LIFESTYLE PHYSICAL ACTIVITY AMONG OLDER ADULTS:

THE HEALTH IMPLICATIONS

by

Laurie Y. Blackman

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STATEMENT OF DISSERTATION APPROVAL

The dissertation of **Laurie Y. Blackman**

been approved by the following supervisory committee members:

Caren Jean Frost	, Chair	**11/08/2016** Date Approved
Reiko Hayashi	, Member	**11/08/2016** Date Approved
Patrick Thomas Panos	, Member	**11/08/2016** Date Approved
Larry Lorenzo Smith	, Member	**11/08/2016** Date Approved
Roberta Hollander	, Member	**11/08/2016** Date Approved

and by **Lawrence Henry Liese** , Dean of

the College of **Social Work**

and by David B. Kieda, Dean of The Graduate School.

ABSTRACT

The aging of the American population brings increased concerns about the consequences of chronic diseases and the associated health challenges related to these illnesses. Regular exercise is linked to reducing or eliminating risks of disease and provides the ability to delay the onset of disabilities. Despite the known benefits of exercise, there is a low adherence to exercise regimens among older Americans. This study used a conceptual approach that was informed by Dweck and Leggett's incremental theory, Cockerham's health lifestyle theory, and Ajzen's theory of planned behavior to look at lifestyle physical activity—the daily accumulation of nonstructured physical activities (i.e., chores, gardening, incidental walking)—and its impact on health among adults. Analyzing data from the Active for Life: Translation of Physical Activity Programs for Mid-Life and Older Adults, the study explored the effects of lifestyle physical activity on self-rated health and self-reported health conditions among adults 50+. Results demonstrated that lifestyle physical activity is a protective factor for positive self-rated health scores and self-reported health conditions. This study offers a significant contribution to the understanding of the importance of lifestyle physical activities while providing policy implications and future research directions.

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CHAPTER 1

INTRODUCTION

Background Information

Regular physical activity has been shown to reduce the risk of cardiovascular disease, stroke, hypertension, type 2 diabetes, osteoporosis, obesity, colon cancer, breast cancer, anxiety, and depression (Gremeaux et al., 2012). Among older adults, a significant, positive relationship has been found between physical activity and physical function with older adults who are more physically active being less likely to experience functional limitation than their more sedentary counterparts (Yorston, Kolt, & Rosenkranz, 2012). Physical activity is a broad term defined as "any bodily movement produced by skeletal muscles that requires energy expenditure—including activities undertaken while working, playing, carrying out household chores, travelling, and engaging in recreational pursuits" (WHO, 2014, "What Is Physical Activity?" para. 1). For adults 65 and older, there is a recommendation of at least 150 minutes per week of moderate-intensity physical activity, or at least 75 minutes of vigorous-intensity aerobic physical activity throughout the week, or an equivalent combination of moderate- and vigorous-intensity activity for optimal health benefits (WHO, 2010).

Exercise is a type of physical activity, but not all physical activity is exercise (Brach, Simonsick, Kritchevsky, Yaffe, & Newman, 2004). According to the World Health Organization, "the term 'physical activity' should not be confused with 'exercise',

which is a subcategory of physical activity that is planned, structured, repetitive, and aims to improve or maintain one or more components of physical fitness" (WHO, 2014, "What Is Physical Activity?" para. 1). Although an individual might be physically active throughout the day, walking often and doing work around the home, this person might not be doing any exercise (Brach et al., 2004).

In a 2012 study, Langlois et al. assessed the effect of a 3-month physical exercise intervention in frail and nonfrail older adults on three dimensions: physical capacity, cognitive performance, and quality of life. Training-related improvement was observed in functional capacity, physical endurance, executive functioning, processing speed, working memory, and self-reported quality of life in leisure activities, physical capacity, social/family relationships, and health. Benefits were overall equivalent in frail and nonfrail participants (Langlois et al., 2012).

Taylor (2014) argued that whether physical activity is defined as incidental or as exercise is of less importance than the amount, the frequency, and the intensity of the activity. For older adults, the main aim is to foster long-term adherence to physical activity (Gremeaux et al., 2012). Determining the best way to foster long-term adherence to physical activity served as the impetus for this study.

Statement of the Problem

Ekblom-Bak, Ekblom, Vikström, de Faire, and Hellénius (2014) stated that an active daily life has important beneficial associations with cardiovascular health and longevity in older adults. Additionally, regular physical activity increases average life expectancy through its influence on chronic disease development. By engaging in regular physical activity, there is a reduced risk of developing a number of chronic diseases and

conditions; it is also valuable in the treatment of numerous diseases (Chodzho-Zajko et al., 2009). In a 3-month physical exercise intervention among frail and nonfrail older adults, Langlois et al. (2012) observed larger gains in executive control, processing speed, and working memory, all playing a critical role in everyday activities, such as driving, cooking, or managing finances.

Despite the well-understood benefits of physical activity, and the research that supports the effect of exercise and its role in improving emotional, cognitive, social, and perceived physical function of older adults, older adults are generally less physically active than young adults (Taylor et al., 2004), exacerbating their physical and functional decline. Although older adults acknowledge the importance of physical activity, as a group, they do not sufficiently engage and subsequently commit to this practice.

Win et al. (2011) found that physical inactivity accounted for approximately 25% of the increased risk of cardiovascular mortality due to depression in community-dwelling older adults. Physical inactivity has been defined as not meeting any of three criteria: (a) 30 minutes of moderate-intensity physical activity on at least 5 days every week, (b) 20 minutes of vigorous-intensity physical activity on at least 3 days every week, or (c) an equivalent combination achieving 600 metabolic equivalent minutes per week (WHO, 2011). Additional research found that physical inactivity was positively associated with increased likelihood of reporting disease and disability, low functional capacities, and being socially disengaged with life, the three commonly used criteria used to determine unsuccessful aging (Depp & Jeste, 2006; Meisner, Dogra, Logan, Baker, & Weir, 2010; Rowe & Kahn, 1997).

Researchers believe that the most feasible approach to reduce sedentary time is to

promote nonexercise physical activities (NEPAs; Ekblom-Bak et al., 2014). In their study of 3,839 60-year-old Swedish men and women, Ekblom-Bak et al. (2014) discussed the significance of NEPAs for older adults. They found that older adults tend to sit more compared to other age groups and spend a relatively greater proportion of the remaining day performing NEPAs as they more often find it difficult to achieve the recommended exercise intensity levels (Ekblom-Bak et al., 2014). Tremblay, Esliger, Tremblay, and Colley (2007) looked at a similar concept of incidental (nonexercise) and lifestyle-embedded physical activities (i.e., chores, incidental walking). This concept refers to activities that occur throughout the course of the day during activities of daily living. These activities are generally of low intensity but often contain some sporadic bouts of moderate intensity activity (Tremblay et al., 2007).

With the abundance of literature linking physical inactivity to chronic health conditions (Reed, Crespo, Harvey & Andersen, 2011; Taylor, 2014; Win et al., 2011) and by factoring in the research findings of Ekblom-Bak et al. (2014) and Tremblay et al. (2007), it was important to look at the group of inactive older adults to determine if an "active lifestyle" approach could provide older adults with enough movement to show improved health outcomes. As such, the purpose of this dissertation was to explore whether lifestyle physical activity (LPA) would have a significant effect on health outcomes among adults 50 years of age and older.

This research study chose to look at adults 50 years of age and older because in 2015, 1 of every 5 Americans was between the ages of 50 and 64. As they entered this age group, 70% were already diagnosed with at least one chronic condition and nearly half had two or more. The resulting disease and disability may have seriously

compromised their ability to carry out the multiple roles they play at this point in their lives. National experts agree on a set of recommended clinical preventive services that can help detect many of these diseases, delay their onset, or identify them early in their most treatable stages. Despite the cost-effectiveness of many of these services, the percentage of adults who are up to date on receiving them is low (CDC, AARP, & AMA, 2009). As such, looking at this age group served as a useful benchmark for assessing the patterns in health characteristics observed among adults in the older groups.

Lifestyle physical activity or an "active lifestyle" approach includes such things as pacing or walking while on the phone instead of sitting in a chair, taking the stairs instead of riding an elevator or escalator, or otherwise seeking out opportunities to be physically active in daily life when a choice is available (Loprinzi & Cardinal, 2013). By design, these forms of physical activity most often occur asynchronously and in short (i.e., <10 minutes) or even very short (i.e., 1 or 2 minutes) durations multiple times throughout the day. Compared with continuous and more structured forms of exercise, the active lifestyle forms of physical activity may actually be much more consistent with an adult's natural movement preferences and tendencies (Loprinzi & Cardinal, 2013).

Purpose of the Study

Using the LPA approach, this study sought to explore and compare older adults' perceptions of their health to various health measures, including their reported number of chronic illnesses. Adults 50 years of age and older were selected using secondary data from the survey "Active for Life: Translation of Physical Activity Programs for Mid-Life and Older Adults, 2003–2007."

The Active for Life (AFL) initiative investigated how two physical activity

programs for adults aged 50 and older, Active Choices (telephone support) and Active Living Every Day (in-person support), worked in community settings to promote physical activity.

The proposed study also explored whether, within an active lifestyle, the intensity of the participants' activities was correlated with their health outcomes. Lastly, the study examined LPA and four social determinants (race/ethnicity, sex, income, and education) to see if there was any correlation with health.

An understanding of the impact of nonstructured physical activity through the use of LPA on health outcomes can positively influence the way older adults try to increase their activity level on a daily basis, which in turn will improve their quality of life. By promoting physical activity as less structured and more incidental to daily activities, it is believed that incorporating physical activity will seem more doable and therefore feel more achievable.

The specific aims of this study were to:

1. Assess the relationship between self-rated health and self-reported health conditions in older adults who engage in LPA;
2. Determine if within an active lifestyle, health outcomes of older adults are impacted by the type and/or intensity of the physical activity; and
3. Determine within LPA if social determinants are predictors of health conditions.

Research Questions and Hypotheses

In this quantitative study using secondary data analysis, the following research questions (RQs) were addressed:

RQ1. Among older adults who engage in LPA, is there an association between self-rated health score and self-reported health conditions?

H_1. Older adults who have a higher score for their self-rated health will have fewer self-reported health conditions.

RQ2.1. Among older adults who engage in LPA, does type of activity and/or intensity affect self-rated health score?

H_1. Older adults who engage in more vigorous LPA will have a better self-rated health score.

RQ2.2. Among older adults who engage in LPA, does type of activity and/or intensity affect self-reported health conditions?

H_1. Older adults who engage in more vigorous LPA will have fewer self-reported health conditions.

RQ3. Among older adults who engage in LPA, when looking at race/ethnicity, sex, income, and education, which social determinants have significant associations with self-reported health conditions? Of these, which ones are predictors of health conditions?

H_1. There will be a significant association between social determinants and health conditions among older adults who engage in LPA.

Summary

In summary, the goal of this dissertation was to identify to what degree LPA impacts self-rated health scores and self-reported health conditions, to assess the correlation of these measures, and to assess the relationship between LPA, health, race/ethnicity, sex, income, and education. Chapter 2 explores in greater detail the

literature pertaining to inactivity, chronic diseases in the elderly, exercise, physical activity, LPA, self-rated health and quality of life among older adults. It also includes a discussion about Dweck and Leggett's (1988) incremental theory, Cockerham's (2005) health lifestyle theory, and Ajzen's (1991) theory of planned behavior, as the theoretical framework for the study. Chapter 3 outlines the study design, which uses already collected data from the "Active for Life: Translation of Physical Activity Programs for Mid-Life and Older Adults, 2003–2007." Additionally, it discusses the approach used to address the research questions and hypotheses. Chapter 4 provides an analysis of the findings and Chapter 5 discusses the implications of the research for social work, and makes recommendations for future areas of study.

CHAPTER 2

LITERATURE REVIEW

Introduction

The U.S. population is aging at a rapid rate. In 2012, Americans aged 65 or older represented 13.7% of the U.S. population, about 1 in every 7 Americans (Administration on Aging, 2013). This older population (persons 65 years or older) numbered 43.1 million, which was an increase of 7.6 million or 21% since 2002 (Administration on Aging, 2013). By 2050, it is anticipated that Americans aged 65 or older will number nearly 89 million people (Ortman, Velkoff, & Hogan, 2014). In 2012, persons reaching age 65 had an average life expectancy of an additional 19.3 years (20.5 years for females and 17.9 years for males; Kochanek, Murphy, Xu, & Arias, 2014). Additionally, there were 61,985 persons aged 100 or more (0.14% of the total 65+ population), a 93% increase from the 1980 figure of 32,194 (Administration on Aging, 2013). According to Dr. Takuji Shirasawa, professor in Aging Control Medicine at the Juntendo University in Tokyo, Japan, "the key is not just to *live longer*, but to stay healthy longer" (Spitzer, 2014).

