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Understanding Motivation for Behavior Change to Decrease Sedentary Behavior in Midlife Women: A Qualitative Study

by

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of the Requirements for the Degree
Doctor of Philosophy

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ABSTRACT

Sedentary behavior has recently been recognized as a widespread, independent risk factor for increased morbidity and mortality from chronic conditions including diabetes, cardiovascular disease, and cancer. Midlife women (age 40-64) are known to have high levels of sedentary behavior and corresponding cardiovascular disease risk. Currently, little is known about mechanisms involved in reducing and maintaining reductions to sedentary behavior in midlife women. Theory-based nursing interventions are needed which reflect process, personal meaning, person-environment interaction, and incorporate a strength-based perspective. Wellness Motivation Theory guided the research, conceptualizing behavioral change processes within culturally and environmentally relevant contexts, while recognizing bidirectional influences of personal and environmental factors on behavioral patterns. The Wellness Motivation Theory addresses social support and norms, community and material resources that influence behavioral choices, individual motivation and goals, and the behavioral change processes of self-knowledge, motivational appraisal, and self-regulation. A qualitative descriptive approach was used to explore social contextual resources and behavior change processes leading to action as decreasing sedentary time in midlife women. The maximum variation sample included 31 midlife women, employees of Arizona State University. Participants attended a one-hour focus group to discuss their experiences with sedentary behavior, and their efforts to sit less and move more. Midlife women characterized social support as: Raising Me Up, Timing Time and Walking and Talking. Support from contextual resources reflected themes of Seeking Place, Stepping Up, and Walking the Talk. Women experienced self-knowledge as Envisioning the Future, Taking Inventory,

and Considering Possibles. Motivational appraisal was characterized as Reevaluating Priorities, Wayfinding, and Going All In. Self-regulation was reflected as Recounting Benefits, Keeping On Track, and Creating New Ways. A deeper understanding of motivational processes central to reducing sedentary behavior in midlife women fosters identification of leverage points for future theory-based intervention research which provides primary prevention opportunities to lower cardiovascular disease risk, and promote successful aging.

DEDICATION

This dissertation is dedicated to the memory of my mother, Carol Louise Zubeck, whose love of learning and the nursing profession lives on in me. My mother passed away long before her time of cardiovascular disease. I am vividly aware of the many ways that her experiences have inspired me in my own pursuit of, and passion for, healthy and successful aging.

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OPERATIONAL DEFINITIONS

Exercise:	A subset of physical activities that are planned, structured, repetitive, and purposive, with the improvement or maintenance of one or more components of physical fitness as the objective. (Caspersen, Powell & Christenson, 1985).
Inactive:	Those performing insufficient amounts of MVPA, not meeting specified physical activity guidelines (SBRN, 2012).
Light Physical Activity:	Light activities perceived as very light to fairly light physical exertion (Garber et al., 2011) with absolute energy expenditure estimates of between 1.5-3.0 METs (Buman, 2010; McMahon, 2012).
MET:	One metabolic equivalent (MET) represents the amount of oxygen consumed (energy expended) while at rest, equal to 3.5 ml O2 per kg body weight x minutes (Jetté, 1990), while in a seated posture (SBRN, 2012).
Moderate to Vigorous Physical Activity:	Activities requiring an energy expenditure of between 3 to 8 METs, such as brisk walking or running (Ainsworth et al., 2011; Zhu, 2017).
Physical Activity:	Any bodily movement produced by skeletal muscles that results in energy expenditure (Caspersen, Powell & Christenson, 1985).
Sedentary Behavior:	Any waking behavior with a metabolic energy expenditure of equal to or less than 1.5 METs while in a sitting or reclining posture (SBRN, 2012).

CHAPTER I

INTRODUCTION

The evolution of modern technology and mass production in the United States and other industrialized countries has significantly reduced opportunities to be physically active in everyday life. While products and services increase personal convenience and save time, they also promote inactivity and sedentary time (Zhu, 2017). As a society, we now spend the majority of waking hours sitting or reclining; commuting to and from work, sitting at desks, and engaged in home or leisure activities including computer use and television or movie watching (Zhu, 2017). The human body is at odds with these living conditions. Evolutionary perspectives in anthropology, human anatomy, physiology, kinesiology, and biochemistry support that humans were designed for mobility, and evolved to optimally function in the context of daily physical exertion and movement.

Research examining the role of physical activity in health and wellness supports significant health benefits in the prevention and management of chronic illness (Blair SN, 2006). Similarly, physical inactivity adversely impacts health and well-being, posing significant risk for chronic illnesses including diabetes, metabolic syndrome, and cardiovascular disease (CVD) (Blair & Morris, 2009; Haskell, Blair, & Hill, 2009; Janssen & Leblanc, 2010; Kokkinos, 2012; Miller et al., 2016; Reiner, Niermann, Jekauc, & Woll, 2013; Warburton, Nicol, & Bredin, 2006; White, Gabriel, Kim, Lewis, & Sternfeld, 2015). Despite general understanding of the adverse effects of physical inactivity, a significant number of adults do not meet the minimum suggested guidelines

for daily physical activity, characterizing them as inactive (American Heart Association, 2016).

While the ill health effects of physical inactivity have been established, the concept of sedentary behavior has recently been recognized as a widespread, independent risk factor for increased morbidity and mortality from chronic conditions including diabetes, CVD, and cancer (Bankoski, 2011; Chastin et al., 2016; O'Donoghue et al., 2016; Tremblay, Healy, Owen, Colley, & Saunders, 2010; Zhu, 2017). Sedentary behavior is defined as any waking behavior with a metabolic energy expenditure of equal to or less than 1.5 METs, while in a sitting or reclining posture (Dunstan, Howard, Healy, & Owen, 2012; Owen, Healy, Matthews, & Dunstan, 2010; Owen, Sparling, Healy, Dunstan, & Matthews, 2010; Pate, O'Neill, & Lobelo, 2008; SBRN, 2012; Tremblay et al., 2010). Zhu (2017) notes that the emergent science of sedentary behavior has made impressive progress in characterizing prolonged sitting as a health risk distinct from a lack of physical activity or exercise, presenting novel opportunities for initiatives in public health, occupational health, and clinical and social policy (Zhu, 2017).

Women at midlife are at increased risk for chronic illness secondary to obesity, diabetes, and metabolic syndrome (Folta, Lichtenstein, Seguin, Goldberg, Kuder & Nelson, 2015; Ford, Li, Zhao, Pearson, Tsai, & Churilla, 2010; Fornias, Lopes, Rey-López, Rodrigues, & Carmo, 2014; Mosca et al., 2011; Schenck-Gustafsson, 2009); considered to be independently associated with sedentary behavior (Bankoski, 2011). Approaches to primary prevention of chronic conditions by reducing and maintaining reduction in sedentary behavior among midlife women are essential.

While epidemiological and clinical research is beginning to address the health consequences of sedentary behavior, there are significant gaps in our understanding of theory-based interventions designed to reduce sedentary behavior. Currently, little is known about the mechanisms involved in changing sedentary behavior, and how to best promote maintenance of sedentary behavior change. Exploring the processes of behavior change in a naturalistic setting will inform intervention research needed to reduce sedentary behavior in real-world settings, and thus promote reduction of a modifiable cardiovascular disease risk factor in a vulnerable population. Reductions in known and modifiable risk factors such as excessive sedentary time are key to promoting successful aging.

This chapter begins with a definition of sedentary behavior as distinct from physical inactivity. The prevalence of sedentary behavior is discussed, along with an overview of epidemiologic data supporting sedentary behavior and CVD risk. An overview of CVD in the United States is offered, supporting the significance of the proposed research in framing interventions to reduce sedentary behavior in midlife women. The chapter includes a summary and critique of theoretical perspectives and models currently guiding research in sedentary behavior. The chapter concludes with presentation of research questions guiding the proposed study, and a discussion of research significance and relevance to nursing science.

Sedentary Behavior

For centuries, scholars have associated an inactive lifestyle with increased morbidity and mortality. Hippocrates' writings lauded the benefits of physical exercise for a variety of physical and mental illnesses and the promotion of health (DHHS, 1996;

Pate et al., 2008). Claudius Galenus (Galen), whose medical writings dominated Europe for centuries, believed that exercise or physical activity in some form was valuable for treating nearly every disease (DHHS, 1996; Pate et al., 2008). Insufficient physical activity is a known risk factor in CVD disease burden and mortality (Young et al., 2016). Over the past 50 years, scientists and researchers have validated ancient scholarly perspectives, supporting reduced risk of chronic illness and premature mortality among those who engage in regular moderate-to-vigorous physical activity (MVPA) (DHHS, 1996).

The physiological and health impact of sedentary behavior is an emerging focus of study in the field of cardiovascular health and related chronic conditions (SBRN, 2012; Tremblay et al., 2010). The word "sedentary" refers to a distinct behavior, and is derived from the Latin word 'sedentarius' which means "characterized by or requiring a sitting posture" (sedentary. (n.d.). *Dictionary.com, Unabridged*, 2017). The study of sedentary behavior has its early impetus in epidemiological studies addressing active and inactive occupations in the UK and United States, namely differences in health outcomes between desk-bound workers and more active counterparts who were walking most of the day (Zhu, 2012; Paffenbarger, Lee & Kampert, 1997). These studies supported the deleterious health consequences of prolonged sitting time in the workplace (Brown, Bauman, & Owen, 2009; Zhu, 2012).

The concept of "sedentary behavior" has been marked by operational inconsistency, particularly in research conducted prior to 2012 (SBRN, 2012). The field of sport and exercise science has characterized sedentary behavior from the perspective of physical activity, with sedentary as a synonym for inactive; absence of a level or

threshold of moderate to vigorous physical activity (MVPA) (Church, C.K; Thompson, Earnest, Mikus, & Blair, 2009; Church, Earnest, Skinner, & Blair, 2007; Melanson, 2009; Mullen, 2011; Pate, O'Neill & Lobelo, 2008; SBRN, 2012; Sims, et al., 2012). Indeed, a review by Bennett and colleagues (2006) noted that the majority of contemporary sedentary behavior research defined 'sedentary' to mean an insufficient amount of physical activity (Bennett, Winters-Stone, Nail, & Scherer, 2006).

Sedentary behavior has also been characterized in terms of energy expenditure. Energy expenditure is measured in terms of oxygen consumption, expressed in metabolic equivalent units (METS) (Jetté, 1990). One metabolic equivalent (MET) represents the amount of oxygen consumed (energy expended) while at rest, equal to 3.5 ml O2 per kg body weight x minutes (Jetté, 1990). Low energy (low MET) sitting activities comprise a substantial portion of daily activity for many adults. Accelerometer studies with population samples in Australia and the U.S. have shown that a typical adult averages 20 to 30 minutes of MVPA per day, up to 10 hours of sitting per day, and the remainder of waking hours in light intensity activity (Healy, Clark, Winkler, Gardiner, Brown, & Matthews, 2011; Healy, Matthews, Dunstan, Winkler, Owen (2011); Owen, Sparling, et al., 2010; Zhu and Owen, 2017). Time spent sitting displaces higher energy expenditure activities, resulting in lower overall energy expenditure (Buman et al., 2014; Zhu, 2017).

Scientific consensus supports sedentary behavior, or too much sitting, as a concept distinct from physically inactive, or too little physical activity, with unique determinants and health consequences. Evidence is mounting to support that individuals who exhibit high levels of sedentary behavior exhibit increased levels of morbidity and mortality, regardless of level of moderate to vigorous physical activity (Dunstan et al.,

2010; Katzmarzyk, Church, Craig, & Bouchard, 2009; Owen, Sparling, et al., 2010; Thorp, Owen, Neuhaus, & Dunstan, 2011).

Sedentary behaviors typically exist in many contexts, including occupational, household, leisure, and transportation (Ford & Caspersen, 2012). Behaviors considered to be sedentary include, but are not limited to, sitting; reading; relaxing; thinking; watching television or a movie; eating; talking on the telephone, and riding in a car or other form of transportation. Most of these activities are 'sedentary' because they are conducted while awake and in a seated or reclining posture, and expending metabolic energy in the lower range of 1.0 to 1.5 METs (Ainsworth et al., 2011; Ford & Caspersen, 2012; Zhu, 2017). In contrast, moderate to vigorous physical activity such as brisk walking or running may require an energy expenditure of between 3 to 8 METs (Ainsworth et al., 2011; Zhu, 2017).

Ford and Caspersen (2012) identified four approaches to assess sedentary behavior: (1) occupational studies categorizing workers by activity level; (2) estimations of sedentary behavior from brief questionnaires; (3) use of heart rate monitors; and 4) accelerometer studies (Ford & Caspersen, 2012). Much of the sedentary behavior research conducted prior to 2012 relied on self-report methods to estimate sedentary time, including characterizing television viewing time as a proxy for time spent sitting or reclining (Foster, Gore, & West, 2006; Gardiner et al., 2011; Hu, Li, Colditz, Willett, & Manson, 2003; Manson et al., 2002; Dunstan, Salmon, Owen, Armstrong, Zimmet, Welborn, et al., . . . on behalf of the AusDiab Steering, C. (2005); Gorely, Marshall, & Biddle, 2004; Sugiyama, Healy, Dunstan, Salmon, & Owen, 2008). These approaches

produced marked differences in characterizing sedentary activities, particularly energy expenditure cut-off points (Ford & Caspersen, 2012).

As a risk factor for chronic conditions, sedentary behavior has been considered in light of the level of moderate or vigorous physical activity (MVPA) accumulated during a day (Biddle, 2007; Biddle, Gorely, Marshall, Murdey, & Cameron, 2004; Biswas, 2015; Ekelund et al., 2016). However, it is possible for individuals to accumulate large amounts of sedentary time during the course of a typical day, despite engaging in sufficient amounts of MVPA (Healy et al., 2008; Katzmarzyk et al., 2009; Owen, Sparling, et al., 2010; Tremblay et al., 2010; Wong & Leatherdale, 2009).

