthit et al., 2015; Meit et al., 2014), thus possibly explaining some of the negative stories farmers hear about others' experiences in smaller cities and communities. The farmer may also have issues relating to, understanding, and communicating with their healthcare professional (Hull et al., 2017; Yousaf et al., 2015), which could lead them to seek out someone with characteristics more suitable to their preferences and values.

The patient-provider relationship is very important in the patient's level of desire to follow the plan of their healthcare professional (Suchman, 1965; Dobson et al., 2018). Having a compassionate, caring healthcare provider, who expresses warmth and is able to effectively communicate by delivering educational and thorough information, facilitates and nurtures this relationship (Green et al., 2014), which would potentially make farmers more likely to select a healthcare provider with these skills and characteristics. Patients also want to feel as if they are not wasting their healthcare provider's time when consulting with them about issues and questions (Hall et al., 2014; Low et al., 2015; McCutchan et al., 2015; Whitaker, Macleod, Winstanley, Scott, & Wardle, 2015), while feeling supported and that the healthcare professional is concerned about them (Renzi, Whitaker, & Wardle, 2015; Renzi, Whitaker, Winstanley, & Wardle, 2016). Knowing this, perhaps a farmer's prostate cancer treatment decision may be determined by whether or not his healthcare professional is patient, willing to listen to all questions and concerns, in a caring, supportive manner.

Additionally, those with symptoms of cancer may feel worry or fear in relation to seeking out a healthcare provider and having these feelings may act as either help-seeking motivators or deterrents (Balasooriya-Smeekens et al., 2015). Most likely a healthcare provider who can help mitigate patients' negative emotions related to seeking care and getting treated would possess the characteristics a farmer with prostate cancer may be looking for in order to enable a treatment determination. Healthcare professional maltreatment and misdiagnosis also impacts a patient's path to treatment (Mwaka et al., 2015). A farmer who hears about such an instance with a healthcare professional he is currently seeing would certainly be motivated to seek care and treatment consultation elsewhere, with a more suitable, capable individual.

Theme seven, prostate cancer treatments invoking physical concerns and side effects indicated that physical symptoms were typical, common, and expected, in some cases. The farmers' expectations of surgical outcomes were primarily centered around the urinary and sexual dysfunctions that could and did result from the procedures. Those not having the surgery expressed fears of having to wear a diaper for the remainder of their lives, due to urinary and bladder control issues, as well as worries about their sexual health being impacted.

Radiation treatment seemed to invoke many concerns and actual symptoms in the farmers in this study. Each of those who actually had radiation expressed having physical symptoms and effects from their treatment. The most common symptom occurrence from radiation treatment was fatigue, which manifested as feeling tired, weak, and not having enough energy to perform daily tasks and work. Urinary issues were also common, especially having the urge to urinate more often. Major concerns expressed by one farmer related to hormonal injection treatment were the potential of having symptoms similar to those experienced during menopause, such as sweats and hot flashes. No one in this study receiving hormonal therapy mentioned side effects from these treatments. These concerns

about side effects are typical, because regardless of the treatment type, side effects are possible, which tend to be urinary and sexual in nature (ACS, 2019).

Based on the physical concerns and actual side effects of prostate cancer treatment for the farmers in this study, providing interpretations of why these farmers chose specific procedures and not others may be warranted. Using the NCCN's specific treatment recommendation protocols, which rely on the risk category of the patient, determined by TNM staging (AJCC, 2017), and the ISUP guidelines (Epstein et al., 2016), may enlighten the treatment decisions of the farmers in this study.

First, that no farmer in this study had the least aggressive treatment approach—observation—is rather obvious since observation is only recommended for patients with very-low-risk and low-risk prostate cancers whose life expectancies are less than 10 more years (Mohler et al., 2019). Two farmers in this study had very-low-risk prostate cancer (and none with low-risk). These two individuals were definitely expected to live at least 10 more years, due to their ages and current overall health status. Based on their prostate cancer risk category, as well as their expected years of life remaining (which was most likely 10-20 or more), the general options for prostate cancer treatment for these two farmers were active surveillance (i.e., the preferred initial approach), EBRT or brachytherapy, or radical prostatectomy, potentially including EBRT with/without ADT for six months (Mohler et al., 2019). Not surprisingly, both chose active surveillance. Most likely, their decisions were guided by how slow-growing and non-aggressive their tumors were, and perhaps they also wanted to avoid/delay having potential symptoms from other curative therapies.

Indeed, the benefits of active surveillance are that nearly two-thirds of patients will not need curative therapies, thus avoiding treatment side effects, and possibly maintaining a better overall quality of life. The potential negative outcomes of active surveillance are not curing the disease, having to undergo biopsies and multiparametric MRIs on an annual basis, and knowing that about one-third of these patients will eventually need some type of curative therapy (Mohler et al., 2019). Due to one of

the patient's negative experiences with prostate cancer biopsy side effects, perhaps future decisions about his cancer treatment approach will change, partially based on subsequent biopsy outcomes. However, understanding the effects of curative treatments, this individual will most likely endure biopsies for as long as his cancer remains in the very-low-risk classification.

Two individuals in the study were most likely diagnosed with favorable intermediate-risk prostate cancer, and each of them received around nine weeks of EBRT, five days per week. For those in this risk category with life expectancies of at least 10 more years, the potential treatment options are surgery, EBRT, brachytherapy, or active surveillance. For those in this risk category expected to live between five to 10 more years, the preferred approach is observation, although EBRT or brachytherapy are additional options. Additionally, observation is preferred for those expected to live five years or less in this risk category (Mohler et al., 2019).

Considering the ages of the two farmers in this study with favorable intermediate-risk prostate cancers (75 and 82), active surveillance or observation may logically have been the most sensible approaches, with observation as an especially preferred method for the 75-year-old, who had many other co-morbidities and life-threatening issues. Although the 82-year-old farmer may not have had quite as many physical co-morbidities, his advanced age may have been reason to also strongly consider observation. However, each of them seemed highly motivated to pursue curative therapy, regardless of their age and other competing health complications. Based on some of the symptoms that the 75-year-old experienced throughout and after EBRT, such as fatigue and discomfort, one wonders if this individual thinks he made the best possible treatment selection. The answer to this question will most likely be related to the long-term outcomes of this farmer's prostate cancer treatment and follow-up examinations and procedures. The 82-year-old farmer, who had very strong feelings in support of PSA-testing and more aggressive treatment, regardless of age and life expectancy, would most likely not express any treatment regrets, especially since he did not have severe side effects from the EBRT, other

than mild tiredness. He also witnessed negative prostate cancer experiences among his father and brother, which impacted his diagnostic and treatment choices. It is important to note, that although some of the farmers in this study have indicated above that having EBRT as a first line of treatment would ultimately rule out a later possibility of a radical prostatectomy, Mohler et al. (2019) pointed out that this is not necessarily the case.

Three of the farmers in this study were considered high-risk and four fit the criteria for very-high-risk prostate cancer cases. Of these seven, two of the high-risk participants had EBRT and hormonal injections, with one high-risk participant still undergoing the treatment decision process at the time of the interview, although he was not a good candidate for surgery and was most likely considering EBRT with/without hormonal therapy. Of the four individuals in the very-high-risk group, one had EBRT, two had radical prostatectomies, and another had a variety of chemotherapy drug treatments.

EBRT or ADT are the typical treatment options for individuals with high- or very-high-risk prostate cancer, who are not expected to live at least five more years, who are asymptomatic, but who expect future disease spread and/or hydronephrosis. Observation may also be an option for those in these risk categories who are not expected to live at least five more years. Those in these risk groups who are expected to live at least five more years typically choose from the following treatment approaches: EBRT with ADT, EBRT and brachytherapy with ADT, or radical prostatectomy with PLND, which is most commonly chosen for healthier and younger patients. For patients undergoing surgical removal of the prostate with no lymph node metastasis and an adverse pathology report (i.e., unclear margins, tumor invasion of seminal vesicles and/or extracapsular space, and/or a detectable PSA level), subsequent EBRT with or without ADT should be a consideration. When there are lymph nodes testing positive for cancer, ADT should be considered with/without EBRT (Mohler et al., 2019).

The treatment selections of two of the high-risk farmers, EBRT and ADT, seemed logical, based on the above treatment recommendations, and the third high-risk patient considering EBRT

with/without ADT also seems sensible, especially since his doctor advised against radical prostatectomy. What is interesting is that of these three individuals, one who received EBRT and ADT was 84 years-old, and did not express having symptoms so, perhaps, observation would have been a more appropriate option for him to consider. Perhaps there was a fear that his cancer would spread in the future; he did mention having some thoughts about how they would treat him if his cancer spread. The other high-risk farmer receiving EBRT and ADT expressed an extremely strong family history of prostate cancer in several first-degree relatives (i.e., seven of his eight biological brothers had been diagnosed with the disease); however, he said he had not been genetically tested by his healthcare professional. Perhaps having known he carried a particular gene increasing the risk of prostate cancer could have impacted his course of treatment.

Of the farmers with very-high-risk prostate cancer in the study, one had EBRT-only, with no subsequent hormonal therapy. With this individual being in his early 80s during his treatment and having a history of many serious and life-threatening co-morbidities, this treatment decision seemed to make sense, especially due to how aggressive his tumor was. Of the very-high-risk farmers opting for radical prostatectomies, neither had adjuvant therapies, which signified that there was no adverse pathology report subsequent to their surgeries. EBRT with ADT or brachytherapy and EBRT with ADT appear to be the other treatment options available in their cases (Mohler et al., 2019), but each of these farmers made strong arguments for selecting surgery. Each essentially just wanted the cancer removed from their bodies as quickly as possible. One of the individuals was 49 years-old at the time of his surgery and had a variety of co-morbidities, especially related to his kidney function. However, since his father had also undergone a radical prostatectomy for prostate cancer, this farmer was fairly insistent upon having the procedure. The other individual would have been in his mid-to-late 60s at the time of his surgery and did not have any severe co-morbidities at this time. In justifying their decisions to have surgery, each of them also expressed how their doctors had basically argued against them having any

type of radiation as a primary treatment approach, based on the damage it could cause to healthy cells and tissues around the prostate and for fears that the prostate would be inoperable in the future.

When prostate cancer has metastasized, whether that is regionally or distally, a variety of treatment approaches are available. In general, when prostate cancer spreads to regional lymph nodes, EBRT and ADT is the preferred therapy, although a variety of other hormonal therapies are possible as adjuvant treatments to EBRT and ADT. Prostate cancer that spreads to distant sites contains a variety of treatment options, which are typically chemotherapeutic drugs, hormones, ADT, or EBRT, as well as a variety of further clinical tests, such as genetic testing and other biomarker tests. Metastatic prostate cancer treatments also depend on whether the cancer is castration-naïve (i.e., when ADT was not being used at the onset of the progression of the disease) or castration-resistant (i.e., when disease has advanced upon clinical examination, even when castrate levels of serum testosterone are below 50 ng/mL; Mohler et al., 2019).

The remaining farmer with very-high-risk prostate cancer most likely had metastatic CRPC, with a positive test for MSI-H or dMMR, leading to a genetic test, which came back positive for the BRCA2 homologous recombinant gene. And because his cancer had spread to his bones, the preferred initial treatment is typically bone antiresorptive therapy with denosumab or zoledronic acid, with radiation therapy for bone pain as a palliative measure, or even sipuleucel-T, which is an immunotherapy (Mohler et al., 2019). If the metastatic CRPC is considered small cell/neuroendocrine prostate cancer, a more fatal type of prostate cancer than prostate adenocarcinoma (Aggarwal et al., 2018; Mohler et al., 2019), many different chemotherapy combinations are advised, or participation in a clinical trial. For those with prostate adenocarcinoma that is present in bone, radium-223 is recommended, as well as clinical trials, other chemotherapy drugs, or secondary hormones (Mohler et al., 2019).

Since the specific name of the cancer and particular chemotherapy drugs were not detailed in the interview, knowing exactly the type of prostate cancer the farmer in this study has is difficult.

However, the cancer was present in the bones upon diagnosis, he had undergone treatment with five different chemotherapy drugs, he carried the BRCA2 gene, and he participated in a clinical trial for two different drugs. Regardless of the therapies and type of cancer he had, his cancer is evidently very aggressive, and he also worries that his treatment options will run out soon. Since this farmer lived in a smaller city and saw a doctor in that city, he remarked in the interview about not having access to newer drugs and clinical trials. Thus, one wonders if this patient's condition had been different if he had sought care at a larger, research-oriented institution, with access to the newest types of drugs and therapies, as well as the top medical experts for his cancer. Though a difficult question to answer, it seems that the patient sought care from some of the best institutions and experts available in his region.

Application of Health Behavior Theory

MRNI-SF and the integrated behavioral model (IBM).

The MRNI-SF contains eight overall measurements derived from a 21-item questionnaire, with each item containing a seven-point Likert scale with varying levels of agreement. The most important results gathered from MRNI-SF are average measurements of the overall TMI, as well as the sub-factors of AoF, NTSM, SRMS, T, Dom, IoS, and RE. In general, higher scores indicate scoring toward the traditional end of the scale, and thus signaling a stronger endorsement of particular items related to traditional masculine norms in Western society (Rankin et al., 2013).

Since MRNI-SF items are all related to individual beliefs about norms related to traditional masculinity, the most appropriate health behavior theory which could be applied to constructs from this questionnaire would most likely be focused at the intrapersonal level, and in particular, those in the integrated behavioral model (IBM), which combines elements from the theory of reasoned action (TRA), the theory of planned behavior (TPB), and other important health behavior theories. Both the TRA and TPB are concerned with individual motivational factors acting as determinants of behavior, with the best predictor of behavior being intention, as determined by one's attitude and perceived control toward the behavior, as well as the social norm perceptions pertaining to the behavior (Montaño & Kasprzyk, 2008).

Utilizing components from the TRA/TPB models, a description of the major constructs within the IBM is provided. Intention remains the primary determinant of behavior in the IBM. Three elements are important in mediating intention to perform a behavior, the skills and knowledge one has to enact the behavior, the environmental barriers present in one's life (Triandis, 1980), and the importance of the behavior to the individual (Becker, 1974). A fourth component, habit, explains that having experience with performing a behavior may make intention less crucial in one's eventual enactment of a behavior (Triandis, 1980).

Three important constructs also govern the intention to performing a behavior in the IBM. First, attitude is one construct explaining one's inclinations for a behavior, whether they are favorable or not. Experiential attitude is one's emotional regard for enacting a behavior, whereas instrumental attitude is based on cognitions of the outcomes of the behavior (Fishbein, 2007). The second major construct mediating behavioral intention is perceived norm, which pertains to the pressure one has from his/her social network to enact/not enact a behavior. Injunctive norm is determined by one's normative beliefs pertaining to others' expectations of what one should do, as well as that person's motivation to fulfill those expectations of others. Descriptive norm is influenced by one's normative beliefs of others' behaviors, particularly others in one's personal or social network (Bagozzi & Lee, 2002; Triandis, 1980; Triandis, Bontempo, & Villareal, 1988). The final major construct influencing behavioral intention is personal agency, which Bandura (2006) explained as an individual's capability to impact his/her own behavior and environment. Two aspects of personal agency are addressed in the IBM, perceived control and self-efficacy. Perceived control relates to one's supposed level of control he/she has for enacting a behavior, which is governed by the presence or absence of environmental facilitators or barriers to perform the behavior. Alternatively, self-efficacy relates to one's level of confidence in their capacity for enacting a behavior, despite potential interferences and obstructions (Ajzen, 2002; Fishbein, 2007).

Qualitative data.

The model of pathways to treatment (Scott et al., 2013) is the primary theory explaining the processes and factors impacting the following events among the participants in this study: the first detection of prostatic changes, the first visit with a healthcare professional for prostate cancer symptoms, the first time being told one has prostate cancer, the first time receiving treatment for prostate cancer, and the experiences with prostate cancer treatment. Additionally, the common-sense model of illness self-regulation (Leventhal, Meyer et al., 1980) and the social cognitive theory (Bandura, 1986, 1997) are additional frameworks helping to explain the processes and factors occurring up until one has first visited a healthcare professional for prostate cancer symptoms.

The two main events occurring in the model of pathways to treatment prior to a first visit with a healthcare professional for prostate cancer symptoms in this study were (a) the farmer detecting bodily changes related to the prostate (event one) and (b) the farmer perceiving these prostatic changes as abnormal symptoms and a reason to speak with a healthcare professional (event two). The time between these two events is known as the appraisal interval (Scott et al., 2013). Between these two events, some of the farmers went through an appraisal and self-management process, where they assessed their bodily changes and responded to them in manners other than seeking help. During this appraisal and self-management process, symptoms may be misinterpreted and/or managed by the farmer himself, such as via active monitoring, self-medicating, adapting one's lifestyle, and/or seeking advice from other non-healthcare specialists (Scott et al., 2013). Playing a significant role in this patient appraisal and self-management process are various aspects from the common-sense model of illness self-regulation, a model explaining the immediate and automatic appraisal of a bodily changes' expectedness in the current context and its level of interference. Within the model, various heuristics, cognitive representations, coping mechanisms, and factors related to one's social context are considered (Leventhal, Meyer et al., 1980).

The heuristics are 12 rules that can impact the decisions one makes regarding the meaning of the bodily changes and whether they require medical attention. Cognitive representations are the specific aspects of the bodily changes and what they might mean. The five main cognitive representations are identity, timeline, consequences, control or cure, and cause. Coping mechanisms refer to particular reactions by the farmer to the bodily changes. Actions by the farmer may attempt to mitigate the issue (i.e., danger control) and/or alleviate the negative feelings associated with the issue (i.e., fear control). And as far as the farmer's social context, self-regulating a bodily change also depends on input and guidance from his social network of family, friends, and others. Seeking the advice of others and receiving input from others impacts how the farmer self-regulates the issue. Additionally, the farmer himself may act as the primary agent of self-regulation (Leventhal, Meyer et al., 1980).

Of the five participants who reported noticing some type of bodily change pertaining to the prostate, the main heuristic that a few mentioned was related to the age-illness rule, which is the idea that as people get older, they tend to attribute new bodily feelings and changes to the process of aging rather than to a specific disease or illness (Leventhal, Meyer, et al., 1980; Scott et al., 2013). Thus, they believed that their prostate issues, namely urinary troubles, were strictly due to getting older and the aging process.

Another construct from the common-sense model of illness self-regulation is the cognitive representation of consequences of these prostatic issues, which may be described as the functional, social, and financial costs of the issues and of pursuing treatment (Leventhal, Meyer et al., 1980; Scott et al., 2013). A few participants in the study described some of the consequences of their prostatic issues, such as causing some mild physical problems, being socially embarrassed and/or frustrated, having issues with one's self and spouse getting enough rest, and also getting in the way of one's work (e.g., due to lower back pain or excessive urination instances).

Another cognitive representation that participants talked about was the cause or underlying link or mechanism for their prostatic issues (Leventhal, Meyer et al., 1980). The reason for excessive urination tended to be attributed to the presence or absence of certain behaviors, such as drinking too much soda, not having enough sexual intercourse, frequently riding ATVs throughout one's farm property, or taking a water pill medication for kidney issues. One of the participants with blood in the urine after intercourse thought this issue was from overexerting himself during the sexual intercourse episode. Another participant also pondered whether his condition may have been related to his mother's previous experience with having breast cancer.

Self-management is an additional aspect of the patient appraisal process (Leventhal, Meyer et al., 1980; Scott et al., 2013), which may involve a variety of actions, such as active monitoring, self-medication, changing lifestyle behaviors, and/or seeking lay advice. Of those participants who detected a prostatic change, only one acknowledged actually practicing some type of self-management technique, which was by actively monitoring the issue more closely and staying educated on the matter by reading more literature on topics concerning the prostate.

Between a farmer perceiving prostatic changes as abnormal symptoms and a reason to speak with a healthcare provider (i.e., event two) and actually attending his first appointment with a healthcare professional for the prostate symptoms (i.e., event three), the process of a farmer deciding to speak with a healthcare professional and scheduling an appointment for prostate symptoms occurs. The time between events two and three is known as the help-seeking interval (Scott et al., 2013), which involves various constructs from the social cognitive theory (Bandura, 1986, 1997).

Self-efficacy helps explain farmers' perceived abilities with discussing symptoms with a healthcare professional. Impacting a farmer's self-efficacy for talking about his prostate symptoms are sociostructural barriers and opportunities. Barriers may be personal (e.g., not having time to visit a healthcare professional, issues with traveling to an appointment, or mental health related) and/or

related to the healthcare system, such as having issues with accessing and affording care or having trust issues with a healthcare professional. Sociostructural opportunities increasing self-efficacy for seeking help for prostate symptoms include having a pre-scheduled routine-care or preventative appointment or attending a free health screening (Bandura, 1986, 1997), which several of the farmers mentioned in the study.

Outcome expectations, known as the perceived consequences of acting, were an additional construct from the social cognitive theory helping to explain help-seeking for prostate symptoms in farmers. Physical outcome expectancies were the perceived beliefs farmers had about seeking help and how it may impact their physical prostate symptoms. Social outcome expectancies related to the perceived social impact and sanctioning that may occur for a farmer seeking help for prostate cancer symptoms. Self-evaluative outcome expectancies were the self-assessment and sanctioning that farmers underwent for seeking or not seeking help (Bandura, 1986, 1997). Competing priorities are an additional component of the help-seeking interval, which are things that a farmer may be experiencing or dealing with (e.g., job, care-taking duties, holidays, healthcare accessibility issues, and co-morbidities) while he is also making the decision to seek help from a healthcare professional for prostate symptoms (Scott et al., 2013).

The model of pathways to treatment defines time to presentation as the amount of time that passes between a farmer first detecting any prostatic changes (i.e., event one) to his first visit with a healthcare professional for prostate symptoms (i.e., event three). Many contributing factors can impact a farmer's time to presentation for prostate symptoms. Patient factors may be related to demographics, prior experiences, co-morbidities, cognitions, and emotions. Healthcare professional and system factors signify healthcare services that may affect the decisions and actions of both the patient and healthcare professional (e.g., access to a general practitioner, specialist, and/or specific diagnostic and treatment procedures, as well as issues related to healthcare policy). Disease factors relate to the specific condition

being experienced and its clinical and physiological features, such as the disease's location, development, growth, and size (Scott et al., 2013).

According to the above information from the social cognitive theory explaining the process of deciding to consult a healthcare professional and actually scheduling an appointment, a process occurring between events two and three, an interval of time known as the help-seeking interval (Bandura, 1986, 1997; Scott et al., 2013), one personal barrier was expressed as perhaps impacting one's time to presentation to a healthcare professional, which was being in denial of the issue. Another construct from the social cognitive theory that impacted one farmer's decision to speak with a healthcare professional and schedule an appointment for prostate cancer symptoms was outcome expectations--the perceptions or beliefs that seeking help/not seeking help for prostate cancer symptoms will lead to some type of result (Bandura, 1986, 1997). For this participant, who had been experiencing fairly severe problems, his issues were causing such bad pain and disruption of his lifestyle, as well as fears related to what the problem may have been, that he contacted his healthcare professional for help.

The main factor enhancing the self-efficacy (Bandura, 1986, 1997) of participants to seek prostate help and to become aware of a prostate issue were the socio-structural opportunities present in their lives, which were essentially having pre-scheduled/routine appointments to be examined by a healthcare professional. Having routine check-ups already scheduled with a healthcare professional was the primary reason the majority of the participants' prostate cancer diagnoses were discovered. Of those who reported being seen by their doctors on a routine basis, one individual initially cancelled his appointment to have his prostate examined and another chose to not have his annual physical because he did not want to be told by his doctor (again) that he should quit smoking. As it turned out, the individual who initially cancelled his appointment would receive a call from his doctor urging him to

come in and be examined, which he obliged. For the other participant not scheduling an annual visit, it would take him experiencing severe urinary issues and lower back pain to schedule an appointment.

The model of pathways to treatment also helped explain the processes and factors affecting a farmer's time to diagnosis, which is the time elapsed from the detection of prostatic changes to the date of being told he has prostate cancer, known as event four. The patient appraisal and self-management process occurs between events one and two, and the process of deciding to speak with a healthcare professional and scheduling an appointment for prostate symptoms happens between events two and three. During the time to diagnosis, an additional process occurs between events three and four, which involves a healthcare professional's appraisal as well as investigations, referrals, and appointments related to prostate symptoms. The time between the first appointment with a healthcare professional for prostate symptoms to a farmer being told he has prostate cancer is known as the diagnostic interval. It is important to note that events one and two and the processes occurring between events one and two and events two and three may/may not occur during the time to diagnosis of prostate cancer for all individuals. For example, if a patient does not experience or sense any prostatic changes or symptoms, and he opportunistically receives a routine prostate screening by his healthcare professional and is eventually diagnosed with prostate cancer, then he would have begun his time to diagnosis with event three (Scott et al., 2013).

As the healthcare professional is appraising the patient for prostate cancer, clinical investigations are very common. Many of the farmers recalled receiving a DRE as one of the initial examinations of the prostate, in order to check for any abnormalities. Another investigation common among the experiences of all of the farmers was PSA-testing. Most participants provided information explaining how the PSA helped act as a gauge and predictor of their prostate cancer, with significant and/or rapid increases in the number generally indicating malignancy of the prostate. The majority of participants expressed very positive attitudes towards getting PSA-tested.