Chronic Diseases and the Elderly

Aging is linked to changes in physiology and psychological functioning. Associated with the current growth in the number and proportion of older adults in the United States is a probable increase in health concerns, the occurrence of disability,

frailty, and chronic diseases including Alzheimer's, cancer, cardiovascular, and cerebral diseases (Lang, Benson, & Anderson, 2005). According to the Administration on Aging's *A Profile of Older Americans: 2013*, most older persons have at least one chronic illness; specifically, just under half of Americans ages 50–64 have been diagnosed with at a least one chronic condition (AARP, 2011). Among Americans 75 and older, 9 out of 10 have at least one chronic condition and more than 20% suffer from five or more chronic illnesses (AARP, 2011). The aging of the American population brings increased concerns about the consequences of chronic disease and its impact on quality of life, the ability to delay the onset of disabilities, and the associated costs of health care (Lang et al., 2005).

Chronic diseases, such as heart disease, cancer, diabetes, and stroke, are long-term illnesses that are rarely cured (Federal Interagency Forum on Aging-Related Statistics, 2012). Chronic diseases can affect a person's ability to perform important and essential activities, both inside and outside the home. Initially, the person may have trouble with the instrumental activities of daily living, such as managing money, shopping, preparing meals, and taking medications as prescribed (CDC, 2011). As functional ability—physical, mental, or both—further declines, people may lose the ability to perform more basic activities, called activities of daily living, such as taking care of personal hygiene, feeding themselves, getting dressed, and toileting (CDC, 2011). Many chronic conditions can be prevented or modified with behavioral interventions (Federal Interagency Forum on Aging-Related Statistics, 2012). Adopting a healthier lifestyle can help to prevent the onset of many chronic diseases and disabilities, thus allowing for independent living for a longer period.

The Benefits of Physical Activity for Older Adults

Exercise (planned, structured physical activity) is recommended for all older adults as a way to promote health, prevent falls, sustain independence in functioning, and reduce complications of comorbid conditions (Sullivan-Marx, Cuesta, & Ratcliffe, 2008). Many older adults know that exercise is a means to sustain or even improve health and well-being. Researchers (Hogan, Mata & Carstensen, 2013) pointed to the importance of exercise for both physical and psychological health. They suggested that even as individuals age, exercise remains an important contributor to psychological health, including affective experience and cognitive performance (Hogan et al., 2013). From a psychological perspective, the antidepressant effect of exercise helps to improve the mental well-being in older adults (Taylor et al., 2004).

More broadly, exercise improves the emotional, cognitive, social, and perceived physical function of older adults and alleviates physical symptoms such as pain, fatigue, and lack of energy and sleep (Taylor et al., 2004). The benefits of regular physical activity in older adults are extensive (Nelson et al., 2007). The findings of various researchers (Sullivan-Marx et al., 2008; Taylor, 2014; Taylor et al., 2004) add to a growing body of literature pointing to the importance of exercise for both physical and psychological health by suggesting that, even as individuals age, exercise remains a key contributor to psychological health, including affective experience (mood/emotions) and cognitive performance (Hogan et al., 2013; Taylor, 2014; Taylor et al., 2004).

Physical activity is any body movement that works the muscles and requires more energy than resting (NIH, 2011). Physical activity does not need to be strenuous to achieve health benefits. Research studies have found that as people age, participation in less intense types of physical activity increases, while participation in more vigorous

activities such as exercise decreases (Kruger, Ham, & Sanker, 2008). As recommended by the World Health Organization, adults 65 and older should engage in at least 150 minutes per week of moderate intensity physical activity. In order to maintain engagement in physical activity, more emphasis must be placed on helping older persons sustain the regularity of an active lifestyle over the course of their lifetime (Hughes, Prohaska, Rimmer, & Heller, 2005).

Persons aged 65 years and over gain substantial health benefits from regular physical activity and these benefits continue to occur throughout their lives (Chodzko-Zajko et al., 2009). The benefits of physical activity or exercise are reflected in improved cardiovascular and respiratory functions, reduction of risk factors of coronary heart diseases, and decreased morbidity and mortality (Chodzko-Zajko et al., 2009). Increases in the levels of physical activity can contribute to improvements in the quality of life of older adults (Guedes, Hatmann, Martini, Borges, & Bernardelli, 2012) and can be extremely beneficial to many persons with chronic medical conditions (Reed et al., 2011). Daily physical activity has been linked to reducing or eliminating risks of disease (Kruger et al., 2008).

More and more research has focused on the effect of physical activity in older adults. Williamson and Pahor (2010) and Taylor (2014) found that regular physical activity is associated with greater longevity as well as functional independence in older adults – the most important health outcome, even more than death, for most older people. Therefore, the more a person is able to increase the amount of physical activity through higher intensity, greater frequency, and/or longer duration, the more he or she will benefit (Chodzko-Zajko et al., 2009).

A 2013 research study by Brown, Riddell, Macpherson, Canning, and Kuk using a nationally representative U.S. sample of middle-aged, old, and very old adults found that participating in moderate-vigorous physical activity 1 time a week or more is associated with a lower mortality risk compared to being completely inactive. This study was one of the first to show that very old adults (≥80 years) who participate in moderate-vigorous physical activity 5 or more times per week have a significantly lower mortality risk compared to very old adults who are physically active but participate in a lower frequency of physical activity. This research suggests that all adults and in particular very old adults should be encouraged to participate in physical activity 5 or more times per week (Brown et al., 2013).

Physical Activity Guidelines for Older Adults

According to the Centers for Disease Control and Prevention, for adults (65 and older), physical activity is essential to healthy aging and is one of the most important things that persons can do for their health. As adults age, regular physical activity can prevent many of the health problems that seem to come with age (CDC, 2014). Outlined in Figure 2.1 are the recommended guidelines for adults 65 and older.

These guidelines serve to highlight what type of regular physical activity in which to engage. Of note, for adults under the age of 65, the guidelines are the same as for those 65 and older (CDC, 2014).

The American College of Sports Medicine and the American Heart Association in their joint recommendation state that to promote and maintain health older adults need moderate-intensity aerobic physical activity for a minimum of 30 minutes on 5 days each week or vigorous-intensity aerobic activity for a minimum of 20 minutes on 3 days each

Guidelines for Older Adults:

	at least 150 minutes (2 hours and 30 minutes) a week of moderate-intensity, **and**
	muscle-strengthening activities that are moderate or high intensity and involve all major muscle groups on 2 or more days a week

	75 minutes (1 hour and 15 minutes) a week of vigorous-intensity aerobic physical activity, **and**
	muscle-strengthening activities that are moderate or high intensity and involve all major muscle groups on 2 or more days a week

	an equivalent combination of moderate- and vigorous-intensity aerobic activity, **and**
	muscle-strengthening activities that are moderate or high intensity and involve all major muscle groups on 2 or more days a week
	aerobic activity should be performed in episodes of at least 10 minutes, and preferably spread throughout the week

Figure 2.1. Physical Activity Guidelines for Persons 65 Years of Age or Older.

week (Nelson et al., 2007). Moderate-intensity aerobic activity, which is generally equivalent to a brisk walk and noticeably accelerates the heart rate, can be accumulated toward the 30-minutes minimum from bouts lasting 10 or more minutes (Haskell et al., 2007). In 2007, the American College of Sports Medicine and the American Heart Association clarified the concept of accumulating short bouts of physical activity toward the 30-minute goal because there was confusion regarding how short these episodes could be. For consistency and clarity, the minimum length of these short bouts was clarified as being 10 minutes (Haskell et al., 2007). However, if older adults cannot meet the guidelines, they should be as physically active as their abilities and conditions allow (Chodzko-Zajko et al., 2009).

CDC's Behavioral Risk Factor Surveillance System (BRFSS) is a nationwide

surveillance system designed to collect state-level data. BRFSS has helped states survey U.S. adults regarding a wide range of personal behaviors that affect their health. BRFSS survey questions assess how many people engage in these and other health and risk behaviors, whether these behaviors are increasing over time, and which populations might be most at risk (CDC, 2013). Data from the 2013 BRFSS found that 28.1% of Americans 55–64 years of age and 33.5% of Americans 65 and older had not participated in any physical activity during the past month. Only 49.7% of Americans age 55–64 years and 47.8% of Americans age 65 and older met current recommendations (CDC, 2013) for physical activity as previously described. Therefore, over half of Americans are not meeting the guidelines of 150 minutes or more of physical activity per week.

Physical Inactivity

Despite all the recognized benefits of physical activity, the data indicate that a substantial number of older adults do not engage in sufficient physical activity to promote their health (Sun, Norman, & While, 2013; Taylor et al., 2004). Physical inactivity is implicated as a major risk factor in the development of cardiovascular disease (Taylor et al., 2004) and it accounts for approximately 25% of the increased risk of cardiovascular mortality due to depression in community-dwelling older adults 65 years and older (Win et al., 2011). Additionally, lack of physical activity is strongly associated with the development of physical impairment (Simonsick et al., 1993) and increased morbidity and mortality (Taylor, 2014). Psychosocial dimensions of health, including psychological well-being, and health-related quality of life (i.e., emotional, cognitive, and social functioning) are also impacted by physical inactivity (Taylor et al., 2004).

Kruger et al. (2008) examined the prevalence of inactivity among adults 50 years and older (*N* = 185,702) based on findings from the 2005 BRFSS. The researchers found that the prevalence of physical inactivity during leisure time among the older adults was 30%, and women reported a higher prevalence of inactivity than men across all age groups (Kruger et al., 2008). The prevalence of inactivity was lowest among those persons 50−64 years of age and highest among those ≥85 years of age. Almost 40% of men and 49% of women in this oldest age group were inactive.

Similarly in 2009, 33 % of Americans ages 45 to 64 did no physical activity in their leisure time. This percentage was 38% for 65- to 74-year-olds and jumped to 55 % for people 75 and older. Over two thirds of adults ages 65 and older reported no vigorous leisure-time physical activity lasting more than 10 minutes in the week (Jacobsen, Kent, Lee, & Mather, 2011).

In a study by Yorston et al. (2012), physical function was measured using the Medical Outcomes Study Physical Functioning (MOS-PF) scale, which indicates how participants' health limits them in their daily functional activities. The researchers found that adults 85 and older (30.4%) reported insufficient levels of physical activity defined as (1 to 149 minutes of physical activity per week); 16.8% of adults 85 and older reported no physical activity (0 minutes of physical activity per week); these findings are similar to the results of Kruger et al. (2008). Participants in this age group were also nearly 7 times as likely to develop a functional limitation as those aged 65 to 74.

Researchers agree that all adults should avoid inactivity; some physical activity is better than none (Dogra & Stathokostas, 2012); and adults who participate in any amount of physical activity gain some health benefits (Chodzko-Zajko et al., 2009), which

impacts their quality of life.

Successful Aging and Quality of Life

Successful aging is a major determinant of quality of life in older adults (Rowe & Kahn, 1997). For older adults, successful aging suggests not only living longer but also being able to maintain or improve quality of life over these years of extended life (Hand et al., 2012). According to Rowe and Kahn (1997), successful aging encompasses three main components: low probability of disease and disease-related disability, high cognitive and physical functional capacity, and active engagement with life. All of these are important aspects in maintaining quality of life with aging (Hand et al., 2012) and physical activity plays an important role in improving all three of these main components.

Functional limitations that impair the ability to live independently (such as walking and climbing a flight of stairs) are often reported to increase with advanced age (Grubert, Baker, McGeever, & Shaw, 2013). Functional limitations can increase the lack of mobility at home or in the community for older adults, which significantly narrows an older person's ability to do the things that bring enjoyment and meaning to life. Physical function is necessary to maintain independence and participate in community activities (Kawamoto, Yoshida, & Oka, 2004); it helps to keep persons engaged in life by enjoying the company of family and friends. Physical function is the most universally accepted indicator of health status in the elderly and is widely recognized as a crucial component of quality of life and an important consideration for older adults (Guedes et al., 2012; WHO, 2010).