Prolonged sitting is understood as a distinct behavior manifested in many life contexts and merits research as a unique construct because of its different and independent effects on physical function, metabolism, and health outcomes (Tremblay et al., 2010). Lack of a consistent definition of 'sedentary' across prior studies rendered it difficult to compare study results or generalize findings (Bennett et al., 2006). In 2012, the Sedentary Behavior Research Network (SBRN) proposed a precise definition of sedentary behavior to foster consistency in measurement and research. SBRN defines sedentary behavior as: "any behavior during waking hours that is characterized by energy expenditure less than or equal to 1.5 METs, while in a sitting or reclining posture. Thus, sedentary activities consist of low energy (less than 1.5 METs), non-exercise activities that involve a sitting or reclining posture. Researchers are encouraged to avoid confusion in concept terminology by reserving the term 'inactive' to describe individuals who are performing insufficient amounts of MVPA (i.e., not meeting specified physical activity guidelines" (SBRN, 2012).

The United States government and several other developed countries have published physical activity guidelines for children, adults, and older adults; however these guidelines are specific to physical activity, and do not address sedentary behavior (U.S. Department of Health and Human Services, 2008; Young et al., 2016). Broad public health recommendations for reducing sedentary behavior in adults to help reduce CVD risk have been issued in Australia and the United Kingdom, in response to emerging research on the health risks of sedentary behavior (Young et al., 2016). An American Heart Association Advisory (2016) stated that "such broad public health guidelines for adults are likely appropriate, because evidence is still accumulating regarding the strength of the association, the evidence for causation (including understanding mechanisms), and the support for dose-response relationships that demonstrate sedentary behavior to be an independent risk factor for adverse health outcomes" (Young et al., 2016).

Sedentary Behavior Prevalence

The reduction of sedentary behavior, or "sitting time," is emerging as an approach for public health initiatives directed at the prevention and management of chronic conditions. Sitting time reflects the accumulated time during waking hours spent in sedentary behaviors such as commuting, the workplace, at school, at home, or during leisure time. Sedentary behavior has increased dramatically since the 1960s according to time use, occupational, and economic surveys (Young et al., 2016).

Sedentary occupations comprised approximately 15 percent of jobs in the United States in 1960, but by 2008, over 20 percent of jobs required excessive sitting (T. S. Church et al., 2011; Young et al., 2016). Ng and Popkin (2012) reported that adult

sedentary time increased an average of 12 hours per week from 1965 (26 hours) to 2009 (38 hours) (Ng & Popkin, 2012).

Objective measurement using accelerometry suggests that the average American adult spends more than 50% of their waking hours, or an average of 6 to 8 hours per day in sedentary time, either in a sitting or reclining posture (Clemes, O'Connell, & Edwardson, 2014; Ekelund et al., 2009; Matthews et al., 2008; Schuna, Johnson, & Tudor-Locke, 2013; Stamatakis, Hamer, & Dunstan, 2011; Thorp et al., 2012; Wijndaele et al., 2011). Adults over age 60 are more sedentary, with an average of 8.5 to 9.6 hours of sedentary time per day (Bankoski, 2011; Evenson, Buchner, & Morland, 2012; Gennuso, Gangnon, Matthews, Thraen-Borowski, & Colbert, 2013; Gorman et al., 2014; Harvey, Chastin, & Skelton, 2013; Santos et al., 2012).

Even adults who meet national public health guidelines of 30 minutes per day of moderate to vigorous physical activity (MVPA) are exposed to the negative metabolic effects of 7 to 10 hours of daily sitting time (Healy, Matthews, Dunstan, Winkler, & Owen, 2011; Salmon, 2011; Salmon, Tremblay, Marshall, & Hume, 2011). Adults who engaged in sufficient amounts of MVPA had similar amounts of sedentary time when compared to less physically active adults, (7.9 hours compared to 8.2 hours per day), suggesting that MVPA does not displace sedentary time (Schuna et al., 2013).

Self-report data on sedentary behavior has also been collected through surveys that assess activities such as sitting time, television viewing, computer use, transportation, or screen time. These study results are less consistent, with the daily amount of time in sedentary behaviors ranging from 2 to 8 waking hours per day (Bauman et al., 2011; G. G. Bennett et al., 2006; Bennie et al., 2013; Clemes et al., 2016;

Dempsey, Howard, Lynch, Owen, & Dunstan, 2014; Larsen, Martin, & Strong, 2014). According to the 2009-2010 NHANES analysis, Mexican American adults reported the least amount of sitting. Sitting time increased with age, and with the level of education. Sitting time was also more prevalent in females with a BMI greater than or equal to 30kg/m^2 (Harrington, Barreira, Staiano, & Katzmarzyk, 2014).

Gender differences in the prevalence of sedentary behavior are unclear. According to the 2003-2004 NHANES study (Matthews et al., 2008), women less than 60 years old were more sedentary compared to men, but after age 60 men were more sedentary (Ekelund et al., 2009; Evenson et al., 2012; Santos et al., 2012). Research providing descriptive epidemiology of sitting among U.S. adults (Harrington, Barreira, Staiano, & Katzmarzyk, 2014) concluded that self-reported sitting time differed by ethnicity, education, age, and body mass index, but there was no overall significant difference by gender. Contextual factors such as occupation type, child care, and other activities could also vary by gender and age, and confound results, making interpretive comparisons challenging (Young et al., 2016).

The Neilsen Company reported that in 2016, the average American spent approximately 35 hours per week watching television, four hours on the internet, 20 minutes watching online videos, and 4 minutes watching mobile videos. (Neilsen Company, 2016). Nielsen's fourth-quarter 2016 report found that over 92% of screen viewing was on television and television-connected devices, and that older adults spend more time viewing than other age groups. Time spent viewing these screen-devices represented the most common leisure time sedentary behavior (Nielsen, 2017).

Overview of CVD in Women

Cardiovascular disease (CVD) is the leading cause of death for women in the US. (AHA, 2016). Women have a consistently higher mortality rate from CVD when compared with men (AHA, 2016). In 2013, over 398,000 women in the United States died of CVD, representing approximately half (49.7%) of all CVD deaths. Women are at higher risk for stroke when compared to men; each year approximately 55,000 more women than men suffer a stroke. Women represent 58.4% of total stroke deaths (AHA, 2016). The incidence of CVD in women lags behind men by approximately 10 years for coronary artery disease, and by 20 years for clinical events such as myocardial infarction and sudden death. While women develop cardiovascular disease later in their lives than men, morbidity rates are higher.

Obesity and diabetes are well-established risk factors for CVD in women. An estimated 65% of American women over the age of 20 are either overweight or obese (AHA, 2016). U.S. obesity prevalence data from the National Health and Nutrition Examination Survey (NHANES) 2013-2014, reported 68.5% of all adults were overweight or obese; 34.9% were obese, and 6.4% were extremely obese (Grade 3, BMI ≥ 40). The prevalence of Grade 3 obesity was higher in women (8.3%) when compared to men (4.4%) and by age, with 7.7% of adults extremely obese. Between 2003-2004 and 2011-2012, the prevalence of obesity in U.S. women aged 60 and older increased from 31.5% to more than 38% (Flegal, Kruszon-Moran, Carroll, Fryar, & Ogden, 2016; Guo & Garvey, 2016; Nejat, Polotsky, & Pal, 2010; Ogden, Carroll, Kit, & Flegal, 2014).

Linking Sedentary Behavior and CVD Risk

Modifiable risk factors have been established for cardiovascular disease (CVD), including tobacco use, diabetes, high cholesterol, and hypertension (CDC, 2016). Other behavioral and lifestyle factors such as obesity, physical inactivity, and sedentary behavior have also been studied as independent risk factors for CVD. Sedentary behavior has recently been independently associated with an elevated risk of obesity, type-2 diabetes, metabolic syndrome, CVD, and all-cause mortality (Gennuso et al., 2013; Wilmot et al., 2012).

Individuals who 'sit' for greater than 4.5 hours per day on average have a forty percent greater risk of CVD mortality than those who are not sedentary (Levine, Vander, Hill, & Klesges, 2006). Sedentary individuals with the most sitting time have a higher mortality risk, independent of time spent engaging in physical activity (Bankoski, 2011; Katzmarzyk et al., 2009; Matthews et al., 2008; Owen, Healy, et al., 2010).

Several studies since 2011 have examined the connection between increased sedentary behavior and the incidence of CVD (Same et al., 2016). Wijindale and colleagues followed CVD-free participants for 11 years, determining that each hour per day increase in sedentary television time increased CVD mortality risk (Wijndaele et al., 2011). A systematic review and meta-analysis by Wilmot and colleagues (2012) involving nearly 800,000 participants reported strong and consistent associations between increased sedentary behavior and diabetes, CVD, and all-cause mortality (Wilmot et al., 2012). Buman and colleagues (2014) report the beneficial effects of reallocating time spent in sedentary behaviors to sleep, light activity, or moderate to vigorous physical activity to improve cardio-metabolic risk markers, improving the CVD risk profile.

Brocklebank and colleagues (2015) conducted a systematic review of research reporting accelerometer-measured sedentary time, reporting significant associations of sedentary behavior with poor insulin sensitivity and high triglyceride levels (Brocklebank, Falconer, Page, Perry, & Cooper, 2015).

A systematic review and meta-analysis conducted by Biswas (2015) reported a significant association between sedentary behavior and CVD mortality. Hazard ratios associated with sedentary time and disease risk incidence were generally more pronounced at lower levels of physical activity; disease risk was mitigated by the presence of higher levels of physical activity (Biswas, 2015).

Sedentary Behavior and CVD Risk in Women

Midlife and older women are growing both more sedentary and are experiencing increased rates of obesity and CVD risk. Emerging research suggests that forty percent of all adult women are inactive or sedentary (Mosca et al., 2011). The highest level of CVD risk among women is found when they are both inactive and sedentary (Chomistek et al., 2013; Same et al., 2016). Associations between sedentary behavior and CVD risk were found to be stronger among overweight or obese women and in those who were over 70 years of age (Mosca et al., 2011).

All-cause mortality and CVD mortality rates are negatively affected by sitting time, especially in women. Women have a greater associated risk of CVD-related death than men for any amount of time sitting. (Allison, Jensky, Marshall, Bertoni & Cushman, 2012). The consequences of sedentary behavior on CVD risk in women is beginning to be explored, with studies linking increased sedentary time to weight gain, obesity, metabolic syndrome, increased fat cell inflammation (Allison, Jensky, Marshall, Bertoni,

& Cushman, 2012), insulin insensitivity, glucose intolerance, and high triglyceride levels (Saunders, Larouche, Colley, & Tremblay, 2012).

Analysis of older women participants in the Women's Health Initiative identified a linear relationship between sedentary time and mortality risk (Seguin et al., 2014). Research examining the relationship between sedentary behavior and physical activity to incident CVD in a heterogeneous sample of over 71,000 participants found that prolonged sitting time, in excess of 10 hours per day, was associated with increased CVD risk when compared with less than 5 hours per day of sitting time, using multivariable models that also included physical activity (Chomistek et al., 2013).

Television watching is a particularly unhealthy sedentary behavior for women. Women who spend more than 40 hours per week sitting to watch television increase their risk for developing obesity by 94%, and also have a 70% increased risk of developing diabetes (Hu, Li, Colditz, Willett, & Manson, 2003). Stamatakis and colleagues (2011) identified a CVD hazard ratio (HR) of 2.30 for participants who reported 4 or more hours of screen or television time per day, relative to those who spent less than 2 hours per day in those activities (Same et al., 2016; Stamatakis, Hamer, & Dunstan, 2011).

Addressing Sedentary Behavior in Midlife Women to Lower CVD Risk

CVD is perhaps the most serious and neglected health issue for women in both developed and developing countries, taking the lives of over 8.6 million women each year (WHO, 2002). The world statistics on CVD indicate that women are dying of heart disease in increasing numbers and at a younger age. Schenck-Gustafsson (2009) suggests that the discipline and practice of women's health management has not traditionally

included interventions for the primary prevention of CVD, because CVD has been commonly perceived as a 'man's illness'. (Schenck-Gustafsson, 2009).

Sedentary behavior as a modifiable risk factor for CVD may be particularly relevant for middle age and older adults. Hajduk and Chaudhry (2016) conducted a scoping review of literature to describe the prevalence of sedentary time among older adults with CVD, and examine the association between sedentary behavior and CVD risk, finding that older adults with CVD spend more than 75 percent of their waking day in a seated or reclined position (Hajduk & Chaudhry, 2016). Higher levels of sedentary behavior were consistently associated with increased cardiac risk scores and worse lipid profiles in older adults (Hajduk & Chaudhry, 2016). In this review, associations between sedentary behavior and hypertension, CVD incidence, and CVD mortality were less clear, suggesting the need for additional study with larger sample sizes and using validated methods (Hajduk & Chaudhry, 2016).

Women experience the cumulative effects of CVD risk factors, along with social and contextual challenges at midlife. Physiological and metabolic changes in midlife include menopause promoting weight gain, increases in body fat, metabolic syndrome, increased cortisol levels, intracellular inflammation, (Allison, Jensky, Marshall, Bertoni, & Cushman, 2012), as well as insulin insensitivity, glucose intolerance, and high triglyceride levels (Saunders, Larouche, Colley, & Tremblay, 2012). Social and contextual influences include changing family roles and responsibilities, reductions in physical activity and increased sedentary time, sedentary occupations, and leisure time that promote sedentary behavior.

Women in midlife (age 40-64) are at increased risk for developing CVD due to physical inactivity and sedentary lifestyles, resulting in weight gain and obesity. Interventions targeting sedentary behavior in women at midlife represent a significant opportunity for primary prevention of CVD risk, to promote healthy aging. Midlife women are an understudied population at high risk for adverse health outcomes relative to CVD.

Reducing excessive sedentary time during midlife can substantially increase energy expenditure and support reduction of other known CVD risk factors, such as obesity and weight gain. While a growing number of epidemiological studies have reported the association between sedentary behavior and negative health consequences, interventions to reduce sedentary behavior in midlife women are limited.

Adults over the age of 60 comprise approximately 18% of the US population, but make up more than half of those with CVD (U.S. Census Bureau, 2008). With the aging of the baby boomers, the population of older adults is expected to nearly double from 56 million to over 100 million by 2040. The social and economic burden of caring for older adults with CVD represents a public health crisis, emphasizing the importance of primary prevention efforts in midlife. Addressing sedentary behavior in midlife women is essential, to prevent CVD and to promote healthy aging. The proposed research will foster understanding of motivation to decrease sedentary behavior in midlife women. The proposed research will provide a basis for the development and testing of theory-based intervention to reduce sedentary behavior and CVD risk in this population.