The final investigation, which acted as the initial way to officially diagnose someone with prostate cancer, was the prostate biopsy. With all the participants undergoing this procedure, a few did indicate some hesitations, concerns, and issues experienced with the biopsy. Due to hearing of a friend's horror story of having a biopsy, one participant was nervous and concerned prior to having the procedure, although noting that his experience ended up being "pleasant." Another, who already had a history of the fear of needles, recalled the anxiety and impatience he felt while having the procedure. And a third participant actually had some side effects from the procedure, largely due to pain, and he told his doctor, "That was a kick in the nut sack!" He expressed being disgruntled and upset because he said that his doctor did not provide with him all the details of the potential effects of the procedure, so he felt "blindsided" by his physical symptoms. Thus, the biopsy may be seen by some as somewhat of a bugaboo but necessary procedure for diagnosing prostate cancer.

Receiving and reacting to the prostate cancer diagnosis highlighted various dimensions of participants' psychological health. Psychological health is the dynamic and intricate relationship of the mental, social, emotional, and spiritual aspects of health (Donatelle, 2019), with the latter three particularly emphasized and described by the participants. Regarding social health, participants cited many examples of social support playing an important role while coping with the prostate cancer diagnosis. Social support is defined as "aid and assistance exchanged through social relationships and interpersonal transactions" (Heaney & Israel, 2008, p. 191) and is classified into the following forms of support: emotional (e.g., providing love and empathy), instrumental (e.g., providing tangible assistance), informational (e.g., giving helpful advice), and appraisal, for example, providing someone with words of encouragement or affirmation (House, 1981). Social support plays an integral and reciprocal role in health behaviors and outcomes (Heaney & Israel, 2008). The different types of social support were mentioned among the participants; however, some of them also revealed a reluctance to seeking social

support, in order not to worry others or due to the fear of the stigma of cancer being placed upon them by others.

Participants also displayed aspects of emotional health, which are the feelings that occur among everyone on a day-to-day basis (Donatelle, 2019). Some participants expressed worry, concern, and uncertainty. Others mentioned feeling “hurt” after being notified of a prostate cancer diagnosis. Others were not worried or concerned, and some even recalled intentionally not showing sad or unhappy emotions around loved ones for fear of upsetting them. Some of the participants also offered little comment about how they dealt with the problem emotionally and rather expressed an attitude of moving on and taking care of the problem. It is difficult to say, but perhaps these feelings of wanting to move on and deal with things quickly were examples of resilience, which is the phenomenon of making positive adjustments during adverse situations (Luthar, Cicchetti, & Becker, 2000). On the other hand, the reaction of not wanting to emotionally respond to the cancer diagnosis and wanting to move on could have been defense mechanisms to avoid anxious thoughts about their condition (Freud, 1894, 1896).

Spiritual health, the sense of being part of something greater than one’s personal or physical world, was also a dimension of psychological health apparent in this study among the participants. Several of the individuals noted having trust in a higher power and relying on their faith to help them through their prostate cancer journey. The reliance on their faith also helped many of them deal with the thought of dying early of prostate cancer. A recent study of 43 men preparing to undergo radiation treatment for prostate cancer showed faith as significantly impacting functional well-being (Walker et al., 2017), with spirituality (i.e., meaning/purpose) significantly affecting functional, physical, social, emotional, and prostate health well-being. Functional well-being signified high levels of agreement to the following characteristics: being able to work, finding work enjoyable, being able to enjoy life,

accepting one's condition, sleeping fine, enjoying leisure activities, and being content with one's current quality of life (Esper et al., 1997).

Time to treatment for prostate cancer is the time elapsed from the detection of prostatic changes to starting treatment for prostate cancer, whether curative or palliative (i.e., event five). Time to treatment may not involve all the events and processes of the model of pathways to treatment, especially for farmers who do not detect prostatic changes or experience symptoms and who are instead, opportunistically screened and diagnosed (Scott et al., 2013). A process that will occur during time to treatment is the scheduling and planning of treatment, which takes place between events four and five, a time period known as the pre-treatment interval, or the time between a farmer first being told he has prostate cancer and receiving his first treatment for prostate cancer. During the treatment planning and scheduling process, discussions occur about different options for treating the prostate cancer, plans are put into place for beginning treatment, and treatment is scheduled for the farmer. During this process, further investigations may need to occur, treatment may be unavailable or not accepted, and the availability and arrangement of the healthcare system may impact this time period. Decisions and input by the farmer are also important and part of this period, as well as utilizing the experiences of others to help the farmer make a treatment determination. Additionally, factors related to the patient, healthcare professionals and system, and disease impact this time period as well (Scott et al., 2013).

Treatment decisions were primarily based on two main factors, the characteristics and qualities related to healthcare professionals and others' experiences with prostate cancer treatment. The preferred healthcare professional characteristics were typically related to having an honest, truthful, intelligent, caring doctor, who also practiced active listening and made decisions based on the latest and best medical evidence. Having a doctor that was easy to talk to, pleasant, and not arrogant, was also important. Participants also determined their best treatment options by listening to the experiences of

others who had been treated for prostate cancer or who had experienced some kind of cancer. Many of the participants chose specific treatments based on family members' experiences, and other participants relied on friends and others' treatment experiences.

Once a farmer has started prostate cancer treatments, many factors affected the possible treatment outcomes. It is important to note that once treatments begin, farmers could potentially re-enter the appraisal and help-seeking intervals, depending on treatment side effects and symptoms. This is an example of the fluid and dynamic nature of the model of pathways to treatment. As stated previously related to the research sub-questions, the contributing factors related to the patient, healthcare professionals and systems, and disease, also impact this portion of a farmer's experience with prostate cancer treatment (Scott et al., 2013).

The major treatment worries and actual outcomes of the participants were mainly physical in nature. Several expressed their concern of having to eventually wear diapers because of treatment effects. For the two participants undergoing radical prostatectomy, urinary issues were an issue, and each of them reported having to wear some type of protective pad. Also, each of these individuals recalled the surgeons telling them that sexual function would be limited or even non-existent post-surgery. Other participants recalled various individuals sharing stories of their prostate removal and the negative urinary and sexual side effects.

The majority of the participants actually expressed and experienced issues due to radiation treatment. Some participants were told by doctors that radiation would actually lead to enhanced symptoms for quite some time. Others recalled their physicians telling them that having radiation would eliminate the possibility of ever having surgery, and that radiation would also damage healthy cells around the prostate. Of those actually receiving radiation as their primary treatment, all experienced physical side effects and symptoms, mainly increased fatigue, loss of energy, and loss of strength. Each of the participants recalled how their decreased energy and strength levels impacted their ability to

perform their typical daily duties on the farm. One participant also expressed how the radiation treatments caused him to have uncomfortable sensations in the area that was radiated, which was irritating to him and had enough of an effect that he addressed it with his doctor. Upon detecting bodily changes from radiation treatments, each of these participants entered into the appraisal interval, and once those changes were acknowledged as abnormal, they then began the help-seeking interval (Scott et al., 2013).

Another type of treatment leading one of the participants to re-enter the appraisal and help-seeking intervals was chemotherapy (Scott et al., 2013). Initially, prior to receiving his first round, the participant expressed fear of what the chemotherapy may do to him from a physical standpoint. Now, after trying five different chemotherapy drugs for his cancer, due to their inability to lower his PSA level and reduce the growth of his cancer, he presently expressed having severe anemia issues, with very low platelet levels, which resulted several times in extreme fatigue, dizziness, and lack of strength and balance to walk and maneuver. The biggest worry expressed by this participant at the end of his interview was whether or not drugs would continue to be available to manage his very aggressive form of cancer, which had already not ultimately responded to four previous drugs.

Contribution to the Body of Knowledge

MRNI-SF.

This most likely is the first time that farmers have ever been administered the MRNI-SF in a research setting. Because of this, no research is available to directly compare this study's results. However, based on a wide variety of previous studies measuring similar items in various groups of men, the fact that this study (via the MRNI-SF) found that farmers tended to embrace the majority of the traditional masculine norms in Western society was not necessarily a completely surprising finding.

However, this study was able to provide more specific information about farmers' beliefs for a variety of traditional masculinity constructs. For example, they embraced very strong beliefs against specific policies and behaviors related to homosexuals, such as marriage, gay bars, and public displays of

affection like kissing. Such beliefs demonstrate a strong negative perception and attitude towards sexual minority groups. The farmers also demonstrated high levels of agreement that men should avoid all feminine activities and material items. Specifically, they endorsed watching football games, action movies, and boys playing with trucks, over the more traditionally feminine activities of watching soap operas, reading romance novels, and playing with dolls.

Additionally, farmers placed high value on relying on themselves via their mechanical abilities. For example, farmers strongly endorsed that men should possess skills related to home improvement and also being capable of repairing and fixing most of the items around the house. Additionally, they had high levels of agreement that men should be able to fix their car in the case of a break down. The farmers in this study also embraced the idea that men should have toughness, no matter what. Particularly, they felt it very important that men be risk-takers, even in the possible event of getting injured or hurt. Also, they showed favorable beliefs for the idea that when things get difficult and tough for a man, that man should also get tough himself. And even if a young man is not physically big, the farmers expressed their belief that this young man should still be physically tough.

In regard to sexual activity, there was a general endorsement of the farmers that sex should be important and a priority for men. For example, they agreed that men should always enjoy and never turn down opportunities to engage in sex with someone. Two other individual items from the MRNI-SF indicated that farmers generally believe the U.S. President should always be a man and that men should never admit when someone has hurt his feelings.

The ideas presented above from the MRNI-SF, show farmers' overall endorsement of traditional masculinity, as well as their endorsement of many related traditional masculinity constructs and questionnaire items, such as of avoiding all things feminine, having negative attitudes towards sexual minority groups, relying on themselves through their mechanical skills, expressing and showing toughness at all times, and always liking and accepting sexual activity. Since the MRNI-SF has never been

distributed to farmers, perhaps these are novel findings, although men, in general, tend to embrace these ideologies.

Thus, perhaps the most significant contribution of the MRNI-SF results of this study are for those traditional masculinity constructs and items where farmers did not tend to agree or embrace. Overall, the farmers showed high levels of disagreement with male dominance. Specifically, they did not agree that men should always be the group leader, nor that a man should always be the boss. Also, there was strong disagreement with the belief that men should restrain from expressing their emotions. For example, they did not agree that men should be removed or disconnected in emotionally charged circumstances. They also did not agree that men should not be too quick to tell others that they care about them. A final item from the MRNI-SF revealed that farmers do not endorse the idea that men should always be ready for sexual activity.

The idea that farmers of this study generally disagreed with five of the 21 items of the MRNI-SF, items that are considered traditional masculine norms rooted in Western society are the most noteworthy contributions to the body of knowledge. Previous study after study revealed that men and sub-groups of men have high propensities for demonstrating traditional masculinity in a variety of social settings and contexts. The idea that farmers, who have been portrayed as perhaps practicing some of the most traditional masculinity beliefs and behaviors in Western society, showed that they disagreed or did not generally endorse certain traditional masculine norms is important, despite the fact that they generally endorsed traditional masculinity and embraced the majority of the MRNI-SF constructs and items.

Themes.

The body acting as an occasional guide for prostate cancer detection, theme one, was identified based on nearly half of the farmers reporting some type of prostatic issue and/or symptom prior to their visit with a healthcare professional to address those problems. Thus, on occasion, when paying attention

and addressing somatic issues and symptoms, some farmers were guided to a healthcare professional for an eventual prostate cancer diagnosis. Although others in the study did not acknowledge official symptoms prior to their visit to a healthcare professional, some did mention noticing urinary changes occurring throughout their lives, typically related to having a weaker, slower urine flow.

The results related to theme one support previous research that prostate cancer symptoms are rare, and when present, typically signify later-stage disease. However, seven farmers most likely were diagnosed with high- or very-high-risk prostate cancers, but only three or four of them ever mentioned having any signs or symptoms prior to diagnosis. Therefore, some of the individuals may not have recognized and determined that certain urinary and/or sexual dysfunctions were related to the prostate or perhaps they were in denial of these issues and let them go without being examined for some time. Thus, this first theme of the study recognizes that it is important to pay attention to one's body, especially urinary and sexual functioning, for recognizing and acknowledging changes or symptoms could mean better health outcomes.

Routine checkups serving as the primary method of prostate cancer suspicion was the second theme gleaned from the interviews. Clearly, the majority of the farmers in this study did not detect and/or acknowledge prostate cancer symptoms. Rather, they had routine appointments with a general practitioner or urologist, who raised the concern and performed further examinations and investigations to eventually make a prostate cancer diagnosis.

In comparison with some of the prior research, farmers in this study seemed to see their healthcare professionals and obtain prostate cancer screenings more often than what has previously been reported for farmers. Even though that may be the case, a few farmers in this study still delayed seeing their doctors, due to cancelling, postponing, or not scheduling a regular examination. These three individuals eventually ended up with very-high-risk prostate cancer diagnoses. Therefore, routine

prostate cancer examinations are critical in identifying suspect prostate cancer cases, and perhaps better outcomes may result from having these appointments.

PSA-testing as a powerful predictor of prostate cancer, theme three, promotes the idea that a simple blood test can be such an important indicator and biomarker for prostate cancer. All the farmers in the study received PSA-testing in order to eventually be identified as an appropriate candidate for prostate biopsy, a procedure which led to their cancer diagnoses. Based on the experiences of the farmers in this study, it seems that small, seemingly insignificant rises, steady inclines, or rapid and significant increases in the PSA level can all be evidence of possible prostate cancer. Thus, it seems that regular PSA-testing, preferably with a healthcare provider that closely monitors the PSA changes, while also performing other important prostate examinations (i.e., DRE), is crucial in improving prostate cancer outcomes. Importantly, farmers in this study seemed to all be strong proponents for men receiving regular PSA-testing, regardless of age or life expectancy.

The prostate biopsy as somewhat of a necessary bugaboo for prostate cancer diagnosis is the fourth theme of the study. The prostate biopsy triggered fear and anxiety in some of the farmers of the study, and one ended up having some unexpected pain and discomfort from the procedure. It seems that there were some uncomfortable and fearful feelings from some of the farmers based on where the fairly long needle is inserted to perform the procedure, which can be transrectally or through the perineum. One of the farmers expressed that he was not given the full details and possible effects of the procedure, and upon experiencing symptoms after the procedure, he felt frustrated and agitated with his healthcare professional. Therefore, without frightening and/or deterring men from having the prostate biopsy, there seems to be a feeling that it is a needed yet somewhat bugaboo approach to collecting prostatic tissue.

The prostate cancer diagnosis putting psychological health on display, theme five, refers to how upon being told that they had prostate cancer, farmers' obvious social, emotional, and spiritual methods

of coping engaged. Socially, some of the farmers seemed to be very open about their diagnosis, eager to speak with others and even help others that may be going through similar situations. On the other hand, several farmers seemed to have a desire to not tell others and keep their condition as private as possible. Coping responses from an emotional standpoint also demonstrated a variety of feelings related to the prostate cancer diagnosis. Some farmers were not concerned, others were very concerned, and others seemed to restrict their feelings and just wanted to proceed with treatment and taking care of the issue. And from a spiritual perspective, Christian religious beliefs seemed to assist many of the farmers by providing comfort and peace, as they dealt with feelings and thoughts related to prostate cancer and their own mortality.

Generally speaking, the vast majority of research in relation to farmers' psychological health are for studies focused primarily on mental health. This study gives a glimpse of how a prostate cancer diagnosis can impact a farmers' mental health. Although most research portrays farmers as having many risk factors for psychological issues, this study shows that some farmers practice prosocial behaviors during challenging times, while also tending to other aspects of their psychological health, such as spirituality. However, it is important to say that the majority of the farmers in this study still seemed to demonstrate more restrictive emotionality and antisocial coping strategies.

Healthcare professional characteristics and others' experiences reigning paramount in treatment decisions was the sixth theme of this study. This theme highlighted the importance farmers place on who will be treating them and the treatment stories of other prostate cancer patients, as they make their final treatment decision. In fact, farmers set quite high standards for their chosen healthcare professional, in terms of their overall credentials, character, and ability to relate to and care for their patients. The other essential components of a farmer selecting a particular healthcare professional and eventual treatment are the experiences others have had with those specific treatments and/or healthcare professionals. Typically, the negative or unfortunate experiences of others are those that

best motivate the farmer in his final decision of who will treat him and how they will do it, although positive stories of others are also helpful and informative in these decisions.

Prostate cancer treatments invoking physical concerns and side effects is the seventh and final theme of this study. This theme demonstrated that of the various therapy options and selections of the farmers, physical issues and symptoms seemed to be common worries and occurrences. Farmers were particularly eager to talk about their worries concerning various treatments, as well as their actual side effects that they experienced.

Overall, there is a general aversion to wearing male inserts, shields, or diapers, for urinary issues related to surgery. Fears do also exist about the sexual impacts of surgery; however, among this group of farmers, that did not seem to be a priority or primary concern for those who had the surgery. These worries seemed more common for those who did not have the surgery but who had heard about others' unfortunate surgical experiences and outcomes. Also, fatigue and weakness seem to be a shared experience for those receiving radiation treatments. Other radiation effects were excessive urination and discomfort around the radiated area. Chemotherapy also revealed some more severe side effects, specifically related to blood count issues and anemia-related symptoms.

Despite the potential and realized effects of the various treatments, the general sentiment among the farmers was that having physical symptoms from prostate cancer treatment is worth the price if the therapy can get rid of the cancer. On the other hand, there were two individuals in the study who elected to undergo active surveillance, a less aggressive, more conservative treatment approach. Thus, there was a clear delineation in treatment decisions based on the risk classification of the cancer, with very-low-risk cases selecting non-curative methods and higher risk cancers opting for curative approaches.

Conclusions

The primary research questions of this study were answered via a qualitative design known as transcendental phenomenology (Moustakas, 1994), which involved in-depth, semi-structured interviews, containing questions centered around three health behavior theories: the model of pathways to treatment (Scott et al., 2013), the common sense model of illness self-regulation (Leventhal, Meyer et al., 1980), and the social cognitive theory (Bandura, 1986, 1997). After editing the interview transcriptions, which were completed utilizing NVivo Transcription software, aspects of Moustakas' (1994) modified version of van Kaam's (1959, 1966) data analysis method were used, as well as NVivo 12 Plus software, to organize the data and identify seven major themes which best described the meaning 11 Indiana farmers ascribe to their times to presentation, diagnosis, and treatment for prostate cancer, as well as experiences with treatment. An additional aspect of the study utilized the 21-item MRNI-SF (Levant et al., 2013) to quantitatively assess specific beliefs of the farmers about a variety of constructs related to traditional masculinity ideology.

One of the study's areas of interest was being able to describe the overall beliefs of farmers pertaining to traditional masculinity. Thus, using the MRNI-SF, the author collected demographic information for the 11 farmers and their levels of agreement to 21-items, which were each measured using a seven-point Likert scale (Levant et al., 2013). To the researchers' knowledge, this is the first study that has administered the MRNI-SF to farmers.

The findings showed that overall, farmers endorsed traditional masculine norms in Western society (i.e., TMI). The results also indicated their general endorsement of specific constructs of TMI, such as avoiding all things feminine (AoF), showing negativity towards sexual minorities (NTSM), being self-reliant through mechanical skills (SRMS), having a desire to be tough (T), and placing high importance on sexual activity (IoS). Although no previous studies used the MRNI-SF with farmers, prior studies generally indicate that this study's findings of farmers endorsing traditional masculinity are not necessarily surprising. However, what is rather surprising is that farmers did not endorse the overall

constructs for Dom and RE. These results specifically indicated that the farmers did not agree that men should always be the boss or leader of a group, nor with the ideas that men should be disconnected in emotionally charged instances or that men should not be too fast in telling others they care about them.

Perhaps these results show that this group of farmers, although a small sample size, do not tend to endorse some of the characteristics associated with traditional, hegemonic masculinity, and rural masculinities, such as being stoic during difficult times, and believing that men should always be in positions of authority. Having said that, men still make up the vast majority of farmers in the U.S., and mental health issues and suicidality among farmers are incredibly high, compared to most U.S. occupations. Therefore, although this study found some interesting results from the MRNI-SF in regard to farmers not endorsing several traditional masculine norms, these findings do not necessarily reflect some of the outcomes seen in the overall lives of U.S. farmers.

Informed by the model of pathways to treatment (Scott et al., 2013), the central research question of the study was concerned with finding the meaning that farmers attribute to their times to presentation, diagnosis, and treatment for prostate cancer. To completely address this central issue, sub-questions were identified in order to describe the major processes and contributing factors impacting the events leading up to a farmer having a first consultation with a healthcare professional for prostate cancer symptoms, being told he has prostate cancer, and receiving his first treatment for prostate cancer. An additional question was concerned with describing the contributing factors impacting farmers' experiences with prostate cancer treatment.

Themes one and two of the study, the body as an occasional guide for prostate cancer detection and routine checkups serving as the primary method of prostate cancer suspicion, respectively, are two ideas that particularly help describe the pathway to a farmer's first appointment with a healthcare professional for symptoms related to prostate cancer (i.e., time to presentation). Essentially, a little less

than half of the farmers in this study acknowledged having prostatic issues and/or symptoms at some point in their lives, typically urinary and sexual in nature, and eventually seeing a healthcare professional for these problems. The rest of the farmers did not recognize or acknowledge any issues or symptoms related to prostate cancer, and instead, presented to a healthcare professional because of typically having a pre-scheduled, routine checkup. Together, both themes should inform farmers and other men that having regularly scheduled appointments with a healthcare professional to have one's prostate examined is important. Additionally, it is also critical that farmers, and men in general, have a higher sense of somatic awareness and acknowledge issues and symptoms earlier on and not just wait for one's next appointment to have problems examined.

The third and fourth themes of the study help provide insight into the pathway to a farmer being told he has prostate cancer (i.e., time to diagnosis), with the fifth theme helping provide understanding into how farmers cope with their diagnoses. These three themes are: (theme three) PSA-testing as a powerful predictor of prostate cancer, (theme four) prostate biopsy as somewhat of a necessary bugaboo for prostate cancer diagnosis, and (theme five) the prostate cancer diagnosis putting psychological health on display.

One of the first steps in the prostate cancer diagnostic process is having a PSA test with one's general practitioner or urologist. If the number is concerning enough, and the patient meets certain clinical criteria, a prostate biopsy is performed by a urologist in order to make an official diagnosis. For the majority of the farmers in the study, their PSA levels had shown steady inclines over time, until getting to a point where their healthcare professional felt it necessary to proceed to a biopsy. For others, the PSA level increased in dramatic fashion over shorter amounts of time, thus prompting healthcare professionals to encourage biopsies. The interesting information related to the PSA-testing of this group of farmers is that cancer was detected in each of their first-ever biopsies, which speaks to the power of the PSA test as a remarkable biomarker for prostate cancer.

Once the farmers in this study knew they would be having a biopsy is when some fears, apprehensions, anxieties, and worries occurred among some of them. Some of these fearful or nervous emotions occurred before and during the procedure, while others had actual unexpected physical side effects as a result of the procedure. One participant showed fear regarding the length of the needle as well as surprise with the number of samples the doctor needed to take, while another remembered being frightened by a friend's recollection of his biopsy experience. Another participant expressed physical feelings after his procedure similar to that of getting kicked in the groin, while also feeling frustration with his doctor for not sharing all the possible effects of the procedure. Therefore, the prostate biopsy seemed to cause a certain level of fear and even symptoms in some of the farmers.

Themes three and four are important in helping one understand the pathways farmers take and experiences they endure during the prostate cancer diagnostic journey. After being diagnosed with prostate cancer, the farmers in the study exhibited various coping strategies highlighting multiple aspects of their psychological health. From a social and emotional health standpoint, farmers had a variety of reactions to having cancer and disclosing it to others. Some individuals practiced prosocial behaviors, showing a willingness to share their diagnosis with others and talk about their story. In general, these participants expressed receiving high levels of social support from others. Others were more reserved with their diagnosis and demonstrated a reluctance for others knowing, which may have included close family, friends, and the general public. General reasons for not wanting to disclose their condition were related to fear of stigma, minimization of the problem, wanting to be more informed about their condition, not wanting to worry or burden others, and also not wanting sympathy from others.

Emotionally, a variety of coping methods emerged, with some of the farmers expressing an initial sadness, fear, and even uncertainty from the diagnosis, and others showing very little if any worry or concern. There seemed to be a third type of coping as well, which included the participants who did

not seem to even acknowledge their feelings regarding the diagnosis, and instead, just wanted to keep moving forward to address the issues as soon as possible, without taking time to grieve or wanting others to grieve for them. And spiritually, there was a general belief and faith in a higher power and afterlife that alleviated some of the worry and concern a prostate cancer diagnosis may provoke.

Impacting the events prior to a farmer first receiving prostate cancer treatment is the idea from theme six, which is determining the best treatment based particularly on the characteristics of the healthcare professional and others' prostate cancer treatment experiences. In order to find the best treatment option, farmers were concerned with identifying a healthcare professional who met high professional and personal standards. Additionally, the farmers relied on primarily negative but also positive stories and experiences from friends, family, and others in order to determine the best course of treatment.

Once the farmers in this study began treatment for prostate cancer, common experiences occurred among those receiving curative therapy, namely, the fact that prostate cancer treatments invoked physical concerns and actual side effects (i.e., theme seven). Radical prostatectomy typically stoked fears and worries about urinary dysfunction and having to wear a diaper, as well as becoming impotent and losing the ability to have sex. Actual results of this surgery among the participants seemed to justify these concerns, as both individuals needed to wear some type of insert for urinary issues, and impotence was also present.