Felce and Perry (1995) define quality of life as a conscious judgment of the

satisfaction an individual has with respect to his/her life. In addition, Guedes et al. (2012) found that physically active subjects present better quality of life perception than their sedentary peers.

Older Adults and Self-Rated Health

Aging is an individual experience influenced by well-being, quality of life, and perceived health (Harper, 1999). One of the major constraints in assessing the health of older adults is the lack of health status indicators that can be readily collected for a large number of individuals with minimal expenditure of resources (i.e., time, money, and logistics; Rahman & Barsky, 2003). Self-reported general health, in which respondents are asked to classify their current health status on some form of hierarchical scale (e.g., excellent, good, fair, poor), has become commonly used (Rahman & Barsky, 2003). Though clearly informative, an individual's self-rated health is not always in line with objective measures of his or her health (Hong, Zarit, & Malmberg, 2004). Self-assessments of health may differ from objective health because of comparisons of one's own health to that of others (Borawski, Kinney, & Kahana, 1996; Hong et al., 2004). It is likely that subjective physical activity studies reflect social desirability and recall bias (Sun et al., 2013).

Chipperfield (1993) utilized a self-rated health measure that asked participants to rate their own health compared to others their age, and the researcher cross-classified this with self-reports of diseases and chronic health problems. Results from this study showed that older adults (average age of 75 years) tended to overestimate their health and that this overestimation of health was linked with longevity and survivorship. In another study, Brown et al. (2013) found that for all ages, self-rated health tended to be good or

excellent with increasing levels of physical activity, and fair or poor with decreasing levels of physical activity.

Researchers Borawski et al. (1996) classified older adults as health optimists, those who rated their own health better than their physical health status, whereas those who rated their health accurately were classified as health realists. In the 1996 research of Borawski et al., of the older adults who were in poor objective health, those who appraised their health positively (i.e., health optimists) were significantly more likely to transcend their health problems. They accomplished this psychologically by identifying positive attitudinal and behavioral factors, rather than focusing on their physical health as the attributions underlying their health appraisals. McInnis-Dittrich (2005) found that older persons who had a positive attitude about their own abilities to handle what life dealt them also showed less likelihood of experiencing a decline in cognitive and intellectual functioning. In her research, Van Doorn (1999) found that respondents who acknowledged that they had health problems or concerns but who followed their answers with phrases such as “but I’m doing great” or “but I’m coping just fine” were exclusively health optimists. Health optimists contrary to health realists tended to maintain a positive view of their health by comparing themselves positively to others in their lives both familiar and not, writing off changes, and downplaying them as not surprising and not bad given their advancing years (Van Doorn, 1999). Interestingly, in Van Doorn’s study, health realists were more likely than health optimists to make neutral social comparisons (or were unwilling to compare) stating, “I don’t know about other people. I cannot tell about them, only me” (Van Doorn, 1999, p. 450).

Despite some of the shortcomings, self-rated health assessments can be a useful

and simple screening tool. Han et al. (2005) found that a change in self-rated health can be a useful and simple screening tool for individuals with a high risk of mortality. The researchers found that a decline in self-rated health over time indicated that health status was deteriorating and mortality risk was increasing.

Lifestyle Physical Activity

Given the demographic shift towards an older and less active population, the most feasible approach to reducing inactivity is to promote an active lifestyle. The benefits of this concept are important to explore because of the high number of older adults who are not meeting the recommended physical activity guidelines.

Lifestyle physical activity emerged in the early 1990s as part of a public health intervention that focused on increasing moderate-intensity activity while attempting to take into account individual, cultural, and environmental differences (Dunn, Andersen, & Jakicic, 1998). This approach (a) provides opportunities and options for tailoring physical activities to individuals regardless of their current lifestyle and (b) is aimed at individuals who are inactive or inadequately active (Dunn et al., 1998).

In LPA, people focus on integrating physical activity into their daily lives instead of restricting it to isolated exercises (Opdenacker, Delecluse, & Boen, 2011; Van Roie et al., 2010). This approach is expected to facilitate long-term maintenance of physical activity. LPA is especially effective because it requires few resources (Opdenacker et al., 2011). The benefits of LPA are supported through the research of Brawley, Rejeski, and King (2003) who found that "the fact that the lifestyle intervention *was at least as good as* standard physical activity programming offers adults a potential lifestyle management alternative for independently improving their physical activity" (p. 179).

Proposed Study

For this study, the definition of LPA draws from the work of Dunn et al. (1988). Lifestyle physical activity is defined as the daily accumulation of self-selected activities, which include leisure, recreational, or household activities that are physical in nature and can be planned or unplanned. These activities are not structured and are a part of everyday life. A critical point in this definition is that these are activities that the individual selects and are not prescribed. Also, these self-selected activities can be consciously planned by the individual or they can be unplanned by manipulation of the environment, such as climbing stairs instead of using escalators. Lifestyle physical activities can be accumulated in short bouts during the day rather than performed in one long bout of continuous activity (Dunn et al., 1988). As suggested by Newson and Kemps (2005), using a broad measure of activities integral to daily functioning and also encompassing measures of routine events such as shopping, doing housework, and other leisure activities, provides a more accurate reflection of the daily activity level of older adults.

As previously stated, the American College of Sports Medicine and the American Heart Association suggest a minimum of 30 minutes of physical activity on 5 days each week for older adults. This recommended amount of aerobic activity (whether of moderate or vigorous-intensity) is in addition to routine activities of daily living of light-intensity (e.g., self-care, cooking, casual walking, or shopping) or moderate-intensity activities lasting less than 10 minutes in duration (e.g., walking around home or office, walking from the parking lot; Haskell et al., 2007).

Secondary data from the AFL dataset (Wilcox, 2009) were used to answer the research questions that looked at whether there were notable health benefits among

participants who did not meet the recommended physical activity guidelines (related to frequency, duration, and intensity) but who engaged in LPA. Lifestyle physical activity was measured using data from the Community Healthy Activities Model Program for Seniors (CHAMPS) physical activity questionnaire. The CHAMPS questionnaire has established reliability and validity measures in this population (Stewart et al., 2001). The 41-item questionnaire assesses weekly frequency and duration of various physical activities typically undertaken by older adults. It includes activities typically undertaken by older adults for exercise, activities done in the course of their day that are physical in nature, and recreational activities that provide physical activity (Stewart et al., 2001). This study focused on lifestyle activities using the definition above. All other activities that did not fit within the definition were excluded from analysis in order to maintain the distinction between structured exercise and incidental physical activity.

Theoretical Framework

In trying to address the problem of inactivity and sedentary behavior among older adults, a theoretical framework was needed that suggests (a) persons engaging in inactivity and sedentary behavior are capable of change, (b) the method that will be utilized to change the behavior will be realistic, and (c) the goal will appear to be achievable. Since there was not one theory that captured all three of these elements, a combination of the major principles of three theories was utilized. The study used a conceptual approach that was informed by Dweck and Leggett's (1988) incremental theory, Cockerham's (2005) health lifestyle theory, and Ajzen's (1991) theory of planned behavior.

Incremental Theory

According to an incremental view, dispositions are malleable and people can change (Dweck, Chiu, & Hong, 1995). People with an incremental mindset believe that negative behavior is something changeable, requiring more effort, rather than something more permanent, such as low ability or inability. Incremental theorists focus more on behavioral factors (e.g., effort, problem-solving strategies) as the cause of negative achievement outcomes, and believe that people tend to act on these behavioral factors (i.e., try harder, develop better strategies) as they continue to work towards mastery of the task (Dweck et al., 1995).

Studies in the domains of achievement, goals, and personality have provided data that suggest that people can indeed change through effort (Kammrath & Peetz, 2012). Through hard work and environmental supports, people can improve their performance, learn new skills, and adopt positive habits (Koestner et al., 2006; Stadler, Oettingen, & Gollwitzer, 2009). Consequently, for inactive older adults wishing to increase their level of physical activity, choosing activities that are enjoyable and can be done regularly is important.

The difficulty of change should not be minimized, but the possibility of change through effort should be emphasized. Individuals with chronic conditions are less likely to engage in health behaviors than the general population, and this may lead to greater difficulties in improving lifestyles (Newsom et al., 2012). If they set realistic expectations, people may be less likely to experience negative emotions if change occurs in baby steps rather than grand leaps (Carver, 2004; Webb & Sheeran, 2006). As such, shorter increments of physical activity will seem more achievable than long bouts of exercise and nonexercise physical activities (e.g., climbing a flight of stairs vs. taking the

elevator) can more readily be incorporated into activities of daily life. Continuing physical activity in the long term is related to how reasonable the activity form is for the person (Hirvensalo, Heikkinen, Lintunen, & Rantanen, 2003). From an incremental perspective, it is important that older persons pick activities that match their abilities.

Health Lifestyle Theory

Central to health lifestyle theory is the proposition that "people align their goals, needs, and desires with their probabilities of realizing them and choose a lifestyle according to their assessments of the reality of their resources and class circumstances" (Cockerham, 2005, p. 61). More relevant to physical activity, many daily lifestyle choices and practices involve considerations of health outcomes (Cockerham, 2005). Thus, choices and chances operate in tandem such that persons possessing greater economic, cultural, and social resources also have a greater belief in their own ability to affect their health and attain desired goals (Cockerham et al., 1997).

The health lifestyle theory suggests that people set goals based on how realistic they perceive the goal achievement to be. Lifestyle physical activity suggests that physical activity does not have to be strenuous to be beneficial. Using the health lifestyle theory, the focus is on adding more movement and activity to one's life; therefore, goals related to physical activity can be small, incremental, and personalized. As such, the recommendation for inactive older adults is to increase physical activity gradually over time. This advice minimizes risk of overuse injury, makes increasing activity more pleasant, and allows positive reinforcement for small steps that lead to attainment of intermediate goals (Nelson et al., 2007). Once the goal is set, the theory of planned behavior accounts for the way in which individuals make decisions about whether to

perform a specific behavior (Ajzen, 1991).

Theory of Planned Behavior

The theory of planned behavior is a model that accounts for the way in which individuals make decisions about whether to perform a specific behavior (Ajzen, 1991). The model proposes that a person's intentions to perform a particular behavior are determined by three separate components: the individual's attitude towards the behavior; the favorability of the perceived social opinion about the behavior, or subjective norm (i.e., the perceived social pressure to perform a behavior); and the degree of perceived behavioral control (i.e., the person's belief about the ease or difficulty in performing a given behavior based on past experiences, resources, opportunities, and barriers). According to Ajzen (2011), in the theory of planned behavior, the most detailed substantive information about the determinants of a behavior is contained in a person's behavioral, normative, and control beliefs. The theory does not specify where these beliefs originated; it merely points to a host of possible background factors that may influence the beliefs people hold. Perceived behavioral control (PBC) has been described as "people's perception of the ease or difficulty of performing the behavior of interest" (Ajzen, 1991, p. 183) and is useful for predicting behavior that is not under an individual's volitional control.

In using the guiding principles of the above-referenced theories, we can gain better insight into the best practices involved in engaging older adults into an active lifestyle. This understanding will help us to determine and promote the most successful interventions. This study served to highlight the importance and benefits of a physically active lifestyle that is nonstructured but individualized to meet a person's ability. This

research was important because it suggested a cost-effective intervention for promoting better health in older adults leading to added years of independence.

CHAPTER 3

RESEARCH METHODS

Introduction

Inactivity among adults 50 and older is associated with a variety of health problems and impacts quality of life and life satisfaction. Much of which has been examined by previous researchers was described in Chapter 2. As such, it is important to examine ways of incorporating physical activity as part of a person's daily routine. Lifestyle physical activity in the proposed study is described as the daily accumulation of nonstructured physical activities. A mastery of this LPA approach will help professionals in the aging field to promote physical activity that is focused around an older person's day-to-day activities.

This chapter describes the research methodology of the original study—AFL—which evaluated two evidence-based behavioral programs. Also provided are descriptions of the current study design and rationale; a description of the secondary source of the data that included the sample selection for the study population; definitions and descriptions of the independent, dependent, and covariate variables; and a summary of the statistical analysis plans for the study, study limitations, and ethical protections for research subjects.