Perspectives on Changing Sedentary Behavior

The use of theory guiding intervention in health and behavior change research strengthens intervention design, development, and evaluation, by supporting problem identification, guiding intervention approaches, and explaining the mechanisms for intervention effects on behavioral and health outcomes (Closs, 1999; Sidani, Doran, & Mitchell, 2004; Fleury & Sidani, 2012; Dutta, Koepp, Stovitz, Levine, & Pereira, 2014; Evans, Fawole, Sheriff, Dall, Grant, & Ryan, 2012; Gilson, Puig-Ribera, McKenna, Brown, Burton, & Cooke, 2009; Hammoudeh et al., 2013; Healy et al., 2013; Jones, Harvey-Berino, Otten, & Littenberg, 2009). "At the simplest level, a theory is an explanation of why a phenomenon occurs the way it does. Theory reflects a body of knowledge that organizes, describes, predicts, and explains a phenomenon" (Fleury & Sidani, 2012). Using theory to guide intervention in emerging field of sedentary behavior research moves the science forward by providing a consistent framework for intervention design that is directly testable. The use of appropriate theoretical perspectives to guide sedentary behavior intervention research will foster valid and replicable conclusions; adding to our knowledge about the phenomenon. Theory applied to sedentary behavior research will explicate the mechanisms involved in changing sedentary behavior, and guide how to best promote maintenance of sedentary behavior change (Fleury & Sidani, 2012).

Evaluation and critique of theoretical perspectives guiding sedentary behavior research in midlife women is essential as the evidence base in this emerging field develops. There is a growing literature of randomized controlled trials designed to evaluate the impact of interventions on the reduction of sedentary behavior.

Contemporary theoretical perspectives guiding sedentary behavior research in midlife women include Social Cognitive Theory (Carr, Karvinen, Peavler, Smith, & Cangelosi, 2013; Carr et al., 2016; Klaren, Hubbard, & Motl, 2014; Neuhaus, Healy, Dunstan, Owen, & Eakin, 2014); Theory of Planned Behavior (Lakerveld, Bot, van der Ploeg, & Nijpels, 2013; Pedersen, Cooley, & Mainsbridge, 2014; van Berkel, Boot, Proper, Bongers, & van der Beek, 2014); Behavioral Choice Theory (Aadahl et al., 2014); and Social Ecological Perspective (Gilson et al., 2009; Puig-Ribera et al., 2015).

Social Cognitive Theory

Social Cognitive Theory explains behavior in terms of reciprocal determinism; the dynamic and reciprocal interaction of behavior, personal factors including thoughts and cognitions, and environmental influences (Baranowski, 1993). Social Cognitive Theory developed from social learning theory, addressing cognition, anticipated consequences, and reinforcement (Bandura, 1986; J. Fleury, 1992). The theory proposes that individual perceptions of ability influence behavior, level of motivation, thought patterns, and emotion in response to potentially threatening situations. A distinctive feature of Social Cognitive Theory is the focus on the potential of human beings and their ability to learn, control, and respond to their environment. These abilities include symbolizing, modeling, forethought, self-regulation, and self-reflection (Bandura, 2001; Sharma, 2012).

Within Social Cognitive Theory, self-efficacy reflects individual confidence in being able to carry out a given behavior (Bandura, 1986). Evaluation of self-efficacy is based on information from four sources: (1) enactive attainment, or the performance of a behavior; (2) seeing or visualizing another performing a behavior; (3) verbal persuasion; and (4) physiological state, or cues experienced by the individual.

The expectation of outcome is the individual belief that a given behavior will lead to a positive outcome. Individual expectations concerning mastery include: (1) expectancies about environmental cues, or beliefs about how events are connected; (2) expectancies about the consequences of one's actions, or beliefs about how individual behavior will influence outcomes; and (3) expectancies about one's competence to perform the behavior needed to influence outcomes.

Both outcome and efficacy expectations reflect individual beliefs about capabilities and behavior-outcome links. People desire to achieve positive outcomes and avoid negative outcomes. According to Bandura (1977), an expectation of self-efficacy may be a more central determinant of subsequent behavior than is the expectation of outcome, but in many cases both are important. Behavior is thought to be motivated by its reinforcements, but only as those reinforcements are interpreted by the individual.

Perceived environment, or situational perception, refers to the ways in which individuals interpret and perceive environmental influences (Baranowski, 1993). Environmental influences reflect individual representations of real, distorted, or imagined factors that can affect behavior. Situation also refers to place, time, physical features, activity, participants, and the role of the individual. Combining environmental and situational perception provides an ecological approach to understanding behavior in the context of Social Cognitive Theory (Baranowski, 1993). The role of social support in Social Cognitive Theory arises from the environment construct of the theory, which refers to the social circumstances surrounding the individual. This construct is typically modified by providing opportunities to overcome situational or personal barriers, such as

improving access to the health care system, and by building social support for the individual in their environment (Sharma, 2012).

Studies investigating sedentary behavior from the perspective of Social Cognitive Theory have found efficacy expectation to be an important factor in the decision to initiate behavior change. However, perceptions of self-efficacy may vary over time and in different situations (Fleury, 1992). Thus, self-efficacy for the maintenance of behavior may differ from efficacy in behavior initiation.

Although individual perception of efficacy may be one important factor in the decision to reduce sedentary time, individual differences in the value of the behavior must also be considered. Bandura (1977) alludes to outcome value when noting the importance of incentive factors on behavior. Thus, individuals may feel efficacious in initiating behavior, but may perceive greater value in not engaging in the behavior.

Theory of Planned Behavior

The Theory of Planned Behavior aims to explain the roles of attitudes and intentions in predicting behavior. This perspective interprets social behavior at the level of individual decision-making. Within the Theory of Planned Behavior, individual intention to perform a behavior is considered to be the immediate determinant of action. Attitudes, subjective norms, and perceived control influence the intention to perform a behavior (Ajzen, 2002; 2011). According to the Theory of Planned Behavior, the more favorable the attitude and subjective norm with respect to a behavior and the greater the perceived control over behavioral outcomes, the stronger the intention to initiate behavior.

Personal determinants reflect attitude toward a specific behavior, or the relative value of outcomes to be achieved by performing a behavior. Attitudes are specific to a given behavior, rather than to the disease the behavior is intended to prevent or manage.

Social determinants refer to subjective norms, or the perceived expectations of others related to a specific behavior, and individual motivation to attend to these expectations. The individual will consider the opinions and expectations of others regarding a change in behavior, particularly if these expectations are valued.

Perceived control is an additional antecedent to intention. Perceived control refers to individual control over engaging in a given behavior. Perceived control is determined by the ease or difficulty inherent in engaging in a behavior, and reflects past experiences as well as perceived ability to overcome anticipated obstacles (Ajzen, 1985, 2002; Ajzen & Fishbein, 1980).

The Theory of Planned Behavior provides limited guidance in understanding how changes in attitudes, subjective norms, and perceived control consistent with intention to act might occur. Further, data indicate that individual intent to act and action represent different processes involving choice, the initiation and maintenance of action, and individual interaction with the environment.

Sniehotta and colleagues (2014) have suggested that the proposed mediating processes of the Theory of Planned Behavior lack empirical support (Sniehotta, Presseau, & Araújo-Soares, 2014). While the Theory of Planned Behavior characterizes intentions as predicting behavior, other research indicates that attitude may be a stronger predictor (Ajzen, 2011; Araújo-Soares, 2013; Conner, 2013; Geraerts, 2008). Ajzen (2002) has noted that factors external to the theory may independently influence intention, including

prior habits and consideration of valued outcomes (Ajzen, 2002; J. Fleury, 1992; Godin, 1989). Similarly, predictors of behavior include level of motivation, anticipated regret, conscientiousness self-efficacy, planning, extraversion, personal habits and environmental proximity (Rhodes, & Dickau, 2013).

The Theory of Planned Behavior does not address the process of engaging in behavior change beyond intention. The intention to engage in a behavior, actualization of intention, and maintenance of behavior may represent very different processes, involving motivation, preferences and personal choice, and contextual resources (Fleury, 1992). According to Ajzen and Fishbein (1980), intention to engage in behavior varies over time and context. While the Theory of Planned Behavior provides a basis for understanding individual attitude, subjective norms, perceived control, and intention within a situational context, the constructs have no temporal element; limiting understanding of the potential for change over time. This is significant because health behaviors, such as a reduction in sedentary behavior, function to reduce cardiovascular disease risk when they are maintained (Fleury, 1992; Gantt, 2001).

A systematic meta-analysis of 237 studies found that the Theory of Planned Behavior accounted for 19.3% of the variability in health behavior, with intention being the strongest predictor of behavior (McEachan, Conner, Taylor & Lawton, 2011). However, the theory was less predictive of behavior in longitudinal studies, when objective outcome measures were used compared to self-report, and when study participants were not university students in a controlled setting (McEachan, 2011). These findings confirm a “gap” between intention and behavior, limiting the utility of the Theory of Planned Behavior, particularly in terms of behavior maintenance.

The Theory of Planned Behavior also neglects social and contextual influences on intention and behavior change, as well as the recognition of the patterning of personal behavior change due to environmental and social contextual influences (Fleury, 1992).

Behavioral Choice Theory

Behavioral Choice Theory describes the reciprocal relationship between individuals and their environment, including how personal and environmental factors influence the choice to allocate time between physically active and sedentary behaviors. In Behavioral Choice Theory, this relationship consists of external processes, including feedback functions, which are properties of the environment, and internal processes, which reflect the value of possible alternatives. Assessment of the properties of the environment that limit certain behaviors such as physical activity, and facilitate others such as sitting time, guide our understanding of why some behaviors are chosen over others.

A behavioral epidemiological framework based on Behavioral Choice Theory has been proposed by Owen and colleagues (2010) for understanding and influencing sedentary behavior (Owen, Healy, Matthews, & Dunstan, 2010; N. Owen, Leslie, Salmon, & Fotheringham, 2000; Owen, Sparling, Healy, Dunstan, & Matthews, 2010; Owen et al., 2011; Zhu, 2017). Epstein (1998) suggests that principles derived from Behavioral Choice Theory apply to the study of sedentary behavior: (a) The choice to be sedentary depends on the behavioral cost of the alternatives. Thus, reducing the accessibility of options promoting sedentary behavior, or increasing the cost of being sedentary may reduce sedentary time (Epstein, 1998). (b) The choice to be sedentary depends on available alternatives and the reinforcing value of the alternatives. (c)

Providing a choice to engage in sedentary or active behavior is a motivational reinforcement. If individuals perceive that they do not have a choice, they may not be motivated to change their behavior (Epstein, 1998). (d) Choice will be reflective of the perceived delay between choosing and receiving alternatives. This concept is relevant to choices between active and sedentary behaviors, as the benefits of a physical activity behavior may be delayed but benefits of sedentary alternatives are often immediately enjoyed.

According to Zhu and Owen (2017), the constructs of Behavioral Choice Theory provide insight into the environmental determinants of sitting time, particularly how sedentary behavior is influenced by the availability and accessibility of amenities such as chairs, desks, and sofas, as well as constraints on access (Epstein, Paluch, Consalvi, Riordan, & Scholl, 2002; Epstein & Roemmich, 2001; Epstein, Roemmich, Paluch, & Raynor, 2005; Lappalainen & Epstein, 1990; Zhu, 2017). Behavioral Choice Theory suggests that environmental modification to increase the proximity and convenience of physical activity, and decreasing access to sedentary activity will decrease sedentary time. Determining factors that lead to choices for sedentary or active behaviors can inform development of relevant public health intervention strategies (Zhu, 2017), including substation or allocation of time between sedentary and active behaviors (Zhu, 2017).

Ecological Perspective

Ecological perspectives have been applied in interventions designed to address sedentary behavior from a public health perspective, (Gilson et al., 2009; O'Donoghue et al., 2016; Neville Owen et al., 2011; Puig-Ribera et al., 2015; & Sallis, 2015). Ecological

perspectives suggest multiple levels of influence on human behavior, fostering understanding of how people interact with their environments and multilevel approaches to improve health behaviors. Ecological perspectives further an understanding of the premise that providing individuals with motivation and skills to change behavior cannot be effective if environments and policies make it difficult or impossible to choose healthful behaviors (Glanz, 2002). Zhu and Owen (2017) argue that social and physical environments, including policy or community contexts, may have a greater impact on sedentary behaviors than do individual factors.

One strength of Ecological perspectives is their focus on multiple levels of influence, which broadens the reach of the intervention. Policy and environmental interventions may establish settings and resources designed to sustain behavior changes, in contrast to interventions that are focused on the individual. The European Joint Programme Initiative for action on diet, physical activity and health (DEDIPAC), a multidisciplinary team dedicated to addressing growing global trends in physical inactivity have recently proposed the System of Sedentary Behaviors Framework, advocating an Ecological perspective (Chastin et al., 2015).

Specifying the ways in which Ecological perspectives influence sedentary behavior has been challenging, due to the multilevel nature of the influences proposed, and the unspecified relationships among these influences. While Ecological perspectives provide value in targeting social, physical, and policy contexts for intervention, the mechanisms by which behavior change takes place are not specified, limiting potential for theory-based interventions targeting behavioral change processes influencing, changing, and maintaining reduction in sedentary behavior.

By addressing multiple levels of influence, Ecological perspectives broaden approaches to intervention, however little is known about the relative importance of influences either within or across levels, indicating a need to identify critical targets for intervention. Further, Ecological perspectives are limited in their ability to capture the complex nature of relationships across levels of influence, essential to developing and testing theory-based interventions. Chastin and colleagues (2015) note that the six clusters outlined in the System of Sedentary Behavior Framework interact synergistically to promote or prevent sedentary behavior, but were unable to identify or define the behavioral change processes connecting the clusters, including the nature and direction of change. Researchers targeting behavioral change have supported the principle of multilevel influences, but have found inconsistent support for interactions across levels (Chastin et al, 2015; Owen, et al., 2011).