Concerns and physical symptoms also resulted from radiation therapy. A few of the farmers expressed perceived worries about the radiation damaging healthy tissues and cells around the prostate, causing the area to be inoperable, if necessary, at a later date. The actual effects of the radiation treatment, which was EBRT for all those receiving this therapy, were increased fatigue, tiredness, and weakness, with one also expressing discomfort in the prostate and rectal areas. After hearing each EBRT-recipient speak of the physical effects of treatment, it seemed there was an element

of surprise with the amount of fatigue they experienced and a general unhappy or frustrated feeling with how the treatment interrupted their work schedules and routines, due to lacking energy to perform their normal daily tasks.

The final treatment procedure that led to physical side effects and concerns was chemotherapy, which was a therapy received by only one of the participants. At the time of the interview for this study, this individual was taking his fifth different chemotherapy drug for his cancer, which had metastasized to his bones. The major treatment concerns of this patient were related to the number of treatments he had received that had not helped with significantly lowering his PSA levels and reducing the growth of his cancer. He also expressed major concerns about whether new future treatments would continue to be available to treat his cancer, in the case that his current treatment ended up not helping with reducing his cancer. At the time of the interview, this participant reported having severe anemia, which could have been related to his treatments, cancer, or both, which had caused him to have extreme fatigue and weakness, leading him to nearly pass out on several occasions, after doing basic activities of daily living. Even with the advancements of modern medicine and the amount of cancer therapy options available to patients today, this participant's specific prostate cancer case highlights the unfortunate situation when an aggressive form of cancer seems to eventually overpower any of the treatments that are thrown its way, with the treatments and/or nature of the cancer also leading to potentially unbearable physical side effects and complications.

Suggestions for Future Research

Moving forward, this study provides a variety of research opportunities to enhance theory and practice in areas such as masculinity, healthcare, health promotion, health education, health behavior, cancer, mental health, and farmer health. This study's findings and conclusions related to the MRNI-SF and themes provide a solid foundation on which to recommend future investigations and scientific work in public health.

Based on this study's evidence from the MRNI-SF, several areas for future study are suggested. First, due to the small sample size utilized in this study, the MRNI-SF should be administered to larger, more nationally representative populations of farmers in order to draw more definitive and statistically significant conclusions about farmers and their traditional masculinity beliefs. Perhaps future studies with farmers could also use the revised version of the MRNI-SF, which is known as the MRNI-Very Brief (VB) questionnaire. The MRNI-VB measures overall TMI in much the same way as the MRNI-SF, but it does so via only five items (McDermott, Levant, Hammer, Borgogna, & McKelvey, 2019). Using either of the above questionnaires, future work could compare the TMI beliefs of male farmers with female farmers, rural male and female nonfarmers, and other more urban groups of men and women. Based on the MRNI-SF of this study, further investigation of male farmers' RE and Dom are indicated in order to better understand their beliefs about dominance and emotional expression of feelings. Using various qualitative approaches, research with male and female farmers can be conducted that focuses specifically on rural and farm masculinities. Finally, future masculinity studies could benefit from the incorporation and application of health behavior theories and models, which may help in understanding why individuals believe and enact various gender ideologies and practices.

Concerning the qualitative findings and themes of this study, a wide variety of suggestions for the future are outlined. For themes one (i.e., the body as an occasional guide for prostate cancer detection) and two (i.e., routine checkups serving as the primary method of prostate cancer suspicion), more emphasis could be placed on health education for farmers about the signs and symptoms of prostate cancer, and a stronger emphasis placed on the promotion of these individuals being more somatically aware and comfortable with seeking help early for their prostate health, so that they are not just waiting for their next scheduled appointment to address a concern. Additionally, in this study, one of the farmers actually did not schedule and attend his regular annual physical examination one year, due to not wanting to be told by his doctor to quit smoking again. In 2015, this participant's PSA level

was 2.8 at his physical examination; he did not have his regular examination in 2016, and he would ultimately end up at his doctor's office nearly two years later in 2017 with a PSA of 1,200 and stage 4 prostate cancer with metastasis to his bones. Thus, a stronger emphasis and devotion could be placed on educating and equipping future and current healthcare professionals with the knowledge and skills related to motivational interviewing (MI), which is defined by Miller and Rollnick (2013) as "a collaborative, goal-oriented method of communication with particular attention to the language of change. It is intended to strengthen personal motivation for and commitment to a change goal by eliciting and exploring an individual's own arguments for change" (p. 29). MI is regarded by many as the only health coaching technique that consistently demonstrates causality and direct independent associations with positive health behavior outcomes (Butterworth, Linden, & McClay, 2007; Olsen & Nesbitt, 2010; Wolever et al., 2013). Perhaps if this participant's doctor were skilled in the MI approach, the participant would not have skipped his annual physical examination in 2016 and his cancer would have been detected at an earlier, more manageable stage.

Additional items for future study related to theme two would be to study farmers' attitudes and behaviors related to healthcare utilization and visiting a healthcare professional in general. Also, research could focus on healthcare systems and scheduling of patients for routine examinations and screenings, particularly related to cancer, in order to make sure that patients do not "fall through the cracks" in terms of scheduling and attending appointments.

Regarding theme three (i.e., PSA-testing as a powerful predictor of prostate cancer), better education of farmers about the PSA test and why it is used would be helpful, as there seemed to be confusion in this study on the exact rationale for the PSA test. Also, those individuals who have a family history of prostate cancer should be educated and encouraged to consider genetic testing. For example, seven out of eight of one of the participant's biological brothers had experienced prostate cancer, with all of them now deceased; however, this participant had never been genetically tested for any genes

related to prostate cancer. The nephew of this farmer was also a participant in this study, and after being diagnosed, he actually tested positive for the BRCA2 gene. So, in general, men should think more seriously about their risk based on family history, and when genetic testing is appropriate and available, it should be a consideration.

Additionally, it seems that the U.S. PSA-testing recommendations would benefit by being revisited and reconsidered, in order to make them more uniform among the various leading health entities and organizations that develop recommendation policies. With prostate cancer having the number one incidence and second-highest mortality rate among U.S. men, (ACS, 2019a, 2019b), perhaps PSA-testing recommendations should consider reflecting those of female breast cancer screening. Breast cancer is the most commonly diagnosed and the second-deadliest form of cancer in women (Siegel, Miller, & Jemal, 2020), and biennial mammograms are recommended for average-risk women beginning at age 50 until age 74 (USPSTF, 2016a). PSA-testing recommendations may also benefit from the recent findings about colorectal cancer in the U.S., which revealed that incidence and mortality rates increased among those under 50 years of age by 22% (from 2000 to 2013) and 13% (from 2000 to 2014), respectively (Siegel et al., 2017). Although the current USPSTF (2016b) guidelines recommend colorectal cancer screening for all average-risk adults ages 50 to 75 years-old, Siegel and colleagues' (2017) findings led the ACS to change the recommended ages to all average-risk 45-75-year-olds (Smith, Andrews et al., 2018).

According to theme four (i.e., the prostate biopsy as somewhat of a necessary bugaboo for prostate cancer diagnosis), improving health education and counseling for prostate cancer patients is suggested to help them better understand what to expect before, during, and after the biopsy procedure. This process must involve honesty, no "candy-coating," and perhaps most importantly, focus on benefits of the procedure. Additionally, future research could examine how men's perceptions and level of comfortability with their bodies play a role in their beliefs, attitudes, and actual behaviors

related to prostate biopsy. Perhaps those men with the most somatic fear and embarrassment, especially with the biopsy being performed either transrectally or transperineally, would provide interesting findings that could inform future practices of the procedure with various sub-groups of men.

For theme five (i.e., the prostate cancer diagnosis putting psychological health on display), the healthcare system and professionals need to provide more psychological and mental health resources and support to farmers, so that they can develop healthy coping strategies after being diagnosed with cancer. Male farmer suicide rates are among the top 15 highest rates for occupations in the U.S. and have increased in recent years by more than 8.5% (Peterson et al., 2018), and for some men, a diagnosis of prostate cancer carries a stigma (Ettridge et al., 2018). Thus, when diagnosed with prostate cancer, in addition to all of the other mental health struggles that farmers may be facing, it seems like having access to psychological assistance would be helpful.

Based on theme six (i.e., healthcare professional characteristics and others' experiences reigning paramount in treatment decisions) and some of the information that the farmers shared during the interviews, it is highly suggested that rural regions of the U.S. focus their efforts and resources on recruiting and retaining highly qualified specialized healthcare professionals that are culturally competent for specific rural settings. Regarding prostate cancer care, rural regions of the U.S. have very low proportions of urologists, radiation oncologists, and overall cancer care compared to more urban areas (Cohen et al., 2019; Fung et al., 2019; Onega et al., 2008). Moreover, it seems that in addition to farmers making treatment choices based on healthcare professional credentials and likeability, as well as others' experiences that are shared with them, their conditions should be more fully explained to them so that they actually understand their risk classification, as determined by the NCCN (Mohler et al., 2019). If farmers and men in general know more about their prostate cancer diagnosis, perhaps this will also help them make more informed treatment decisions.

For theme seven, which is prostate cancer treatments invoking physical concerns and side effects, a variety of suggestions for the future are warranted. In order to allow farmers to have a better idea of what to expect from their treatments, mixed methods research should be conducted with farmers pertaining to their treatment outcomes and symptoms, whether physical or mental. The findings of these studies would better inform farmers about what they may face after therapy for prostate cancer. In addition to having research-based evidence of prostate cancer treatment outcomes from other patients who happen to also be farmers, healthcare professionals must improve education to farmers about prostate cancer treatments, as far as which patients are best suited for certain treatments and what outcomes are possible from the various treatments. From the results of this study, it seems some of the farmers were not entirely prepared nor were they expecting some of the treatments effects they experienced.

Also, in relation to theme seven, future studies should compare farmers of varying prostate cancer risk classifications and their selections of therapies, whether curative or palliative, as well as those electing to undergo observation or active surveillance. For example, why does a younger man less than 65 years of age with very-low-risk prostate cancer select active surveillance, while an 84-year-old with high-risk prostate cancer select EBRT and ADT? Besides the specific treatment guidelines outlined by Mohler and colleagues (2019), what are the patient factors that impact the treatment decisions, and why do some farmers wish to be more aggressive and others more conservative?

Additionally, a focus on and further examination of interesting and unique cases of farmers with prostate cancer is suggested (i.e., farmers or other men with rare types of prostate cancers, and/or those who happen to carry a particular gene for the disease, such as BRCA2). Understanding their times to presentation, diagnosis, and treatment, as well as treatment outcomes is very important for others who may have a similar type of prostate cancer in the future.

And beyond the themes of this study, a variety of additional suggestions for future investigations are proposed. Even though many quantitative studies have been conducted concerning the association between pesticide exposure in farmers and prostate cancer incidence and mortality, rarely has this topic been studied qualitatively. Thus, interviewing farmers about their previous pesticide use and their beliefs about its potential health outcomes, especially in regard to prostate cancer and other cancers commonly associated with pesticide exposure, would be novel. In addition to environmental exposures, future studies should focus on non-modifiable risk factors and risk of prostate cancer in farmers and other men in general.

A final issue that should be investigated more fully in the future is how competing priorities, such as co-morbidities and work duties, impact a farmer's times to presentation, diagnosis, and treatment, especially for those farmers who are not retired and working full-time. Additional studies could also examine how healthcare accessibility and affordability impact a farmer's prostate cancer journey, or journey with any type of serious illness. Moreover, just as the common-sense model of illness self-regulation (Leventhal, Meyer, et al., 1980) and the social cognitive theory (Bandura, 1986, 1997) were integrated into the appraisal and help-seeking intervals of the model of pathways to treatment (Scott et al., 2013), respectively, future studies should examine how other health behavior theories can be integrated into the diagnostic and/or pre-treatment intervals of the model of pathways to treatment (Scott et al., 2013). Additionally, future studies should also more clearly explain and define how patients can enter and re-enter specific intervals of the model of pathways to treatment (Scott et al., 2013) during an illness experience, in order to better depict the fluidity and dynamism of the model.

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Supplemental Materials

Appendix A: Life Expectancy at Birth (Years) in 2013

Table A1

1	Monaco	89.50
2	Singapore	85.00
3	Japan	85.00
4	Macau	84.50
5	San Marino	83.30
6	Iceland	83.00
7	Hong Kong	82.90
8	Andorra	82.80
9	Switzerland	82.60
10	Guernsey	82.50
11	Israel	82.40
12	Korea, South	82.40
13	Luxembourg	82.30
14	Italy	82.20
15	Australia	82.20
16	Sweden	82.10
17	Liechtenstein	81.90
18	Jersey	81.90
19	Canada	81.90
20	France	81.80
21	Norway	81.80
22	Spain	81.70
23	Austria	81.50
24	Anguilla	81.40
25	Netherlands	81.30
26	Bermuda	81.30
27	Isle of Man	81.20
28	New Zealand	81.20
29	Cayman Islands	81.20
30	Belgium	81.00
31	Finland	80.90
32	Ireland	80.80
33	United Kingdom	80.70
34	Germany	80.70
35	Greece	80.50
36	Saint Pierre and Miquelon	80.50
37	Malta	80.40
38	Faroe Islands	80.40
39	European Union	80.20
40	Taiwan	80.10
41	Virgin Islands	80.00

42	United States	79.80
43	Turks and Caicos Islands	79.80
44	Wallis and Futuna	79.70
45	Saint Helena, Ascension, and Tristan da Cunha	79.50
46	Gibraltar	79.40
47	Denmark	79.40
48	Puerto Rico	79.40
49	Portugal	79.30
50	Guam	79.10
51	Bahrain	78.90
52	Chile	78.80
53	Cyprus	78.70
54	Qatar	78.70
55	Cuba	78.70
56	Czechia	78.60
57	Panama	78.60
58	Costa Rica	78.60
59	British Virgin Islands	78.60
60	Curacao	78.30
61	Albania	78.30
62	Slovenia	78.20
63	Sint Maarten	78.10
64	Dominican Republic	78.10
65	Northern Mariana Islands	78.00
66	Kuwait	78.00
67	Saint Lucia	77.80
68	New Caledonia	77.70
69	Lebanon	77.60
70	Poland	77.60
71	United Arab Emirates	77.50
72	French Polynesia	77.20
73	Uruguay	77.20
74	Paraguay	77.20
75	Brunei	77.20
76	Slovakia	77.10
77	Argentina	77.10
78	Dominica	77.00
79	Morocco	76.90
80	Aruba	76.80
81	Algeria	76.80
82	Sri Lanka	76.80
83	Ecuador	76.80
84	Bosnia and Herzegovina	76.70
85	Estonia	76.70
86	Antigua and Barbuda	76.50
87	Libya	76.50

88	Georgia	76.20
89	Macedonia	76.20
90	Tonga	76.20
91	Tunisia	76.10
92	Hungary	75.90
93	Mexico	75.90
94	Croatia	75.90
95	Cook Islands	75.80
96	Venezuela	75.80
97	Saint Kitts and Nevis	75.70
98	Colombia	75.70
99	Maldives	75.60
100	Mauritius	75.60
101	China	75.50
102	Oman	75.50
103	Serbia	75.50
104	American Samoa	75.40
105	Saudi Arabia	75.30
106	Barbados	75.30
107	Saint Vincent and the Grenadines	75.30
108	Solomon Islands	75.30
109	Romania	75.10
110	Malaysia	75.00
111	West Bank	75.00
112	Iraq	74.90
113	Lithuania	74.90
114	Syria	74.90
115	Turkey	74.80
116	Thailand	74.70
117	El Salvador	74.70
118	Seychelles	74.70
119	Jordan	74.60
120	Armenia	74.60
121	Bulgaria	74.50
122	Latvia	74.50
123	Montserrat	74.40
124	Grenada	74.30
125	Gaza Strip	73.90
126	Uzbekistan	73.80
127	Brazil	73.80
128	Samoa	73.70
129	Peru	73.70
130	Jamaica	73.60
131	Vanuatu	73.40
132	Vietnam	73.40
133	Bangladesh	73.20

134	Nicaragua	73.20
135	Palau	73.10
136	Marshall Islands	73.10
137	Micronesia, Federated States of	72.90
138	Trinidad and Tobago	72.90
139	Belarus	72.70
140	Fiji	72.70
141	Indonesia	72.70
142	Egypt	72.70
143	Azerbaijan	72.50
144	Greenland	72.40
145	Bahamas, The	72.40
146	Guatemala	72.30
147	Suriname	72.20
148	Cabo Verde	72.10
149	Ukraine	71.80
150	Iran	71.40
151	Honduras	71.10
152	Kazakhstan	70.80
153	Russia	70.80
154	Moldova	70.70
155	Nepal	70.70
156	Kyrgyzstan	70.70
157	Korea, North	70.40
158	Turkmenistan	70.10
159	Bhutan	70.10
160	Mongolia	69.60
161	Philippines	69.20
162	Bolivia	69.20
163	Belize	68.70
164	India	68.50
165	Guyana	68.40
166	Timor-Leste	68.10
167	Pakistan	67.70
168	Tajikistan	67.70
169	Papua New Guinea	67.20
170	Nauru	67.10
171	Burma	66.60
172	Ghana	66.60
173	Tuvalu	66.50
174	Kiribati	66.20
175	Madagascar	65.90
176	Yemen	65.50
177	Togo	65.00
178	Gambia, The	64.90
179	Sao Tome and Principe	64.90

180	Eritrea	64.90
181	Cambodia	64.50
182	Laos	64.30
183	Equatorial Guinea	64.20
184	Comoros	64.20
185	Sudan	64.10
186	Kenya	64.00
187	Haiti	63.80
188	Namibia	63.60
189	Djibouti	63.20
190	South Africa	63.10
191	Western Sahara	63.00
192	Mauritania	63.00
193	Tanzania	62.20
194	Ethiopia	62.20
195	Benin	61.90
196	Senegal	61.70
197	Malawi	61.20
198	Guinea	60.60
199	Burundi	60.50
200	Rwanda	60.10
201	Congo, Republic of the	59.30
202	Liberia	59.00
203	Cote d'Ivoire	58.70
204	Cameroon	58.50
205	Sierra Leone	58.20
206	Zimbabwe	58.00
207	Congo, Democratic Republic of the	57.30
208	Angola	56.00
209	Mali	55.80
210	Burkina Faso	55.50
211	Niger	55.50
212	Uganda	55.40
213	Botswana	54.50
214	Nigeria	53.40
215	Mozambique	53.30
216	Lesotho	53.00
217	Zambia	52.50
218	Somalia	52.40
219	Central African Republic	52.30
220	Gabon	52.10
221	Swaziland	51.60
222	Afghanistan	51.30
223	Guinea-Bissau	50.60
224	Chad	50.20

Table A2

Country	Female	Male	Difference
Afghanistan	62	61	1
Albania	76	73	3
Algeria	74	70	4
Andorra	86	79	7
Angola	53	50	3
Antigua and Barbuda	77	73	4
Argentina	80	73	7
Armenia	75	67	8
Australia	85	80	5
Austria	84	79	5
Azerbaijan	75	70	5
Bahamas	78	73	5
Bahrain	78	76	2
Bangladesh	72	70	2
Barbados	81	75	6
Belarus	78	66	12
Belgium	83	78	5
Belize	78	72	6
Benin	60	57	3
Bhutan	69	68	1
Bolivia (Plurinational State of)	70	65	5
Bosnia and Herzegovina	80	75	5
Botswana	65	63	2
Brazil	79	72	7
Brunei Darussalam	79	76	3
Bulgaria	78	71	7
Burkina Faso	59	58	1
Burundi	58	54	4
Côte d'Ivoire	54	52	2
Cabo Verde	78	71	7
Cambodia	75	70	5
Cameroon	58	56	2
Canada	84	80	4
Central African Republic	52	50	2
Chad	53	51	2
Chile	83	77	6
China	77	74	3
Colombia	81	75	6
Comoros	63	60	3

Congo	60	58	2
Cook Islands	78	74	4
Costa Rica	81	77	4
Croatia	81	75	6
Cuba	80	77	3
Cyprus	84	80	4
Czech Republic	81	75	6
Democratic People's Republic of Korea	73	66	7
Democratic Republic of the Congo	54	51	3
Denmark	82	78	4
Djibouti	63	60	3
Dominica	77	72	5
Dominican Republic	74	73	1
Ecuador	79	73	6
Egypt	74	69	5
El Salvador	77	68	9
Equatorial Guinea	57	55	2
Eritrea	66	61	5
Estonia	82	72	10
Ethiopia	66	63	3
Fiji	73	67	6
Finland	84	78	6
France	85	79	6
Gabon	65	62	3
Gambia	63	60	3
Georgia	78	71	7
Germany	83	79	4
Ghana	64	62	2
Greece	84	79	5
Grenada	77	70	7
Guatemala	75	68	7
Guinea	59	57	2
Guinea-Bissau	55	53	2
Guyana	67	60	7
Haiti	64	61	3
Honduras	77	72	5
Hungary	79	71	8
Iceland	84	81	3
India	68	65	3
Indonesia	73	69	4
Iran (Islamic Republic of)	76	72	4

Iraq	74	67	7
Ireland	83	79	4
Israel	84	81	3
Italy	85	80	5
Jamaica	77	72	5
Japan	87	80	7
Jordan	76	72	4
Kazakhstan	73	63	10
Kenya	63	60	3
Kiribati	69	64	5
Kuwait	79	78	1
Kyrgyzstan	73	66	7
Lao People's Democratic Republic	68	65	3
Latvia	79	69	10
Lebanon	82	78	4
Lesotho	52	48	4
Liberia	63	61	2
Libya	77	73	4
Lithuania	79	69	10
Luxembourg	84	80	4
Madagascar	66	63	3
Malawi	61	58	3
Malaysia	76	72	4
Maldives	79	77	2
Mali	57	57	0
Malta	82	79	3
Marshall Islands	73	68	5
Mauritania	65	62	3
Mauritius	78	70	8
Mexico	78	73	5
Micronesia (Federated States of)	70	68	2
Monaco	85	79	6
Mongolia	72	64	8
Montenegro	78	74	4
Morocco	73	69	4
Mozambique	55	53	2
Myanmar	68	64	4
Namibia	70	66	4
Nauru	83	75	8
Nepal	70	67	3
Netherlands	83	79	4

New Zealand	84	80	4
Nicaragua	77	71	6
Niger	59	59	0
Nigeria	55	54	1
Niue	78	72	6
Norway	84	80	4
Oman	79	74	5
Pakistan	67	65	2
Palau	75	71	4
Panama	80	74	6
Papua New Guinea	65	60	5
Paraguay	78	72	6
Peru	79	76	3
Philippines	72	65	7
Poland	81	73	8
Portugal	84	78	6
Qatar	80	79	1
Republic of Korea	85	78	7
Republic of Moldova	75	66	9
Romania	78	71	7
Russian Federation	75	63	12
Rwanda	67	64	3
Saint Kitts and Nevis	78	71	7
Saint Lucia	79	72	7
Saint Vincent and the Grenadines	76	72	4
Samoa	77	70	7
San Marino	84	83	1
Sao Tome and Principe	69	65	4
Saudi Arabia	78	74	4
Senegal	66	63	3
Serbia	77	72	5
Seychelles	78	70	8
Sierra Leone	46	46	0
Singapore	85	81	4
Slovakia	80	72	8
Slovenia	84	77	7
Solomon Islands	70	67	3
Somalia	56	53	3
South Africa	64	57	7
South Sudan	57	55	2
Spain	86	80	6

Sri Lanka	78	72	6
Sudan	65	61	4
Suriname	80	74	6
Swaziland	53	53	0
Sweden	84	80	4
Switzerland	85	81	4
Syrian Arab Republic	78	73	5
Tajikistan	70	68	2
Thailand	79	71	8
The former Yugoslav Republic of Macedonia	78	74	4
Timor-Leste	69	65	4
Togo	60	57	3
Tonga	70	74	-4
Trinidad and Tobago	74	67	7
Tunisia	78	74	4
Turkey	79	72	7
Turkmenistan	68	60	8
Tuvalu	70	66	4
Uganda	61	57	4
Ukraine	76	66	10
United Arab Emirates	78	76	2
United Kingdom of Great Britain and Northern Ireland	83	79	4
United Republic of Tanzania	65	61	4
United States of America	81	76	5
Uruguay	81	74	7
Uzbekistan	72	67	5
Vanuatu	74	71	3
Venezuela (Bolivarian Republic of)	80	72	8
Viet Nam	80	71	9
Yemen	66	63	3
Zambia	60	57	3
Zimbabwe	61	56	5

Note: Adapted from “Life Expectancy: Data by Country,” by the World Health Organization, 2015. Copyright 2015 by the World Health Organization.

Appendix B: Thirty-One Key Determinants of Men's Health

Table B1

Health Behaviors

1. Health-promoting behavior
2. Health-risk behavior
3. Physical abuse and violence
4. Social support
5. Behavioral responses to stress
6. Healthcare use

Health Beliefs

7. Self-rated health status
8. Perceived susceptibility to risk
9. Body image
10. Personal control
11. Readiness to change unhealthy behaviors
12. Masculinity
13. Expression of emotions and physical distress

Factors Influencing Health Behaviors and Beliefs

14. Biology and genetics
15. Psychophysiology
16. Ethnicity
17. Socioeconomic status
18. Age
19. Marital status
20. Sexual orientation
21. Occupational hazards
22. Unemployment
23. Imprisonment
24. Societal beliefs about masculinity and the social treatment of men
25. Media and advertisements
26. Health knowledge

Healthcare

27. Insurance coverage and healthcare costs
 28. Healthcare access
 29. Institutional influences and research methodology
 30. Clinician-patient interaction and communication
 31. Clinicians' gender biases
-

Note. Adapted from "Dying to be Men: Psychosocial, Environmental, and Biobehavioral Directions in Promoting the Health of Men and Boys" by W. H. Courtenay, 2011, New York, NY: Taylor and Francis Group, LLC. Copyright 2011 by W. H. Courtenay. Adapted with permission.