Active for Life: Translation of Physical Activity Programs for Mid-Life and Older Adults

The AFL initiative investigated how two physical activity programs for adults aged 50 and older, Active Choices and Active Living Every Day, worked in community settings. The first evidence-based intervention Active Choices (AC) used lifestyle counseling and personalized telephone support to encourage older adults to be physically active. These activities were part of a 6-month program delivered through one face-to-face meeting followed by up to eight one-on-one telephone counseling calls.

The second intervention, Active Living Every Day (ALED), provided lifestyle counseling to promote physical activity by using a classroom setting and workbook format. ALED was delivered as a 20-week program where participants attended weekly small group meetings, but in the last year, it was shortened to 12 weekly meetings. After the first 3 years, the lead organizations requested that the program be shortened to 12 weeks because the length made it difficult to recruit participants and created some barriers in partnering with organizations that typically offered shorter programs or that operated on schedules not conducive to a 20-week intervention cycle. The program developers made adaptations to shorten the program yet maintain its essential elements by (a) eliminating elements not being used (e.g., walk test); (b) making optional or eliminating materials and activities not directly related to the program's essential elements (e.g., in-depth discussion of metabolic expenditure, a relaxation exercise); (c) combining related topics that were previously addressed in separate sessions (e.g., stress management and time management); (d) decreasing the amount of review and reinforcement of lifestyle skills covered in multiple sessions; and (e) extending the length of each session from 60 to 90 minutes (Wilcox, 2009).

Nine organizations received AFL grants to implement programs during 2003–2006. Four grantees implemented the one-on-one AC model at five sites, while five grantees implemented the group-based ALED model at seven sites. The AC grantees were the YMCA of Metropolitan Chicago (Chicago, IL), San Mateo County Health Services (San Mateo, CA), Blue Shield of California (Woodland Hills, CA), and Church Health Center (Memphis, TN). The ALED grantees were the Greater Detroit Area Health Council (Detroit, MI), FirstHealth of the Carolinas (Pinehurst, NC), Jewish Council for the Aging of Greater Washington (Rockville, MD), OASIS Institute (St. Louis, MO), and Council on Aging of Southwestern Ohio (Cincinnati, OH). Recruitment strategies for the AFL study among the grantees included using a combination of newspaper advertisements, direct mail, presentations to community and clinical groups, community flyers, and church contacts (Wilcox, 2009).

Data were collected from the AC and ALED sites for both process and outcome evaluations. The AFL 2003–2007 dataset contains 14 data files on 8,100 study subjects (Wilcox, 2009). The target population for the AFL study were persons residing in the United States who were 50 years of age and older, sedentary or underactive (i.e., 2 or fewer days/week and less than 120 minutes/week of physical activity), and free of medical conditions or disabilities that required higher levels of supervision (Wilcox, 2009).

The primary aims of the process evaluation were to (a) monitor the extent to which the grantees demonstrated fidelity to the AC and ALED models in their program implementation, (b) assess staff experiences implementing the programs, and (c) assess participants' impressions of the programs. A quasi-experimental, pre–post study design

was used to assess outcomes. Primary aims of the outcome evaluation were to evaluate the impact of AC and ALED on self-reported physical activity, and to evaluate the impact of the programs on self-reported stress, depressive symptoms, and satisfaction with body function and appearance (Wilcox, 2009). Secondary aims of the outcome evaluation were to (a) evaluate the impact of the programs on measures of functional fitness; (b) examine whether changes in self-reported physical activity and functional fitness were moderated by participant characteristics, including age, gender, race, baseline physical activity self-efficacy, and baseline physical activity social support; and (c) examine whether changes in self-reported physical activity were consistent with a mediation model for physical activity self-efficacy and physical activity social support (Wilcox, 2009).

Lifestyle Physical Activity Study

The LPA Study used secondary data from the AFL dataset (Wilcox, 2009). This quantitative, cross-sectional study examined if LPA impacted objective and/or subjective health outcomes of older adults. Additionally, the relationship between self-rated health and self-reported health conditions in older adults who engage in LPA was assessed.

Sample

The target population for the study was a subset of the AFL subjects. The sample for the LPA study was persons 50 years of age and older who completed the pretest AFL questionnaire and responded to the question that asked whether they engaged in moderate physical activity for at least 10 minutes per week, n = 5,997 (Table 3.1). In looking at the responses (1 = yes, n = 3,414 and 2 = no, n = 2,539), this dataset was further paired down to focus on respondents who answered “no.” Only respondents who answered “no” to the

question, “In a usual week, do you do at least 10 minutes of moderate physical activity?” were considered in the analysis (n = 2,539). Those who did not meet this criterion were excluded from the analysis. Descriptive statistics were run to determine the distribution by sex of the inactive participants.

Among those individuals who did not do at least 10 minutes of physical activity per week, persons who engaged in housework or gardening or home repair or walking for errands formed the research sample, n = 1,067 (Table 3.2). These individuals responded, “yes” to at least one of these questions:

Q19a. Do heavy work around the house?

Q20a. Do light work around the house?

Q21a. Do heavy gardening?

Q22a. Do light gardening?

Q23a. Work on your car, truck, lawn mower, or other machinery?

Q27a. Walk to do errands?

As such, to determine those subjects that engaged in LPA, the following criteria had to be met (see Figure 3.1). Only those respondents who met all the criteria were considered in the analysis.

Instrumentation

The AFL questionnaire incorporated questions from the Community Healthy Activities Model Program for Seniors (CHAMPS) questionnaire. The CHAMPS questionnaire is a 41-item self-report measure of physical activity that has strong psychometric properties, including demonstrated validity, test-rest reliability, and sensitivity to change. The LPA study used specifically selected questions from the

Table 3.1. Distribution of Persons Who Did at Least 10 Minutes of Moderate Physical Activity

At least 10 minutes of moderate physical activity	No. of persons	%
Yes	3,414	56.5
No	2,539	42.0
Total	5,997	

Table 3.2. Distribution of Lifestyle Physical Activity Sample Group

	No. of participants	%
Females	891	83.5
Males	176	16.5
Total	1,067	100.0
Missing	1	
Total	1,068	100.0

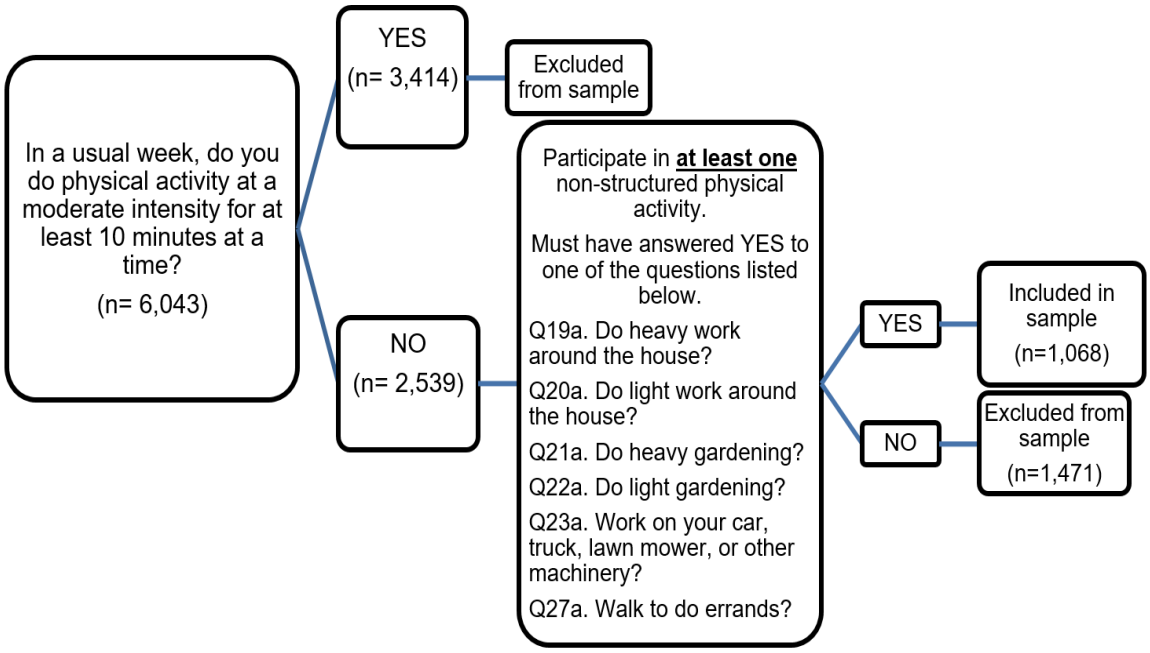

Figure 3.1. Sample Criteria Inclusion

CHAMPS questionnaire to assess LPA.

The AFL questionnaire also incorporated questions from CDC's BRFSS; the BRFSS survey questions assess how many people engage in health risk behaviors, whether these behaviors are increasing over time, and which populations might be most at risk. The LPA study used select questions related to health to assess the self-rated health of respondents and their self-reported health conditions. In selecting questions, efforts were made to control for threats to the study's reliability and validity. According to Rubin and Babbie (1993), it is desirable that a measure be valid (measure the construct in question) and reliable (able to provide consistent data); however, developing measures that are reliable and still capable of tapping the richness of meaning of concepts is a persistent and inevitable dilemma for the social researcher. Using pretest data only minimized several threats to internal validity. The threat to testing was eliminated by only looking at initial responses. The threat to instrumentation is only of concern in the pretest-posttest situation. Additionally, the threat to mortality was not relevant because by using pretest data only, there was no concern of dropouts. The CHAMPS questionnaire that was utilized for the study has strong psychometric properties, including demonstrated validity and test–retest reliability (Harada, Chiu, King, & Stewart, 2001). Table 3.3 provides a list of the specific questions that were used to measure each of the constructs (i.e., self-rated health, self-reported health conditions, sex, race/ethnicity, income and education).

Research Questions and Hypotheses

RQ1. Among older adults who engage in LPA, is there an association between self-rated health scores and self-reported health conditions?

Table 3.3. Description of Variables and Questions

Variable Name	Variables	Questions
Health_self-rated	Self-rated health score Ordinal variable coded as excellent (5); very good (4); good (3); fair (2); poor (1)	In general, would you say your health is . . .
Health_conditions	Self-reported health conditions Nominal variable (dichotomous) and coded as 0–1 chronic health conditions = low (1); 2+ chronic health conditions = high (2)	Have you ever been told by a doctor, nurse, or other health professional that you have any of the following: a. Diabetes? b. High blood pressure? c. A heart attack, also called myocardial infarction? d. Angina (chest pain) or coronary heart disease? e. A stroke? f. Some form of arthritis, rheumatoid arthritis, gout, lupus, or fibromyalgia? g. Osteoporosis (weak bones)?
Race_ethnic	Race and Ethnicity Nominal variable and coded as Black or African American (1); Hispanic (2); Other (3); and White (4).	Which one or more of the following would you say is your race? Are you Hispanic or Latino?
Sex	Sex Nominal variable and coded as either female (0) or male (1).	What is your gender?
Educ	Education level Ordinal variable and grouped as less than high school (1); high school or GED (2); and some college or higher (3).	What is the highest grade or year of school you completed?
Income_cat	Household/family income Interval variable and coded as <$30,000 (1); $30,000–$59,999 (2); and $60,000 + (3)	What is your total yearly household/family income from all sources?

H_1. Older adults who have a higher score for their self-rated health will have fewer self-reported health conditions.

RQ2.1. Among older adults who engage in LPA, does type of activity and/or intensity affect self-rated health scores?

H_1. There will be a significant association between type of activity and/or intensity and self-rated health scores among older adults who engage in LPA.

RQ2.2. Among older adults who engage in LPA, does type of activity and/or intensity affect self-reported health conditions?

H_1. There will be a significant association between type of activity and/or intensity and self-reported health conditions among older adults who engage in LPA.

H_2. Older adults who engage in more vigorous LPA will have less self-reported health conditions.

RQ3. Among older adults who engage in LPA, when looking at race/ethnicity, sex, income, and education, which social determinants have significant associations with self-reported health conditions? Of these, which ones are predictors of health conditions?

H_1. There will be a significant association between social determinants and health conditions among older adults who engage in LPA.