Ecological approaches are concerned with influencing health behavior changes to promote wellness across communities and populations. However, community members have different developmental perspectives, needs, and priorities, which may reflect different targets for intervention. Chastin and colleagues (2015) note that influences in each cluster of the System of Sedentary Behavior Framework may change over the life course, with interactions between clusters changing dependent on context and population.

Discussion

While contemporary perspectives have achieved some success in reducing sedentary behavior, research is needed examining themes of interest to nursing science, including knowledge related to the optimal function of human beings; the patterning of

human behavior in interaction with their environment; and those processes through which changes in health occur (Donaldson & Crowley, 1978).

Contemporary perspectives guiding intervention to reduce sedentary behavior are grounded in deficit-based views of behavior, restricting the development and implementation of perspectives focused on personal strengths, meaning, and growth. Nursing intervention is reflective of human-environment processes (Reed, 1997; Sidani & Braden, 1998); contemporary approaches to reducing sedentary behavior view behavior as a mechanistic and predictable response to a stimulus. Focusing on deficits limits the exploration of strengths, which increases the risk for diminished health in midlife and older adults (Holstein & Minkler, 2003; McMahon, 2012; McMahon & Fleury, 2012). Few interventions build upon individual assets and experiences as fostering behavioral change. There remains limited knowledge regarding approaches to promote growth and change among midlife women by realizing potential and building on strengths, while simultaneously addressing women's diverse and changing needs (McMahon & Fleury, 2012).

Although contemporary perspectives identify a variety of factors, including attitudes, beliefs, and intentions underlying the individual decision to reduce sedentary behavior, they do not examine the meaning of health behavior change to the individual. In setting valued goals for change, persons adapt their world to self-generated needs and projects, rather than adapting themselves to a given world (Nuttin, 1987; Parse, 1981; Derenowski, 1990). Theoretical perspectives are proposed and tested based on the assumption that the variables studied are appropriate and meaningful. However, values, meanings, and priorities change across the lifespan, particularly during times of

transition, and require different approaches to health behavior change. The development of interventions designed to reduce sedentary behavior in midlife women must include an awareness of the meaning driving behavior and behavior change, in order to achieve a reduction in sedentary behavior.

Contemporary perspectives provide some understanding of the decision-making processes involved in reducing sedentary behavior. However, these perspectives are limited in capturing behavior change as a process. Contemporary approaches provide a theoretical structure to observe and predict behavior, but do not allow for an investigation of the processes characterizing both intention and volition in change. The variables involved in the prediction of behavior, the weights they receive, and the ways variables interact are presumed to remain constant from the moment an individual perceives a need through the time when behavior is initiated. The pre- and post-decisional processes guiding the initiation and maintenance of health behaviors may be very different, and require differing interventions. However, contemporary perspectives do not reflect this process. The development of relevant theory-based interventions must include awareness of the processes through which a reduction in sedentary behavior is initiated and sustained over time (Fleury, 1991).

Contemporary approaches are limited in furthering understanding of the patterning of human behavior in interaction with their environment. Social contextual resources are acknowledged in a number of perspectives, yet have received less attention relative to individual variables. Research on the determinants of physical activity among older adults has shown that environmental social, behavioral and cognitive factors are key for the initiation, and long-term maintenance, of physical activity. However, it is not

known if these same factors also determine sedentary behavior. Ecological perspectives acknowledge the need to test interventions targeting multiple levels of influence, based on the premise that intervening simultaneously at multiple levels, in multiple settings within levels, and with multiple intervention components within and across levels and settings, will produce greater and longer-lasting effects (Manini, Carr, King, Marshall, Robinson, & Rejeski, 2014). However, establishing the relevance and effectiveness of such approaches remains a challenge. A better understanding is needed regarding the role of social contextual resources in reducing sedentary behavior in midlife women, as well as the capacity of women to meet challenges posed by the environment.

Current understanding of the determinants of sedentary behavior and mechanisms of change required to decrease sedentary behavior in midlife women is lacking. Interventions designed to reduce sedentary behavior have shown variable effects, and are derived from perspectives designed to promote physical activity. Research exploring social contextual resources and behavior change processes related to sedentary behavior in midlife women, a vulnerable population, is essential.

Formative research is needed to better understand the processes through which midlife women engage in changes to decrease sedentary behavior, especially with respect to the social contextual and behavioral change processes underlying the Wellness Motivation Theory. This knowledge will facilitate the development of interventions to address motivation to reduce sedentary behavior in midlife women. In midlife and older adults, there is a lack of qualitative research related to sedentary behavior, as well as a lack of studies examining motivational and contextual processes and resources in reducing sedentary behavior (Brug & Chinapaw, 2015). The knowledge generated from

this research will inform the design and delivery of interventions to reduce sedentary behavior, recognizing midlife women's resources, experiences, and strengths. Building upon individual strengths and optimizing potential will advance nursing knowledge about growth as part of healthy aging (McMahon & Fleury, 2012).

The study of sedentary behavior is evolving, advancing an understanding of the unique consequences of sedentary behavior on cardiovascular health; however, the processes through which midlife women engage in change to reduce sedentary behavior are not well understood. Further, intervention research reducing sedentary behavior in midlife women has not included a theoretical perspective which honors the complex patterning of behavior in social and environmental contexts.

The Wellness Motivation Theory provides a unique perspective to the study of sedentary behavior, recognizing non-linear patterns of behavior change and growth over time. Nursing science encompasses the development, implementation and evaluation of theory and interventions to promote and motivate individuals to achieve their own potential. The research literature on sedentary behavior contains few studies advancing a nursing perspective (SBRN, 2012). Thus, perspectives advancing nursing science are essential.

Research Problem of Interest

The Wellness Motivation Theory, a middle-range nursing theory, is proposed as the theoretical perspective guiding the proposed research of sedentary behavior in midlife women. What are the experiences of midlife women regarding sitting less and moving more? A qualitative descriptive approach will be used to explore the social contextual resources and behavior change processes leading to action as decreasing sedentary time

in midlife women. A deeper understanding of motivational processes central to reducing sedentary behavior in midlife women will foster identification of leverage points for theory-based intervention research.

Currently, little is known about the mechanisms involved in changing sedentary behavior, and how to best promote maintenance of sedentary behavior change. Exploring social contextual resources and behavioral change processes in a naturalistic setting will inform intervention research needed to reduce sedentary behavior in real-world settings, and thus promote reduction of a modifiable cardiovascular disease risk factor in a vulnerable population. Reductions in known and modifiable risk factors such as excessive sedentary time are key to promoting successful aging.

Significance of the Research

Midlife women are known to have high levels of sedentary behavior and corresponding cardiovascular risk. Theory-based interventions for reducing sedentary behavior in midlife women are needed, which reflect process, personal meaning, and person-environment interaction. The proposed research will explore social contextual resources and behavioral change processes, consistent with the Wellness Motivation Theory, as well as extend and enrich the Wellness Motivation Theory based on the perspectives of midlife women engaged in the change process. New ways of supporting midlife women to promote healthy aging are urgently needed; the proposed research represents a first step in programmatic research developing innovative approaches to support healthy aging.

Summary

Sedentary behavior, or activity that does not increase energy expenditure above resting metabolic levels, is an emerging focus for research and is a unique concept from physical activity. Sedentary behavior is an independent risk factor for cardiovascular disease, and midlife women are particularly at risk due to sedentary lifestyle, developing obesity and metabolic syndrome. To date, there is a significant gap in our research knowledge about the complex personal, social and environmental factors that influence and promote sedentary behaviors in midlife women. The current research also lacks both a solid theoretical foundation and a nursing perspective. The issue of motivation for behavior change is complex, suggesting that there are opportunities to approach motivation to reduce sedentary behavior from the lens of a nursing perspective, which enhances and promotes individuals' strengths, viewing the individual as interacting within a complex social and environmental context. The alternative theoretical approach to studying sedentary behavior restricts the lens of focus to the simple removal of a deficit, or correcting of a perceived problem which is insufficiently explicated to its antecedents.

CHAPTER 2

THEORETICAL FRAMEWORK

The Wellness Motivation Theory will be used as the theoretical foundation for the proposed research. The Wellness Motivation Theory guides understanding of social contextual resources and behavioral change processes, and acknowledges the contextual dependence and complexity of motivation for health behavior change (Fleury, 1996). The Wellness Motivation Theory is grounded in nursing science, and provides a unique perspective to the emerging discipline of sedentary behavior research. This chapter provides an overview of the Wellness Motivation Theory, a theoretical framework of the research problem, worldview and key assumptions underlying the Wellness Motivation Theory, a description of foundational constructs, and a discussion of the relevance of the proposed study to nursing science.

Wellness Motivation Theory

The Wellness Motivation Theory is a middle-range nursing theory which conceptualizes the process of behavioral change within culturally and environmentally relevant contexts, while recognizing the bidirectional influence of personal and environmental factors on behavioral patterns. The Wellness Motivation Theory addresses social support and norms, community and material resources that influence behavioral choices, individual motivation and goals, processes of behavioral change, and has empirical support in promoting physical activity (Silva-Smith, Fleury & Belyea; 2013; McMahon, et al, 2014).

The Wellness Motivation Theory conceptualizes motivation as "empowering potential," reflecting the unique values, needs, priorities and personal health goals of the

individual in initiating and sustaining health behavior change (Fleury, 1991). The Wellness Motivation Theory includes three primary constructs: (a) social contextual resources, (b) behavioral change processes, and (c) action. Social contextual resources and behavioral change processes mutually influence health related behavior (action) (Fleury, 1996; McMahon, 2012).

The Wellness Motivation Theory extends traditional behavioral and motivational theories in explaining behavior within a complex context of personal, social, cultural and environmental influences. Wellness Motivation Theory reflects mechanisms through which individuals create and evaluate valued goals, establish behavior standards, determine change strategies, and strengthen and regulate behavior patterns over time (Fleury, 1991; Fleury, 1996; Perez & Fleury, 2009). Wellness Motivation Theory addresses the idea that humans interact within an environmental context, and the dynamic presence or deficit of fundamental behavioral change processes and social support resources in activating new healthy behaviors (Fleury, 1996).

Worldview of Wellness Motivation Theory

The Wellness Motivation Theory extends traditional behavioral and motivational theories by explaining how people develop unique goals for changing their behavior, how they envision opportunities to act that have personal relevance, and how they develop and implement strategies to initiate and maintain behavior changes (Fleury, 1996).

The Wellness Motivation Theory reflects a simultaneity and unitary-transformative worldview (Fawcett, 1993, 2005), providing a unique nursing perspective to the emerging field of sedentary behavior research. The unitary-transformative worldview assumes certain characteristics of humans and relationships, and how

behavioral change occurs: (1) humans are unitary, evolving fields with the capacity for self-organization; (2) human fields are identified by pattern and by interaction with the whole surrounding environment; (3) change is unidirectional and unpredictable; (4) systems evolve through organization and disorganization, achieving a higher complexity of organization; and (5) emphasis is on personal knowledge and patterns of behavior (Fawcett, 1993; 2013).

According to Parse, a simultaneity paradigm assumes that humans exhibit synergy, and are more and different than the individual sum of their parts. Simultaneity considers humans as mutually, continuously, and rhythmically interacting with their environment, in the act of co-creating health (Fawcett, 1993; Parse, 1981, 2000; Wright, 2006). Health reflects a dynamic process of becoming, living valued priorities (Fawcett, 1993). The phenomenon of concern to nursing is the human-universe-health process (Parse, 2000), consistent with the worldview of the Wellness Motivation Theory.

Qualitative research and intervention testing based on the Wellness Motivation Theory reflects contemporary scientific philosophies such as intermodernism (Reed, 1995, 2006, 2011). Ontological perspectives congruent with unitary-transformational worldviews and epistemological perspectives congruent with intermodernism are foundational to the assumptions underlying the Wellness Motivation Theory. The intermodernism philosophy of science builds upon the intersection of modernism and postmodernism views, and supports knowledge generation from a synthesis of research, theory, and practice (Reed, 2006, 2011; Whallen & Hicks, 2002). Intermodernism promotes a concentration on human developmental potential to aspire to well-being (Reed, 2006, 2011; Whallen & Hicks, 2002). Intermodernism supports processes of

critical thinking, creativity, experimentation and acknowledges ambiguity, rejecting rigid views of truth, while maintaining both skepticism and an open mind (Reed, 2006, 2011). Principles of intermodernism include: (a) new applications of observation and experimentation, which encompass novel and varied techniques; (b) clinicians are educated to produce knowledge in practice; (c) critical realism, comprising a wide range of human experiences; (d) concern for oppression with a value for differences; (e) assumed shared principles, individual differences, and local truths; and (f) value for ongoing review and analysis to keep working philosophies and theories dynamic, open, and contextually relevant (Reed, 2006, 2011).

The unitary-transformational worldviews emphasize pattern recognition and personal knowledge and are consistent with an intermodernism philosophy of science (Reed, 2011). In this worldview, humans exist as a single unit, and are continually changing and growing; evolving as self-organized fields through complex and continual phases of disorganization and organization (Fawcett, 1993). Personal becoming and pattern recognition are the primary phenomena of interest (Fawcett, 1993; Reed, 1995, 2011, McMahon, 2012).

Wellness Motivation Theory-based interventions reflect relational nursing processes focused on promoting meaningful goals and values in continuous interaction with the physical and social environment. Wellness Motivation Theory provides a theoretical foundation through which nursing may facilitate individual exploration of values, dreams for the future, and personal health goals with particular attention to social contextual resources (Parse, 1988; Fleury, 1991; Fleury, 1996). These relational, interpersonal nursing processes move away from a focus on standardized antecedents or

determinants of motivation, to motivational processes which honor complexity, evolution, and the patterning of human behavior in mutual process with the environment (Fleury, 1991; Fleury, 1996; Arslanian-Engoren, Hicks, Whall, & Algase, 2005; McMahon, 2012).

From this worldview, wellness and illness are not static, but viewed on a continuum, and defined and viewed differently for each human, from their own "self" perspective and place in a social, cultural, and environmental context. Behavior is not motivated by tension or loss, as is theorized by value-expectancy models of behavior change, which assume linear, fixed, and predictable relationships between a stimulus or intervention, and the expected action response. "Well-being is a value, it is not an absolute" (Rogers, 1990).