Appendix C: Modifiable Behaviors that Increase Men’s Risk for Disease, Injury, and Death

Table C1

Preventive care and self-care

Screening tests
Self-examinations
Sun protection
Dental care
Sleep
Hand washing
Use of medicines and vitamins
Behavioral responses to stress

Risk taking and reckless behavior

Reckless driving
Drinking and driving
Safety belt use
Helmet use
Sexual activity
Sports and recreation

Diet

Meats and dietary fat
Cholesterol
Fiber, vegetables, and fruits
Salt intake

Substance use

Tobacco use
Alcohol use
Anabolic steroid use

Violence

Physical fighting
Weapon ownership and use
Criminal activity

Social support and marriage

Social support
Marriage

Healthcare utilization

Weight

Physical activity

Employment

Note. Adapted from “Dying to be Men: Psychosocial, Environmental, and Biobehavioral Directions in Promoting the Health of Men and Boys” by W. H. Courtenay, 2011, New York, NY: Taylor and Francis Group, LLC. Copyright 2011 by W. H. Courtenay. Adapted with permission.

Appendix D: Model of Pathways to Treatment

Figure D1

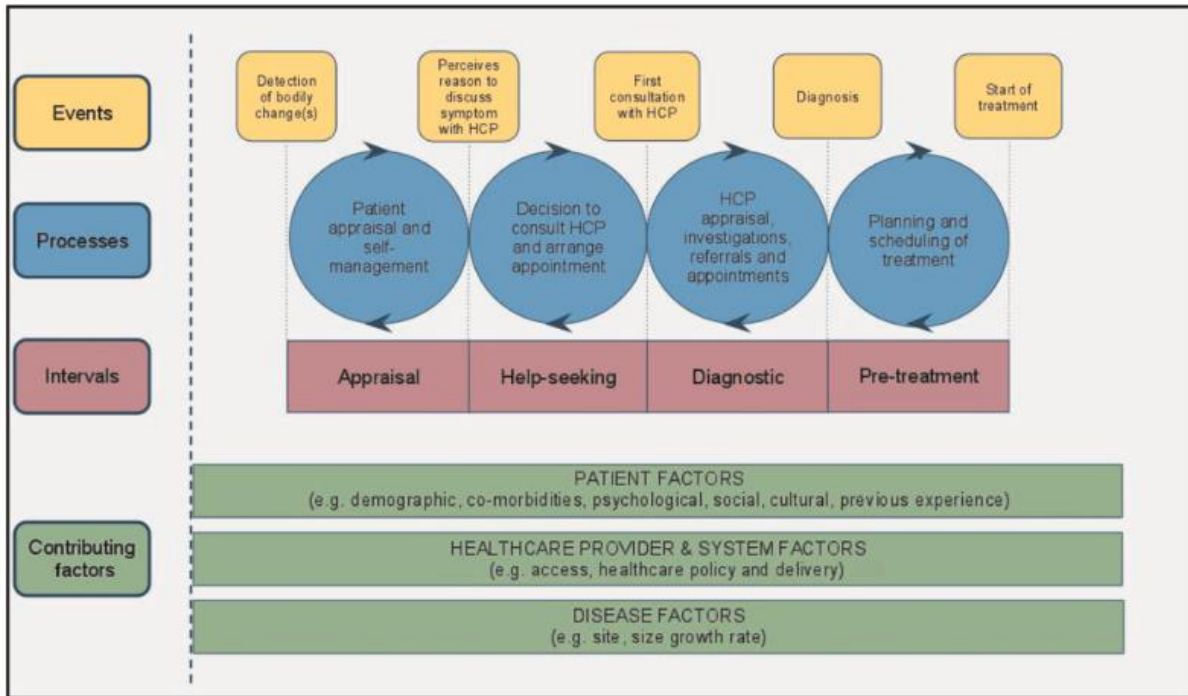


Figure 3 Model of pathways to treatment
HCP = health care provider

Note: Adapted from "The Andersen Model of Total Patient Delay: A Systematic Review of its Application in Cancer Diagnosis" by F. Walter, A. Webster, S. Scott, and J. Emery, 2012, *Journal of Health Services Research & Policy*, 17, p. 116. Copyright 2012 by SAGE Publications. Reprinted with permission.

Appendix E: Male Role Norms Inventory – Short Form (MRNI-SF)

We are interested in finding out about masculinity beliefs in farmers. The following questionnaire requests that you respond to seven demographic items and 21 items from the MRNI-SF measuring multiple dimensions of traditional masculinity ideology.

Part One: Demographics

Please complete the following demographic items by either circling the letter which indicates the response that best applies to you or writing your answer on the line(s) provided.

- 1) What is your age? (please specify with a whole number) _____

- 2) What is your gender?
 - a. Male
 - b. Female
 - c. Other (please specify): _____
 - d. Prefer not to say

- 3) What is your race? (please circle all that apply)
 - a. White
 - b. Black or African American
 - c. American Indian or Alaska Native
 - d. Asian
 - e. Native Hawaiian or Pacific Islander
 - f. Other (please specify): _____

- 4) What is your ethnicity?
 - a. Hispanic or Latino or Spanish origin
 - b. Not Hispanic or Latino or Spanish origin

- 5) What is the highest degree or level of school you have completed?
 - a. Less than a high school diploma
 - b. High school degree or equivalent
 - c. Trade or vocational school
 - d. Bachelor's degree (e.g., B.A., B.S.)
 - e. Master's degree (e.g., M.A., M.S., M.Ed)
 - f. Doctorate (e.g., Ph.D., Ed.D., M.D., D.O.)
 - g. Other (please specify): _____

- 6) What is your current employment status? (please circle all that apply)
 - a. Employed full-time (40+ hours a week)
 - b. Employed part-time (less than 40 hours a week)
 - c. Unemployed (not currently looking for work)
 - d. Student

- e. Retired
 - f. Self-employed
 - g. Unable to work
 - h. Other (please specify): _____
- 7) What is your marital status?
- a. Single (never married)
 - b. Married
 - c. In a domestic partnership
 - d. Divorced
 - e. Widowed
 - f. Other (please specify): _____
- 8) What is your household income?
- a. Less than \$25,000
 - b. \$25,000 - \$50,000
 - c. \$50,000 - \$100,000
 - d. \$100,000 - \$200,000
 - e. More than \$200,000
 - f. Prefer not to say

Part Two: MRNI-SF

Please complete the following items by circling the number which indicates your level of agreement or disagreement with each statement. Give only one answer for each statement.

Strongly Disagree	Disagree	Slightly Disagree	No Opinion	Slightly Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

1. Homosexuals should never marry.

1	2	3	4	5	6	7
----------	----------	----------	----------	----------	----------	----------

2. The President of the US should always be a man.

1	2	3	4	5	6	7
----------	----------	----------	----------	----------	----------	----------

3. Men should be the leader in any group.

1	2	3	4	5	6	7
----------	----------	----------	----------	----------	----------	----------

4. Men should watch football games instead of soap operas.

1	2	3	4	5	6	7
----------	----------	----------	----------	----------	----------	----------

5. All homosexual bars should be closed down.

1	2	3	4	5	6	7
----------	----------	----------	----------	----------	----------	----------

6. Men should have home improvement skills.
1 2 3 4 5 6 7
7. Men should be able to fix most things around the house.
1 2 3 4 5 6 7
8. A man should prefer watching action movies to reading romantic novels.
1 2 3 4 5 6 7
9. Men should always like to have sex.
1 2 3 4 5 6 7
10. Boys should prefer to play with trucks rather than dolls.
1 2 3 4 5 6 7
11. A man should not turn down sex.
1 2 3 4 5 6 7
12. A man should always be the boss.
1 2 3 4 5 6 7
13. Homosexuals should never kiss in public.
1 2 3 4 5 6 7
14. A man should know how to repair his car if it should break down.
1 2 3 4 5 6 7
15. A man should never admit when others hurt his feelings.
1 2 3 4 5 6 7
16. Men should be detached in emotionally charged situations.
1 2 3 4 5 6 7
17. It is important for a man to take risks, even if he might get hurt.
1 2 3 4 5 6 7
18. A man should always be ready for sex.
1 2 3 4 5 6 7
19. When the going gets tough, men should get tough.
1 2 3 4 5 6 7
20. I think a young man should try to be physically tough, even if he's not big.
1 2 3 4 5 6 7

21. Men should not be too quick to tell others that they care about them.

1 2 3 4 5 6 7

This is the end of the questionnaire. Thank you for participating.

Appendix F: Omnibus Permission Form for MRNI-SF

[External] RE: Omnibus Permission Form for MRNI-SF

Ronald F Levant <levant@uakron.edu>

Mon 11/18/2019 12:52 PM

To: Nolting, Tyler Marcus <tmnoltn@indiana.edu>;

1 attachment

MRNI-SF_and_scoring.doc

This message was sent from a non-IU address. Please exercise caution when clicking links or opening attachments from external sources.

Hello Tyler: Thank you for sending your permission request for the use of the MRNI-SF. Your permission is granted. I have attached the instrument and all of the information that you will need. Good luck on your project!

Sincerely,
Ron Levant

Ronald F. Levant, Ed.D., M.B.A., A.B.P.P.
Professor Emeritus, Psychology
Senior Fellow, Institute for Life-Span Development and Gerontology
Buchshtet College of Arts and Sciences
The University of Akron
Akron, OH 44325-4301
Email: Levant@uakron.edu
Web: DrRonaldLevant.com
Facebook: Gender Research Team
Twitter: @LevantR
Co-editor: [The Psychology of Men and Masculinities](#)

From: Nolting, Tyler Marcus <tmnoltn@indiana.edu>
Sent: Monday, November 18, 2019 12:29 PM
To: Ronald F Levant <levant@uakron.edu>
Subject: Omnibus Permission Form for MRNI-SF

Hello Dr. Levant,

Attached is the completed permission form for the MRNI-SF, which I plan to use for my dissertation research project for the Ph.D. in Health Behavior through Indiana University's School of Public Health-Bloomington. On November 8th, 2019, I successfully defended my dissertation proposal; however, one revision my committee wants to see is that I incorporate an instrument measuring traditional masculinity ideology, instead of solely performing qualitative interviews. Thus, after reading several articles and instrument questions, I determined the MRNI-SF would be the most appropriate and applicable to my study.

Please let me know if you have any questions/concerns and whether or not you wish to grant me access to the instrument.

Thanks so much and take care,

Tyler

--

Tyler Nolting, MPH, MCHES

Ph.D. candidate | Indiana University School of Public Health-Bloomington

Department of Applied Health Science

tmnoltn@indiana.edu | (812) 350-6707

[]

Appendix G: Recruitment Letters

Dear Sir,

We are writing to invite you to participate in a study being conducted through Indiana University at (name of church). The title of the study is: "A Phenomenological Investigation of Appraisal and Help-Seeking Experiences of Midwestern Farm Operators with Prostate Cancer and Measurements of Traditional Masculinity Ideology: A Mixed-Methods Analysis." Since you have expressed interest to us in participating in the study, we are sharing this letter with you.

You are eligible to participate if: 1) you are currently or were previously a farmer in the Midwest and 2) you currently have or previously had prostate cancer.

The purpose of this research study is to describe Midwestern farmers' experiences of pursuing medical care for prostate issues and to assess their beliefs about masculinity.

It is important to know that this letter is not to tell you to join this study. It is your decision and your participation is strictly voluntary. Whether or not you participate in this study will have no effect on your relationship with (name of church).

You will receive a \$25.00 Visa gift card for your participation in the study.

Please refer to the "Indiana University Study Information Sheet" for more details about the study.

If you are interested in participating in the study, please contact the study researcher, Tyler Nolting, at (812) 350-6707 or tmnoltin@indiana.edu.

You do not have to respond if you are not interested in this study. If you do not respond, no one will contact you.

Thank you for your time and consideration. We look forward to hearing from you.

Sincerely,

Tyler Nolting, MPH, MCHES®
Ph.D. Doctoral Candidate
Indiana University-Bloomington
School of Public Health
Department of Applied Health Science

Dr. David Lohrmann, Ph.D., MCHES®
Professor and Chair
Indiana University-Bloomington
School of Public Health
Department of Applied Health Science

Dear Sir,

We are writing to invite you to participate in a study being conducted through Indiana University at (name of deli and convenience store). The title of the study is: "A Phenomenological Investigation of Appraisal and Help-Seeking Experiences of Midwestern Farm Operators with Prostate Cancer and Measurements of Traditional Masculinity Ideology: A Mixed-Methods Analysis." Since you have expressed interest to us in participating in the study, we are sharing this letter with you.

You are eligible to participate if: 1) you are currently or were previously a farmer in the Midwest and 2) you currently have or previously had prostate cancer.

The purpose of this research study is to describe Midwestern farmers' experiences of pursuing medical care for prostate issues and to assess their beliefs about masculinity.

It is important to know that this letter is not to tell you to join this study. It is your decision and your participation is strictly voluntary. Whether or not you participate in this study will have no effect on your relationship with (name of convenience store).

You will receive a \$25.00 Visa gift card for your participation in the study.

Please refer to the "Indiana University Study Information Sheet" for more details about the study.

If you are interested in participating in the study, please contact the study researcher, Tyler Nolting, at (812) 350-6707 or tmnoltin@indiana.edu.

You do not have to respond if you are not interested in this study. If you do not respond, no one will contact you.

Thank you for your time and consideration. We look forward to hearing from you.

Sincerely,

Tyler Nolting, MPH, MCHES®
Ph.D. Doctoral Candidate
Indiana University-Bloomington
School of Public Health
Department of Applied Health Science

Dr. David Lohrmann, Ph.D., MCHES®
Professor and Chair
Indiana University-Bloomington
School of Public Health
Department of Applied Health Science

Dear Sir,

We are writing to invite you to participate in a study being conducted through Indiana University at (name of medical clinic). The title of the study is: "A Phenomenological Investigation of Appraisal and Help-Seeking Experiences of Midwestern Farm Operators with Prostate Cancer and Measurements of Traditional Masculinity Ideology: A Mixed-Methods Analysis." Your medical provider, (name of medical clinic), has identified you as a potential participant and is contacting you on our behalf. Your name, contact information, and protected health information have not been shared with us.

You are eligible to participate if you 1) are currently or were previously a farmer in the Midwest and 2) currently have or previously had prostate cancer.

The purpose of this research study is to describe Midwestern farmers' experiences of pursuing medical care for prostate issues.

It is important to know that this letter is not to tell you to join this study. It is your decision and your participation is strictly voluntary. Whether or not you participate in this study will have no effect on your relationship with the (name of medical clinic) as a patient.

You will receive a \$25.00 gift card for your participation in the study.

Please refer to the enclosed "University Name Study Information Sheet" for more details about the study.

If you are interested in participating in the study, please contact the study researcher, Tyler Nolting, at (812) 350-6707 or tmnoltin@indiana.edu.

You do not have to respond if you are not interested in this study. If you do not respond, no one will contact you.

Thank you for your time and consideration. We look forward to hearing from you.

Sincerely,

Tyler Nolting, MPH, MCHES
Ph.D. Doctoral Candidate
Indiana University-Bloomington
School of Public Health
Department of Applied Health Science

Dr. David Lohrmann, Ph.D., MCHES
Professor and Chair
Indiana University-Bloomington
School of Public Health
Department of Applied Health Science

STUDY SEEKING FARMERS WHO HAVE OR HAD PROSTATE CANCER



Are you a farmer who has ever been diagnosed with prostate cancer?
If so, please participate in our research study.

You will be asked to complete one in-depth interview and one survey that will be done at your preferred time and location. You will receive a \$25.00 Visa gift card after completing the interview and survey.

In order to participate, you must meet the following criteria:

- Identify as a farmer and
- Have been diagnosed with prostate cancer at some point in your life.

If interested, please email Tyler Nolting at tmnoltin@indiana.edu
or call at (812) 350-6707.



Appendix I: Study Information Sheet

INDIANA UNIVERSITY STUDY INFORMATION SHEET FOR

A Phenomenological Investigation of Appraisal and Help-Seeking Experiences of Midwestern Farm Operators with Prostate Cancer and Measurements of Traditional Masculinity Ideology: A Mixed-Methods Analysis

You are invited to participate in a research study of Midwestern farmers' experiences with pursuing medical care for prostate issues and their beliefs about masculinity. You were selected as a possible subject because you are a Midwestern farmer who currently has or previously had prostate cancer. We ask that you read this form and ask any questions you may have before agreeing to be in the study.

The study is being conducted by Tyler Nolting and Drs. David Lohrmann, Cecilia Obeng, and Lesa Huber of the Department of Applied Health Science at Indiana University's (IU's) School of Public Health-Bloomington (SPH-Bloomington), Dr. Khalid Khan of the Department of Environmental and Occupational Health at IU's SPH-Bloomington, and Dr. Tina Kruger of the Department of Multidisciplinary Studies at Indiana State University.

STUDY PURPOSE

The purpose of this study is to describe Midwestern farmers' experiences of pursuing medical care for prostate issues, as well as their beliefs about masculinity.

PROCEDURES FOR THE STUDY:

If you agree to be in the study, you will do the following things:

Complete one questionnaire and participate in one audio-recorded, face-to-face interview. The questionnaire and interview are outlined as follows:

- Questionnaire (~ 10 minutes): focuses on assessing traditional masculinity ideology by measuring level of agreement to 21 questions focused on restrictive emotionality, self-reliance through mechanical skills, negativity towards sexual minorities, avoidance of femininity, dominance, the importance of sex, and toughness. The questionnaire will be completed in-person, immediately before conducting the interview.
- Interview (30-120 minutes): focuses on the time period from when you first noticed prostate-cancer symptoms to the first medical appointment for these symptoms and on making meaning of these experiences

The interviews are expected to take place at any of the following facilities (depending on your affiliation):

- Clay City Center for Family Medicine-Clay City, Indiana;
- Cork Medical Center-Marshall, Illinois;
- St. Paul Evangelical Lutheran Church-Columbus, Indiana;
- St. Peter's Lutheran Church-Columbus, Indiana; or
- Mill St. Deli and Convenience, LLC-Elizabethtown, Indiana.

You may also choose a different interview location, depending on your preferences.

RISKS AND BENEFITS

While in the study, the risks are:

- Being uncomfortable answering the questions.
- Possible loss of confidentiality.

While taking part in the interview, you can tell the researcher that you feel uncomfortable or do not care to answer a particular question.

The benefits to participation that are reasonable to expect in the subjects are: emotional relief and support, finding a sense of purpose, becoming more self-aware, and sharing your story may help positively impact the health of other farmers.

CONFIDENTIALITY

Every effort will be made to keep your personal information confidential; however, we cannot guarantee absolute confidentiality. Your personal information may be disclosed if required by law. Your identity will never be included in reports in which the study may be published and databases in which results may be stored. Tyler Nolting and Drs. David Lohrmann, Cecilia Obeng, Lesa Huber, Khalid Khan, and Tina Kruger are the only individuals who will have access to the questionnaires, interview audio recordings, and written transcripts. The questionnaires, audio recordings, and transcripts will be kept under lock and key until being destroyed 3 years from the study end date.

Organizations that may inspect and/or copy your research records for quality assurance and data analysis include groups such as the study investigator and his/her research associates, the Indiana University Institutional Review Board or its designees, and (as allowed by law) state or federal agencies, specifically the Office for Human Research Protections (OHRP). Any agency that might review your records is also required by law to protect your privacy and medical confidentiality.

PAYMENT

You will receive a \$25.00 Visa gift card, which will be disbursed to each subject (in-person) upon the completion of the questionnaire and interview.

CONTACTS FOR QUESTIONS OR PROBLEMS

For questions about the study, contact the researcher, Tyler Nolting, at (812) 350-6707 or tmnoltin@indiana.edu.

For questions about your rights as a research participant or to discuss problems, complaints or concerns about a research study, or to obtain information, or offer input, contact the IU Human Subjects Office at (317) 278-3458 [for Indianapolis] or (812) 856-4242 [for Bloomington] or (800) 696-2949.

VOLUNTARY NATURE OF STUDY

Taking part in this study is voluntary. You may choose not to take part or may leave the study at any time. Leaving the study will not result in any penalty or loss of benefits to

which you are entitled. Your decision whether or not to participate in this study will not affect your current or future relations with Indiana University.

Appendix J: Church Announcement

Study seeking farmers who have or had prostate cancer: Are you are farmer who has ever been diagnosed with prostate cancer? If so, please consider participating in our research study. You will be asked to complete one in-depth interview and one survey that will be done at your preferred time and location. You will receive a \$25.00 Visa gift card after completing the interview and survey. In order to participate, you must meet the following criteria: a) identify as a farmer and b) have been diagnosed with prostate cancer at some point in your life. If interested, please contact Tyler Nolting at tmnoltin@indiana.edu or phone at (812) 350-6707.

Appendix K: IRB Exempt Approval Letter



INDIANA UNIVERSITY
OFFICE OF THE VICE PRESIDENT FOR RESEARCH
Office of Research Compliance

To: David Lohrmann
APPLIED HEALTH SCIENCE

Tyler Nolting
SCHOOL OF PUBLIC HEALTH-IUB

From:

Human Subjects Office
Office of Research Compliance – Indiana University

Date: January 26, 2016

RE: NOTICE OF EXEMPTION - NEW PROTOCOL

Protocol Title: "Time to Presentation": Midwestern Farmers with Prostate Cancer

Study #: 1512036025

Funding Agency/Sponsor: None

Status: Exemption Granted | Exempt

Study Approval Date: January 26, 2016

The Indiana University Institutional Review Board (IRB) EXE000001 | Exempt recently reviewed the above-referenced protocol. In compliance with (as applicable) 45 CFR 46.109 (d) and IU Standard Operating Procedures (SOPs) for Research Involving Human Subjects, this letter serves as written notification of the IRB's determination.

Under 45 CFR 46.101(b) and the SOPs, as applicable, the study is accepted as Exempt , with the following determinations:

Acceptance of this study is based on your agreement to abide by the policies and procedures of the Indiana University Human Research Protection Program and does not replace any other approvals that may be required. Relevant policies and procedures governing Human Subjects Research can be found at: http://researchcompliance.iu.edu/hso/hs_guidance.html.

The Exempt determination is valid indefinitely. Substantive changes to approved exempt research must be requested and approved prior to their initiation. Investigators may request proposed changes by submitting an amendment through the KC IRB system. The changes are reviewed to ensure that they do not affect the exempt status of the research. Please check with the Human Subjects Office to determine if any additional review may be needed.

You should retain a copy of this letter and all associated approved study documents for your records. Please refer to the assigned study number and exact study title in future correspondence with our office. Additional information is available on our website at <http://researchcompliance.iu.edu/hso/index.html>.

If your source of funding changes, you must submit an amendment to update your study documents immediately.

If you have any questions or require further information, please contact the Human Subjects Office via email at irb@iu.edu or by phone at 317-274-8289 (Indianapolis) or 812-856-4242 (Bloomington).

You are invited, as part of ORA's ongoing program of quality improvement, to **participate in a short survey** to assess your experience and satisfaction with the IRB related to this approval. We estimate it will take you approximately **5 minutes to complete the survey**. The survey is housed on a Microsoft SharePoint secure site that requires CAS authentication. This survey is being administered by REEP; please contact us at reep@iu.edu if you have any questions or require additional information. Simply click on the link below, or copy and paste the entire URL into your browser to access the survey: https://www.sharepoint.iu.edu/sites/iu-ora/survey/Lists/Compliance/IRB_Survey/NewForm.aspx.

/enclosures

Appendix L: IRB Questionnaire Answers

Protocol Number: 1512036025 Submission Type: Initial Protocol Application
Title: "Time to Presentation": Midwestern Farmers with Prostate Cancer Principal Investigator: Lohrmann, David K.
Report Printed: 03/04/2016

- ID #625: Describe the purpose of this study in lay terms.

The purpose of this study is to describe Midwestern farmers' experiences of pursuing medical care for prostate issues.

- ID #24927: List and describe all research interactions and/or interventions, including the frequency and duration of procedures, and length of participation for individual subjects.

Participate in 2 in-depth audio-recorded interviews, scheduled 3-7 days apart from each other. The following is the outline for the interviews:

Interview #1 (30-75 minutes): focuses on a brief life history, which includes events from birth until the first evidence of prostate cancer symptoms,

Interview #2 (30-120 minutes): focuses on the time period from the first evidence of prostate cancer symptoms to the first medical appointment for these symptoms and on making meaning of the experiences from interviews #1 and #2

The interviews are expected to take place with participants at any of the 3 following facilities (depending on where participants receive care):

Clay City Center for Family Medicine; Clay City, Indiana,
Cork Medical Center; Marshall, Illinois, or
Waltz Family Practice; Rockville, Indiana

These 3 facilities mentioned are all part of the Union Health System, which is a partnership between Union Hospital and Union Affiliated Physicians.

Note: Interviews may take place elsewhere, depending on the participants' preferences.

*Interview #1 and #2 question guides are included in the Notes and Attachments tab.

- ID #626: List criteria used to determine that a subject, record, or specimen is eligible to be included in this study.