Data Analysis

Data were downloaded from the Inter-university Consortium for Political and Social Research (ICSPR) website. Statistical analyses were conducted using the

Statistical Package for Social Sciences (SPSS), version 22.0. The numerical variables were screened for missing cases, normality, and outliers. The alpha level was set at the traditional values for social science research (0.05) with the goal of maintaining good statistical power and statistical significance (Abu-Bader, 2010).

Both descriptive and inferential statistics were used in the LPA study to test the hypotheses and to help to interpret the results. Descriptive statistics is a method for presenting quantitative descriptions in a manageable form (Rubin & Babbie, 1993). The descriptive statistics were used to summarize the demographic information of the study population.

Inferential statistics involves statistical computations relevant to making inferences from findings about a population from observations and analyses of a sample (Rubin & Babbie, 1993). Research Question 1 and Research Question 2.1 used the independent *t* test to examine the difference between the means of two independent groups to see whether the difference is statistically significant (Abu-Bader, 2006). The Mann-Whitney *U* test, a nonparametric test used to compare two groups when the dependent variable is measured at the ordinal level, or measured at the interval level, was also conducted since the dependent variable did not meet the assumption of normality (Abu-Bader, 2006) for both questions. Part 2 of RQ 2 used a chi-square test. A chi-square test was used to test if the categorical variables are associated in any way in the LPA group. Phi was used to measure the percentage of variance in the dependent variable that is accounted for by the independent variable (Abu-Bader, 2006). Traditionally, social science researchers set alpha at .05; that is, the probability of making a type I error is 5 in 100 (Abu-Bader, 2006). A significant result ($p < .05$) indicates that a relationship exists.

A nonsignificant result means that no effects were discovered and chance could explain the observed differences. Question 3 was analyzed using logistic regression. Logistic regression is a predictive analysis that can be used to identify the variables associated with being in one condition over another (Meyers, Gamst, & Guarino, 2006). In other words, logistic regression analysis is used primarily to examine the probability that an individual will fall into one of the two groups (Abu-Bader, 2006). These statistics are noted below and linked to the appropriate research question. Also identified are the independent and dependent variables in each question. An independent variable is a variable that stands alone and is not changed by the other variables being measured. It is a variable believed to cause an effect (Abu-Bader, 2006). A dependent variable is something that depends on other factors. It is a measure of the effect of the independent variable (Abu-Bader, 2006). Tables 3.4 to 3.6 provide the details for the three research questions of the study.

Limitations

Limitations of the LPA study included the inability to quantify the degree of lifestyle physical activities in terms of the exact duration, intensity, and weekly frequency. In addition, the use of standardized instruments did not allow for additional questions that might add value to the responses. There was no control of or input in the data collected. The cross-sectional nature of the study did not allow causal inference. Finally, the reliance on self-reported data was also a limitation because responses received could be inaccurate and there was subsequently no way of verifying the information.

Table 3.4 Research Question 1

Component	Details
Question	Among older adults who engage in LPA, is there an association between self-rated health scores and self-reported health conditions?
Independent variable	Self-reported health conditions
Dependent variable	Self-rated health score
Statistical analysis	Independent *t* test /Mann-Whitney *U*

Table 3.5 Research Question 2

Component	Details
	Research Question 2.1
Question	Among older adults who engage in LPA, does type of activity and/or intensity affect self-rated health scores?
Independent variable	Type of activity
Dependent variable	Self-rated health score
Statistical analysis	Independent *t* test /Mann-Whitney *U*
	Research Question 2.2
Question	Among older adults who engage in LPA, does type of activity and/or intensity affect self-reported health conditions?
Independent variable	Type of activity
Dependent variable	Self-reported health conditions
Statistical analysis	Chi-square and phi

Table 3.6 Research Question 3

Component	Details
Question	Among older adults who engage in LPA, when looking at race and ethnicity, sex, income, and education, which social determinants have significant associations with self-reported health conditions? Of these, which ones are predictors of health conditions?
Independent variables	1. Race and ethnicity 2. Sex 3. Income 4. Education
Dependent variable	Self-reported health conditions
Statistical analysis	Logistic regression

Ethical Considerations

The LPA study used public and restricted, archived, secondary data from the Health and Medical Care Archive, which is the data archive of the Robert Wood Johnson Foundation and operated by the Inter-university Consortium for Political and Social Research at the University of Michigan. Use of the study data did not pose a risk of identification or breach of confidentiality for any study participant. There were no names linked to the case numbers and all data were kept in a secure and restricted facility. The study proposal was submitted to the University of Utah Institutional Review Board and received approval prior to any data analysis. Additionally, the study also received approval from the Inter-university Consortium for Political and Social Research to use the restricted data.

CHAPTER 4

FINDINGS

Introduction

Chapter 4 summarizes the results of the data analysis used to address the three specific aims for this research study. Using the AFL study from 2003 to 2007, this study considered the concept of LPA among older adults who engage in this practice and explored whether there is an association between their self-rated health and their health conditions. Also examined among this group was whether intensity of the participants' activities impacted their health outcomes. Finally, the study looked LPA and four social determinants (race and ethnicity, sex, income, and education) to see if there was any correlation with self-reported health conditions.

This chapter presents the descriptive statistics and findings based on the data. The statistical analysis was accomplished using SPSS 22.0, which was used to run the *t* test, Mann-Whitney *U*, chi-square, descriptive statistics, crosstabulations, and multivariate logistic regression analysis.

Sample Demographics

The sample (n = 1,067) consisted of both males (16.5%) and females (83.5%) between the ages of 47 and 96, with a mean age of 68 years of age (see Figure 4.1). The majority of participants identified as White (50%); however, Blacks/African Americans (37%) and Hispanics (8%) were the next two largest groups. Sixty-two percent of

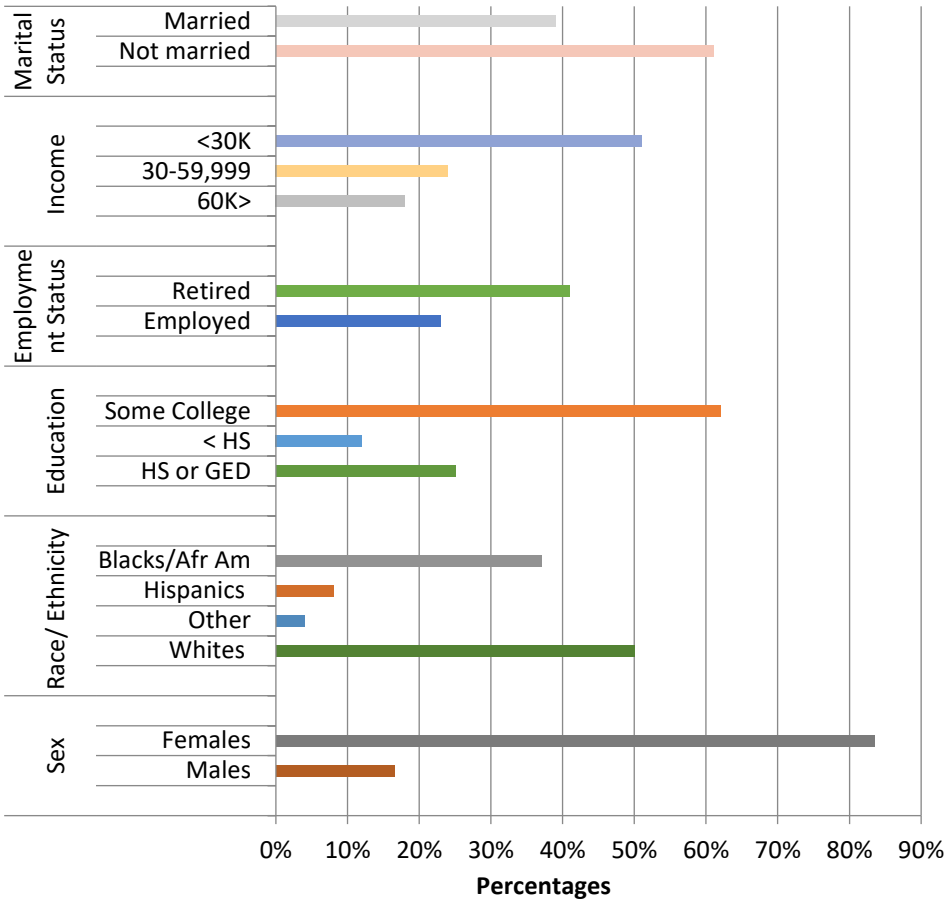

Figure 4.1. Summary of Demographics for Sample Group

participants had completed some college or higher, 25% completed high school or received a GED, and 12% had less than a high school education. The majority of the study participants were retired (41%); however, 23% were employed or self-employed. Participants surveyed had modest household incomes. Fifty-one percent had a household income of less than $30,000; followed by household income of $30,000 - $59,999 (24%), and household income $60,000 or greater (18%). Thirty-nine percent were married or partnered; the remainder (61%) was divorced, widowed, separated, or single. Participants lived in 15 states, but the top three states represented were California (19%), Illinois (15%), and Tennessee (14%).

When assessing health status through their calculated body mass index (BMI), 48% of participants were considered obese, with a BMI > 30.0 kg/m^2; 32% were overweight, with a BMI of 25.0 to 29.9 kg/m^2; 19% were in the normal range of 18.5 to 24.9 kg/m^2; and 1% were underweight (below 18.5 kg/m^2; see Figure 4.2). BMI is a person's weight in kilograms divided by the square of height in meters. BMI can be used as a tool to screen for weight categories that are linked to physical health challenges (CDC, 2015).

Interpretation of Findings

Research Question 1

The first research question looked at how older adults who remained active by participating in household activities viewed their health. The aim of this research question was to compare how they viewed their health with the number of chronic ailments they were experiencing to see if there was a relationship between the two. The research question was, "Among older adults who engage in LPA, is there an association between self-rated health scores and self-reported health conditions?"

Inferential statistics were used to answer the first question. Testing the hypothesis began with recoding self-rated health scores from string variables to ordinal variables and self-reported health conditions from string variables to numerical variables. Once recoded, the categorical variables of self-rated health scores and self-reported health conditions were screened for missing cases, normality, and outliers. There were 12 missing cases and 0 outliers. While the Kolmogorov-Smirnov test for normality showed a violation, all other tests showed that the distributions were sufficiently normal and the sample size was large enough (n = 1,056).

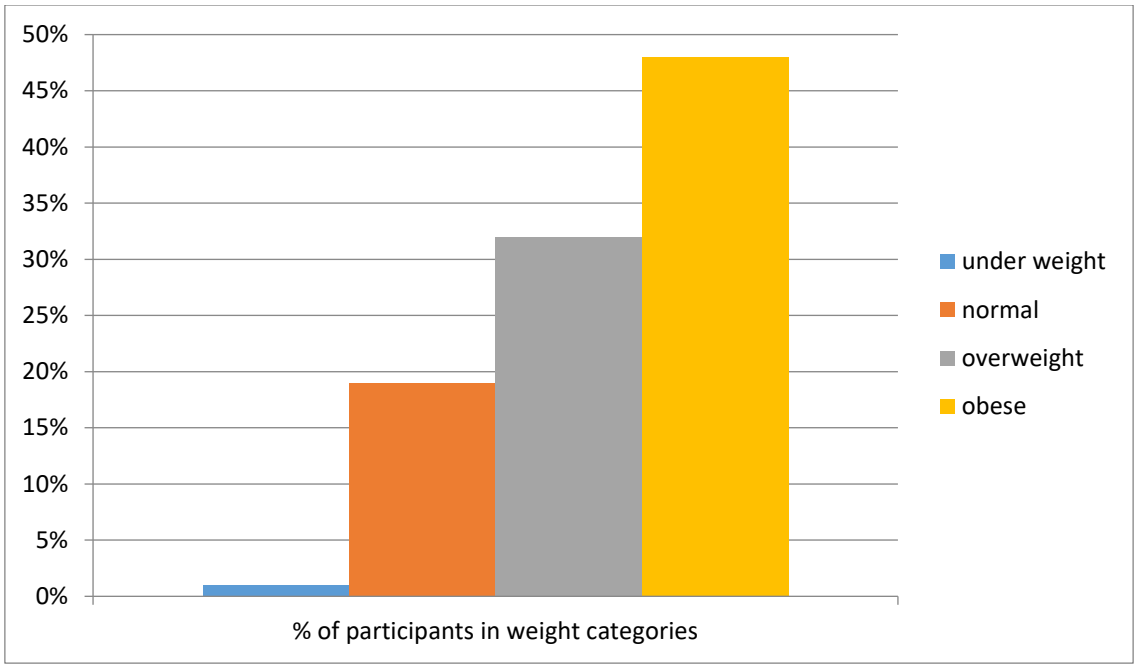

Figure 4.2. Weight Categories for Sample Group as Measured With Body Mass Index

An independent *t* test was conducted to examine the differences in self-rated health scores among persons with low self-reported health conditions and high self-reported health conditions. The results showed a statistically significant difference in self-rated health scores between the low health conditions group and the high health conditions group ($t_{(df = 1054)} = 8.34$; $p < .05$). In the study, the group with zero to one chronic illnesses, the low health conditions group, reported significantly higher self-rated health scores ($M = 3.19$) than the group with two or more chronic illnesses, the high health conditions group ($M = 2.77$). The mean difference was .42 and significant at 5 percent level. These results are supported by the results of the Mann-Whitney *U* test, which also showed a significant difference in self-rated health scores between persons with low and high health conditions ($z = -8.02$, $p < .05$). Table 4.1.