Assumptions of Wellness Motivation Theory

The Wellness Motivation Theory focuses on wellness, and fosters personal growth and movement toward personal behavior change goals in way that honors situational context and personal meaning for the individual. (Fleury, 1991, 1996). The underlying assumptions of WMT pertain to humans, motivation, change, wellness, and nursing (McMahon, 2012). Assumptions regarding humans:

1. Humans are unique individuals, members of families, various groups, and communities, with unique interests and goals that vary by situation and over time (Fawcett, 2005; McMahon, 2012).
2. Humans are free to choose personal ways of being and becoming that include their pursuit of wellness (Fleury, 1996; Parse, 1988; McMahon, 2012).
3. Humans continually develop and grow, becoming more complex and more integrated

over time (Reed, 1997; McMahon, 2012).

4. Humans continually and dynamically change in mutual process with their changing environment (Rogers, 1988; McMahon, 2012).

Assumptions regarding motivation: (a) motivated behavior serves as a pathway for personally meaningful change and growth, rather than addressing loss or perceived deficit (Fleury, 1991, 1996); and (b) motivation is complex--contextually dynamic and nonlinear, moving individuals beyond the present, toward personal goals and dreams for their future (Mitchell, 1988; Fleury, 1991, 1996; McMahon, 2012).

Assumptions regarding change: (a) behavior change is a process of intention formation and value directed activity guiding the development and actualization of goals and new behavior patterns; (a) decision processes which guide behavior change rely on personal awareness, values, social context, and knowledge of culture (Fleury, 1991, 1996; McMahon, 2012).

Assumptions regarding wellness: (a) "wellness is a purposeful process of individual growth, integration of experience, and meaningful connection with others, reflecting personally valued goals and strengths, and resulting in being well and living values" (McMahon & Fleury, 2012); and (b) wellness is unique to the individual, not a process that can be standardized or prescribed, and exists across all health and functional statuses (McMahon, 2012).

Assumptions regarding nursing: (a) nurses interact with individuals to facilitate clarification of personal values and meaning, as well as priorities and the use of resources to promote maximized wellness (McMahon, 2012). Through this helping intervention, nurses assist individuals to mobilize new patterns of behavior and living that transform

the self, so that individuals can integrate and reach beyond their old ways of being (Parse 1988; McMahon, 2012; Reed, 2007); (b) The discipline of nursing is characterized by the study and promotion of processes of well-being in human systems…"nursing processes are manifested by changes in complexity and integration that generate well-being" (Reed, 1997, p 77).

The Wellness Motivation Theory conceptualizes individuals as interacting in mutual process within their environments, and focuses on growth-motivated behavior based on dynamic personal meaning and values (Fleury, 1996; Parse, 1988). These assumptions and ideas of how people behave, grow, and change move the Wellness Motivation Theory beyond traditional motivational theories which focus on stages of change, attribution, and cognition (Conner & Norman, 2005; Eccles & Wigfield, 2002).

The underlying assumptions of the Wellness Motivation Theory are consistent with the work of Rosemarie Parse in humanbecoming. According to Parse (1988, 1998), individuals make choices reflective of personal meaning, uncovering the imagined self, thus knowing through the lens of the individual's own values and priorities. Parse's work emerged from Rogerian thought, which describes the unitary-transformative nature of humans as reflecting open existence, energy field, patterns, connection to the environment in a non-linear, pan-dimensional way that reflects helicy, resonancy, and integrality (Rogers, 1988; Fawcett, 2005). Empowering potential, the overarching construct guiding the Wellness Motivation Theory, reflects a process of individual growth and development, fostering the emergence of positive health behaviors and patterns that are consistent with an individual's own personal values and goals (Fleury, 1996).

The Wellness Motivation Theory offers an explanation of health behavior change in context, reflecting human motivational complexity, patterning and personal meaning, and the situational dynamics of change over time, as people are interacting within their environments.

Theoretical Constructs of Wellness Motivation Theory

The theoretical constructs of Wellness Motivation Theory reflect the ways in which health behavior changes and maintains evolving patterns of change over time. Wellness Motivation Theory has been tested in a variety of applications regarding physical activity in older adults. Social contextual resources include social support and community and environmental resources. Behavioral change processes include self-knowledge, motivation appraisal, and self-regulation. Behavioral change takes place in culturally and environmentally relevant contexts. The mediating processes influencing behavioral change lead to measurable health outcomes.

Social contextual resources. The presence or absence of social contextual resources can significantly impact behavioral change processes, as well as behavior initiation and maintenance; in the case of sedentary behavior, the behavior relates to decreasing sitting time, or standing up and moving more. Social contextual resources arise from physical or sociocultural environments, as well as in interpersonal contexts (Fleury, 1991, 1992, 1996; Fleury, Keller & Perez, 2009). Examples of social contextual resources that may impact motivation to reduce sedentary behavior include: feeling fatigue from sitting, perceived lack of time to exercise or reduce sitting time, use of technology through television or computer time, and lack of support from spouses or significant others to engage in healthy behaviors. Environmental resources may include

opportunities to take breaks from sitting during sedentary desk jobs.

Behavioral change processes. In the Wellness Motivation Theory, behavioral change processes include self- knowledge, motivation appraisal, and self-regulation. These processes reflect the ways in which individuals identify and evaluate personal goals, establish standards for behavior change, develop and implement strategies to enact change, and regulate and strengthen patterns of behavior, leading to sustained behavioral change and new ways of doing and being (Fleury, 1991; 1992; 1996). These behavior change processes reflect the nature of humans, and the human tendency to move beyond existing achievements and strive for new goals and dreams for the future (Fleury, 1991; 1992; 1996).

Self-knowledge. The self is the central reference point for cognition, emotion, motivation, and social behavior (Sedikides & Strube, 1997; Fleury & Sedikides, 2007). Researchers have explored the concept of self-knowledge as a component of the self-system, which is a significant correlate and antecedent of motivation in behavioral change (Fleury & Sedikides, 2007; Markus & Nurius, 1986; Wilson & Dunn, 2004). Self-knowledge is defined as one's stored knowledge about themselves, including feared or ideal selves, goals, and action plans (Fleury & Sedikides, 2007).

Within the Wellness Motivation Theory, self-knowledge is the foundation for developing personal contextual meaning—an understanding about the self and future goals—'where am I now, and where do I want to be?' Through the process of acquiring and changing self-knowledge, individuals identify and interpret new information about themselves. Self-knowledge facilitates the development of personally meaningful goals and self-regulation strategies, acknowledging fears and hopes about future health, and

gauging their confidence in performing new behaviors (Fleury, 1996; Fleury & Sedikides, 2007). Fleury and Sedikides (2007) identified three primary processes comprising self-knowledge: representational processes, evaluative processes, and behavioral action processes (Fleury and Sedikides (2007). Representational processes involve socially created, desired, and feared selves. Evaluative processes encompass potential for growth, goal expectations and self-efficacy. Behavioral action for self-knowledge refers to developing action plans, negotiating social contexts, and self-regulating (Fleury and Sedikides (2007). Self-knowledge in the Wellness Motivation Theory may be operationalized by exploring representational, evaluative and behavioral action processes.

Self-knowledge and its components have been empirically tested across health behavior changes, including physical inactivity (Fleury, 1991; 1996; Perez, 2009; Bluethmann, 2017); falls prevention (McMahon, 2013); chronic disease and medication management (Enriquez et al., 2015; Rosen,Berrios-Thomas, & Engel, 2016); and disordered eating (Silva-Smith, Fleury, & Belyea, 2013; Mummah, King, Gardner, & Sutton, 2016). Self-knowledge was found to be important among older adults in minority populations where consideration of possible selves was a motivator in enacting personal health goals (Fleury, & Sedikides, 2007). Self-knowledge operationalized as self-efficacy and outcome expectancy showed a significant increase in a wellness motivation theory-based intervention designed to foster physical activity maintenance in older Hispanic women (Perez, 2009). Rosen and colleagues (2016) tested approaches to building self-knowledge and self-efficacy in health coaching interventions designed to help congestive heart failure patients better understand their condition and symptoms, set

health goals, feel safe, and know how to make healthy choices. Mummah and colleagues (2016) tested a theory-based approach focused on motivation, personal goal-setting and self-monitoring strategies to increase vegetable consumption in overweight adults.

Motivation appraisal. Motivation appraisal reflects the process of developing readiness to act, identified as commitment and intention formation for goal directed behavior which is consistent with personal beliefs and values, information, resources, and goals (Fleury, 1991, 1996; McMahon, 2012). Readiness concepts have been addressed in a variety of motivational interventions related to behavior change (Marcus, Rakowski & Rossi, 1992; Marcus & Owen, 1992; Rossi, 1995; Young, King, Sheehan, & Stefanick, 2002; Pinto, 2005, 2008, 2009; Clark, 2008; Kruglanski, 2014; Han, 2017). Motivational appraisal has been evaluated in Wellness Motivation Theory interventions to increase physical activity in older adults (Fleury, 1997; Perez, 2009). McMahon (2013) developed the "Ready-Steady" app for older adults with low levels of physical activity and fall risk, which focused on theory-based motivational messages to improve readiness, including the importance of commitment to personal goals. Enriquez and colleagues (2015) implemented a "Ready" intervention testing the Wellness Motivation Theory to improve HIV medication and treatment adherence among HIV-positive adults (Enriquez, 2015).

Among sedentary midlife women, motivation appraisal using Wellness Motivation Theory may be operationalized by exploring concerns about reducing sedentary time, and engaging in problem-solving strategies to reduce barriers. Enhancing readiness for behavior change may be achieved helping individuals connect their beliefs, values, and resources to personal valued goals, and assisting in development of skills to

achieve goals.

Self-regulation. Self-regulation reflects the process of transforming goal intentions into personalized action using cognitive, affective, and behavioral strategies consistent with an individual's valued goals. Striving to achieve personal goals, and maintaining personal standards for behavior are important sources of motivation requiring internal behavior regulation. Self-regulation guides individuals in goal-directed behaviors through selective processing of information, behavioral monitoring, judging individual performance, and engaging in self-evaluation (Fleury, 1992; Bellg, 2003; Maes & Karoly, 2005; McMahon, 2012). Self-regulatory mechanisms are important to understanding volitional behavior, in that they mirror ways in which individuals behave in concert with personally valued goals, particularly in the presence of conflicting goals, or when the goals present different rewards over time (Bellg, 2003; Maes & Karoly, 2005; McMahon, 2012).

The concept of self-regulation has been used to describe and predict adherence to regular physical activity, as a means to reduce cardiovascular disease risk factors in older adults (Anderson, Wojcik, Winett, & Williams, 2006; Bandura, 2004; Hallam & Petosa, 2004). Kim and colleagues (2011) and Pinto and colleagues (2013) tested theory-based interventions including self-regulation approaches to self-monitoring and problem-solving, to promote physical activity among breast cancer survivors. King and colleagues (2013) evaluated the use of mobile phones in reducing sedentary behavior, using self-regulation approaches to goal setting, self-monitoring, and adaptive problem solving. Using a Wellness Motivation Theory-based intervention to improve motivation for physical activity in inactive older Hispanic women, Perez (2009) found a statistically significant increase in self-regulation skills, as measured by the Index of Self-Regulation

(Fleury, 1995).

Recognition and development of self-regulatory skills is critical because maintenance of valued behavioral change requires strategies to promote continued motivation in response to changing social contextual influences. Self-regulation may be operationalized by self-monitoring, fostering problem-solving strategies to address concerns, developing additional resources to support goal achievement, anticipating and responding to changes in social contextual resources, and overcoming adherence/maintenance barriers (McMahon, 2012).

Action. The action construct of the Wellness Motivation Theory operationalizes the specific behavioral and health outcomes relevant to the population and problem being studied. According to the Wellness Motivation Theory, individual action is prompted by increases in awareness, procurement and use of social contextual resources and increases in the behavioral change processes of self-knowledge, motivational appraisal, and self-regulation skills.

Significance of the Research

The Wellness Motivation Theory is grounded in nursing science, and provides a unique perspective to the production of nursing knowledge in sedentary behavior research. The Wellness Motivation Theory honors themes of human interaction within their environment, and dynamic presence of fundamental behavioral change processes and social support resources in activating new healthy behaviors (Fleury, 1996). The Wellness Motivation Theory fosters the understanding of patterns of behavior that define human motivation in a context of complexity and meaning that defines the unique human experience.

Midlife women have high levels of sedentary behavior and corresponding cardiovascular risk. Effective approaches to reducing sedentary behavior and promoting everyday movement in midlife women are not yet established. To date, there has been limited research evaluating the relevance of the Wellness Motivation Theory addressing sedentary behavior from the perspective of motivation for wellness. Formative research is needed to develop a deeper understanding of existing social contextual resources and behavioral change process skills in midlife women with respect to their experiences with sedentary behavior. The proposed research will extend the research knowledge base about factors influencing sedentary behavior in midlife women, and facilitate the development and testing of relevant, theory-based motivational interventions for sedentary behavior reduction (Owen, Healy et al, 2010). The proposed formative research is the first step in a planned program of research to develop innovative approaches in sedentary behavior reduction that support successful aging.

Summary

Sedentary behavior, or activity that does not increase energy expenditure above resting metabolic levels, is an emerging focus for research and is a unique concept in physical activity. Sedentary behavior is an independent risk factor for cardiovascular disease, and midlife women are particularly at risk due to a sedentary lifestyle. To date, there is a significant gap in the research knowledge about the complex personal, social and environmental factors that influence and promote sedentary behaviors in midlife women. The issue of motivation for behavior change is complex; the proposed research will foster an understanding of motivation to reduce sedentary behavior from a nursing perspective of maximizing wellness, which enhances and promotes individuals strengths,

and views the individual as interacting within a complex social and environmental context.

The Wellness Motivation Theory, a middle-range nursing theory, is chosen for this research study to advance nursing science regarding motivation to reduce sedentary behavior. The Wellness Motivation Theory honors themes of human interaction within their environment, and dynamic presence of fundamental behavioral change processes, and social support resources in activating new healthy behaviors (Fleury, 1996).