The participants must be current or previous Midwestern farmers, who currently have or previously had prostate cancer, which will be known via access to the participant electronic medical record for Clay City Center for Family Medicine, Cork Medical Center, and Waltz Family Practice. The individual accessing the participant electronic medical record will be an employee of the Union Health System, who is the practice manager of Clay City Center for Family Medicine and Cork Medical Center. The practice manager will contact the information technology staff of the Union Health System, having them run the appropriate electronic medical record report. This report will identify all those men who meet the study criteria.

- ID #24919: Is this research funded by, or has a funding application been submitted to, a federal agency? This includes funding from CTSI and federal pass-through funding.

Yes
 No

- ID #24930: Select the categories that apply to this study:

- Research Studying Educational Practices
- Research Involving Data Collection WITH Subject Interaction**
- Research Involving Data Collection WITHOUT Subject Interaction
- Research Studying Government-Funded Programs or Public Officials
- Research Involving Food Taste, Quality, and/or Consumer Acceptance

- ID #622: Will information be recorded in a way that human subjects can be identified, directly or through identifiers linked to the subjects?

- Yes
- No

- ID #631: Could any disclosure of the subjects' responses outside the research reasonably place the subjects at risk of criminal or civil liability, be damaging to the subjects' financial standing, reputation, or ability to be employed or insured?

- Yes
- No

- ID #24936: Select all age groups the researchers will survey, interview, or interact with (beyond public observation).

- Children ages 13 and younger. Do not complete any additional questions below. The research is not eligible for exemption.
- Adolescents ages 14 to 17
- Adults

- ID #24944: Describe how subjects will be recruited, including how they will be identified and contacted, and any written materials that will be used, such as advertisements. All materials that will be shared with subjects must be uploaded to the Notes & Attachments tab.

An employee of the Union Health System, who is the practice manager of Clay City Center for Family Medicine and Cork Medical Center, will contact the information technology staff of the Union Health System and have them run the appropriate electronic medical record report of patients at Clay City Center for Family Medicine, Cork Medical Center, and Waltz Family Practice (all entities that are part of the Union Health System). This report will generate a list of patients who meet the study criteria. This list will then be sent to another Union Health System staff member who works at the Richard G. Lugar Center for Rural Health (an entity that is also a part of Union Health System. This staff member will send (via mail and email) a recruitment letter, recruitment flyer, and study information sheet to each of the potential study subjects. The recruitment materials will instruct potential subjects to contact the study investigator, Tyler Nolting, to enroll.

*The recruitment letters, flyer, and study information sheet are attached in the Notes and Attachments tab.

- ID #24945: Describe how subjects will be given the following minimum information: (i) they are being asked to participate in research, (ii) what they will be asked to do, (iii) their participation is voluntary, (iv) the risks and benefits of participation, and (v) who to contact with any questions about the research.

- A separate Study Information Sheet will be given to each potential subject to review
- Study personnel will verbally discuss the research with potential subjects
- This information will be included at the beginning of written materials, such as a survey, that will be completed by subjects
- Other

- ID #24947: Select any of the following circumstances which apply to this research.

- A member of the study team is a teacher or professor or instructor and his or her own students will participate as subjects in the research
- A member of the study team is an employer or supervisor of individuals who will participate as subjects in the research
- A member of the study team is a health care professional and his or her patients will participate as subjects in the research
- None of the above
- ID #644: Will subjects be paid for participation in the study?
 - Yes
 - No
 - ID #23347: Describe the payment arrangement, including amount and timing of disbursement.
 - Each subject will receive a \$25.00 Walmart gift card, which will be disbursed to each subject (in-person) at the end of the final interview.
 - ID #24995: Will the research be conducted at any non-IU site not already listed on the Organization panel of the Protocol tab?
 - Yes
 - No
 - ID #24952: Is permission necessary to conduct research at the non-IU site?
 - Yes. A letter, email, or other correspondence indicating agreement to conduct research at the external facility is attached on the Notes & Attachments tab.
 - Yes. The recruitment plan includes a process for obtaining permission from appropriate contacts before the research begins.
 - No. The site does not require researchers to seek permission.
 - ID #608: Is any research taking place outside the United States?
 - Yes
 - No
 - ID #24953: Select any source of information listed below that will be used for the research, either to identify potential subjects or gather research data.
 - Medical records or information from a health care provider
 - Student records
 - Subject-provided health information
 - None of the above
 - ID #24968: Is any member of the study team conducting the research on behalf of a covered entity or an IU covered component (HIPAA Affected Area)? See list of IU HIPAA Affected Areas for additional information.
 - Yes
 - No
 - ID #23299: Explain how research data will be protected so that only approved persons have access to subjects' identifiable data (i.e. confidentiality of data).

Tyler Nolting and Drs. David Lohrmann, Cecilia Obeng, Lesa Huber, and Tina Kruger are the only individuals who will have access to the interview audio recordings and interview transcripts, and these audio recordings and notes will be destroyed 3 years from the date of the study closure with the IRB.

In terms of data storage, every participant will be given a number and only that number will be associated with recordings and transcripts. A codebook (e.g. sheet of paper) with their names and corresponding participant number will be kept in a bank safe deposit box, separate from the recordings and transcripts, once number assignments have been made. Recordings and transcripts will be stored in a locked facility/room and in encrypted, password protected computer files. Participants' names will never be used in reports and publications (i.e. articles); for humanizing purposes, pseudonyms might be used (all names will be different from any names in the participant pool; 10 participants will have 10 completely different names).

- ID #627: Provide the anticipated end date of the research.

12/01/2016

Appendix M: Protocol Questionnaire Report

Exempt Research

Protocol Number: 1512036025 Submission Type: Amendment

Title: A Phenomenological Investigation of Appraisal and Help-Seeking Experiences of Midwestern Farm Operators with Prostate Cancer and Measurements of Traditional Masculinity Ideology: A Mixed-Methods Analysis Principal Investigator: ~~Lohmann~~, David K.

Report Printed: 03/31/2020

- ID #625: Describe the purpose of this study in lay terms.
 The purpose of this study is to describe the time to presentation for several farm operators with prostate cancer symptoms. Time to presentation is defined as the time elapsed from a farm operator first noticing prostatic changes to the first consultation with a healthcare provider for prostatic symptoms, which is a time period that includes the appraisal and help-seeking intervals. A farm operator is defined as an individual who run a farm and earns most of their income from this farm.

- ID #24927: List and describe all research interactions and/or interventions, including the frequency and duration of procedures, and length of participation for individual subjects.

Participate in one in-depth, semi-structured, face-to-face, and audio-recorded interview and complete one questionnaire (i.e., the Male Role Norms Inventory-Short Form [MRNI-SF]). The following is the outline for the interview:

Interview (30-120 minutes): focuses on the time period from the first evidence of prostate cancer changes/issues to the first medical appointment for these symptoms and on making meaning of the entire experience

The interview is expected to take place with participants attending and/or affiliated with any of the following facilities:

Clay City Center for Family Medicine-Clay City, Indiana;
Cork Medical Center-Marshall, Illinois;
St. Paul Evangelical Lutheran Church-Columbus, Indiana;
St. Peter's Lutheran Church-Columbus, Indiana; and
Mill St. Deli and Convenience, LLC-Elizabethtown, Indiana.

Note: Interviews may take place at the above locations or elsewhere, depending on the participants' preferences.

The MRNI-SF is a 21-item instrument using a seven-point Likert scale for each item (i.e., one = strongly disagree, two = disagree, three = slightly disagree, four = no opinion, five = slightly agree, six = agree, and seven = strongly agree), which measures overall traditional masculinity ideology and the following individual items: restrictive emotionality, self-reliance through mechanical skills, negativity toward sexual minorities, avoidance of femininity, the importance of sex, dominance, and toughness. The MRNI-SF will be administered in-person immediately before conducting the interview and should take about 10 minutes or less to complete.

*The interview question guide and MRNI-SF instrument is included in the Notes and Attachments tab. Additionally, a permission form to use the MRNI-SF as well as the author's official permission (i.e., an email) to use the instrument are attached.

- ID #626: List criteria used to determine that a subject, record, or specimen is eligible to be included in this study.
 The participants must be current or previous Midwestern farm operators, who currently have or previously had prostate cancer. For patients attending Clay City Center for Family Medicine or Cork Medical Center, eligibility information will be known via access to the electronic medical record for each of these clinics. The individual accessing the electronic medical records will be an employee of the Union Health System, who is the practice manager of Clay City Center for Family Medicine and Cork Medical Center. The practice manager will contact the information technology staff of the Union Health System, having them run the appropriate electronic medical record report. This report will identify all those men who meet the study criteria.

The participants attending/affiliated with St. Paul Evangelical Lutheran Church and St. Peter's Lutheran Church will self-identify themselves as eligible after reading a posted flyer and/or announcement from the church.

Exempt Research

The participants attending/affiliated with Mill St. Deli and Convenience, LLC will self-identify themselves as eligible after reading a posted flyer at the deli.

- ID #24919: Is this research funded by, or has a funding application been submitted to, a federal agency? This includes funding from CTSTI and federal pass-through funding.
 Yes
 No
- ID #24930: Select the categories that apply to this study:
 Research Studying Educational Practices
 Research Involving Data Collection WITH Subject Interaction
 Research Involving Data Collection WITHOUT Subject Interaction
 Research Studying Government-Funded Programs or Public Officials
 Research Involving Food Taste, Quality, and/or Consumer Acceptance
- ID #622: Will information be recorded in a way that human subjects can be identified, directly or through identifiers linked to the subjects?
 Yes
 No
 - ID #631: Could any disclosure of the subjects' responses outside the research reasonably place the subjects at risk of criminal or civil liability, be damaging to the subjects' financial standing, reputation, or ability to be employed or insured?
 Yes
 No
 - ID #24936: Select all age groups the researchers will survey, interview, or interact with (beyond public observation).
 Children ages 13 and younger. Do not complete any additional questions below. The research is not eligible for exemption.
 Adolescents ages 14 to 17
 Adults
- ID #24944: Describe how subjects will be recruited, including how they will be identified and contacted, and any written materials that will be used, such as advertisements. All materials that will be shared with subjects must be uploaded to the Notes & Attachments tab.
 An employee of the Union Health System, who is the practice manager of Clay City Center for Family Medicine and Cork Medical Center, will contact the information technology staff of the Union Health System and have them run the appropriate electronic medical record report of patients at Clay City Center for Family Medicine and Cork Medical Center (both entities that are part of the Union Health System). This report will generate a list of patients who meet the study criteria. This list will then be sent to another Union Health System staff member who works at the Richard G. Lugar Center for Rural Health (an entity that is also a part of Union Health System). This staff member will send (via mail) a recruitment letter, recruitment flyer, and study information sheet to each of the potential study subjects. The recruitment materials will instruct potential subjects to contact the study investigator, Tyler Nolting, to enroll.

The individuals attending/affiliated with St. Paul Evangelical Lutheran Church and St. Peter's Lutheran Church will be recruited via posted flyers at each church and an announcement in each of the churches' bulletins, newsletters, and email. Those viewing the flyer and/or announcement and interested in participating in the study will contact the study investigator, Tyler Nolting, who will then give each individual a recruitment letter and study information sheet. If interest in participation remains, the individual will contact the study investigator again to enroll.

The participants attending/affiliated with Mill St. Deli and Convenience, LLC will be recruited via posted flyers at the deli. Those interested in participating in the study will contact the study investigator, who will then give each individual a recruitment letter and study information sheet. If interest in participation remains, the individuals will contact the study investigator again to enroll.

Exempt Research

*The recruitment letters, flyer, study information sheet, and church announcements are attached in the Notes and Attachments tab.

- ID #24945: Describe how subjects will be given the following minimum information: (i) they are being asked to participate in research, (ii) what they will be asked to do, (iii) their participation is voluntary, (iv) the risks and benefits of participation, and (v) who to contact with any questions about the research.
 - A separate Study Information Sheet will be given to each potential subject to review
 - Study personnel will verbally discuss the research with potential subjects
 - This information will be included at the beginning of written materials, such as a survey, that will be completed by subjects
 - Other
- ID #24947: Select any of the following circumstances which apply to this research.
 - A member of the study team is a teacher or professor or instructor and his or her own students will participate as subjects in the research
 - A member of the study team is an employer or supervisor of individuals who will participate as subjects in the research
 - A member of the study team is a health care professional and his or her patients will participate as subjects in the research
 - None of the above
- ID #644: Will subjects be paid for participation in the study?
 - Yes
 - No
 - ID #23347: Describe the payment arrangement, including amount and timing of disbursement.
 - Each subject will receive a \$25.00 Visa gift card, which will be disbursed to each subject (in-person) at the end of the interview.
- ID #24995: Will the research be conducted at any non-IU site not already listed on the Organization panel of the Protocol tab?
 - Yes
 - No
 - ID #24952: Is permission necessary to conduct research at the non-IU site?
 - Yes. A letter, email, or other correspondence indicating agreement to conduct research at the external facility is attached on the Notes & Attachments tab.
 - Yes. The recruitment plan includes a process for obtaining permission from appropriate contacts before the research begins.
 - No. The site does not require researchers to seek permission.
 - ID #608: Is any research taking place outside the United States?
 - Yes
 - No
- ID #24953: Select any source of information listed below that will be used for the research, either to identify potential subjects or gather research data.
 - Medical records or information from a health care provider
 - Student records
 - Subject-provided health information
 - None of the above
 - ID #24968: Is any member of the study team conducting the research on behalf of a covered entity or an IU covered component (HIPAA Affected Area)? See list of IU HIPAA Affected Areas for additional information.
 - Yes
 - No
- ID #23299: Explain how research data will be protected so that only approved persons have access to subjects' identifiable data (i.e. confidentiality of data).
 - Tyler Nolting and Drs. David Lohrmann, Cecilia Obeng, Lesa Huber, Khalid Khan, and Tina Kruger are the only individuals who will have access to the interview audio recordings and interview transcripts, and these audio recordings and notes will be destroyed 3 years from the date of the study closure with the IRB.

Exempt Research

In terms of data storage, every participant will be given a number and only that number will be associated with recordings and transcripts. A codebook (e.g., sheet of paper) with their names and corresponding participant number will be kept in a bank safe deposit box, separate from the recordings and transcripts, once number assignments have been made. Recordings and transcripts will be stored in a locked facility/room and in encrypted, password protected computer files. Participants' names will never be used in reports and publications (i.e., articles); for humanizing purposes, pseudonyms might be used (all names will be different from any names in the participant pool; 10 participants will have 10 completely different names).

- ID #627: Provide the anticipated end date of the research.

05/30/2020

Appendix N: Amendment Approval



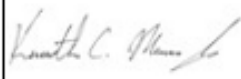
INDIANA UNIVERSITY
 OFFICE OF THE VICE PRESIDENT FOR RESEARCH
 Office of Research Compliance

NOTICE OF EXEMPTION GRANTED

DATE:	December 03, 2019
TO:	David Lohmann , Principal Investigator APPLIED HEALTH SCIENCE Tyler Nolting SCHOOL OF PUBLIC HEALTH-IUB
FROM:	Human Research Protection Program (HRPP) Office of Research Compliance – Indiana University
RE:	Protocol #: 1512036025A001 Protocol Type: Exempt Protocol Title: A Phenomenological Investigation of Appraisal and Help-Seeking Experiences of Midwestern Farm Operators with Prostate Cancer and Measurements of Traditional Masculinity Ideology: A Mixed-Methods Analysis Funding Source: None

In accordance with 45 CFR 46.101(b) and/or IU HRPP Policy, the above-referenced protocol is granted exemption. Exemption of this submission is based on your agreement to abide by the policies and procedures of the Indiana University Human Research Protection Program (HRPP) and does not replace any other approvals that may be required. Relevant HRPP policies and procedures governing Human Subject Research can be found at: <https://research.iu.edu/compliance/human-subjects/guidance/index.html>.

Submission and Review Information:

Type of Submission:	Amendment
Level of Review:	Exempt
Exempt Category(ies), if applicable:	Category 2: Research that only includes interactions involving educational tests, survey procedures, interview procedures or observation of public behavior.
Date of Exemption Granted:	December 03, 2019
Authorized HSO Signature:	 Casey Mumaw

Regulatory Determinations:

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Documents Approved with this Submission (for Amendments and Renewals, documents appearing in bold were either added or replaced with the submission):

Attachment Type - Document Version #
Data Collection Instrument - Interview guide
Data Collection Instrument - Male Role Norms Inventory - Short Form (MRNI-SF) with demographic questions
Other - Email permission to conduct study at St. Peter's Lutheran Church
Other - Email permission to conduct study at St. Paul Evangelical Lutheran Church
Other - Email permission to conduct research study at Mill St. Deli and Convenience, LLC
Other - Attached is an email correspondence indicating permission to conduct the study: "Time to Presentation: Midwestern Farmers with Prostate Cancer" at 3 non-IU sites.

[1512036025A001]

Page 1

Other - Permission form to request access to and use of the Male Role Norms Inventory-Short Form (MRNI-SF)
 Other - Email permission from author to access and use the Male Role Norms Inventory-Short Form (MRNI-SF)
 Other - Email permission to conduct study at Clay City Center for Family Medicine and Cork Medical Center
 Recruitment Materials - Recruitment letter for participants at St. Peter's Lutheran Church
 Recruitment Materials - Recruitment flyer for participants at all locations
 Recruitment Materials - Recruitment letter for participants at Mill St. Deli and Convenience, LLC
 Recruitment Materials - Church announcement for St. Paul Evangelical Lutheran Church and St. Peter's Lutheran Church
 Recruitment Materials - Recruitment letter for participants at Clay City Center for Family Medicine
 Recruitment Materials - Recruitment letter for participants at Cork Medical Center
 Recruitment Materials - Recruitment letter for participants at St. Paul Evangelical Lutheran Church
 Study Information Sheet - Study Information Sheet for all participants

NOTE: If you submitted and/or are required to provide subjects with an informed consent document, please ensure you are using the most recent version of the document to consent subjects.

The following key personnel are approved to participate in the above titled research activities:

Investigator Name	Role	Training
David LOOOUAAA	Principal Investigator	Yes
Tyler Nolting	Co-PI Student/Fellow/Resident	No

Organizations:

Organization
Indiana University

You should retain a copy of this letter and all associated approved study documents for your records. Please refer to the assigned study number and exact study title in future correspondence with our office. Additional information is available on our website at <https://research.iu.edu/compliance/human-subjects/guidance/index.html>.

If you have any questions or require further information, please contact the HSO via email at jrh@iu.edu or via phone at (317)274-8289.

Appendix O: Interview Question Guide

Appraisal Interval

1. Thinking back to before your prostate cancer diagnosis, as well as before your first appointment with a doctor/healthcare provider for prostate cancer symptoms, tell me about any bodily changes or issues that you ever noticed related to your prostate, such as urinary and/or sexual dysfunction, pain and/or stiffness in places such as your upper thighs, hips, and/or lower back, and/or blood in the urine and/or semen. How quickly did these changes or issues start, how severe were they, how would you label them, and how long did they last?
2. How long did it take you to acknowledge these changes or issues as abnormal and symptoms of prostate cancer and a reason to talk with a doctor/healthcare provider? Why did you see these symptoms as reasons to speak with a doctor/healthcare provider? Provide timelines and dates, if possible.
3. How did your symptoms impact your ability to perform daily activities and other duties?
4. After noticing any bodily changes, issues, or symptoms related to prostate cancer, did you perform any self-management practices, such as actively monitoring symptoms, self-medicating, changing your lifestyle, or seeking advice from any lay people? Also, how did friends, family members, and/or others assist you in the self-management process? Did self-management impact bodily changes, issues, or symptoms?
5. Is there anything that influenced your self-management of these bodily changes or issues related to your prostate and/or symptoms of prostate cancer? Some examples may be your own demographic characteristics (e.g., age, gender, education, employment, income, race/ethnicity, location of residence, marital status, etc.), previous life experiences, other illnesses you were also dealing with at the same time, and/or mental and emotional factors.
6. Additionally, did any other factors, such as accessibility to a doctor/healthcare provider, health policy, and/or disease location and development influence your self-management of prostatic changes, issues, and symptoms?
7. What do you think caused your prostate cancer?

Help-Seeking Interval

8. After acknowledging your symptoms as a reason to talk with a doctor/healthcare provider, how long did it take you to schedule an appointment with a doctor/healthcare provider for these symptoms?
9. How much time passed between the scheduling of your initial appointment and your actual attendance? Did any factors affect or impact your attendance to this initial appointment?
10. Were there any competing priorities, such as work duties, responsibilities related to caring for others, or issues concerning doctor/healthcare provider availability and/or accessibility that

impacted your decision to seek help from a doctor/healthcare provider for prostate cancer symptoms?

11. Is there anything that influenced these competing priorities, such as personal demographics (examples mentioned previously), having a lack of time to visit a doctor/healthcare provider, experiencing issues with traveling to a doctor/healthcare provider, being too tired or lethargic, or having issues with doctor/healthcare provider accessibility, affordability, availability, acceptability, accommodation, trust, or other issues related to health policy, and/or disease location and development?
12. What did you believe would be the physical results of seeking help (i.e., having a consultation with a doctor/healthcare provider) for prostate cancer symptoms? Examples of positive physical results for help-seeking could be decreased anxiety/doubt, alleviation of pain, resolution of symptoms, or better prognosis. Examples of negative physical results for help-seeking could be enhanced suffering and/or pain; being diagnosed with a serious and/or fatal disease; being scared of dying and/or leaving relatives behind; having undesirable or unpleasant treatment, examinations, and/or investigations; or being embarrassed, especially for a false alarm or symptoms located in sexual, private, and/or sensitive areas.
13. What did you believe would be the social impact and reaction of others (e.g., family, friends, doctor/healthcare provider, and others) towards you for seeking help for prostate cancer symptoms?
14. How did you believe your identity and “manhood” and masculinity would be impacted by seeking help for prostate cancer symptoms?
15. Given what you have said about your experience when you first noticed prostate cancer symptoms to your first appointment with a professional doctor/healthcare provider, how do you understand help-seeking and going to the doctor/healthcare provider now?
16. What sense does going to the doctor/healthcare provider make to you?
17. Can you describe how you handled/have handled the cancer experience?
18. Can you describe how you feel about going to the doctor/healthcare provider now?
19. Describe how these feelings compare to before you experienced prostate cancer symptoms?
20. Given what you shared with me during this interview, where do you see yourself in the future?
21. If you wish, please make any other comments or remarks about the items discussed in our interviews.

Curriculum Vitae
Tyler M. Nolting, Ph.D., MPH, MCHES®

CONTACT INFORMATION

Email tmnoltin@indiana.edu

ACADEMIC TRAINING

Doctor of Philosophy (Ph.D.)
Indiana University, Bloomington, Indiana
School of Public Health-Bloomington
Major: Health Behavior
Minor: Human Performance
Dissertation Title: *A Phenomenological Investigation of Time to Presentation, Diagnosis, and Treatment for Indiana Farmers with Prostate Cancer and Measurements of Traditional Masculinity Ideology*
Supervisors: David Lohrmann, Ph.D. and Cecilia Obeng, Ph.D.
August 2010-May 2020

Master of Public Health (MPH)
Indiana University, Bloomington, Indiana
School of Public Health-Bloomington
Specialization: Social and Behavioral Sciences
Concentration Track: *Public Health Leadership and Practice*
Supervisor: Zobeida Bonilla, Ph.D.
August 2008-May 2010

Bachelor of Science (B.S.)
Indiana University, Bloomington, Indiana
School of Public Health-Bloomington
Major: Kinesiology
Emphasis: Exercise Science
Minor: Spanish
Advisor: Ginger Lawrence
August 2004-May 2008

PROFESSIONAL APPOINTMENTS

August 2019-present
English Language Learner (ELL) Instructor
Bartholomew Consolidated School Corporation-
McDowell Adult Education Center
ELL Program
Columbus, Indiana
Supervisor: Megan Shaff

August 2015-August 2019	Non-Tenure Track Full-Time Instructor in Health Sciences Indiana State University Department of Applied Health Sciences Terre Haute, Indiana Supervisors: Linda Behrendt, Ph.D. (2019); Yasenka Peterson, PhD., CHES (2018-2019); Kathryn Berlin, Ph.D., CHES, CSPS (2016-2018); Eliezer Bermudez, Ph.D., CP-FS (2015-2016)
October 2014-June 2015	ELL / Integrated Basic Education and Skills Training (I-BEST) Lead Instructor/Coordinator Hawkeye Community College-Metro Center Departments of Industrial and Engineering Technology-Computer Numerical Control (CNC) Machining and Tool-Making Technology and Community Services Waterloo, Iowa Supervisors: Sandra Jensen and Ray Beets
May 2013-June 2014	ELL Instructor Bartholomew Consolidated School Corporation-McDowell Adult Education Center ELL Program Columbus, Indiana Supervisors: Andrea Quick
August 2010-December 2013	Associate Instructor Indiana University Department of Applied Health Science Bloomington, Indiana Supervisors: David Lohrmann, Ph.D. and Catherine Sherwood-Laughlin, HSD, MPH
August 2007-May 2010	Seminar Instructor and Peer Mentor Indiana University Division of Extended Programs-Freshman Interest Groups (FIGs) Bloomington, Indiana Supervisors: Eric Nichols, Ph.D. and Jacek Dalecki, Ph.D.
May 2008-April 2010	Research Associate Indiana University Department of Kinesiology Bloomington, Indiana Supervisors: Eric Holton, Ph.D. and John Shea, Ph.D.