A Mann-Whitney *U* test was conducted to examine the differences in self-rated health scores among persons with low self-reported health conditions and high self-

Table 4.1. Results From the Independent *t* Test for Health Conditions and Self-Rated Health

Variable	*N*	*M*	*SD*	*t*	*p*
Self-rated health score					
Low health conditions	434	3.19	.81	8.34	.000
High health conditions	622	2.77	.79		
Z = -8.02					

p < .05 (significant)

reported health conditions. The results indicated that self-rated health scores were significantly higher among LPA persons with low chronic health conditions than LPA persons with condition health conditions. *U* = 99047.50 *p* < .05 *r* = .25 between small to medium effect size.

Research Question 2.1

Part 1 of the second research question examined types of nonexercise activities participants engaged in around their homes and neighborhoods to see if the type and/or intensity of the activity impacted how they rated their health. Research Question 2.1 was, "Among older adults who engage in LPA, does type of activity and/or intensity affect self-rated health scores?" The types of activities examined to answer the question were (a) heavy work around the house; (b) light work around the house; (c) heavy gardening; (d) light gardening; (e) work on car, truck, lawn mower, other machinery; and (f) walking to do errands.

For RQ 2.1.a., the categorical variables of self-rated health scores and heavy work around the house were screened for missing cases, normality, and outliers. There were 12 missing cases and 0 outliers. While the Kolmogorov-Smirnov test for normality showed a violation, all other normality tests showed that the distributions were sufficiently normal

and the sample size was large enough (n = 1,056).

An independent t test was conducted to examine the differences in self-rated health scores among persons who did and who did not engage in heavy work around the house. The independent t test between self-rated health scores and heavy work around the house found that the result was not significant, $p > .05$, indicating that there was no association between these two variables.

For Question 2.1.b., self-rated health scores and light work around the house were screened for missing cases, normality, and outliers. There were 11 missing cases and 0 outliers. While the Kolmogorov-Smirnov test for normality showed a violation, all other tests showed that the distributions were sufficiently normal and the sample size was large enough (n = 1,057). Therefore, an independent t test between self-rated health scores and light work around the house was conducted to explore the relationship between these two variables. The results showed a statistically significant difference between persons who did light work around the house and persons who did not do light work around the house ($t_{(df = 1054)} = -2.39$; $p < .05$). In the study, the group that *did not* do light work around the house reported significantly lower self-rated health scores (M = 2.79) than the group the group that did do light work around the house (M = 2.97). The mean difference was -.17. These results are supported by the results of the Mann-Whitney U test, which also showed a significant difference in self-rated health scores between persons with low and high health conditions ($z = -2.11$, $p < .05$; Table 4.2).

For Question 2.1.c., self-rated health scores and heavy gardening were screened for missing cases, normality, and outliers. There were 12 missing cases and 0 outliers. While the Kolmogorov-Smirnov test for normality showed a violation, all other tests

Table 4.2. Results From the Independent *t* Test for Light Work around the House and Self-Rated Health

Variable	*N*	*M*	*SD*	*t*	*p*
Self-Rated Health Score					
Light work around the House? NO	146	2.79	.85	-2.39	.02
Light work around the House? YES	911	2.97	.82		
Z = -2.11					

$p < .05$ (significant)

showed that the distributions were sufficiently normal and the sample size was large enough (n = 1,056). Therefore, an independent *t* test between self-rated health scores and heavy gardening was conducted to explore the relationship between these two variables. The independent *t* test between self-rated health scores and heavy gardening showed that the results was not significant $p > .05$, indicating that there was no association between these two variables.

For Question 2.1.d., self-rated health scores and light gardening were screened for missing cases, normality, and outliers. There were 14 missing cases and 0 outliers. While the Kolmogorov-Smirnov test for normality showed a violation, all other tests showed that the distributions were sufficiently normal and the sample size was large enough (n = 1,054). To explore the relationship between self-rated health scores and light gardening, an independent *t* test was conducted. The results showed a statistically significant difference between persons who did light gardening around the house and persons who did not do light gardening around the house ($t_{(df = 1052)} = -3.37$; $p < .05$). In the study, the group that *did not* do light gardening reported significantly lower self-rated health scores (M = 2.85) than the group that did do light gardening (M = 3.03). The mean difference was -.17. These results are supported by the results of the Mann-Whitney *U* test, which also showed a significant difference in self-rated health scores between older persons

with who participate in light gardening versus older persons who do not (z = -3.40, p = .001; Table 4.3).

For Question 2.1.e., self-rated health scores and work on car, truck, lawn mower, or other machinery were screened for missing cases, normality, and outliers. There were 13 missing cases and 0 outliers. While the Kolmogorov-Smirnov test for normality showed a violation, all other tests showed that the distributions were sufficiently normal and the sample size was large enough (n = 1,055). An independent t test between self-rated health scores and work on car, truck, lawn mower, or other machinery found that the results of the test were not significant $p > .05$, indicating that there was no association between these two variables.

For Question 2.1.f., self-rated health scores and walking to do errands were screened for missing cases, normality, and outliers. There were 13 missing cases and 0 outliers. While the Kolmogorov-Smirnov test for normality showed a violation, all other tests showed that the distributions were sufficiently normal and the sample size was large enough (n = 1,055). An independent t test between self-rated health scores and walking to do errands found that the results of the test were not significant $p > .05$, indicating that there was no association between these two variables.

The results of the independent t tests showed that there was only an association between self-rated health scores and the lower intensity activities: light work around the house and light gardening. The results are presented in a summary table (Table 4.4).

Research Question 2.2

Part two of the second research question examined if the types of nonexercise activities participants engaged in around their homes and neighborhoods was associated

Table 4.3. Results From the Independent *t* Test for Light Gardening around the House and Self-Rated Health

Variable	*N*	*M*	*SD*	*t*	*p*
Self-Rated Health Score					
Light gardening around the House? NO	494	2.85	.77	-3.37	.00
Light gardening around the House? YES	560	3.03	.86		
Z = -3.40					

$p < .05$ (significant)

Table 4.4. Summary of Research Findings for Question 2.1

RQ	Independent variable	Dependent variable	Research findings
2.1.a	Heavy work around the house	Self-rated health score	Not significant
2.1.b	Light work around the house	Self-rated health score	Significant
2.1.c	Heavy gardening	Self-rated health score	Not significant
2.1.d	Light gardening	Self-rated health score	Significant
2.1.e	Work on car, truck, lawn mower, other machinery	Self-rated health score	Not significant
2.1.f	Walking to do errands	Self-rated health score	Not significant

with the number of chronic illnesses they experienced. Research Question 2.2 was, "Among older adults who engage in LPA, does type of activity and/or intensity affect self-reported health conditions?"

A chi-square analysis was used to answer part two of the second question. This question examined types of activities: (a) heavy work around the house; (b) light work around the house; (c) heavy gardening; (d) light gardening; (e) work on car, truck, lawn mower, other machinery; and (f) walking to do errands, and self-reported health conditions to determine if there was an association.

For Question 2.2.a., the categorical variables of self-reported health conditions and heavy work around the house were screened for missing cases, normality, and outliers. There were 2 missing cases and 0 outliers. While the Kolmogorov-Smirnov test

for normality showed a violation, all other tests showed that the distributions were sufficiently normal and the sample size was large enough (n = 1,066). The chi-square test of independence between self-reported health conditions and heavy work around the house found that the result was not significant, $p > .05$, indicating that there was no association between these two variables.

For Question 2.2.b., self-reported health conditions and light work around the house were screened for missing cases, normality, and outliers. There was 1 missing case and 0 outliers. While the Kolmogorov-Smirnov test for normality showed a violation, all other tests showed that the distributions were sufficiently normal and the sample size was large enough (n = 1,067). The chi-square test of independence between self-reported health conditions and light work around the house found that the result was not significant, $p > .05$, indicating that there was no association between these two variables.

For Question 2.2.c., self-reported health conditions and heavy gardening were screened for missing cases, normality, and outliers. There were 2 missing cases and 0 outliers. While the Kolmogorov-Smirnov test for normality showed a violation, all other tests showed that the distributions were sufficiently normal and the sample size was large enough (n = 1,066). A chi-square test of independence between self-reported health conditions and heavy gardening found that the result was not significant, $p > .05$, indicating that there was no association between these two variables.

For Question 2.2.d., self-reported health conditions and light gardening were screened for missing cases, normality, and outliers. There were 5 missing cases and 0 outliers. While the Kolmogorov-Smirnov test for normality showed a violation, all other tests showed that the distributions were sufficiently normal and the sample size was large

enough (n = 1,063). A chi-square test of independence between self-reported health conditions and light gardening found that the result was not significant, $p > .05$, indicating that there was no association between these two variables.

For Question 2.2.e., self-reported health conditions and work on car, truck, lawn mower, or other machinery were screened for missing cases, normality, and outliers. There were 3 missing cases and 0 outliers. While the Kolmogorov-Smirnov test for normality showed a violation, all other tests showed that the distributions were sufficiently normal and the sample size was large enough (n = 1,065). The chi-square test of association was utilized to examine the relationship between self-reported health conditions and work on car, truck, lawn mower, or other machinery. The results showed a significant association between these two variables: $\chi^2(1) = 5.42$, $p < .05$.

The results of the contingency table showed that the number of older persons with low chronic illnesses who *do not* do work on their car, truck, lawn mower, or other machinery (n = 412) is less than expected (n = 419.4). It also shows that the number of older persons with high chronic illnesses who *do not* do work on their car, truck, lawn mower, or other machinery (n = 25) is higher than expected (n = 17.6). Conversely, the number of older persons with low chronic illnesses who *do* work on their car, truck, lawn mower, or other machinery (n = 25) is higher than expected (n = 17.6), while the number of older persons with high chronic illnesses who *do* work on their car, truck, lawn mower, or other machinery (n = 18) is less than expected (n = 25.4).

The phi coefficient indicated that self-reported health conditions explained only 0.49% of the variance in levels of activity related to work on car, truck, lawn mower, or other machinery. As such, the two variables have a weak relationship, and more than

99.5% of the variance in these activity levels is unaccounted for (Table 4.5).

For Question 2.2.f., self-reported health conditions and walking to do errands were screened for missing cases, normality, and outliers. There were 3 missing cases and 0 outliers. While the Kolmogorov-Smirnov test for normality showed a violation, all other tests showed that the distributions were sufficiently normal and the sample size was large enough (n = 1,065). A chi-square test of independence between self-reported health conditions and walking to do errands found that the result was not significant, $p > .05$, indicating that there was no association between these two variables.

The results from the chi-square tests indicated that there was only an association between self-reported health conditions and working on car, truck, lawn mower, or other machinery (Table 4.6). In general, persons with two or more chronic illnesses are more likely to not be able to work on their car, truck, lawn mower or other machinery. The study showed that those with fewer chronic illnesses are more likely to do so. Therefore, the ability to engage in more strenuous activity such as working on machinery at home is impacted by the number of chronic illnesses a person has.

Research Question 3: Part I

Hosseinpoor et al. (2012) stated in their research that social factors that are known to be associated with reporting poor health status include education, income, employment and marital status. Research Question 3 explored education and income, but also looked at race/ethnicity and sex. Research Question 3 asked, “Among older adults who engage in LPA, when looking at race and ethnicity, sex, income, and education, which social determinants have significant associations with self-reported health conditions? Of these, which ones are strongest predictors of health conditions?”