CHAPTER 3

METHODOLOGY

Chapter 3 presents research design and methodology, including an overview of the qualitative descriptive approach used to address the research question. Discussion includes provision for the protection of human subjects, discussion of participants and setting, research protocol, recruitment procedures, data collection, data management, data analysis, and approaches to methodological rigor.

Research Design

Qualitative research fosters the discovery of personal knowledge, and encourages reflection on individual experiences (Sandelowski, 2004). The goal of qualitative research is "to produce a rich description and in-depth understanding of the phenomenon of interest, as well as the cultural and lived experience of people in natural settings" (Magilvy, 2003, p. 123). Qualitative approaches to research provide information about the complexity, nuance, and patterning of human responses in health behavior change. This information is critical to the design of culturally sensitive, developmentally appropriate, and effective interventions (Sandelowski, 2003).

Qualitative descriptive design incorporates approaches to gathering information about the human experience, including interviewing individuals, facilitating focus groups, analyzing documents or artifacts, and observing research participants (Sandelowski, 2000, 2010; Thorne, 2000, 2016). These research methods provide rich data capturing personal experiences, feelings, values, and opinions. Qualitative design and methods permit researchers to immerse themselves in the rich data of events and verbal

communication, which allows for a robust description of personal experiences that are natural, unadulterated, and transparent (Sandelowski, 2000).

Qualitative descriptive research may use a theoretical foundation to approach a particular problem of interest. The theoretical foundation guides the manner in which research data are sampled, collected, analyzed, and interpreted (Sandelowksi, 2010). Characteristics of qualitative descriptive methodology include: (a) use of a theoretical perspective that best describes the problem of interest; (b) acceptability of multiple approaches to selecting participants (maximum variation or homogenous); (c) use of structured focus group or interview questions; (d) data analysis using descriptive statistical analysis and qualitative content analysis; (e) descriptive data summaries and organization in an manner that uniquely 'fits' the data (Sandelowski, 2000, 2001, 2010; Morse, 2002; Colorafi & Evans, 2016).

Wellness Motivation Theory provides the theoretical perspective guiding this research, incorporating the constructs of social contextual resources (social and community support), and behavioral change processes of self-knowledge, motivational appraisal, and self-regulation. The Wellness Motivation Theory reflects contextually grounded processes of change through which individuals create and evaluate valued goals, establish behavior standards, determine change strategies, and strengthen and regulate action over time (Fleury, 1991, 1996).

Research Methods

Sample and setting. Qualitative descriptive methods allow for a wide variety of sampling approaches, which ultimately determine the types of conclusions that may be drawn from the research (Miles, Huberman, & Saldaña, 2014).

Inclusion criteria for this research included the following:

1) Female gender;
2) Age 40-64;
3) Ability to speak and understand English; and
4) Willingness to participate in a 1-hour audiotaped focus group interview session.

Arizona State University employees were targeted for this research. Seventy-seven percent of all University employees (Fall 2016) are located at the Tempe Campus (11,360), with thirteen percent (1,846) located at the Downtown campus, and five percent and four percent located at West and Polytechnic Campuses. The Tempe and Downtown campus was targeted for recruitment efforts, with eligible participants invited to attend focus groups at the campus of their employment.

Minors under the age of 18, those adults who were unable to consent, pregnant women, prisoners, Native Americans, and undocumented individuals were not targeted for this research. However, as part of developing a diverse complement of study participants, if an individual who was Native American volunteered to participate in the study and met inclusion criteria, they would have been included in the focus group regardless of their status as a special population.

This research used maximum variation sampling to recruit midlife women, age 40-64, employed by Arizona State University. The majority of contemporary studies regarding sedentary behavior have taken place in a workplace setting. Choosing a university setting for this study advances the science by building on the current available literature of midlife women in sedentary workplace environments. This type of sampling provided opportunities for exploring both common patterns and variability in the data

generated (Miles, Huberman & Saldaña, 2014; Sandelowski, 2011). Attributes for sampling included: age; racial and ethnic diversity; amount of reported sedentary time per day; and variation in processes of change regarding reducing sedentary behavior. National Health and Nutrition Examination Survey (NHANES) data for adults over the age of 20 note that sedentary behavior increases with age, and continues to increase into older adulthood (Matthews, et al, 2008; Evenson, Buchner, & Moreland, 2012).

Harlow and Derby (2015) define midlife as beginning at age 40 and extending through age 64. This age range encompasses the late reproductive to late postmenopausal stages of reproductive aging. Exploring approaches to health behavior at midlife are essential to promote healthy aging. Sampling women across the midlife age span from age 40 through 64 was designed to capture a broad range of experiences of women in stages of life transition, as well as information related to their occupational and leisure sedentary behavior.

Sampling for racial and ethnic diversity was implemented to identify possible differences in sedentary behavior practices and perceptions. Among adults, non-Hispanic whites report the highest levels of sedentary behavior (Zhu, 2017).

The sampling process classified women who were: a) thinking about sitting less and moving more within the next 6 months; b) women who were sitting less and moving more, but not regularly; c) women who were sitting less and moving more regularly, and (d) women who had been sitting less and moving more, but were not currently doing so. The inclusion of participants who were not currently engaged in reducing sedentary behavior provided opportunity to examine and analyze comparison cases. Women were categorized as to variation in the process of behavior change either by self-report or

narrative description. Information from comparing processes of change among various cases served to challenge and strengthen emerging conceptualizations by promoting variation with the data, enhancing the meaningfulness of the categories, and providing an opportunity to refine and extend the Wellness Motivation Theory (Morse, et al., 2002). Morse and colleagues (2002) and Sandelowski (2011) suggests that these types of comparisons are important to a study's validity by helping to clarify aspects of the analysis that are less obvious.

The study recruited female participants for focus group interviews of between 2 and 8 participants per group, until data saturation was achieved. Preliminary data collected between July and November 2016 in two focus groups included eight participants. An additional five focus group interviews conducted during January and February 2018 included 23 participants, totaling 31 participants in this research.

Protection of human subjects. Internal Review Board (IRB) approval for the research was sought through Arizona State University. The research complied with all ethics standards, including standards for obtaining informed consent. Participants were informed both in writing and verbally prior to the start of a focus group session that they had the right to leave a focus group at any time or withdraw from the study at any time without any penalty. Recruited participants were notified verbally and in writing that Investigators would protect their privacy, and their identity and identifying information would remain confidential.

Risk and benefits to participants. There was minimal potential for psychological or social discomfort when attending a focus group interview, or when discussing health or personal experiences regarding physical activity and sedentary behavior. There were

no expected economic risks due to participation in the focus group interviews. Some participants expressed that they experienced benefit from the opportunity to express themselves about their health and their personal experiences regarding physical activity and sedentary behavior.

Recruitment. The Investigator recruited participants using a variety of resources on the Arizona State University campus. The Investigator notified potential participants of the study through recruitment flyers describing the research. The Investigator placed flyers in prominent areas in campus buildings (designated communication boards, message kiosks, administrative and academic units). Executive Assistants and other administrative personnel in the Arizona State University general directory were identified as sources of contact for study recruitment. The Investigator sent the recruitment flyer and study descriptions electronically to Executive Assistants within each Arizona State University College, with a request for additional circulation to staff within those departments. The Communication Director for the College of Nursing and Health Innovation included information about the research in a department newsletter. In addition, the Arizona State University Director of Employee Wellness provided assistance in distributing recruitment flyers to employee wellness classes and other employees. The electronic version of the flyer contained a hyperlink to a secure online SurveyMonkey® website, where interested persons were able to obtain more information about the research, and complete a brief online survey to determine eligibility for the study.

Procedures. The Investigator reviewed all survey responses to determine participant eligibility. A copy of the questions asked in the participant survey is provided

as Table 1. Potential participants were asked as part of the survey to provide a valid e-mail address. The Investigator contacted potential participants who successfully completed the survey by e-mail, notifying them of their eligibility for the study. The Investigator sent each potential participant a list of ten possible date options for focus group meetings on each campus location, with a request for response with availability via return e-mail to the Investigator. Participants were sent an email with instructions for attending the focus group, including the date, time and location of their assigned focus group, as well as a copy of the consent form for their review. The Investigator sent all scheduled participants a reminder e-mail one to two business days prior to their focus group session.

All focus group meetings were held over the lunch hour, from noon until one at either the Arizona State University Memorial Union, or the Downtown Campus Health North location. Scheduled participants were notified that they would receive lunch and a $20 gift card on arrival for their participation.

While participants did provide their name by sending their ASU e-mail address for contact purposes, the participants were assigned an identification number for use during the focus group meeting and in data transcription and analysis. No names or other identifying information were used in the research. Participants provided a signed consent form upon arrival to the focus group meeting.

Data collection. Data collection in qualitative research attempts to uncover the "who, what and where" of human experiences and events (Sandelowski, 2000, p. 338). A focus group approach is appropriate as a way to generate rich and diverse data. Group discussion encouraged the participants to share experiences in their own words.

According to Carey (1994), the most important aspect of the focus group is the nature of the group itself, which reflects participant interaction, flow and patterning of the discussion and how described experiences evolve through the group (Carey, 1994).

The Investigator facilitated focus group discussion using an introductory script and list of guiding questions, using Wellness Motivation Theory as a conceptual lens. Table 1 outlines the links between the focus group questions and Wellness Motivation Theory concepts. The Investigator used open-ended questions to initiate discussion, and then reframed discussion with participants when certain issues or concepts needed further exploration or clarification. Morse suggests that questions may change to meet the analytic goals of the study (Morse, 2002).

At the start of each focus group session, and prior to the start of the audio-recording, the Investigator provided a brief introduction and overview of the research, noting that the research was voluntary and that participants were free to end their participation at any time. Once the audio-recorder was turned on, the Investigator asked guided interview questions of the focus group, and facilitated discussion and responses from research participants for approximately one hour. The Investigator and Mentor both documented field notes, capturing communication approaches, meaning and context in the data. The Mentor also asked reflective, guiding questions as follow up from the interview script. At the completion of 60 minutes of time, the Investigator thanked the participants, asked if there were any additional follow up questions, and provided a synopsis of the discussion. The Investigator informed participants that results of the focus group sessions would be used to develop a better understanding of sedentary behavior, as a basis for future intervention approaches to reduce sedentary behavior.

Participants were also reminded that no individuals would be personally identified as a part of this research. Once the focus group sessions were completed, participants received an e-mail from the Investigator within 1-2 business days to thank them for their participation in the study, with an offer to provide them with additional information on the results of the research, only if they requested this information by return reply e-mail.

Table 1. Guiding Focus Group Questions

Guiding Focus Group Questions	WMT Construct
Talk about ways family/friends/household members encourage you or support your reduction of sedentary time-increased movement/activity.	Social Support
Discuss ways family/social supports participate in your activity	Social Support
Reflect on ways community organizations can support your activity, reducing sedentary time	Community Support
Discuss how your place of work supports healthy movement and activity, reduction of excessive sitting time	Community Support
What thoughts do you have about your own health now, and what goals or ideas do you have to improve your health?	Self-knowledge
Discuss your confidence you have in achieving your health goals	Self-knowledge
Talk about what happens to you when you are inactive or sit too much.	Motivational Appraisal
What are ways that you can fit more movement and less sedentary time into your own life?	Motivational Appraisal
How do you plan to overcome potential barriers of support, environment, negative self-talk, or unsupportive workplace?	Motivational Appraisal
What do you think are the overall benefits of sitting less?	Self-regulation
How do you keep track of sitting time?	Self-regulation
How do you know when and if you are making progress in reducing sedentary time?	Self-regulation

Data Management

Transcription. Within approximately one day of each focus group session, voice recordings from the audio-taped session were converted to a written transcript via an audio-transcription computer application called ExpressScribe®. The Investigator loaded the electronic audio-file from the digitial recorder to a laptop computer, and transcribed the data into a Word® document, using ExpressScribe®. Each transcription included the Investigator listened to each session on full (100%) speed, and on a variety of slower speeds to transcribe words, pauses, and inflection heard to ensure accuracy of the transcription. Listening to the recordings repeatedly while transcribing and noting analytic memos summarizing impressions assisted the Investigator to recall impressions of the focus group meeting, including verbal intonation, and memories of facial expressions or gestures. The transcription of the focus group data by the Investigator fostered immersion in the data. The Mentor verified the accuracy of each transcribed focus group session from the audiotape recordings, with discrepancies noted and corrected in the transcript.

The original audio-recordings and transcribed documents are stored electronically in a secure file location. Written transcripts of focus group sessions, analytic memos, and data analysis were held in a secure location. Information regarding the participant identity will not be released or published.

Data Analysis

Following each recorded focus group interview, the Investigator listened to the audio recording, transcribed each interview, and documented analytic memos. Each transcribed document included wide right and left margins, to allow the Investigator to

generate marginal remarks by hand (right margin) and apply codes (left margin). Marginal remarks were handwritten comments, representing reflections on the meaning of the data. Review of the marginal remarks fostered new interpretations and connections within the data (Miles, Huberman & Saldaña, 2014).

Each focus group was assigned a number, with each transcript page numbered sequentially, beginning with the number one. This process allowed the Investigator to uniquely identify and number any text element from any focus group; for example, 2.5.4-10 means that selection of text appears in the second focus group, fifth transcript page, lines 4-10. An electronic file was prepared and cross-referenced for each focus group transcription to characterize analytic memos for the data reviewed.

Qualitative content analysis included identification of data codes and data categories, using an iterative approach and constant comparison in data analysis (Hsieh & Shannon, 2005). Data were collected and analyzed concurrently, fostering an iterative interaction between data and analysis; what one knows and what one needs to know (Morse et al., 2002). The goal of a directed approach to content analysis is to validate or extend conceptually a theoretical framework or theory. Existing theory or research focused the approach to data collection and analysis (Hsieh & Shannon, 2005).

In the coding process, a coding scheme was used to guide decisions in the analysis of content. The coding scheme included the process and rules of data analysis that were systematic, logical, and scientific. As the analysis proceeded with the addition of each new focus group transcript, additional codes were developed, and the initial coding scheme was repeatedly revised and refined. A preliminary Coding Manual (Table 2.) containing a beginning list of codes derived from the Wellness Motivation Theory,

and related literature guided the initial coding (Hsieh & Shannon, 2005). Codes reflect action oriented words or labels assigned to meaning units, or segments of text that contain a single idea.