August 2009-December 2009

Associate Instructor
Indiana University
Department of Kinesiology
Bloomington, Indiana
Supervisors: Meagan Shipley, Ph.D. and Carol
Kennedy-Armbruster, Ph.D.

CERTIFICATIONS, TRAINING, AND MEMBERSHIPS

April 2005-present (intermittent)

First Aid, CPR, and AED
American Red Cross
Certificate ID: GVWP64

April 2018-present

Master Certified Health Education Specialist
(MCHES®)
National Commission for Health Education
Credentialing, Inc.
Certification ID: 30301

July 2019-June 2020

Indiana Rural Health Association Member
Customer ID: 043750

April 2010-December 2017

Physical Activity in Public Health Specialist
(PAPHS)
American College of Sports Medicine (ACSM) and
the National Physical Activity Society
Certification Number 1015125
ACSM ID: 673932

February 2015

CNC Machining
Hawkeye Community College-Metro Center

January 2015

Comprehensive Adult Student Assessment
Systems (CASAS) eTests Online Proctor
Certification
Hawkeye Community College-Metro Center

ACADEMIC HONORS, AWARDS, AND MEDIA COVERAGE

July 2019

Class of 2018 First Destination Survey-Recognized
by name by one or more students as having
contributed to student success and career
development
Career Center
Indiana State University

September 2018

Experiential Learning and Community Engagement
Grant Recipient-*Promoting Haute Health Topics*

Center for Community Engagement
Indiana State University
Department of Applied Health Sciences

September 2018

Student Recognition in the Class of 2017 First
Destination Survey
Indiana State University
Career Center

September 2018

Guest Lecture for Dr. Whitney Boling's AHS 418
Program Evaluation course
Title of Lecture: *Overview of the CDC's Framework
for Program Evaluation*
Indiana State University
Department of Applied Health Sciences

September 2018

Student Recognition as a Professional Role Model-
Phoebe Mehany in English 305T written
assignment
Indiana State University

April 2017

Experiential Learning and Community Engagement
Grant Recipient-*ISU: Let's Talk About HPV*
Center for Community Engagement
Indiana State University
Department of Applied Health Sciences

January 2017

Experiential Learning and Community Engagement
Grant Recipient-*Eat Wise, Lose a Size*
Center for Community Engagement
Indiana State University
Department of Applied Health Sciences

January 2017

Experiential Learning and Community Engagement
Grant Recipient-*Eating Uncommon in the
Commons*
Center for Community Engagement
Indiana State University
Department of Applied Health Sciences

January 2017

Experiential Learning and Community Engagement
Grant Recipient-*Come and Hear What's Being
S.A.I.D. (Social Anxiety / Illness Disorder)*
Center for Community Engagement
Indiana State University
Department of Applied Health Sciences

January 2017	Experiential Learning and Community Engagement Grant Recipient- <i>Catching Some Z's</i> Center for Community Engagement Indiana State University Department of Applied Health Sciences
January 2017	Experiential Learning and Community Engagement Grant Recipient- <i>BLUE Moves</i> Center for Community Engagement Indiana State University Department of Applied Health Sciences
January 2017	Experiential Learning and Community Engagement Grant Recipient- <i>Young, Single, and Free to Choose</i> Center for Community Engagement Indiana State University Department of Applied Health Sciences
January 2017	Experiential Learning and Community Engagement Grant Recipient- <i>A Breath of Fresh Air</i> Center for Community Engagement Indiana State University Department of Applied Health Sciences
January 2017	Experiential Learning and Community Engagement Grant Recipient- <i>Pepper Spray the Safe Way</i> Center for Community Engagement Indiana State University Department of Applied Health Sciences
January 2017	Experiential Learning and Community Engagement Grant Recipient- <i>Get a Clue, Fight the Flu</i> Center for Community Engagement Indiana State University Department of Applied Health Sciences
January 2017	Experiential Learning and Community Engagement Grant Recipient- <i>ISUse Condom Sense</i> Center for Community Engagement Indiana State University Department of Applied Health Sciences
August 2016	Guest Speaker New Faculty Orientation Indiana State University

January 2016
Experiential Learning and Community Engagement
Grant Recipient-*Got Drugs? A Prescription Drug
Take-Back Program*
Center for Community Engagement
Indiana State University
Department of Applied Health Sciences

January 2016
Experiential Learning and Community Engagement
Grant Recipient-*Student Health Promotion
Office...What's That?*
Center for Community Engagement
Indiana State University
Department of Applied Health Sciences

January 2016
Experiential Learning and Community Engagement
Grant Recipient-*Love Your Bumps, Feel for Lumps*
Center for Community Engagement
Indiana State University
Department of Applied Health Sciences

January 2016
Experiential Learning and Community Engagement
Grant Recipient-*Less Stress, More Play: De-
Stressing with ISU Students*
Center for Community Engagement
Indiana State University
Department of Applied Health Sciences

January 2016
Experiential Learning and Community Engagement
Grant Recipient-*Let's talk About Sex Baby, Let's
Talk About HPV*
Center for Community Engagement
Indiana State University
Department of Applied Health Sciences

January 2016
Experiential Learning and Community Engagement
Grant Recipient-*Eating Healthy on a Budget*
Center for Community Engagement
Indiana State University
Department of Applied Health Sciences

January 2016
Experiential Learning and Community Engagement
Grant Recipient-*Save Lives, Don't Use Phones and
Drive*
Center for Community Engagement
Indiana State University
Department of Applied Health Sciences

January 2016	Experiential Learning and Community Engagement Grant Recipient- <i>Water You Waiting For?</i> Center for Community Engagement Indiana State University Department of Applied Health Sciences
January 2016	Experiential Learning and Community Engagement Grant Recipient- <i>How Much is Too Much?</i> <i>Promoting Safe Drinking on College Campuses</i> Center for Community Engagement Indiana State University Department of Applied Health Sciences
January 2016	Experiential Learning and Community Engagement Grant Recipient- <i>Let's P.A.S.S. on Sexual Assault:</i> <i>Prevention, Action, Speaking Up, and Seeking Help</i> Center for Community Engagement Indiana State University Department of Applied Health Sciences
January 2016	Experiential Learning and Community Engagement Grant Recipient- <i>A Happy Heart Is a Healthy Heart</i> Center for Community Engagement Indiana State University Department of Applied Health Sciences
September 2015	Experiential Learning and Community Engagement Grant Recipient- <i>Preparing for Health Assessments</i> <i>in the "Real World": Health Sciences Students at</i> <i>the ISU Wellness Bash</i> Center for Community Engagement Indiana State University Department of Applied Health Sciences
July 2015	Media: <i>Hawkeye Community College Teaches</i> <i>Machining, English to Immigrants</i> Waterloo-Cedar Falls Courier, Waterloo, Iowa https://www.hawkeyecollege.edu/articles/in-the-news/hawkeye-teaches-machining-english-to-immigrants.aspx
Summer 2015	Media: <i>Contextual Learning: New Hawkeye</i> <i>Program Teaching English, Machining Skills</i> CareerFocus: Hawkeye Community College Waterloo, Iowa http://hawkeyecollege.mycareerfocus.org/contextual-learning-new-hawkeye-program-teaches-english-machining-skills/

Summer 2015

Media: *CNC Training Helps Refugee Find New Career Path*

CareerFocus: Hawkeye Community College
Waterloo, Iowa

<http://hawkeyecollege.mycareerfocus.org/cnc-training-helps-refugee-find-new-career-path/>

Summer 2015

Media: *Student Success Story: Walfer Cifuentes*

CareerFocus: Hawkeye Community College
Waterloo, Iowa

<http://hawkeyecollege.mycareerfocus.org/student-success-story-walfer-cifuentes/>

June 2015

Media: *Not Your Grandfather's Factory*

CareerFocus: Hawkeye Community College
Waterloo, Iowa

<http://hawkeyecollege.mycareerfocus.org/not-your-grandfathers-factory/>

June 2015

Media: *A Different to Look at Adult Education*

Waterloo-Cedar Falls Courier, Waterloo, Iowa

<http://www.kwwl.com/story/29297601/2015/06/11/a-different-way-to-look-at-adult-education>

April 2015

Endeavor Award: For making outstanding contributions to the common good of Hawkeye Community College and Black Hawk County
The Endeavor Recognition Project
Hawkeye Community College-Metro Center,
CNC/I-BEST Pilot Class, Waterloo, Iowa
Departments of Industrial and Engineering
Technology-CNC Machining and Tool-Making
Technology and Community Services
CNC Machining and Tool-Making Technology, I-BEST grant, and African Americans in
Manufacturing Grant

http://wfcourier.com/news/local/education/endeavor-awards-handed-out/article_7154d64c-3e7e-5ccc-aa7a-e9c44369053e.html

April 2015

Media: *Program at Waterloo college brings more minorities into manufacturing*

Waterloo-Cedar Falls Courier, Waterloo, Iowa

http://wfcourier.com/news/local/program-at-waterloo-college-brings-more-minorities-into-manufacturing/article_198bdda5-07c3-5fef-b745-d48d302a67fb.html

February 2015	President's Award for Diversity and Inclusion Hawkeye Community College-Metro Center, Waterloo, Iowa Departments of Industrial and Engineering Technology-CNC Machining and Tool-Making Technology and Community Services CNC Machining and Tool-Making Technology and African Americans in Manufacturing Grant
August 2010-December 2013	Graduate Assistantship Indiana University, Bloomington, Indiana School of Public Health-Bloomington Department of Applied Health Science
August 2004-May 2011	Dr. Rev. Ernest D. Butler Humanitarian Award Indiana University, Bloomington, Indiana Indiana University Foundation
August 2010	Keynote Speaker Indiana University, Bloomington, Indiana Indiana University Foundation Scholarship Reception Banquet
August 2007-May 2010	Assistantship Indiana University, Bloomington, Indiana Office of the Vice Provost for Undergraduate Education Division of Extended Programs-FIGs
August 2009-December 2009	Graduate Assistantship Indiana University, Bloomington, Indiana School of Public Health-Bloomington Department of Kinesiology
August 2004-May 2007	Dr. William Keller Scholarship Indiana University, Bloomington, Indiana Heritage Fund-the Community Foundation of Bartholomew County, Columbus, Indiana
October 2005	BRAVO Award for Community Service and Volunteerism Bloomington Parks and Recreation Department, Bloomington, Indiana Banneker Community Center

GRADUATE TEACHING EXPERIENCE

August 2015-May 2017

Indiana State University
Department of Applied Health Sciences
Terre Haute, Indiana

- Advanced Program Evaluation in Health Professions (Fall 2015, 2016)
- Advanced Health Program Planning and Coordination (Spring 2016, 2017)

UNDERGRADUATE TEACHING EXPERIENCE

August 2015-August 2019

Indiana State University
Department of Applied Health Sciences
Terre Haute, Indiana

- Health Sciences Research Methods (Fall 2015, 2016, 2017; Spring 2016, 2017, 2018)
- Health Promotion Planning (Fall 2015, 2016, 2017)
- Health Program Evaluation (Spring 2016, 2017, 2018)
- Personal Health Science and Wellness (Summer 2016, 2017, 2018, 2019)
- Undergraduate Health Sciences Internship (Summer 2016)
- Health Screening Lecture and Laboratory (Spring 2017, 2018, 2019; Fall 2017, 2018)
- Public Health Concepts (Fall 2017, 2018)
- Society and Aging (Fall 2017)
- Educational Methods (Fall 2018)
- Mental Health and Stress Education (Fall 2018; Spring 2019)

August 2010-December 2013

Indiana University
Department of Applied Health Science
Bloomington, Indiana

- Men's Health (Fall 2012, Spring 2013, Fall 2013)
- Stress Prevention and Management (Fall 2010, Spring 2011, Summer 2012)
- Personal Health (Fall 2011, Spring 2012)

August 2007-May 2010

Indiana University
Office of the Vice Provost for Undergraduate
Education
Division of Extended Programs-FIGs
Bloomington, Indiana

- Sports Medicine (Fall 2007, Fall 2008, Fall 2009)

August 2009-December 2009

Indiana University
Department of Kinesiology
Bloomington, Indiana

- Foundations of Fitness and Wellness (Fall 2009)

COMMUNITY COLLEGE, ELL AND ADULT BASIC EDUCATION (ABE) TEACHING EXPERIENCE

August 2019-present

Bartholomew Consolidated School Corporation-
McDowell Adult Education Center
ELL Program
Columbus, Indiana

- ELL courses for intermediate- and advanced-level ELLs (Fall 2019, Spring 2020)

October 2014-June 2015

Hawkeye Community College-Metro Center
Departments of Industrial and Engineering
Technology-CNC Machining and Tool-Making
Technology and Community Services
Waterloo, Iowa

- CNC Machining and Tool-Making Technology and I-BEST Program for ELLs and ABE students (Fall 2014, Spring/Summer 2015)
- Burlington English (hybrid class) for adult ELLs (Spring 2015)

May 2013-June 2014

Bartholomew Consolidated School Corporation-
McDowell Adult Education Center
ELL Program
Columbus, Indiana

- ELL courses for beginning literacy, low-beginning, and high-beginning ELLs (Spring/Summer 2013, Fall 2013, Spring/Summer 2014)

PUBLICATIONS

Berlin, K., Blondeau, W., Doss, D., & **Nolting, T.** (2018). Easy as PIE: A recipe for approaching the Areas of Responsibility and Competencies for health education specialists. *Pedagogy in Health Promotion: The Scholarship of Teaching and Learning*. Advance online publication. <https://doi.org/10.1177%2F2373379918783007>

RESEARCH IN PROGRESS

Nolting, T., Lohrmann, D., Obeng, C., Huber, L., Khan, K., & Kruger, T. A phenomenological investigation of time to presentation, diagnosis, and treatment for Indiana farmers with prostate cancer and measurements of traditional masculinity ideology.

PEER-REVIEWED POSTER PRESENTATIONS

Nolting, T. (2013, June). *A life history of Jack P. Young: How one person can change a community*. Poster presented at Cedarville University's annual Ethnographic and Qualitative Research Conference, Cedarville, OH.

Nolting, T. (2010, April). *MPH culminating experience*. Poster presented at the exposium of Indiana University's School of Public Health, Bloomington, IN.

Nolting, T. (2010, April). *St. Paul shorty's sports and nutrition program for children ages 3-8 years-old*. Poster presented at the conference of the Indiana Public Health Association as part of National Public Health Week. Indianapolis, IN.

Nolting, T. (2010, April). *CSX transportation health and wellness: Now is the time for the waist management campaign*. Poster presented at the conference of the Indiana Public Health Association as part of National Public Health Week. Indianapolis, IN.

OTHER POSTER PRESENTATIONS

Ali, A., Blue, O., Brown, E., Carter, A., Gill, S., Goines, J., . . . Berlin, K. (2017, April). *Eat wise, lose a size*. Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Cardinal, K., Keinsley, B., Logan, A., Powers, C., Vanwey, K., Crissman, E., . . . Doss, D. (2017, April). *Eating uncommon in the Commons*. Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Chatman, P., Grubbs, J., Herring, B., Sibley, B., Slaughter, C., Weymouth, R., . . . Berlin, K. (2017, April). *Come and hear what's being S.A.I.D (social anxiety illness disorder)*. Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Crumrin, K., Frey, V., Kistler, M., Leavell, M., Mitchell, J., Schmalzried, E., . . . Berlin, K. (2017, April). *Catching some Z's*. Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Heath, N., Shipley, R., Pattyn, C., Black, B., Hefner, T., Pyatt, S., . . . Doss, D. (2017, April). *BLUE Moves*. Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Jones, K., Washington, B., Taylor, R., Tyler, B., Stewart, L., Brown, Z., . . . Doss, D. (2017, April). *Young, single, and free to choose*. Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

McDonald, V., Sharp, W., Miller, J., Leineweber, D., Squarrel, M., Umeh, O., . . . Berlin, K. (2017, April). *A breath of fresh air*. Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Riess, K., Robinson, G., Griggs, L., Craft, L., Hannon, V., Corbin, D., . . . Berlin, K. (2017, April). *Pepper spray the safe way*. Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Smith, A., Miller, C., Morrison, E., Mackey, R., Johnson, K., Madden, C., . . . Doss, D. (2017, April). *Get a clue, fight the flu*. Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Sowers, A., Hendricks, M., Manley, C., Chen, J., Beckford, S., Long, K., . . . Doss, D. (2017, April). *ISUse condom sense*. Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

POSTER PRESENTATION ACKNOWLEDGEMENTS

Admire, C., Brown, K., Hesler, B., Wahlfeldt, A., Warner, T., & Berlin, K. (2016, March). *Got drugs? A prescription drug take-back program*. Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Allsup, J., Cox, W., Douglas, D., Muhammad, K., Obasih, C., Oetken, M., . . . Berlin, K. (2016, March). *Student health promotion office...What's that?* Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Axsom, J., Kolzow, K., Olson, A., Partain, D., Price, J., Williams, B., & Berlin, K. (2016, March). *Love your bumps, feel for lumps.* Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Bazzano, T., Calvin, E., Jackson, S., Snyder, M., & Berlin, K. (2016, March). *Less stress, more play: De-stressing with ISU students.* Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Briley, S., Richman, J., Robinson, J., Crowell, L., Kimbrough, T., & Berlin, K. (2016, March). *Let's talk about sex baby, let's talk about HPV.* Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Cripps, C., Mosley, J., Baker, C., Wiscaver, T., Kearschner, S., & Berlin, K. (2016, March). *Eating healthy on a budget.* Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Harvey, M., Hollingshed, R., Sells, A., & Berlin, K. (2016, March). *Save lives, don't use phones and drive.* Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Mason, B., Michl, J., Overstreet, J., Porter, N., Wallace, M., & Berlin, K. (2016, March). *Water you waiting for?* Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Northern, E., Zollman, A., Rushalk, M., Assr, M., Dietel, D., & Berlin, K. (2016, March). *How much is too much? Promoting safe drinking on college campuses.* Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Sykes, A., Oshun, K., Abram, T., Cooper, C., Lovelace, M., Reed, B., & Berlin, K. (2016, March). *Let's P.A.S.S. on Sexual Assault: Prevention, action, speaking up, and seeking help.* Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

Williams, I., Walson, C., Farley, V., Canas, A., McDaniel, D., Uselman, K., & Berlin, K. (2016, March). *A happy heart is a healthy heart.* Poster presented at the annual exposium of the Indiana State University Center for Student Research & Creativity, Terre Haute, IN.

GRANTS FUNDED

Date	Support	Title & Role	Source	Award
September 2018	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>Promoting Haute Health Topics</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$2,488.00
April 2017	Teaching/Service/Scholarship: Experiential Learning and	<i>ISU: Let's Talk About HPV</i>	Indiana State University, Center for	\$300.00

	Community Engagement Mini-Grant		Community Engagement, Department of Applied Health Sciences	
January 2017	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>Eat Wise, Lose a Size</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$500.00
January 2017	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>Eating Uncommon in the Commons</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$475.00
January 2017	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>Come and Hear What's Being S.A.I.D. (Social Anxiety / Illness Disorder)</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$453.45
January 2017	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>Catching Some Z's</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$699.53
January 2017	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>BLUE Moves</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$415.00
January 2017	Teaching/Service/Scholarship: Experiential Learning and	<i>Young, Single, and Free to Choose</i>	Indiana State University,	\$400.00

	Community Engagement Mini-Grant		Center for Community Engagement, Department of Applied Health Sciences	
January 2017	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>A Breath of Fresh Air</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$409.00
January 2017	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>Pepper Spray the Safe Way</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$702.00
January 2017	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>Get a Clue, Fight the Flu</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$378.00
January 2017	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>ISUse Condom Sense</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$440.00
January 2016	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>Got Drugs? A Prescription Drug Take-Back Program</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$442.50

January 2016	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>Student Health Promotion Office...What's That?</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$487.98
January 2016	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>Love Your Bumps, Feel for Lumps</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$490.63
January 2016	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>Less Stress, More Play: De-Stressing with ISU Students</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$343.50
January 2016	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>Let's talk About Sex Baby, Let's Talk About HPV</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$504.50
January 2016	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>Eating Healthy on a Budget</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$459.00
January 2016	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>Save Lives, Don't Use Phones and Drive</i>	Indiana State University, Center for Community Engagement, Department of	\$500.00

			Applied Health Sciences	
January 2016	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>Water You Waiting For?</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$500.00
January 2016	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>How Much is Too Much? Promoting Safe Drinking on College Campuses</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$317.06
January 2016	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>Let's P.A.S.S. on Sexual Assault: Prevention, Action, Speaking Up, and Seeking Help</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$500.00
January 2016	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>A Happy Heart Is a Healthy Heart</i>	Indiana State University, Center for Community Engagement, Department of Applied Health Sciences	\$488.00
September 2015	Teaching/Service/Scholarship: Experiential Learning and Community Engagement Mini-Grant	<i>Preparing for Health Assessments in the "Real World": Health Sciences Students at the ISU Wellness Bash</i>	Indiana State University, Center for Community Engagement	\$1,387.00
				Total = \$14,080.15

PROFESSIONAL/LEADERSHIP DEVELOPMENT, SERVICE ACTIVITIES, AND STUDENT MENTORSHIP

September 2018-August 2019	Diversity Faculty Advisory Committee Office of Equity, Diversity, and Inclusion Indiana State University
September 2018-August 2019	Employee Wellness Committee Member Office of Human Resources Indiana State University
August 2019	<i>Healthy Heart Screenings at Melon Acres for Migrant Farm Workers</i> Indiana State University Departments of Applied Health Sciences; Applied Medicine and Rehabilitation; Languages, Literatures, and Linguistics
June 2019	Indiana Rural Health Association Annual Conference French Lick, Indiana
June 2019	Guest Presenter (in Spanish)- <i>Project Stepping Stone Students</i> Indiana State University College of Health and Human Services
January 2019-May 2019	AHS 391 Honors Conversion Project-Hayley Thompson Indiana State University Department of Applied Health Sciences
May 2019	<i>AHS 409-Healthy Heart Screenings at ISU</i> Indiana State University Department of Applied Health Sciences
March 2019-April 2019	IU Mini Med School- <i>Healthy Heart Screenings by AHS 409 Students</i> Indiana University School of Medicine, Richard G. Lugar Center for Rural Health, Landsbaum Center for Health Education
February 2019, April 2019	<i>AHS 409-Healthy Heart Screenings for AHS 111 Students</i> Indiana State University Department of Applied Health Sciences
April 2019	29 th Annual Art & Science of Health Promotion Conference

	Hilton Head Island, South Carolina
February 2019	Employee Wellness Event- <i>Blood Pressure Screenings by AHS 409 Students</i> Office of Human Resources Indiana State University
August 2018-December 2018	Search Committee Member for Chairperson of Department of Applied Health Sciences Indiana State University Department of Applied Health Sciences
August 2018-December 2018	AHS 391 Honors Conversion Project-Brielle Batch <i>Promoting Haute Health Topics</i> Indiana State University Department of Applied Health Sciences
December 2018	AHS 409- <i>Healthy Heart Screenings at ISU</i> Indiana State University Department of Applied Health Sciences
September 2018-November 2018	College of Health and Human Services Advisor Trainings Indiana State University
September 2018, November 2018	AHS 409- <i>Health Screenings for AHS 111 Students</i> Indiana State University Department of Applied Health Sciences
November 2018	AHS 391: Campus Research Poster Session <i>Promoting Haute Health Topics</i> Indiana State University Department of Applied Health Sciences
October 2018	AHS 391: Terre Haute Community Health Fair <i>Promoting Haute Health Topics</i> Indiana State University Department of Applied Health Sciences
September 2018	Hispanic Heritage Month Event- <i>Food Fiesta Series-Chile</i> Indiana State University La Casita Student Resource Center
September 2018	Hispanic Heritage Month Event- <i>Food Fiesta Series-Perú</i> Indiana State University La Casita Student Resource Center

October 2016-August 2018	Master's Thesis Committee Member-Jeni Bernethy Indiana State University Department of Applied Health Sciences
January 2017-August 2018	Master's Thesis Committee Member-Johnny Hill Indiana State University Department of Applied Health Sciences
July 2017-August 2018	Master's Thesis Committee Member-Alyssa Gleason Indiana State University Department of Applied Health Sciences
January 2017-May 2018	Master's Thesis Committee Member-Ryan Toth Indiana State University Department of Applied Health Sciences
January 2018-May 2018	AHS 409 Honors Conversion Project-Audra Critcheloe <i>Healthy Heart Screenings at ISU</i> Indiana State University Department of Applied Health Sciences
January 2018-May 2018	AHS 409 Honors Conversion Project-Sarah Parker <i>Healthy Heart Screenings at ISU</i> Indiana State University Department of Applied Health Sciences
May 2018	AHS 409-001- <i>Healthy Heart Screenings at ISU</i> Indiana State University Department of Applied Health Sciences
May 2018	AHS 409-002- <i>Healthy Heart Screenings at ISU</i> Indiana State University Department of Applied Health Sciences
December 2015, 2016, 2017	Winter Commencement Ceremony Indiana State University Department of Applied Health Sciences
September 2017-December 2017	AHS 220 Honors Conversion Poster Presentation-Morgan James <i>Mental Health Among Breast Cancer Survivors</i> Indiana State University Department of Applied Health Sciences