Table 4.5. Results From the Chi-Square Test for Work on Car, Truck, Lawn Mower, or Other Machinery and Self-Reported Health Conditions

	Low chronic illnesses		High chronic illnesses		Total			
Variable	*N*	%	*N*	%	*N*	%	χ^2	*p*
Work on car, truck, etc.?								
No	412	38.7	610	57.3	1,022	96.0	5.42	.02
Yes	25	2.3	18	1.7	43	4.0		
Total	437	41.0	628	59.0	1,065	100.0		

$p < .05$ (significant)

Table 4.6. Summary of Research Findings for Question 2.2

RQ	Independent variable	Dependent variable	Research
2.2.a	Heavy work around the house	Self-reported health conditions	Not significant
2.2.b	Light work around the house	Self-reported health conditions	Not significant
2.2.c	Heavy gardening	Self-reported health conditions	Not significant
2.2.d	Light gardening	Self-reported health conditions	Not significant
2.2.e	Work on car, truck, lawn mower, other machinery	Self-reported health conditions	Significant
2.2.f	Walking to do errands	Self-reported health conditions	Not significant

Prior to entering the factors in the logistic regression analysis, bivariate analyses were conducted to examine whether a significant difference existed between the two outcome groups (low chronic illnesses and high chronic illnesses) with regard to each factor. The factors were race/ethnicity, sex, income, and education.

Self-Reported Health Conditions and Race/Ethnicity

Health conditions and race/ethnicity were screened for missing cases, normality, and outliers. There were 3 missing cases and 0 outliers and a sample size of (n = 1,065). A chi-square test of independence was utilized to examine the relationship between self-reported health conditions and race/ethnicity. The results showed a significant association

between race and ethnicity and self-reported health conditions ($\chi^2_{(df = 3)} = 11.44$, $p < .05$). Therefore, there is an association between self-reported health conditions and race/ethnicity (Table 4.7).

The results of the contingency table showed that the number of Black/African American persons with low chronic health conditions ($n = 147$) is less than expected ($n = 163.7$), whereas the number of Blacks/African Americans with high chronic health conditions ($n = 252$) is greater than expected ($n = 235.3$). The table also showed that the number of Hispanics with low chronic health conditions ($n = 40$) is higher than expected ($n = 35.7$), while the number of Hispanics with high chronic health conditions ($n = 47$) is lower than expected ($n = 51.3$). Furthermore, the contingency table revealed that the number of Whites ($n = 224$) with low chronic health conditions is greater than expected ($n = 220.3$), whereas among White persons with high chronic health conditions ($n = 313$), the number is lower than expected ($n = 316.7$). For other minorities with low chronic health conditions ($n = 26$), the number is higher than expected ($n = 17.2$), whereas for other minorities with high chronic health conditions ($n = 16$), the number is lower than expected ($n = 24.8$). The Cramer's *V* coefficient, however, indicates that race and ethnicity explains only 1% of the variance in self-reported health conditions; therefore, 99% of the variance in self-reported health conditions is unaccounted for.

Self-Reported Health Conditions and Sex

Health conditions and sex were screened for missing cases, normality, and outliers. There were 2 missing case and 0 outliers and a sample size of ($n = 1,066$). A chi-square test of independence between self- reported health conditions and sex found that the result was significant ($\chi^2_{(df = 1)} = 8.79$, $p < .05$).

Table 4.7. Results From the Chi-Square Test for Race/Ethnicity and Self-Reported Health Conditions

	Low chronic illnesses		High chronic illnesses		Total			
Variable	*N*	%	*N*	%	*N*	%	χ^2	*p*
Race and ethnicity								
Black/African American	147	33.6	252	40.1	399	37.5	11.44	.010
Hispanic	40	9.2	47	7.5	87	8.2		
White	224	51.3	313	50.0	537	50.4		
Other	26	5.9	16	2.5	42	3.9		
Total	437	100.0	628	100.0	1065	100.0		

$p < .05$ (significant)

The results of the contingency table showed that the number of persons with low chronic health conditions that were female ($n = 348$) is less than expected ($n = 365.7$), while the number of females with high chronic health conditions ($n = 542$) is greater than expected ($n = 524.3$). The table also showed that the number of males with low chronic health conditions ($n = 90$) is higher than expected ($n = 72.3$), while the number of males with high chronic health conditions ($n = 86$) is lower than expected ($n = 103.7$).

Self-reported health conditions were associated with sex (Table 4.8). However, Cramer's *V* coefficient (.008) explains that there is only a small association between self-reported health conditions and sex. Therefore, according to Cramer's *V,* sex of participant explains only 0.8% of the variance in self-reported health conditions; thus, more than 99% of the variance in self-reported health conditions is unaccounted for.

Self-Reported Health Conditions and Income

Health conditions and income were screened for missing cases, normality, and outliers. There were 78 missing cases and 0 outliers and a sample size of ($n = 990$). A chi-square test of independence was utilized to examine the relationship between self-

Table 4.8. Results From the Chi-Square Test for Sex and Self-Reported Health Conditions

	Low chronic illnesses		High chronic illnesses		Total			
Variable	*N*	%	*N*	%	*N*	%	χ^2	*p*
Sex								
Female	348	79.5	542	86.3	890	83.5	8.79	.003
Male	90	20.5	86	13.7	176	16.5		
Total	438	100.0	628	100.0	1066	100.0		

$p < .05$ (significant)

reported health conditions and income. The results showed a significant association between income and self-reported health conditions ($\chi^2_{(df = 2)} = 16.59$, $p < .05$). Therefore, there is an association between these two variables (Table 4.9).

The results of the contingency table showed that the number of persons with low chronic health conditions with income less than $30,000 ($n = 191$) is less than expected ($n = 222.3$), while the number of persons with high chronic health conditions with income less than $30,000 ($n = 351$) is higher than expected ($n = 319.7$). The table also showed that the number of persons with low chronic health conditions with income between $30,000 and $59,999 ($n = 126$) is higher than expected ($n = 106.2$), while the number of persons with high chronic health conditions with income between $30,000 and $59,999 ($n = 133$) is lower than expected ($n = 152.8$). Furthermore, the contingency table revealed that the number of persons with low chronic health conditions with income of $60,000 or more ($n = 89$) is greater than expected ($n = 77.5$), while the number of persons with high chronic health conditions with income of $60,000 or more ($n = 100$) is lower than expected ($n = 111.5$).

However, based on (Cramer's $V = .0169$), there is only a small association between self-reported health conditions and income. The Cramer's *V* coefficient indicates

Table 4.9. Results From the Chi-Square Test for Income and Self-Reported Health Conditions

	Low chronic illnesses		High chronic illnesses		Total			
Variable	*N*	%	*N*	%	*N*	%	χ^2	*p*
Income								
<$30,000	191	47.0	351	60.1	542	54.7	16.59	.000
$30,000–$59,999	126	31.0	133	22.8	259	26.2		
≥$60,000	89	22.0	100	17.1	189	19.1		
Total	406	100.0	584	100.0	990	100.0		

$p < .05$ (significant)

that income explains only 1.69% of the variance in self-reported health conditions; therefore, more than 98% of the variance in self-reported health conditions is unaccounted for.

Self-Reported Health Conditions and Education

Health conditions and education were screened for missing cases, normality, and outliers. There were 19 missing cases and 0 outliers and a sample size of (n = 1,049). A chi-square test of independence was run to examine the association between self-reported health conditions and education. The results of the chi-square found that the result was not significant. Therefore, there is no association between self-reported health conditions and education.

The results of the chi-square tests showed that only education was not statistically significant and that there was an association between self-reported health conditions and race/ethnicity, sex, and income. The results are summarized in Table 4.10.

Research Question 3—Part II

The social determinants of health are the conditions in which people are born, grow, live, work, and age. These circumstances are shaped by the distribution of money,

Table 4.10. Summary of Research Findings Related to Question 3.1

RQ	Independent variable	Dependent variable	Research
3.1.a	Race and ethnicity	Self-reported health conditions	Significant
3.1.b	Sex	Self-reported health conditions	Significant
3.1.c	Income	Self-reported health conditions	Significant
3.1.d	Education	Self-reported health conditions	Not significant

power, and resources at global, national, and local levels. The social determinants of health are mostly responsible for health inequities - the unfair and avoidable differences in health status seen within and between countries (WHO, 2016). Research Question 3, Part 2 looked at race/ethnicity, sex, income, and education to determine which social determinants were predictors of health conditions among persons who engaged in LPA. The research question was, "Among older adults who engage in LPA, when looking at race and ethnicity, sex, and income which social determinants are predictors of health conditions?"

Chi-squares were performed to determine which of the four factors would be included in the analysis. Abu-Bader (2010) recommends that factors that show significant correlation with the criterion should be included in the logistic regression analysis whereas factors that are not significantly correlated with the criterion should be excluded from the analysis. There was no association between self-reported health conditions and education; therefore, only three factors (race/ethnicity, sex, and income) were entered in the analysis and the last (education) was excluded.

A logistic regression analysis was performed to look at the difference in probability between outcomes depending on the values of the predictive variables (Abu-Bader, 2006). The results from the logistic regression analysis of LPA group members revealed that three factors emerged as significant predictors of self-reported health

conditions. These factors were income less than 30,000 ($Wald_{(df = 1)} = 6.67$, $p < .05$), females ($Wald_{(df = 1)} = 6.05$, $p < .05$), and other minorities ($Wald_{(df = 1)} = -.87$, $p < .05$). Therefore, LPA participants earning less than $30,000/year were 1.6 times more likely than LPA persons earning $60,000+/year to have high chronic health conditions. Furthermore, females were 1.5 times more likely than males to have high chronic health conditions. Lastly, other minorities (described as Asians, Hawaiian/Pacific Islanders, American Indians, and other) were less likely than Whites to have high chronic health conditions.

The results from the logistic regression showed that the overall model significantly improved the prediction of the level of chronic illnesses among persons who engaged in LPA ($\chi^2_{(df = 6)} = 31.38$, $p < .001$). This model has a very good fit (-2 log likelihood = 1,304.98, Hosmer and Lemeshow, $\chi^2_{(df = 7)} = 3.96$, $p = .78$).

The results of the Cox and Snell and the Nagelkerke R^2 indicated that income accounted for 1.7 to 2.3% of the variance in self-reported health conditions. Sex of LPA group members accounted for 0.6 to 0.9% of the variance in self-reported health conditions. Lastly, race and ethnicity accounted for 0.8 to 1.0% of the variance in self-reported health conditions among LPA participants. Overall, the model accounted for 3.1 to 4.2% of the variance in self-reported health conditions.

The model correctly classified 18% of the low self-reported health conditions cases and 89.7% or the high self-reported health conditions cases, revealing that the model was more accurate for high health conditions of 2 or more chronic illnesses. Overall, this logistic model had a 60.3% success rate with predicting health conditions using social determinants (Table 4.11).

Table 4.11. Results From the Logistic Regression for Race/Ethnicity, Sex, Income, and Self-Reported Health Conditions

Factor	*B*	Wald	*df*	*p*	-2LL	R^2	Odds-Ratio
Income							
<$30K	.46	6.67	1	.01	1,319.47	.017–.023	1.59
Sex							
Females	.43	6.05	1	.01	1,312.94	.023–.032	1.54
Race and Ethnicity							
Other minorities: Asians, Hawaiian/Pacific Islanders, American Indians, and other	-.87	6.60	1	.01	1,304.98	.031–.042	.42

CHAPTER 5

SUMMARY, CONCLUSION, IMPLICATIONS, AND RECOMMENDATIONS

Promoting healthy behaviors in older adults is of extreme importance given the irrefutable evidence of the benefits of physical activity at all ages. McInnis-Dittrich (2005) found that although physical aging of the body is inevitable as persons grow older, disability and illness are not. In a recent study by Keadle et at. (2016), the researchers found that the proportion of older adults who reported no leisure-time physical activity was 60.9% for the National Health and Nutrition Examination Survey (NHANES), 42.6% for the National Health Interview Survey (NHIS), and 36.1% for the BRFSS. Helping older persons to realize that regular physical activity can be achievable, accessible, and enjoyable was in part the motivation for this research.