The Investigator explored the data from each transcript by entering data from the hand-coded transcripts to an Excel® worksheet, both to organize the data and as a way to document additional impressions and analyses for each selection of text. In addition, because each participant had been identified by tent card number and by voice in the transcription, it was possible for the Investigator to link the survey responses for each participant to each element of coded text. A list of the Qualitative Analysis Worksheet definitions is provided in Table 4. The Qualitative Analysis Worksheet provided a detailed audit trail of analytic memos and marginal remarks regarding impressions of data, and thought processes involved in coding decisions, particularly when new patterns in the data emerged. Analytic memos as well as detailed notations about specific meaning units provided an initial narrative, documenting reflections and thinking processes about the data. The analytic memos and notes included personal, methodological, or substantive thoughts and questions about themes, processes, and connections in the data, as well as exploration of emerging patterns.

Codes represented action words or labels, which were assigned to segments of text that contained a single idea. These single idea segments are called meaning units (Hsieh & Shannon, 2005). Conceptually similar codes were organized into categories through revisiting the Wellness Motivation Theory framing the study. Data not consistent with initial Wellness Motivation Theory codes was explored to determine if it represented a new category or a subcategory of an existing code.

Corbin and Strauss (2015) recommended preparing a list of codes, then applying more abstract labels to codes as the analysis progressed, revising into fewer, and more abstract categories of codes with each revision (Colorafi & Evans, 2016). This approach reflects second level coding, which groups data into a smaller number of themes or categories (Colorafi & Evans, 2016). During the analysis of data, patterns within the data were explored, with the Investigator and Mentor asking questions of the data and evaluating relationships in the data. A reflective and iterative process was used with the addition of each new focus group transcript as pattern codes were revised and redefined (Colorafi & Evans, 2016). The revised list of codes that was developed via the iterative analysis process is provided as Tables 3a through 3e. Focus groups continued until data saturation, or sufficient data to account for all aspects of the phenomenon (Morse et al., 2002).

The outcome of qualitative content analysis was a descriptive summary of the data organized in a way judged to best fit the data (Sandelowski & Leeman, 2012). The findings from a directed content analysis may offer supporting and non-supporting evidence for a theory (Hsieh & Shannon, 2005). The descriptive summary presented in Chapter 4 documents experiences in sedentary behavior for mid-life women from the perspective of the Wellness Motivation Theory.

Table 2. Preliminary Coding Manual

Construct	Operationalization/Initial Codes
Social Support	**SS0** Family, friends, household members do/say something **SS1** Participated in/offered to participate in an activity **SS2** Gave reminder/encouragement for activity/movement **SS3** Changed schedules to accommodate activity together **SS4** Discussed walking or participating in activity together **SS5** Scheduled other commitments to accommodate **SS6** Asked me for ideas on how to participate in activity
Community Support	**CS1** Community organizations **CS2** Workplace organizations for support **CS3** Having workplace support for activity/movement
Self-Knowledge	**SK1** Thinking about self and health; self-representations **SK2** Health problem that needs improving **SK3** Identifying valued, personally meaningful goals **SK4** Taking inventory of current practices/thoughts to improve **SK5** Confidence in achieving health goals
Motivational Appraisal	**MA1** Anticipating consequences of inactivity **MA2** Cognitive dissonance **MA3** Expressing the need/desire to change behavior **MA4** Goal setting **MA5** Thinking about ways to fit more movement into life **MA6** Developing/having plan for overcoming identified barriers **MA6.1** Barriers of family, environmental support, negative self **MA6.2** Work/bosses not supportive **MA7** Willingness to make sacrifices **MA8** Goal commitment--expressing determination to succeed
Self-Regulation	**SR1** Problem-solving—strategy formulation **SR2** Thinking of benefits of staying active/more movement **SR3** Reminding self of good being done by movement **SR4** Reminding self of importance of movement/walking **SR5** Keeping track of ways one stays active by movement/ **SR6** Watching for signs of progress **SR7** Self-monitoring to see if they are keeping up with goals **SR8** Learning new habits to help participate in movement **SR9** Learning new ways to move more.

Table 3a. Final Codes: Social Support

Code	Meaning	Example
Raising me up	Family, friends, household members do/say something to support; Participate/offer to participate in activity; giving encouragement for activity or movement	*"So we have very different goals, but we are doing it together, so that's one of the things that helps because we go to the gym and we are doing different things, I am doing classes, he is on a treadmill—we feel like we are doing it together."*
Timing time	Viewing of moving more and sitting less through the lens of time	*"We started kind of, planning a time for it, and like I'll say, ok what time what time do we want to do it tonight, you know how your schedules are sometimes different."*
Walking and talking	Reflection of movement as a shared social activity, fostering bonding and developing relationships	*"But it is huge, social is huge...I used to have a lady, years ago, when my son was a little boy, I used to walk we walked…walk, walk and talk, walk and talk, you know it was a beautiful thing, I always think of that relationship, how valuable that was. Just –it was just a beautiful time to touch base with each other and talk, so if you have somebody, a friend, or something to go for it and enjoy each other, and talk and walk."*

Table 3b. Final Codes: Contextual Resources

Code	Meaning	Example
Seeking Place	Reflection on the availability of resources in the workplace and at home that were accessible, in close proximity, and where women felt safe	*"I think the environment I am in is pretty conducive to walking."*
Stepping up	Coworker support for movement, encouragement, covering for others, and buddying up for walking or movement	*"I have a good work friend, and we walk, on our lunch hour when we can."*
Walking the talk	Administration and leaders doing something to support workplace movement, reduced sitting time, or exercise—e.g., policy, program development, investment in modifications.	*"I'm happy that a lot of the offices now are—are having sit-to stand desks, or the Varidesks® that sit on top of the desk and you can put your monitor up and down—I'm happy that they're now conscious about that."*

Table 3c. Final Codes: Behavioral Change Process--Self-Knowledge

Code	Meaning	Example
Envisioning the Future	Identifying valued, personally meaningful goals, practices and thoughts to improve	*"I want to be able to DO things once I retire…I'm hoping that retirement is achievable, and I want to be able to enjoy it, and have fun."*
Taking Inventory	Thinking about self and health; self-representations, identifying health problems that need improving	*"I think, um, I think I'm doing well, I try and get my um regular annual physical, make sure I keep track of vitals like sugar levels, blood pressure, and I think I'm good."*
Considering Possibles	Expressing confidence in achieving health goals, and investing self in future health	*"Well to me, it's just my goal to hit 10,000 steps in a day, because an average person I think does about 5000, and so I have a goal to hit 10."*

Table 3d. Final Codes: Behavioral Change Process—Motivational Appraisal

Code	Meaning	Example
Reevaluating Priorities	Process of evaluating engagement in sedentary behavior in relation to valued ways of being.	*"I need this for ME, and plus, I find that I've gained more weight, so I need that motivation to help me do SOMETHING, you know, if I'm not exercising or something else, at least the walking, get up and get going, that's what I need."*
Wayfinding	Process of creating action aligned with values	*"Like they say, just taking—making small changes…so I don't get overwhelmed. You just have to change your mindset, that it's baby steps."*
Going All In	Willingness to make sacrifices, committing to a goal, and expressing self-determination to succeed	*"…I'm not gonna let anybody stop me, if somebody's using that television in the family room –off!--daughter, husband, I don't care, this is my time, you're getting off, I am doing my thing!"*

Table 3e. Final Codes: Behavioral Change Process--Self-Regulation

Code	Meaning	Example
Recounting Blessings	Thinking of benefits of movement and reminding self of importance of and good being done by movement	*"I can tell the difference in how my day goes...If I do my walk...I just feel better, my day seems to go better... it doesn't drag, I don't start to feel tired halfway through it."*
Keeping On Track	**K**eeping track of ways one stays active by movement, self-monitoring for signs of progress toward goals.	*"Because if I walk the perimeter of our floor, it's actually 250 steps, which is really nice…for these instruments, is because every 500 you know exactly how much you're building, and it's like, 'oh, I could do 4 laps and really get it in'."*
Creating New Ways	Process of engaging in both sustaining and exploring relevant and valued habits, routines and approaches to sitting less and moving more.	*"If you can really think through all those things, and facilitate it in a way to where it just flows, I think it makes it a lot more doable, and just takes a lot of those thinking factors out of it. So I think we can talk ourselves out of anything or make things difficult, so I just accept that taking the time to do these things to prep for something makes me do it successfully."*

Table 4. Qualitative Analysis Worksheet Definitions

Worksheet Column	Description
Focus Group Number	Each focus group was assigned a unique sequential number for analysis and tracking purposes
General Code	The General code represents a main construct of Wellness Motivation Theory
Sub-Code	Further refinement of coded meanings under the general codes. Sub codes were changed and refined throughout the analysis
Level +/-	Level refers to whether the text is a positive case or example of the code, reflecting a high level of the meaning, or a low, or negative example of the coded meaning—allowing for capture of negative examples and cases and nuanced meaning to aid in analysis
Participant Number	The participant number is assigned by the tent card location where the participant is seated for the focus group. Tent cards are set up prior to the arrival of participants, in an order to foster Investigator recall and recording of notes and impressions during the focus group sessions
Survey Number	The Survey number reflects a tracking number of the participant's responses to the initial eligibility survey
Age	Participants age, 40 through 64
University affiliation	Administration, faculty, classified employees of ASU
Race	Race or ethnicity specified
Variation in the Process of Change	Response to survey question—T = Thinking about sitting less and moving more in the next 6 months; NC = was sitting less and moving more, but am not currently; NR = Sitting less and moving more, but not regularly; R = Regularly sitting less and moving more
Sedentary time reported	0 = less than 4 hours; 4 = 4 to 6 hours; 6 =6 to 10 hours; 10 = greater than 10 hours
Text Locator	Specified by the following format: Focus group number . page number . line number, where more than one line of text is represented by a dash – 5.4.3-7 uniquely identifies the focus group 5, page 4, lines 3-7.
Text Selection	The transcript text selection at the text locator position
Notes	Reflections, ideas, and thoughts about the meaning of the text or context; helpful for documenting impressions of text meaning during analyses without "breaking away" to a separate document—provided a detailed, written audit trail for initial coding decisions and changes in coding decisions that arose in iterative analysis.

Methodological Rigor

Qualitative description uses naturalistic inquiry, which captures truth as a belief system, along with the accompanying methods (Lincoln & Guba, 1985; Colorafi & Evans, 2016). In naturalistic inquiry, an investigator does not attempt manipulate how events unfold, but simply studies and observes something in its natural state, which fosters understanding, and truth (Lincoln & Guba, 1985; Colorafi & Evans, 2016). There are five standards used in qualitative descriptive research to ascertain the legitimacy and quality (trustworthiness and authenticity) of the study conclusions (Colorafi & Evans, 2016). These standards are objectivity, dependability, credibility, transferability, and application (Lincoln & Guba, 1985; Miles, Huberman, & Saldaña, 2014; Colorafi & Evans, 2016).

Objectivity, or confirmability ensures that conclusions of the research are neutral, and relatively free of investigator bias. Objectivity was addressed in this research by: (a) providing detailed descriptions of procedures and methods; (b) creating an 'audit trail' providing a verifiable sequence of steps for data collection, analysis and presentation (Colorafi & Evans, 2016); and (c) debriefing between the Investigator and the Mentor to minimize potential bias, including attempts to disprove conclusions drawn from data, and uncovering and reporting personal assumptions or potential bias. While using the Wellness Motivation Theory in a directed approach to qualitative content analysis guided the data collection and analysis, debriefing and questioning conclusions from the data minimized bias (Hsieh & Shannon, 2005). The Investigator and Mentor attended each focus group and shared written field notes, observations, and debriefed after each focus group session. Written transcripts were coded independently by the Investigator, and

shared with the Mentor for a review, which supports verifiable steps in data collection and analysis. The Mentor also reviewed the details of Investigator analytic memos notes and the prepared Qualitative Analysis Worksheet. The Investigator and Mentor discussed individual differences in meaning and codes, and came to consensus on coding results for each meaning unit. During this iterative process, the Investigator and Mentor developed themes and shared conclusions consistent with, and extending the constructs of the Wellness Motivation Theory. The audit trail for the study included field notes, marginal notes, analytic memos characterizing meaning units, recorded audio tapes, written transcripts of focus groups, and paper copies of deconstructed meaning unit analyses by coded element, and electronic copies of coded worksheets.

Dependability supports aspects of reliability and consistency in procedures throughout the research process (Miles et al, 2014; Colorafi & Evans, 2016). Dependability was addressed in this study by: (a) designing focus group questions which reflect constructs of the Wellness Motivation Theory; (b) creating a preliminary coding manual to guide data analysis, including defined codes derived from the constructs of Wellness Motivation Theory and relevant literature (Hsieh & Shannon, 2005); (c) using consistent procedures to collect data across all focus groups; (d) using an audit trail to monitor data analysis, interpretation, and ongoing review of the relevance of data codes and categories; and (e) sharing analytic memos exploring data meaning, coding and patterns throughout the research process. Study procedures were clearly outlined and consistent with the Wellness Motivation Theory, with data generated and analysis linked to relevant theoretical constructs.

Credibility is characterized as objectivity, or the truth value of the data (Miles et al., 2014; Colorafi & Evans, 2016). Credibility, or internal validity, promotes contextual richness and evaluative understanding, and was addressed through: (a) involving a researcher who was familiar with Wellness Motivation Theory to help explore data meaning and interpretation; (b) using the Wellness Motivation Theory to organize and link research findings; (c) having the Investigator closely follow each focus group, including personal transcription of audio-files with verification, to ensure comprehensive, complete, and accurate accounting of the data.

Transferability supports the extent to which research findings can be applied to other populations and settings (Miles et al, 2014; Colorafi & Evans, 2016). Transferability was addressed in this study by: (a) fully describing participant characteristics to permit their comparison with other groups; and (b) presenting findings consistent with, and extending the Wellness Motivation theoretical framework.

Application in a qualitative study refers to how the findings are made accessible and used by study participants and consumers (Miles et al., 2014; Colorafi & Evans, 2016). Application is addressed in this research by making study results available to participants and researchers, and informing the development of future research interventions to reduce sedentary time and increase active movement in midlife women.