September 2017-October 2017	AHS 414 Honors Conversion Poster Presentation- Audra Critcheloe <i>CVD and Vision Health</i> Indiana State University Department of Applied Health Sciences
October 2017	AHS 409 <i>Healthy Heart Screenings</i> -Terre Haute Community Health Fair Indiana State University Department of Applied Health Sciences
May 2016, 2017	Award Presenter Outstanding Senior Student Award for the Health Sciences Degree Program College of Health and Human Services Department of Applied Health Sciences
January 2017-May 2017	AHS 418 Honors Conversion Presentation- Autumn Sowers <i>ISUse Condom Sense Final Program Evaluation Report</i> Indiana State University Department of Applied Health Sciences
January 2017-May 2017	AHS 341 Honors Conversion Poster Presentation- Rebecca Howe <i>Eating Disorders and Mental Health</i> Indiana State University Department of Applied Health Sciences
January 2017-May 2017	AHS 341 Honors Conversion Poster Presentation- Sarah Parker <i>Concussions and Chronic Traumatic Encephalopathy</i> Indiana State University Department of Applied Health Sciences
January 2017-May 2017	AHS 341 Honors Conversion Poster Presentation- Audra Critcheloe <i>Chronic Obstructive Pulmonary Disease</i> Indiana State University Department of Applied Health Sciences
January 2017-May 2017	AHS 341 Honors Conversion Poster Presentation- Katherine Forness <i>Breast Cancer</i> Indiana State University Department of Applied Health Sciences

January 2017, May 2017	AHS 409 <i>Healthy Heart Screenings</i> for AHS 111 Students Indiana State University Department of Applied Health Sciences
February 2017	Student Success Conference- <i>Because We Care: Helping Students Succeed Academically, Personally, and Professionally</i> Indiana State University Department of Applied Health Sciences
January 2017	Workshop Guest Speaker- <i>Meet a Prof</i> Indiana State University Department of Applied Health Sciences
November 2016	Co-Presentation with Dr. Darleesa Doss to undergraduate courses in the Department of Applied Medicine and Rehabilitation Indiana State University
September 2016	Workshop Presenter- <i>Health Occupation Student Association/Indiana State University Day</i> Indiana State University Department of Applied Health Sciences
June 2016-July 2016	Search Committee for Non-Tenure Track Full-Time Lecturer in Health Sciences Indiana State University Department of Applied Health Sciences
August 2015-May 2016	New Faculty Orientation Office of the Provost and Vice President for Academic Affairs Indiana State University
March 2016	The Scholarship of Engagement – Documenting for Tenure, Promotion, and Biennial Faculty Reviews Indiana State University Office of the Provost and Vice President for Academic Affairs
March 2016	Women’s History Month Colloquium Indiana State University Center for Community Engagement, Gender Studies in the Department of Multidisciplinary

	Studies, and the Department of History and African and African American Studies
February 2016	One Better World with Vernon Wall Indiana State University Office of the Provost and Vice President for Academic Affairs
February 2016	Creating a Classroom and University Culture Committed to Social Justice and Equity Indiana State University Office of the Provost and Vice President for Academic Affairs
September 2015-December 2015	AHS 341 Honors Poster Presentation-Autumn Sowers <i>Childhood Health</i> Indiana State University Department of Applied Health Sciences
September 2015-October 2015	AHS 414 Honors Poster Presentation-Nicole Porter <i>Overweight and Obesity</i> Indiana State University-Wellness Bash Department of Applied Health Sciences
September 2015-October 2015	AHS 414 Honors Poster Presentation-Jackie Michl <i>Cardiovascular Disease</i> Indiana State University Department of Applied Health Sciences
October 2015	AHS 414 <i>Healthy Heart Screenings</i> -Wellness Bash Indiana State University Department of Applied Health Sciences
October 2015	Teaching Tour with Dr. Kathryn Berlin Indiana State University Faculty Center for Teaching Excellence
January 2015	Martin Luther King Jr. Banquet Martin Luther King Jr. Center and the African American Heritage League Hawkeye Community College
December 2014	Webinar: "Institutional Self-Assessment to Improve Outcomes for Men of Color: Using the Community College Student Success Inventory"

	San Diego State University, San Diego, California Minority Male Community College Collaborative (M2C3)
November 2014	Webinar: Burlington English Instructor Training Burlington English, Inc. Margo Hernandez Rainwater, Customer Manager
November 2014	Iowa Culture and Language Conference, Coralville, Iowa Hawkeye Community College-Metro Center, Waterloo, Iowa
October 2014	Catalytic Coaching Seminar-Energage, Inc. Hawkeye Community College-Metro Center, Waterloo, Iowa
August 2007-December 2013	Associate Instructor Training and Workshops: Office of the Vice President for Diversity, Equity, and Multicultural Affairs; Office of the Vice Provost for Undergraduate Education; Center for Innovative Teaching and Learning Indiana University, Bloomington, Indiana
November 2013	ELL Institute, Indianapolis, IN “ELL Instruction in the 21st Century: Balancing Acceleration and Differentiation” Bartholomew Consolidated School Corporation- McDowell Adult Education Center, Columbus, Indiana
June 2013	General Education Diploma and Adult Basic Education Technology Workshop, Indianapolis, IN Bartholomew Consolidated School Corporation- McDowell Adult Education Center, Columbus, Indiana
September 2008-September 2009	President-Master of Public Health Association (MPHA) Indiana University, Bloomington, Indiana
September 2006-October 2006	Erich Weidenbener, MD, Primary-Care Sports Medicine Physician Bloomington Bone and Joint Clinic Work Observation Bloomington, Indiana

August 2000, 2006
K. Donald Shelbourne, MD, Orthopedic Surgeon
Shelbourne Knee Center
Work Observation
Indianapolis, Indiana

August 2006
Mark DeCarlo, DPT, Vice President of Clinical
Operations
Methodist Sports Medicine Center
Work Observation
Carmel, Indiana

August 2006
Thomas Klootwyk, MD, Orthopedic Surgeon
Methodist Sports Medicine Center
Work Observation
Indianapolis, Indiana

August 2006
Todd Arnold, MD, Primary-Care Sports Medicine
Physician
Methodist Sports Medicine Center
Work Observation
Indianapolis, Indiana

August 2004-May 2005
Vice Chairman-Judicial Board, Eigenmann Hall
Indiana University, Bloomington, Indiana

COMMUNITY SERVICE ACTIVITIES

October 2017, 2018
Terre Haute Community Health Fair
Promoting Haute Health Topics
Indiana State University
Department of Applied Health Sciences

August 2014-June 2015
Student Transportation Volunteer
College Hill Lutheran Church and Brammer
Student Center
Cedar Falls, Iowa

August 2014-December 2014
ELL Volunteer Instructor
College Hill Lutheran Church and Brammer
Student Center
Cedar Falls, Iowa

August 2004-November 2012
Youth Sports Volunteer Coach
Bloomington Parks and Recreation-Banneker
Community Center
Bloomington, Indiana

January 2009-August 2011

Volunteer Program Director
St. Paul Shorties Sports and Nutrition Program-
St. Paul Evangelical Lutheran Church, Columbus,
Indiana
Indiana University IRB-approved Research
Project, Bloomington, Indiana

December 2005-April 2006

Volunteer Team Captain
Relay for Life-American Cancer Society
Bloomington, Indiana

March 2001-August 2005

Volunteer Clinic Assistant and Translator
Volunteers in Medicine-Spanish Speaking Clinic
Columbus, Indiana

June 2005-August 2005

Youth Sports Volunteer Coach
Buddy Ball Baseball Program-Bloomington Parks
and Recreation
Bloomington, Indiana

August 2001-August 2004

ELL Volunteer Instructor and Translator
St. Paul Evangelical Lutheran Church
Columbus, Indiana

PROFESSIONAL AFFILIATIONS

April 2018-present

National Commission for Health Education
Credentialing, Inc.

April 2010-December 2017

American College of Sports Medicine and the
National Physical Activity Society

October 2014-October 2015

Registered Member-Commission On Adult Basic
Education (COABE)

September 2008-May 2010

MPHA, Indiana University

September 2008-May 2010

Graduate and Professional Student Organization
(GPSO)
Indiana University

April 2005-present

American Red Cross

LANGUAGES

August 2000-present

Fluent in Spanish

COURSE DESCRIPTIONS AND TEACHING EVALUATIONS

Graduate Courses	<i>Indiana State University</i> Number of Sections Taught	Average Enrollment
AHS 628: Advanced Program Evaluation in Health Professions	2	17
AHS 619: Advanced Health Program Planning and Coordination	2	14
Total	4	62 students

Non-Tenure-Track Full-Time Instructor in Health Sciences: AHS 628: Advanced Program Evaluation in Health Professions (online course)

Indiana State University, College of Health and Human Services
Fall 2015, 2016

Description: This course covers advanced techniques in the design, implementation, and analysis of health programs, including the selection and analysis of appropriate instrumentation.

What did you like most about the course and/or instructor?

- *"This was a great class to be taking while I am preparing for my Master's Project."*
- *"I felt Mr. Nolting was a very fair and kind instructor. I never felt uncomfortable asking questions."*
- *"Mr. Nolting is very engaged with the class – much more so than previous professors. This is nice as it shows he is well involved in our success in the course."*
- *"I liked the course, mostly because I felt the professor was actively engaged in it."*
- *"At the beginning of the semester I thought I would hate this class but Dr. Nolting chose good materials that explained the information well and was not boring so that was good. It made the class a lot more interesting than it has any right to be."*

Highest rated items for the course or instructor are:

- My instructor provided timely feedback on coursework.
- *My instructor treated students with respect.*
- *My instructor provided clear expectations of students.*
- *My instructor interacted positively with students.*
- *I believe I can approach my instructor for help.*
- *My instructor was prepared for the class.*
- *My instructor encouraged students to be engaged in the course.*
- *My instructor demonstrated enthusiasm for the course.*

Non-Tenure-Track Full-Time Instructor in Health Sciences: AHS 619: Advanced Health Program Planning and Coordination (online course)

Indiana State University, College of Health and Human Services
Spring 2016, 2017

Description: Advanced techniques in establishing community needs, setting objectives and goals, developing internal and external support, designing and implementing appropriate programs, setting outcomes, and evaluating health promotion programs.

What did you like most about the course and/or instructor?

- *“The course is well-organized.”*
- *“I liked that we had to apply what we were learning to real life in interviewing a stakeholder. Interviewing people is not something that I enjoy, but I recognize that it is something that I need to do. Practicing this through this course was beneficial.”*
- *“I did learn how to put together a program and the planning steps involved.”*
- *“The assignments helped prepare me for the final paper.”*
- *“Whenever I emailed the professor for questions, he provided clarification promptly.”*
- *“The process of assignments through the course was helpful to lead us to the end project. I think this will help me with developing programs and interventions in the future.”*
- *“I really liked that there was a weekly module. This made it nice to be able to lay out times for coursework and not become overwhelmed with what was open.”*
- *“I really liked this course and Mr. Nolting was great and helpful.”*
- *“Reminders were given often. He helped as much as he could and everything was clearly laid out from beginning to end. Reading material was on point. And I liked that every week we had something that helped us to move on in our program that we created so that we didn't feel like it was an overwhelming amount of things to do.”*
- *“Very helpful course and I learned a lot. Mr. Nolting is a great professor. Everything that we did pertained to what we were learning and I didn't feel like it was busy work. He also provided good feedback in a timely manner.”*
- *“I have learned how to truly do research, learned method options that fit my style and comfort level.”*

Highest rated items for the course or instructor are:

- *My instructor provided timely feedback on coursework.*
- *My instructor treated students with respect.*
- *My instructor provided clear expectations of students.*
- *My instructor interacted positively with students.*
- *I believe I can approach my instructor for help.*
- *My instructor was prepared for the class.*
- *My instructor encouraged students to be engaged in the course.*
- *My instructor demonstrated enthusiasm for the course.*

Undergraduate Courses	Number of Sections Taught	Average Enrollment
AHS 341: Health Sciences Research Methods	8	25
AHS 414: Health Promotion Planning	6	26
AHS 491: Health Sciences Internship	1	18
AHS 111: Personal Health Science and Wellness	6	22
AHS 418: Health Program Evaluation	5	31
AHS 220: Public Health Concepts	2	35
AHS 305: Society and Aging	1	35

AHS 409: Health Screening Lecture	8	35
AHS 409: Health Screening Laboratory	10	16
AHS 391: Educational Methods	2	25
AHS 410: Mental Health and Stress Education	2	35
Total	51	1,326 students

Non-Tenure-Track Full-Time Instructor in Health Sciences: AHS 341: Health Sciences Research Methods (face-to-face, hybrid, and online courses)

Indiana State University, College of Health and Human Services

Fall 2015, 2016, 2017; Spring 2016, 2017, 2018

Description: An introduction to the scientific method and those research methods most applicable to Health Sciences. Includes interpreting and communicating scientific research as well as developing a sound research design and executing the steps of the scientific method, which include: identifying the problem, researching the area, identifying a hypothesis and/or research questions, designing an appropriate research design, collecting and analyzing data, and formulating your findings and conclusions.

What did you like most about the course and/or instructor?

- *"The best things about this course were that he engaged with the students and asked for feedback about things that can change."*
- *"Doing the paper in sections throughout the semester was a big help in understanding each section as a whole."*
- *"His teaching style and how much passion he has for teaching. Also really cares about his students."*
- *"Very hard course but great teacher."*
- *"The teacher is the best thing for this class. He goes out of his way to make sure you are doing everything needed to pass this course."*
- *"The instructor was very helpful and made sure the class understood assignments."*
- *"The professor was very passionate about the material and was very helpful to any student who did not understand something."*
- *"That he was so willing to help if you needed it. He was always encouraging people to come to his office hours or to email him. He was quick to respond to email. He was kind to everyone in class. He always asked for feedback on assignments and what he thought he could improve on to make the assignment better."*
- *"I really enjoyed having him and would definitely take another class with him."*
- *"Writing the research paper in sections was helpful in fully understanding what was to be done."*
- *"Mr. Nolting was a very down to earth teacher and was so willing to help. I spent hours and hours in his office this semester and he never once got upset with me or frustrated when I needed help on our research paper."*
- *"I like how he had the class get to know one another. Having the class prepare notes by making sure that we read was helpful in making the class engage with one another other than pairing up to the same people."*
- *"Mr. Nolting was very good about replying to emails and getting back with us in a timely manner."*

- *“The openness that he had with the students – I felt that he was there to help me.”*
- *“This class was laid out really well. The assignments and guidelines were clear and made sense. Mr. Nolting made me want to come to class (which is not something I can say of all professors). He made me even more passionate and sure of the major that I have chosen.”*
- *“This course allowed you to work independently at a timely pace and helped develop professional writing skills.”*
- *“Mr. Nolting is an awesome teacher. The students literally expected him to spoon feed them on how to write a paper and do everything for them. He never once treated any students disrespectfully despite how they were speaking to him.”*
- *“Clear and great communication. Very personable with students and easy to talk to. Assignments were fair.”*
- *“The best things about this course is that my professor was very interactive with the students, and almost every class meeting we would do some type of activity to get to know each other better. At the beginning of the semester, we did a “Crossing the Line” activity that really helped a lot of students feel welcome to open up to Mr. Nolting.”*
- *“Mr. Nolting really cares about his students. Although he is a tough grader, and doesn’t accept late work or excuses, he genuinely cares about the well-being of others. I just wish he were a little more flexible when it comes to understanding the busy lives of students who also have families/other obligations to juggle as well as school work.”*
- *“Mr. Nolting is a great teacher who really tries to work with students. I enjoyed having him this semester.”*
- *“I liked the set-up. We started working on our final paper from day one. This really helped ease the work load and stress coming down to finals.”*
- *“Absolutely loved this course and Mr. Nolting is such a great professor! He enjoyed teaching this course and it really showed. He is so helpful and I was completely comfortable in asking him for help. He wants his students to succeed.”*
- *“I enjoyed the class and prof Nolting. He is a positive role model and enforces work, but also enjoyment of the class.”*
- *“Mr. Nolting is very approachable and helpful inside and outside of the classroom.”*
- *“His detailed grading rubrics really helped in understanding how he grades and what he expects of you to learn from this course. He puts a lot of time in grading the students work and I find that awesome.”*
- *“This class was really good. It taught us an important skill and the instructor's flexibility made it easy to learn the subject without additional stress. I really enjoyed the class.”*
- *“Mr. Nolting took a lot of time to explain things and gave us a lot of time in class to work with our group members. Furthermore, Mr. Nolting adjusted due dates whenever the class felt like they were behind. He really listened to the class and worked with us to make the course better.”*
- *“He paid close attention to the needs of the students.”*
- *“Mr. Nolting cared a lot about the students and wanted to make sure that they succeed in every aspect of the class.”*
- *“Mr. Nolting was a very caring and compassionate teacher about his students.”*
- *“I believe that this has nothing to do with the course instructor ninety-percent of the time. The one thing that I know students do not do, is read their course book thoroughly enough. Mr. Nolting did a fine job preparing us for the more difficult AHS 414 course.”*
- *“Again, I believe Mr. Nolting will go as far with his career as he wants. I wish him the best!”*
- *“I did an honors conversion, and I was able to come to Mr. Nolting for any questions that I had, no matter how stupid.”*

- *"This course focused around a group project proposal. I really liked that we had free range over our groups and topics. I also like that we actually had time in class set aside to work on it together. I felt that it was valuable and it provided opened conversation with the distributor."*
- *"Mr. Nolting has great potential as an Instructor or whatever endeavors he so chooses in the future. Research can be a bit daunting, but Mr. Nolting made the course interactive using positive approaches to unite the classroom."*
- *"The best thing about this course were the icebreakers. Doing this allowed many of my peers and I to feel more comfortable in class."*
- *"This is a great professor that that enjoys to see students being engaged in the course!"*
- *"Great, and understanding instructor."*
- *"I learned a lot from this course and through the work we did. Also Mr. Nolting did a very good job of explaining things and making it more clear if I didn't understand."*
- *"I really enjoyed this class and it will be very helpful in the future with research papers. Mr. Nolting did a great job of teaching this class and helping to explain things and getting me to think differently about how to write better."*

Highest rated items for the course or instructor are:

- *My instructor provided timely feedback on coursework.*
- *My instructor treated students with respect.*
- *My instructor provided clear expectations of students.*
- *My instructor interacted positively with students.*
- *I believe I can approach my instructor for help.*
- *My instructor was prepared for the class.*
- *My instructor encouraged students to be engaged in the course.*
- *My instructor demonstrated enthusiasm for the course.*

Non-Tenure-Track Full-Time Instructor in Health Sciences: AHS 414: Health Promotion Planning (face-to-face and hybrid courses)

Indiana State University, College of Health and Human Services
Fall 2015, 2016, 2017; Spring 2016

Description: This course is an in-depth examination of the concepts, methods, and techniques involved in planning health activities. Includes needs assessment, health promotion models, application, and evaluation. Teaches use of computerized assessment, flow charting, and presentation software.

What did you like most about the course and/or instructor?

- *"I liked that Mr. Nolting always made sure any questions you had got answered thoroughly. I also enjoyed how flexible the schedule was."*
- *"My group has always been a pleasure to work with and Mr. Nolting is a great teacher."*
- *"Professor is very approachable and positive."*
- *"Mr. Nolting is a great professor. I can always count on him to answer any questions or to help me with any problems I am having in the course."*
- *"It was fun to actually plan a promotion program."*
- *"Mr. Nolting is such a great professor. The class was structured to help us in real life when looking for a grant. I felt I could really apply this to my future."*
- *"I love that we had to participate in the Wellness Bash. The grant proposal was also a very fun project and taught us a lot."*

- *“Mr. Nolting was a very enthusiastic professor. He was always willing to help with any assignment or questions I had for him. He truly wants the best for his students.”*
- *“Mr. Nolting is always willing to help students.”*
- *“The instructor was great. Very approachable, involved in class, made the class feel comfortable with him, always responded quickly.”*
- *“He is extremely passionate about what he does and provides very detailed feedback on coursework. He allows for student improvement by being so meticulous on assignments.”*
- *“Being able to do just about everything hands-on and getting hands-on experience with creating a program and writing proposals for it.”*
- *“I loved the fact that the majority of this class was based on group work.”*
- *“I feel the best things in this course were the creation and preparation of the grant proposal. I also like how the instructor broke down the proposal into different sections and spaced out the due dates for each. That gave the class ease in developing the program.”*
- *“The best thing about this course was working in group working towards completing our projects. This course wasn’t like a traditional lecture course, which made it much more exciting.”*
- *“He answered questions for each student. He always helped students to learn more. He always finds more information for students to help them achieve their academic study.”*
- *“I knew I could come to him for help and he was willing to do whatever to help. He made me excited for this program.”*
- *“I have the most respect for him. When you treat a professor with respect you will get it in return. Many said his grading was unfair, but it was all in the rubrics and you knew exactly what to expect. I believe he is compassionate about his work and wants the best for his students, and he does this by challenging his students.”*
- *“I enjoyed being able to piece together a promotion plan for next semester. I also liked being able to make executive decisions with my group and having the possibilities of any activities we could come up with and execute with our \$500 budget.”*

Highest rated items for the course or instructor are:

- *My instructor provided timely feedback on coursework.*
- *My instructor treated students with respect.*
- *My instructor interacted positively with students.*
- *I believe I can approach my instructor for help.*
- *My instructor was prepared for the class.*
- *My instructor encouraged students to be engaged in the course.*
- *My instructor demonstrated enthusiasm for the course.*

Non-Tenure-Track Full-Time Instructor in Health Sciences: AHS 491: Health Sciences Internship (online course)

Indiana State University, College of Health and Human Services
Summer 2016

Description: The purpose of the summer internship program (AHS 491) is to provide students with an opportunity to transition from a university setting to a professional services setting. Furthermore, students have an opportunity to test the practical application of knowledge accumulated during his or her college career under the guidance of an agency professional and university faculty member.

What did you like most about the course and/or instructor?

- *“I loved that the course was online.”*

- *"I really like the discussion boards. I liked reading how everyone else's internships were going and what they were going through and what they were learning throughout their internships. It was a nice way to stay interacted with my classmates even after graduation."*
- *"This course was straightforward and let you work and complete the internship without having a bunch of work to go along with it."*
- *"The best thing about this course is that I was able to learn on-the-job training."*
- *"Structured."*
- *"The discussion boards gave me insight about my peers' internships and how they were enjoying their time spent over the 11 weeks of the course."*
- *"The course was online but easy to navigate through Blackboard and easy to understand what was due and when it was due."*
- *"Makes me try the workplace before having my job."*
- *"Tyler Nolting is a great teacher and I have enjoyed being his student this year."*

Highest rated items for the course or instructor are:

- *My instructor provided timely feedback on coursework.*
- *My instructor provided clear expectations of students.*
- *I believe I can approach my instructor for help.*

Non-Tenure-Track Full-Time Instructor in Health Sciences: AHS 111: Personal Health Science and Wellness (online and face-to-face courses)

Indiana State University, College of Health and Human Services
 Summer 2016, 2017, 2018, 2019

Description: Acquaints students with scientific data on matters of health which affect the individual, family, and society, and introduces concepts for disease prevention, health maintenance, and health resources conservation for improving the quality of life.

What did you like most about the course and/or instructor?

- *"We can do assignments at our own pace."*
- *"Learned a lot about personal health."*
- *"All materials the instructor provided were more than adequate."*
- *"Great class."*
- *"Loved the learning modules and discussion boards."*
- *"Responded to emails very quickly and was very understanding! Great teacher!"*
- *"The course was very structured. It was easy to understand deadlines and expectations. The instructor also provided PowerPoint notes for every chapter, which helped me fully understand the material."*
- *"The assignments, assessments, and readings were posted on Blackboard in a weekly folder. This simplified the process of knowing what was expected of the student every week. The professor was organized and fair."*
- *"I liked some of the chapter discussions that we had that related to us. This health class was in much more depth than any previous class and I loved that. Class discussions were my favorite because the instructor always made it a safe environment to share."*
- *"I appreciated how we studied in class. I also appreciated how every Thursday was a review, a guest speaker, or a field trip."*
- *"My teacher was very approachable and had a great sense of humor."*

- *“That we got feedback from the professor when we finish one week. I liked how everything was organized and we can get to our assignments, readings and PowerPoints, and assessments.”*

Highest rated items for the course or instructor are:

- *My instructor provided timely feedback on coursework.*
- *My instructor treated students with respect.*
- *My instructor provided clear expectations of students.*
- *My instructor interacted positively with students.*
- *I believe I can approach my instructor for help.*
- *My instructor was prepared for the class.*
- *My instructor encouraged students to be engaged in the course.*
- *My instructor demonstrated enthusiasm for the course.*

Non-Tenure-Track Full-Time Instructor in Health Sciences: AHS 418: Health Program Evaluation (face-to-face and hybrid courses)

Indiana State University, College of Health and Human Services
Spring 2016, 2017, 2018

Description: An in-depth examination of the concepts, methods, and techniques involved in evaluating community health promotion and health education programs. Includes validity and reliability, scales and tests, measurement, data analysis, and report writing.

What did you like most about the course and/or instructor?