As previous research suggests, despite the benefits that they can gain from exercise, older people show low participation rates in physical activity (Novak, 2006, p. 321) and a large number of older adults are insufficiently active. Many struggle with the ability to participate in a structured exercise program. As such, finding ways to promote movement in the daily lives of older persons and looking at the impact of this type of physical activity was the focus of this research. The concept of LPA is to increase the level of physical activity in the daily functioning of a person by helping a person to find a more active way of completing tasks (i.e., taking the stairs instead of the elevator).

Researchers consistently point to the importance of regular exercise (structured activities) as a preventative mechanism to diseases and chronic illnesses (Hogan et al., 2013; Taylor et al., 2004); however, it is important to explore alternative solutions because, as previously discussed, a larger majority of older persons are not exercising. *Physical activity*, a broader term that encompasses daily movement, can be a more viable alternative to persons struggling to become active. The current study examined a group of persons 50 years and older who did not engage in moderate physical activity (at least 10 minutes/week) but who did engage in household activities, such as housework, machinery repair, gardening, and walking to do errands. Household activities need few resources, have a low cost, and have easy access (Novak, 2006, p. 335). The group that engaged in household activities comprised the research subjects for the LPA study.

The purpose of the study was to assess the relationship between self-rated health and self-reported chronic illnesses in older adults who engage in LPA and to determine if self-rated health and/or health conditions are impacted by the type/intensity of the LPA. Finding an answer to these questions was important because not only are chronic conditions long lasting but also their progress most often causes irreversible pathology (Kart & Kinney, 2001). This research also examined race/ethnicity, sex, and income to determine which social determinants were predictors of health.

By using secondary data analysis, four research questions were developed and the associated hypotheses tested. The questions were as follows:

1. Among older adults who engage in LPA, is there an association between self-rated health scores and self-reported health conditions?
2. Among older adults who engage in LPA, does type of activity and/or intensity

affect self-rated health scores?

3. Among older adults who engage in LPA, does type of activity and/or intensity affect self-reported health conditions?
4. Among older adults who engage in LPA, when looking at race/ethnicity, sex, income, and education, which social determinants have significant associations with self-reported health conditions? Of these, which ones are predictors of health conditions?

Results of Hypotheses from Research Questions

Research Question 1 looked at a self-assessment of health from participants and compared how they rated their health with the number of chronic illnesses they reported. The purpose was to determine if how they rated their health was associated with how "healthy" they were according to diagnosed conditions.

According to the World Health Organization (n.d.) "health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." It is important for social workers and other health practitioners to understand the interrelation of physical, mental, and social health. Kart and Kinney (2001, p. 106) explained that physical health can be divided into three subcategories: (a) absence of illness; (b) ability to perform basic self-care activities, including activities of daily living; and (c) ability to perform more complex self-care activities that allow for greater independence, which encompasses instrumental activities of daily living. Mental health is defined as a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community (WHO, 2014). Social health is

defined as (a) how a person gets along with other people, (b) a person's level of support from people and institutions around them, and (c) how well a society does at offering every citizen the equal opportunity to obtain access to the goods and services critical to being able to function as a contributing member of society.

As such, the research of Kart and Kinney (2001, p. 133) supports the current study with the suggestion that health is as much a subjective as an objective phenomenon. The current study found that among older adults who engaged in LPA, individuals with better self-rated health scores had fewer self-reported chronic health conditions. As the study demonstrated, simple activities can have health benefits for the participants. These findings support the health lifestyle theory, which suggests that people set goals based on how realistic they perceive the goal achievement to be. Therefore, by setting simple goals, participants achieve greater success. Those benefits (even if only perceived) serve to encourage participants to increase their level of movement through personalized activities that are fulfilling and enjoyable. The cumulative effect of increased movement, interactions, and mental functioning has a positive effect on improving the cognitive and physical functioning of persons in later adulthood promoting a more positive self-evaluation. Therefore, persons who engage in LPA will experience better health outcomes when compared to their more sedentary counterparts. Exploring the barriers to physical activity that older persons face will be an important component to be addressed when working with them. It will also be necessary to help these persons to develop strategies to tackling their inactivity. Suggesting simple lifestyle choices that encourage persons to be more active will be an initial step to initiating the process. On-going health education that explains the importance of making

good health and wellness a priority in a person's life, and connecting this to quality of life, is important in getting persons to shift from an inactive lifestyle to engaging in regular physical activity. Persons who value good health are more likely to make decisions that promote their health (Pruitt & Stein, 1999).

Part 1 of RQ 2 looked at the types of nonstructured activities to determine if the type and/or intensity of LPA significantly impacted how an individual rated their health. Unlike the research of Wen, Liang, Zhu, and Wu (2013) that only looked at the effects of housework on health, this current study looked at the relationship between LPAs, which included gardening, housework, doing errands, and working on machinery and self-rated health. Wen et al. (2013) found that the association of housework with the health of older adults was not significant. In contrast, the results of the current study were significant among light intensity LPAs. The research findings showed that when persons who participated in light work around the house and light gardening were compared to their counterparts who did not engage in these activities, those who participated in these types of LPAs had a higher self-rated health score. A larger portion of the individuals that engaged in these types of LPAs felt that they were in good to excellent health compared to their counterparts who did not engage in light intensity LPAs.

Regarding the effects of light LPAs on self-rated health, this higher rating could be due to individuals perceiving that the ability to engage in these activities suggests that they are in good health. Research has found that optimistic beliefs about one's physical abilities can lead individuals to adopt healthy behaviors such as physical activity (Caudroit, Stephan, Chalabaev, & Le Scanff, 2012). As such, self-perception has a positive impact on health and it is an important consideration when trying to engage older

adults in activities. These findings have a practical implication for social work practitioners and other health professionals who want to promote older adults' involvement in physical activity. Eliminating the emphasis on intensity in recommending activities to inactive persons helps to suggest more options for them. The type of activity and the level of enjoyment a person may derive from it will impact their likelihood to initiate and adhere to the activity.

Part 2 of RQ 2 looked at the impact of type of LPA on self-reported health conditions to determine if there was an association between type of LPA and health conditions. The result was only significant among the more strenuous LPAs. The research findings showed that the ability to engage in more strenuous LPAs such as working on a car, truck, or other machinery was impacted by the number of chronic illnesses the older adult was experiencing. Persons with greater numbers of chronic illnesses were less likely to engage in strenuous lifestyle physical activities. This affirms that persons with high chronic health conditions will have physical limitations created by the illnesses, and will need to adapt to these changes and limitations.

Research Question 3 looked at race/ethnicity, sex, income, and education among LPA participants to determine if self-reported health conditions were associated with any of these social determinants. The results showed that there was a significant association between race/ethnicity, sex, income, and self-reported health conditions. Other minorities (described as Asians, Hawaiian/Pacific Islanders, American Indians, and other) were less likely than Whites to have high chronic health conditions. Females were 1.5 times more likely than males to have high chronic health conditions and LPA participants earning less than $30,000/year were 1.6 times more likely than LPA persons earning

$60,000+/year to have high chronic health conditions. The findings support several studies that looked at social determinants and older adults (Hosseinpoor et al., 2016; Pudrovska, 2015; Wallace, 2014). The research of Wallace (2014) found that older African Americans consistently had higher rates of major health problems (including hypertension, diseases of the circulatory system, and diabetes) than did non-Latino Whites. Pudrovska (2015) found that when compared with men, women reported poorer self-rated health and more chronic illnesses, problems with activities of daily living, physical activity limitations, and pain. Hosseinpoor et al. (2016) looked at data from the World Health Survey of adults aged 50 or older and found that the prevalence of disability increased with decreasing household economic status. As such, this study advances the existing literature by exploring a different aspect—looking at social determinants of health, chronic illnesses, and correlates of LPAs in a sample of adults 50 and older.

Conclusion

Physical activity enables older persons to function better in everyday life, as well as live longer and better even in the face of other health problems (Rowe & Kahn, 1998, p. 99). Using a sample of older persons 50 and over from the AFL dataset, the research found that LPA is a protective factor for positive self-rated health scores and self-reported health conditions. As the current research suggested, LPA allowed older adults to engage in nonstructured activities to achieve health gains. This finding suggests that LPAs are an important component for maintaining functional health independence as persons advance in age.

Ideally, regular physical activity should be maintained for a lifetime and be made

to be a part of a healthy lifestyle. This research suggests that doing so need not be stressful or complex. A gentle approach to increasing participants' level of physical activity using the LPA approach would be to encourage them to engage in a little more physical activity than the week before. Lifestyle physical activity provides a way to make physical activity sustainable. This approach provides participants the flexibility to set both personal and realistic goals. As McInnis-Dittrich (2005) stated,

> physical fitness is not about taking up basketball at age 70 . . . rather, it is about maintaining the ability to walk comfortable and safely, to negotiate stairs, to reach up to shelves and cupboards, and to perform daily activities without becoming winded or injured. (p. 55)

In other words, simple activities that help persons to maintain their functionality also helps them to maintain their independence. Traditionally, to promote social and physical activities practitioners refer their older clients to senior centers where they can join group activities. For those persons who prefer to remain in their home environment, LPAs can provide the flexibility to engage in activities that are meaningful and enjoyable to them. Although much of the focus has been on the physical benefits that physical activity provides to older persons, of equal importance are the benefits of LPAs on mental and social health.

Implications for Social Work

As the population continues to grow older, the challenge for social workers will be to enable older people to maintain their health and social functioning and engage in activities that they find rewarding (Gelfand, 1999, p. 226). For older adults suffering from physical limitations and chronic illnesses, their day-to-day health status becomes the organizing principle in their lives. How the older adult feels can be the barometer for his/her willingness to leave his/her home, participate in social activities, and interact with

others (McInnis-Dittrich, 2005, p. 43). In other words, the quality of an older adult's psychological functioning is highly contingent on the quality of his or her health (McInnis-Dittrich, 2005, p. 81). Therefore, in recognizing the biopsychosocial approach in social work, it is important that social workers be actively involved with the interdisciplinary team of health care professionals when addressing psychosocial challenges. Additionally, social workers may wish to take on a greater role in initiating the physical activity discourse with inactive older adults. For social workers, understanding the benefits of LPA can help to promote and structure a more participatory care plan for older adults. But the likelihood of success in working with inactive older persons will depend in part on how well the social worker is able to involve a client in designing the appropriate intervention.

Social workers are uniquely positioned to understand the complex interplay of physical, environmental, psychological, and social factors that influence an older person's ability to adopt a healthier lifestyle. Therefore, for social work practitioners working with older persons, educating clients about healthy living is multifaceted. It involves promoting daily movement, interacting with members of the community, engaging in activities that provide mental stimulation, and a host of other activities.

An understanding of these challenges can help to provide feasible strategies in a supportive environment for older persons struggling to become more active. For social work practitioners working with older adults who are inactive, using the findings of this research and other similar studies would show support for using evidence-based strategies to develop interventions that are client-centered and user-friendly.

Recommendations for Future Research

There still remains a major challenge to find effective ways to support older adults in increasing their level of physical activity. It would be of interest to examine the impact of assigning simple chores to older persons in senior homes and assisted living facilities. The research project could look at if this prescribed assignment encourages persons to be more active while empowering them to adopt healthier behaviors using pre–post testing. These activities could also serve to keep older adults engaged in their community.

Another area of possible research is the use of technology to improve health behaviors. Devices such as activity trackers are capable of tracking steps taken, distance traveled, calories burned, stairs climbed, active minutes throughout the day, and sleep patterns. Activity trackers can also provide positive reinforcement for physical activity. As the user achieves different milestones, encouraging messages are displayed. These interactive devises encourage users to sustain their progress. Social workers need to be innovative in their thinking and open to integrating technology in their treatment approach with clients. More specifically, social workers should be advocates for leading the way to having activity trackers viewed as another type of assistive device for older persons (such as a cane or walker) that could be covered under their insurance plan. This technology is designed to make persons more mindful of their activity level (Duffy, 2016), and help persons to keep moving with real-time statistics. Activity trackers are expected to help a person become more active, or make a person aware of their sedentary behavior in order to affect a change in behavior. It would be of interest to measure the impact of activity trackers on attitudes and behaviors of older adults related to regular physical activity. Can activity trackers promote more habitual physical activity behaviors

among inactive older adults? In order to make these devises more accessible to the senior community, policy efforts need to be implemented that support subsidizing interventions that promote preventative health.

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