- *“Mr. Nolting is nice and is open to new ideas. He communicates very well and is patient.”*
- *“He provided good examples to assignments and had precise feedback for errors.”*
- *“Mr. Nolting is a great professor and very approachable.”*
- *“I enjoyed implementing the mini-grant health program that our groups created last semester and using that program to complete our evaluations instead of using a hypothetical program.”*
- *“Hands-on course work.”*
- *“I really enjoyed Mr. Nolting as a professor. I think he did a great job for his first year teaching.”*
- *He is very enjoyable to have as a professor and knows the material. He is also very helpful during his office hours. I am very thankful for him and he is a great asset to the department.”*
- *“The best things about this course was being able to work as a team and complete our projects.”*
- *“I feel that the PowerPoints were very helpful and helped me to learn the most. I was able to refer to the PowerPoints as well as the CDC for everything.”*
- *“Implementing our program was the most fun part of this course. It was also nice that we were able to work all semester with our group members on class assignments. The support from group members helped me stay focused and get things accomplished. I also like how open the professor is at helping students with anything they needed help with.”*
- *“The best thing about this course were the clear guidelines with each assignment. Mr. Nolting always made sure we had instructions to each assignments or examples for each assignment.”*
- *“Mr. Nolting is a very passionate teacher; he always makes sure we understand a question that we may have.”*
- *“Very hardworking teacher. Pushes us to be more and open up with coursework.”*
- *“He was very enthusiastic. He kept a smile on his face while talking about the subject.”*
- *“Mr. Nolting is one of the most helpful, sincere teachers I have had at ISU. He has gone above and beyond to help my group throughout the entire health promotion program process.”*
- *“Mr. Nolting is a great instructor. He is very open if you needed help with any course work.”*

- *“Mr. Nolting taught us very valuable information and is a great instructor.”*
- *“Learning the ways and skills of planning, implementing, and evaluation programs. Kept students in charge of analyzing results.”*

Highest rated items for the course or instructor are:

- *My instructor provided timely feedback on coursework.*
- *My instructor treated students with respect.*
- *My instructor provided clear expectations of students.*
- *My instructor interacted positively with students.*
- *I believe I can approach my instructor for help.*
- *My instructor was prepared for the class.*
- *My instructor encouraged students to be engaged in the course.*
- *My instructor demonstrated enthusiasm for the course.*

Non-Tenure-Track Full-Time Instructor in Health Sciences: AHS 220: Public Health Concepts (face-to-face course)

Indiana State University, College of Health and Human Services
Fall 2017, 2018

Description: An introduction to the health issues and needs in various types of communities and public health settings, and to the concepts of effective health promotion, program planning, and evaluation. This course is designed to provide undergraduate students with a thorough understanding of critical issues in population health, whether they are planning a career in public health, entering a clinical health profession, or taking the first steps toward becoming more informed and aware citizens. The text takes a systems-based approach that pushes students to develop critical-thinking and analytical skills and build a theoretical framework for thinking about public health issues in a larger context.

What did you like most about the course and/or instructor?

- *“Mr. Nolting is very flexible and willing to work with students.”*
- *“I enjoyed the class and I also liked doing the Facebook posts.”*
- *“I enjoyed how well Mr. Nolting interacted with students and making sure they stayed engaged.”*
- *“Mr. Nolting’s enthusiasm for the course. Even at 8 am he was always in a positive up-beat mood!”*
- *“I honestly loved this course. Everything was great.”*
- *“I thought this class was well-organized, and I learned just fine in it.”*
- *“This was a well-structured online course.”*
- *“Mr. Nolting was great with feedback.”*
- *“He was fast at responding to my email.”*
- *“Being an online course, it can be difficult to interact. However, Mr. Nolting did a great job doing this and emailed us every Monday morning, which was super helpful and nice.”*

Highest rated items for the course or instructor are:

- *My instructor provided timely feedback on coursework.*
- *My instructor treated students with respect.*
- *My instructor interacted positively with students.*
- *I believe I can approach my instructor for help.*
- *My instructor encouraged students to be engaged in the course.*

- *My instructor demonstrated enthusiasm for the course.*

Non-Tenure-Track Full-Time Instructor in Health Sciences: AHS 305: Society and Aging (online course)

Indiana State University, College of Health and Human Services
Fall 2017

Description: This course introduces the social aspects of aging and the life course through multiple ways of knowing. Students will differentiate between the aging individual and the aging population, discuss the social implications of an aging society, and seek to understand the social influences on older adults.

What did you like most about the course and/or instructor?

- *"The book Tuesdays with Morrie was fabulous. Assignment instructions were clear."*
- *"The online accessibility made completing the work easier for a busy life schedule. I enjoyed interviewing a resident of a nursing facility and learning more about their past."*
- *"The professor was very approachable."*
- *"Overall, I learned a lot from this course."*
- *"The semester-long project was very interesting and interactive. I enjoyed getting to learn about someone else's life story and incorporating the information from class into the project."*

Highest rated items for the course or instructor are:

- *My instructor provided timely feedback on coursework.*
- *My instructor treated students with respect.*
- *My instructor provided clear expectations of students.*
- *My instructor interacted positively with students.*
- *I believe I can approach my instructor for help.*
- *My instructor was prepared for the class.*
- *My instructor encouraged students to be engaged in the course.*
- *My instructor demonstrated enthusiasm for the course.*
- *This course helped me to understand the course topic(s) from multiple perspectives (e.g., scientific, historical, artistic, literary, ethical, social behavioral).*
- *I was required to complete an extended project or presentation that asked me to analyze the course topic(s) from multiple perspectives (e.g., scientific, historical, artistic, literary, ethical, social behavioral).*

Non-Tenure-Track Full-Time Instructor in Health Sciences: AHS 409: Health Screening (face-to-face courses)

Indiana State University, College of Health and Human Services
Spring 2017, 2018, 2019; Fall 2017, 2018

Description: The course provides students with the most common health screening and health counseling knowledge, skills, and abilities. Students are taught the most current screening and health counseling techniques.

What did you like most about the course and/or instructor?

- *"The best part of this course was actually getting to screen people during the Terre Haute Community Health Fair and the Wellness Bash."*

- *"I like the way that Mr. Nolting teaches and I enjoyed being able to do hands-on work in this course."*
- *"I would recommend Mr. Nolting to any student."*
- *"The best things about this course were the CPR Training we had and the health screening events we attended."*
- *"Very good course. The teacher gave good feedback on all assignments, and this course prepared me well for the future."*
- *"I liked it that he put us in groups to find answers and then have us teach the class; I feel that I learned better this way."*
- *"I enjoyed the equal balance of lecture in class and hands-on activities in the assessment lab."*
- *"The best part of this course was the in class discussions and interactions. It made it more fun and easier to learn material. Overall, having group discussions and activities made the class more enjoyable."*
- *"I believe switching the last portion of the semester to motivational interviewing was a great addition to the course, compared to the original material we were going to cover. Proper communication between the client and practitioner is a huge component when discussing results and behavior change within the client."*
- *"I enjoyed the hands-on work and being able to perform screenings."*
- *"Being able to have open discussions about our own health issues and being able to work together with classmates on setting new regimens for a healthier lifestyle!"*
- *"Having hands-on experience and playing the role as a physician!! Having this experience allowed for me to get a better understanding of how health screenings are conducted and more experience to conduct myself in a professional manner!"*
- *"The best part of this course was having the opportunity to work in a lab/clinic setting and perform hands-on tests. Another favorite part about this course was getting to talk to 'patients' as well as working healthy heart screening events. It was a very beneficial opportunity."*
- *"Getting real experience and working with real people. Also, practicing multiple times so we were more comfortable."*

Highest rated items for the course or instructor are:

- *My instructor provided timely feedback on coursework.*
- *My instructor treated students with respect.*
- *My instructor provided clear expectations of students.*
- *My instructor interacted positively with students.*
- *I believe I can approach my instructor for help.*
- *My instructor was prepared for the class.*
- *My instructor encouraged students to be engaged in the course.*
- *My instructor demonstrated enthusiasm for the course.*

Non-Tenure-Track Full-Time Instructor in Health Sciences: AHS 391: Educational Methods (face-to-face courses)

Indiana State University, College of Health and Human Services
Fall 2018; Spring 2019

Description: Methods, procedures, aids, devices, and material sources appropriate for use by educators in applied health sciences.

What did you like most about the course and/or instructor?

- *"The material we learned was beneficial and I know I will use it in my future career."*
- *"Knowing that there are many different ways to teach a health topic was useful."*
- *"The discussions in class were interesting."*
- *"Mr. Nolting is a great teacher and very understanding."*
- *"Overall, Mr. Nolting was a great professor who wanted to see his students succeed. I appreciated that he did his best to get his students involved, even if they didn't always cooperate. He integrated the course material in interesting ways."*
- *"I liked that we were encouraged to participate in class."*
- *"Overall, I enjoyed this course and respect Mr. Nolting for his professionalism and teaching style. After some of our group project issues were resolved, the course was much better."*
- *"Really enjoyed his interest into each student individually, as well as his variety of teaching methods."*
- *"He used many different ways of teaching and made the class very interactive."*
- *"His patience and understanding."*
- *"I really loved having Mr. Nolting for this class and look forward to having him in the future for classes. The work load was appropriate for the class and I learned more in this class than any other this semester but wasn't stressed about it at all."*
- *"I would like to say Tyler Nolting is truly a great professor. He's a very caring individual, where if you missed a day a professor would mark you absent, he would reach out and want to know what's going on. He's a really good guy that truly cares about his students and their success."*
- *"Great professor that really works with students in a great manner!"*

Highest rated items for the course or instructor are:

- *My instructor encouraged students to be engaged in the course.*
- *My instructor demonstrated enthusiasm for the course.*
- *My instructor treated students with respect.*
- *My instructor interacted positively with students.*
- *I believe I can approach my instructor for help.*
- *My instructor provided clear expectations of students.*

Non-Tenure-Track Full-Time Instructor in Health Sciences: AHS 410: Mental Health and Stress Education (face-to-face course)

Indiana State University, College of Health and Human Services
Fall 2018; Spring 2019

Description: Designed to enable educators to establish sound foundations and teaching strategies in mental health and stress education.

What did you like most about the course and/or instructor?

- *"Overall, this course was a good learning experience about mental health and stress education. It was a pleasure having Mr. Nolting as an instructor. If I could pinpoint one thing it would be a better understanding of the material. With that being said, it was his first time teaching the course and the material was just as new to him as it was to me."*
- *"He explained everything well and always tried to figure out a better way for us if we did not understand something."*
- *"I think this course was well taught and I learned a lot. I loved the book we used for class."*

- *“I enjoyed the overall focus about this course, considering I am a college student who stresses over things I shouldn’t, as well as stressing over the littlest things. I also really like the different class presentations and getting to learn how stress effects the body both mentally and physically.”*
- *“I loved the content and found it very interesting. Professor Nolting did a good job of portraying the information to us.”*
- *“The book was great! Totally up-to-date, and the teacher knows his stuff!”*
- *“I would like to thank Dr. Nolting for being so understanding this semester. This semester I was dealing with a new mental illness and he was there for me. I was dealing with some other battles. This semester was the worst and longest semester of my life and he was able to make it move a little better.”*
- *“Mr. Nolting is a great professor. I felt that he really cared about my well-being and helped me a lot during this course.”*
- *“I got to learn about different mental health disorders and how to reduce stress.”*
- *“Prof. Nolting was always excited to teach the information.”*
- *“The teacher was very helpful and compassionate.”*

Highest rated items for the course or instructor are:

- *My instructor provided timely feedback on course work.*
- *My instructor encouraged students to be engaged in the course.*
- *My instructor interacted positively with students.*
- *My instructor treated students with respect.*
- *I believe I can approach my instructor for help.*

Indiana University

Undergraduate Courses	Number of Sections Taught	Average Enrollment
H306: Men’s Health	3	47
H180: Stress Prevention and Management	3	59
H263: Personal Health	2	69
COLL X111: Sports Medicine Freshmen Interest Group	3	15
P105: Foundations of Fitness and Wellness	2	75
Total	13	651 students

Associate Instructor: H306: Men’s Health

Indiana University, School of Public Health-Bloomington
Fall 2012, 2013; Spring 2013

Description: The purpose of this course is to provide a thorough foundation for understanding men’s health and risks and the differences between men. It will discuss effective, evidence-based strategies for students to improve the health and well-being of boys and men by drawing from a wealth of literature and research in a diverse array of disciplines, as well as from Dr. Will Courtenay’s original research designed specifically to examine gender and men’s health.

What did you like most about the course and/or instructor?

- *"Tyler is a great teacher; I was excited to have him again."*
- *"I appreciated his enthusiasm."*
- *"He did an overall good job, and I would recommend him for any students."*
- *"Set up of course was solid."*
- *"Relates to students."*
- *"I had fun everyday."*
- *"Friendly, open guy; good teacher."*
- *"Good, fair teacher."*

Highest rated items for the course or instructor are:

- *My instructor treats students with respect.*
- *My instructor makes me feel free to ask questions in class.*
- *My instructor is regularly available for consultation.*

Associate Instructor: H180: Stress Prevention and Management

Indiana University, School of Public Health-Bloomington

Fall 2010, Spring 2011, & Summer 2012

Description: The purpose of this course is to emphasize experiential learning and encourage students to personalize information through practical applications and a "tool box" of stress-reducing resources, including activities and online stress-relief audio files. The course is engaging and empowers students to experience personal wellness by understanding and managing stress, gives stress-related topics a real-life context, and motivates students to manage stress in a way that accommodates their lifestyle, values, and goals.

What did you like most about the course and/or instructor?

- *"What I liked most about the course was that it was so applicable to real life; and not just in the way that you could use it someday, but instead in that it's actually useful from day-to-day. What I liked most about the instructor was his ability to create such a positive environment. Everybody became a little closer to being friends in each class, although 1 hour and 50 minutes seemed like a short amount of time."*
- *"His methods of teaching went very well. He incorporated students to teach us well and used music. It was great."*
- *"The course was enjoyable and very open for everyone to get to know each other."*
- *"I liked how everyone in the class was involved in group meetings. Also liked the guest speakers"*
- *"Tyler has a huge heart and genuinely care about his students. He is someone who I want to keep in touch with, and I wish him much success in all of his endeavors."*
- *"I think Tyler is one of the best teachers I have ever had. I actually look forward to this class every day. He makes learning fun in his unique way and he clearly care a lot about teaching and being a good teacher. I would gladly take his class in the future and intend to."*
- *"He was very enthusiastic and informed."*
- *"It was interactive and interesting; I feel like I learned a lot and can use this in the future."*
- *"His energy."*
- *"All the different techniques that he used to teach the topics that were discussed in class."*
- *"I thought the course had a very comfortable and inviting feel that instigated some good class discussions."*

- *“Tyler thoroughly explained all the material and I feel confident about my grade. He did an excellent job.”*
- *“I liked his enthusiasm for the course, as well as his knowledge on topics.”*
- *“What I liked most was how he connected everything that was taught to us and our everyday lives/situations.”*
- *“I liked that we had to do stress relieving activities out of class. Learning new ones in class was fun too!”*
- *“His passion for the course.”*
- *“I liked that I learned stress management techniques that I didn’t previously know much about before. I also liked that I could apply a lot to it in real life.”*
- *“Tyler is an amazing teacher. He made the material interesting and I enjoyed coming to class every time. He truly cares about his students; he even learned 70 names and will stop and talk to his students if he sees them outside of class. The guest speakers were great as well. It’s great that IU offers a class like this.”*
- *“I liked most how passionate the instructor was about teaching.”*
- *“I am a stressful person and it helped me with everyday activities/stress.”*
- *“The course was interesting and the instructor structured the class well.”*
- *“Well spoken.”*

Highest rated items for the course or instructor are:

- *My instructor is enthusiastic about teaching this course.*
- *My instructor makes me feel free to ask questions in class.*
- *The level of difficulty of this course is appropriate for me.*
- *My instructor treats students with respect.*
- *My instructor is fair and impartial when dealing with students.*

Associate Instructor: H263: Personal Health

Indiana University, School of Public Health-Bloomington
Fall 2011 & Spring 2012

Description: This purpose of this course is to provide a theoretical and practical treatment of the concepts of disease prevention and health promotion. We will cover such topics as emotional health, aging and death, alcohol, tobacco, and drug abuse, physical fitness, nutrition and dieting, consumer health, chronic and communicable diseases, safety, and environmental health.

What did you like most about the course and/or instructor?

- *“I liked the material and the attitude towards the class the instructor had.”*
- *“He gave us examples from his own experiences and provides us with opportunities to share our own experiences with our classmates. It made the course really interesting at times.”*
- *“The instructor was very nice and had a connection to the students.”*
- *“That he knew a lot about the material and made topics exciting.”*
- *“He is always enthusiastic and makes the course interesting.”*
- *“Explains subjects in depth.”*
- *“I liked the supplemental activities/videos that we used along with the material.”*
- *“The instructor is interactive with students. There are often activities, not just lecture.”*
- *“Taught straight-forward, clear.”*
- *“It was fun when we played games or participated as a class.”*
- *“I liked the topics and guest presenters.”*

- *"I liked that Tyler is very organized, consistent, and respectful."*
- *"All information for quizzes were straight-forward and easy to retain."*
- *"The instructor seemed very caring of our health."*
- *"The instructor was extremely personable and caring."*
- *"He's humorous."*
- *"I liked how we got tips on how to better ourselves."*
- *"I liked how the instructor was passionate about what he is doing and how it reflected in his teaching and the course overall."*
- *"I liked his teaching methods-guest speakers, videos, class activities, and group activities. He also shared personal stories to relate."*
- *I believe he did all that he could and felt passionate about what he was teaching. He truly respected his students as well."*
- *I enjoyed that guest speakers who used their experiences to help me understand better"*
- *"This course is really important for my health."*
- *"I liked how it was nice that we were required to keep up with the class; so it had a nice effect with my grade since I did."*
- *"The instructor worked hard to make the course interactive & group-oriented."*
- *"You could tell that the instructor was really excited to teach this course."*
- *"I liked how enthusiastic he was to teach the material and how much he is willing to help."*
- *"I enjoyed how the instructor kept the lectures interesting with videos and group activities."*
- *"Personable, caring, understanding."*
- *"I felt he really enjoyed teaching this material, which made it easier to learn."*
- *"What I liked most about this course and instructor is that it was very informative and made it easy for me to understand concepts."*
- *"The thing I liked least about it is its only 8 weeks long."*

Highest rated items for the course or instructor are:

- *My instructor treats students with respect.*
- *My instructor makes me feel free to ask questions in class.*
- *My instructor is enthusiastic about teaching this course.*

**Associate Instructor Teaching Evaluation for H263: Personal Health:
Performed by Kathy Flynn-H263 Personal Health Coordinator**

A. Teaching Techniques (received the highest possible rating in the following areas)

- *Demonstrates sufficient mastery of content.*
- *Provides for student participation.*
- *Encourages and acknowledges individual students' accomplishments and appropriate behavior.*
- *Uses logical, purposeful and thought-provoking questions.*
- *Provides interesting and adequate reinforcement.*
- *Presents reading, writing, speaking, and listening strategies using concepts and language which students understand.*
- *Provides relevant examples and demonstrations to illustrate concepts and skills.*
- *Incorporates higher level thinking skills.*
- *Demonstrates professionalism.*
- *Demonstrates enthusiasm for topic.*
- *Proper enunciation.*
- *Customization of course to skill level/interest*

- *Reasonable speed*
- *Explanation of new material*
- *Demonstrations/visual aids/handouts*
- *Use of technology*
- *Use of clear examples*
- *Comprehension check*
- *Synthesis of ideas*
- *Provides motivation*

B. Effective Planning (received the highest possible rating in the following areas)

- *Displays evidence of preparation.*
- *Directions to students are clearly thought out and well stated.*
- *Materials for this class are organized and available.*
- *Provides enrichment and/or remediation where needed.*
- *Summarizes the main point(s) of the instructional activity.*
- *Punctuality of both start and end of class.*

C. Student/Teacher Relationships (received the highest possible ratings in the following areas)

- *Maintains student interest and attention.*
- *Works constructively with individual or group.*
- *Manages routine so as to avoid confusion.*
- *Exhibits poise, voice control, and tact.*
- *Uses positive statements to students.*
- *Makes supportive statements to students.*
- *Maintains a friendly and respectful teacher-student relationship.*
- *Encouragement of discussion*
- *Control of discussion*
- *Listening to questions*
- *Answering questions*
- *Allowing/encouraging peer explanations*
- *Willingness to accept alternate explanations*

Associate Instructor: COLL X111: Sports Medicine Freshmen Interest Group (FIG)

Indiana University, Office of the Vice Provost for Undergraduate Education, Division of Extended Programs-Freshman Interest Groups

Fall 2007, 2008, 2009

Description: The purpose of this course is to increase an incoming student's likelihood of success at college through targeted integration of ideas and approaches within the students' shared courses (P280: Principles of Athletic Training and Emergency Care and P101: Introductory Psychology I) and community (Briscoe Quad Floor 6). This course is built on three components: integration, skill building, and connection. Each of these components encompasses a range of sports medicine related materials, assignments, and activities that will increase your depth of knowledge (integration), improve personal practice (skill building), and help you to establish yourself in your new community (connection).

- Evaluations not available

Associate Instructor: P105: Foundations of Fitness and Wellness

Indiana University, School of Public Health-Bloomington

Fall 2009

Description: The purpose of this course is to broaden your view of what it means to “live well” by actively pursuing healthy lifestyles. P105 utilizes interactive learning activities in order to help promote wellness through health education, physical activity, and social interaction. Students will focus on the concept of goal setting to enhance the fitness and wellness living and learning experience.

- Evaluations not available

Hawkeye Community College-Metro Center

Community College, ELL and ABE Courses	Number of Sections Taught	Average Enrollment
Advanced Manufacturing Technology-Computer Numerical Control (CNC) Machine Setup/Operator Certificate Training	2	24
BurlingtonEnglish-Intermediate and Advanced	1	17
MFG157	1	31
MFG122	1	31
Total	5	127 students

ELL/I-BEST Lead Instructor/Coordinator for the CNC Machining and Tool-Making Technology Program: CNC Machine Setup/Operator Specialist Certificate Training

Hawkeye Community College-Metro Center
Fall 2014; Spring/Summer 2015

Description: The purpose of this course is to introduce CNC machine setup and operation procedures to adult English language learners and basic education students. Students will receive instruction in machine manufacturing safety, mathematics (i.e. order of operations, fractions, trigonometry, and formulas), blueprint reading/drawing, and hands-on instruction and training on virtual CNC machine emulators, simulators, manual lathes, and CNC mills.

- 30 students received CNC machining certificates on June 26, 2015.

ELL Instructor: BurlingtonEnglish-Intermediate and Advanced

Hawkeye Community College-Metro Center
Spring/Summer 2015

Description: The purpose of this course is to offer a unique program for English language acquisition. It combines face-to-face classroom activities with any time-anywhere access to online interactive courses. With the BurlingtonEnglish SpeechTrainer®, students will improve their pronunciation and comprehensibility, giving them the abilities and confidence to communicate successfully in most situations.

- All 17 students increased their English reading, listening, speaking, and writing skills.

**ELL/I-BEST Lead Instructor/Coordinator for the CNC Machining and Tool-Making Technology Program:
MFG157: Intro to CNC Programming I**

Hawkeye Community College-Metro Center
Spring/Summer 2015

Description: The purpose of this course is to provide English language learners and adult basic education students the instruction and practice in CNC computer programming. Students will learn and use G- and M-Code to create a computer program and product on the CNC mill.

- 30 students received passing grades on June 26, 2015.

**ELL/I-BEST Lead Instructor/Coordinator for the CNC Machining and Tool-Making Technology Program:
MFG122: Machine Trade Printreading I**

Hawkeye Community College-Metro Center
Spring/Summer 2015

Description: The purpose of this course is to provide students the opportunity to read and produce a variety of blueprints. Students will be exposed to actual manufacturing blueprints and will learn the appropriate vocabulary to identify and describe various blueprint aspects. Students will ultimately design their own unique blueprint, which will be used to eventually produce a product on the CNC mill.

- 30 students received passing grades on June 26, 2015.

McDowell Adult Education Center

Adult ELL Courses	Number of Sections Taught	Average Enrollment
ELL Advanced	1	20
ELL High-Beginning	3	20
ELL Beginning Literacy and Low-Beginning	4	25
Total	9	160 students

ELL Instructor: ELL Advanced

Bartholomew Consolidated School Corporation, McDowell Adult Education Center
Fall 2019 & Spring 2020

Description: The purpose of this course is to teach English language skills to adult ELLs. The students will practice their reading, writing, speaking, and listening skills in a course utilizing the communicative language teaching method. By the end of the course, students will be able to advance to a higher level of education (i.e., HiSET and/or community college programs) and obtain and/or increase employment status.

ELL Instructor: ELL High-Beginning

Bartholomew Consolidated School Corporation, McDowell Adult Education Center
Spring/Summer 2013, Fall 2013, & Spring/Summer 2014

Description: The purpose of this course is to teach English language skills to adult ELLs. The students will practice their reading, writing, speaking, and listening skills in a course utilizing the communicative language teaching method. By the end of the course, students will be able to advance to a higher level

of education (i.e., HiSET and/or community college programs) and obtain and/or increase employment status.

Educational Gains:

66.67% of the high-beginning adult ELLs achieved at least one educational gain on the Test of Adult Basic Education (TABE) Complete Language Assessment System-English (CLAS-E).

ELL Instructor: ELL Beginning Literacy and Low-Beginning

Bartholomew Consolidated School Corporation, McDowell Adult Education Center
Spring/Summer 2013, Fall 2013, & Spring/Summer 2014

Description: The purpose of this course is to teach English language skills to adults ELLs. The students will practice their reading, writing, speaking, and listening skills in a course utilizing the communicative language teaching method. By the end of the course, students will be able to advance to a higher level of education (i.e., advanced ELL classes, HiSET) and obtain and/or increase employment status.

Educational Gains:

An average of 55.85% of the beginning literacy and low-beginning adult ELLs achieved at least one educational gain on the Test of Adult Basic Education (TABE) Complete Language Assessment System-English (CLAS-E).