Summary

This Chapter presented the research methodology, including design, sampling, research methods, data collection and analysis procedures, and methodological rigor. A qualitative descriptive design is a thoughtful and appropriate approach for generating new

insights about the meaning of sedentary behavior to midlife women, framed within the Wellness Motivation Theory. The following Chapter presents the study findings.

CHAPTER 4

FINDINGS

This research explored motivation for decreasing sedentary behavior in midlife women. Chapter 4 presents the results of qualitative descriptive analysis, including: (a) a description of the research participants, and (b) a presentation of findings and interpretation of qualitative descriptive content analysis through the conceptual framework of the Wellness Motivation Theory (Fleury, 1997).

Participant Demographics

The participants in this study included 31 English-speaking women, all Arizona State University (ASU) employees. Participants were recruited using flyers and directed electronic mail solicitation targeting the ASU Downtown or Tempe Campus. Using maximum variation sampling in this research of midlife women promoted a diverse sample of participants: (a) age representation across the 25 years spectrum of midlife, age 40 through 64; (b) differing race and ethnicity; (c) differences in reported daily sedentary time; and (d) variances among women in their experiences of processes of change for reducing sedentary time.

Participant ages ranged from 40 to 64 years, (mean age = 53.9 years, *SD* = 7.4), with a median age of 55. The race and ethnicity of the participant sample was predominantly white/Caucasian (81%), with ten percent of the sample Hispanic, six percent of the sample African-American, and three percent Asian-Pacific Islander. The sample included women representing several colleges and departments across the university, primarily staff positions, as well as some faculty and administrators. Eight of the participants did not specify their University classification. Forty-eight percent of

participants (n=15) reported being sedentary from six to ten waking hours per day, with twenty-six percent reporting over ten hours of sedentary time per day. Only two participants (6%) reported sitting less than four hours per day. Variation in processes of change for reducing sedentary behavior was captured either by self-report, or through analysis of narrative descriptions in transcribed data. Of 21 participants who reported their place in the process of change: (a) four reported thinking about sitting less and moving more within the next six months; (b) six reported regularly sitting less and moving more; (c) ten reported sitting less and moving more, but not regularly; while (d) three participants reported previously sitting less and move more, but were not currently doing so. Table 5 displays the demographic characteristics of participants in this research.

Table 5. Demographic Characteristics of the Participant Sample

Participant Characteristic	*n* (%)	Range in Years	*M (SD)*
Gender			
Female	31 (100)		
Age		40 – 64	53.9 (7.4)
Median age: 55			
Mode age: 58			
Race/Ethnicity			
Asian/Pacific Islander	1 (3)		
African American	2 (6)		
White, Hispanic	3 (10)		
White, Caucasian	25 (81)		
University Classification[1]			
Administration	3		
Faculty	1		
Staff/Classified	19		
Reported Daily Sedentary Time			
Less than 4 hours/day	2 (6)		
4-6 hours/day	6 (19)		
6-10 hours/day	15 (48)		
> 10 hours/day	8 (26)		
Variations in Process of Change for Sitting less and Moving More[2]			
Thinking to start w/in 6m	4		
Yes, regularly	6		
Yes, but not regularly	10		
Was, but not currently	3		

Note: Sample size: *n* = 31
[1]Eight of 31 participants did not report data for University Classification
[2]Eight of 31 participants-Variation in Process of Change captured through transcript analysis

Wellness Motivation Theory

The Wellness Motivation Theory is a middle-range nursing theory which conceptualizes the process of behavioral change within culturally and environmentally relevant contexts, while recognizing the bidirectional influence of personal and environmental factors on behavioral patterns. The Wellness Motivation Theory addresses social support and norms, community and material resources that influence behavioral choices, individual motivation and goals, and processes of behavioral change, and has empirical support in promoting physical activity (Silva-Smith, Fleury & Belyea, 2013; McMahon, et al, 2014).

The Wellness Motivation Theory conceptualizes motivation as "empowering potential," reflecting the unique values, needs, priorities and personal health goals of the individual in initiating and sustaining health behavior change (Fleury, 1991). The Wellness Motivation Theory includes three primary constructs: (a) social contextual resources, (b) behavioral change processes, and (c) action. Social contextual resources and behavioral change processes mutually influence health related behavior (action) (Fleury, 1996; McMahon, 2012).

The Wellness Motivation Theory extends traditional behavioral and motivational theories in explaining behavior within a complex context of personal, social, cultural and environmental influences. Wellness Motivation Theory reflects mechanisms through which individuals create and evaluate valued goals, establish behavior standards, determine change strategies, and strengthen and regulate action patterns over time (Fleury, 1991; Fleury, 1996; Perez & Fleury, 2009). Wellness Motivation Theory addresses the idea that humans interact with an environmental context, and the dynamic

processes of behavioral change processes and social contextual resources in activating health behavior (Fleury, 1996).

The theoretical constructs of Wellness Motivation Theory reflect the ways in which health behavior changes and maintains evolving patterns of change over time. Wellness Motivation Theory has been tested in a variety of applications regarding physical activity in older adults. Social contextual resources include social support and community and environmental resources. Behavioral change processes include self-knowledge, motivation appraisal, and self-regulation. Behavioral change takes place in culturally and environmentally relevant contexts.

Social Contextual Resources

Social Support

Women reflected on ways in which they received support, encouragement, or participation with family and friends to reduce sedentary time and increase movement. Supportive action and assistance, encouraging words, movement reminders, accommodating schedules, and engaging in valued activities were ways in which others provided support. In this study, midlife women shared their experiences of social support in the categories Raising Me Up, Timing Time, and Walking And Talking.

Raising Me Up. In Raising Me Up, women shared the role of others in encouraging and acknowledging efforts to reduce sedentary time and increase movement. The recognition of individual attempts to change, as well as the expression of congruency with selected goals served to facilitate increased movement. Through positive reinforcement and affirmation of attempts to move more and sit less, supportive others serve as powerful motivators. “We are able to be positive for each other.”

So we have very different goals, but we are doing it together, so that's one of the things that helps because we go to the gym and we are doing different things, I am doing classes, he is on a treadmill—we feel like we are doing it together.

Women expressed a deep sense of worthiness and belonging in affiliation with gym, yoga, or dance groups, noting that it felt good to be part of a group, with participation, accomplishments, and absences noticed. In these cases, the lasting friendships, camaraderie, connections and support emerged from a sense of belonging and feeling valued as part of the group.

If I don't show up at the gym, they send you a text or they go on social media and will go, 'where were you?' People know that I'm there, and then I think I am missed somehow. There's a sense of worthiness to be part of that group, that they acknowledge that –'oh, she's missing today, I wonder what happened—it's been a couple a days—what happened to her?' so that helps.

Similarly, women noted that a sense of accountability and responsibility to themselves and others fostered efforts to move more and sit less. The importance of commitment to moving more extended to include commitment to others, as a partnership. Women noted the value of having a group or another individual 'push' them, and acknowledged the mutual benefits of 'holding each other to it' in efforts to move more and sit less. "And we're holding each other to it, like we have sent a text out, you know making sure we hold each other to it." You're going to show up, and you're going to participate, because it helps to have that person or somebody…I have to have somebody there pushing me.

Timing Time. In Timing Time, women talked moving more and sitting less from a context of time; "making time," "finding time," and "taking time." Women viewed time in context of relationships with family members, friends, and the role of time and physical activity in staying connected.

Women noted that support for sitting less and moving more was fostered when scheduling and planning time for activity with others. Women expressed that the support of others in "making time for them" was essential to moving more and sitting less. "We started planning a time for it, and like I'll say, 'ok what time do we want to do it tonight?'" "So it's just finding the time and making it happen and putting it on your calendar to make it happen."

Some women expressed concern about taking time away from family and friends when engaging in activities to move more and sit less. One approach to managing time was to incorporate family and friends in movement, thereby limiting the concern of "taking time away."

> *I think having someone that is doing it with you, especially if you have a time concern where you feel like you're taking time away from somebody, if there's somehow to incorporate a friend, spouse, family member into the equation, I think it makes it a little bit easier.*

Walking and Talking. Walking and Talking reflected movement as a shared social activity, fostering bonding and developing relationships. Women expressed finding great value, sustenance, and motivation in seeking deep social connections with other women who shared a common interest in a valued activity.

Walking as a form of social connection promoted consistency in movement and

activity, with connection reflecting happiness, fun, and shared accomplishment.

> *But it is huge. Social is huge…I used to have a lady, years ago, when my son was a little boy, I used to walk…walk…walk and talk, walk and talk, you know it was a beautiful thing, I always think of that relationship, how valuable that was. Just–it was just a beautiful time to touch base with each other and talk, so if you have somebody, a friend, or something to go for it and enjoy each other, and talk and walk.*

Connection with others served as a source of motivation for moving more.

> *So the only time I've ever been consistent is when there's a social connection. I run with—I used to run with friends, I hike with friends every weekend, so social is a huge motivator for me, for exercise for sure. It keeps me going.*

> *So one of the things I have done is, I have a group of friends and when our kids are practicing their sports, we've started to try to make it social time where we will go and walk, during the hour that they are practicing sports.*

Women noted that a lack of friends available to walk and talk negatively influenced engagement in moving more. "And there are days that he didn't do it, so on the days that HE didn't do it, like then I wouldn't do it, cause I didn't have my buddy."

I've only been here a year, and a couple months, and I really don't have any friends here, but you know, I walked the other day, in my neighborhood, and I--so I was walking like this way, and I saw a young lady walking towards this way…But it occurred to me that I wanted to ask her, 'do you wanna walk together?' but, she you know, just to meet and start talking, because I think I do better when I'm walking and talking to somebody, and the time goes—so, I didn't do it--approach her---sometimes it's just the way a person—they don't look at me, or acknowledge me, then I just you know, feel like they don't want to be bothered. So, I just walked it.

Contextual Resources

The community, environment and workplace dimension of contextual resources captures resources unique to the environment. In this study, midlife women shared their experiences of community, environment, and workplace resources as Seeking Place, Stepping Up, and Walking the Talk.

Seeking Place. In Seeking Place, women reflected on the availability of resources in the workplace and at home that were accessible, in close proximity, and where they felt safe. Women described the availability of walking trails, and the proximity of safe walking places as conducive to moving more, both at home and work. "I think the environment that I am in is pretty conducive to walking." "What's nice about that area is you've got the hills, and you've got a lot of variation, so I do like to do the walking and that's typically what I'll do, like on Sundays and Saturdays is a walk."

Stepping Up. In Stepping Up, women reflected on support and encouragement from co-workers as a resource for moving more and sitting less. Work colleagues explored opportunities for activity, and engaged in walking and movement activities together. Women expressed connectedness and a sense of belonging to the larger ASU and their own academic community. Through exploring various approaches to moving more and sitting less, women viewed work colleagues as supportive and facilitating desired change.

> *So maybe if there was time for us to get a walking buddy or something that would say 'ok…in 10 minutes, so clear up what you're doing so we can go take a walk around the building or walk around the block'.*

> *My coworkers, a lot of time they don't bring their lunch, so, we will make a point that everybody goes for a walk with them. That really helps. And we'll say, 'oh I'm not going to get lunch, but I'm going for the walk and the fresh air.' That helps a lot.*

Women described ways in which colleagues "stepped up," "stepped in," and volunteered support to "cover for each other" in the office environment around moving more and sitting less. Women offered to cover the phones, answer questions, or address visitors, allowing co-workers an opportunity, although typically limited, to walk around the office.

> *If we gave ourselves permission, and we would have support amongst ourselves, to say, yes, go--go, take care of yourself, take 10 minutes. So B and I do that, on occasion, she's like 'I need to take a break' I'm like, 'go,*

I'll answer the phones, just go for a little bit.'

Women noted the importance of work colleagues in acknowledging attempts to move more and sit less, providing positive reinforcement and affirmation in the change process. This collective connection was a source of acceptance, self-worth, and efficacy in change. "They put together some walking groups...we got pedometers, and we did 10,000 steps a day, each group supported each other."

Walking the Talk. Women reflected on administrative and leadership investment in workplace movement as a significant contextual resource. Women reflected on leadership approach to fostering movement in the workplace, and the extent to which the actions of administration regarding movement were consistent with their values, or "walking the talk." Women recognized administration as budgeting for, or investing in changes to the workplace to foster reduction in sedentary time. "I said 'how do I get a standing desk? What do I have to do?', and she said, 'oh, it's funny you asked, because we are going to get—our office is going to get them.'"

Administrators supported workplace movement by developing and implementing supportive policies or programs. Women appreciated workplace "challenges" incorporating tangible support, such as pedometers, the support of team members, and online monitoring and encouragement. "They put together some walking groups, which might help if we keep each other moving...we got pedometers, and we did 10,000 steps a day and each group supported each other."

I think when they had that challenge--I think that motivated a lot of people to get up and get moving, you know, so if they would have those every once in a while, I think that would be great—I think more people would

actually get up and move.

A disconnect was experienced between the "talk" of administration emphasizing health and well-being, and the "walk" of leadership which fostered sedentary time through expectations for women to remain seated at their desks and available at all times during the workday. "I think that goes back though to administration, your leadership team has to support that, and I work in an environment where I can't do that, I can't leave the office."

> *I just don't have time to really just get up and you know walk 20 minutes or something like that during the day because my boss expects me to be at my desk all day... unless I'm at lunch or bathroom breaks or something, She just expects people to be at their desk.*

Behavioral Change Processes

In the Wellness Motivation Theory, behavioral change processes include self-knowledge, motivation appraisal, and self-regulation. These processes reflect the ways in which individuals identify and evaluate personal goals, establish standards for behavior change, develop and implement strategies to enact change, and regulate and strengthen patterns of behavior, leading to sustained behavioral change and new ways of doing and being. These behavior change processes reflect the nature of humans, and the human tendency to move beyond existing achievements and strive for new goals and dreams for the future.

Self-Knowledge

The self is the central reference point for cognition, emotion, motivation, and social behavior (Sedikides, 2003; Fleury & Sedikides, 2007). Self-knowledge has been

explored as a component of the self-system, which is a significant correlate and antecedent of motivation in behavioral change (Fleury & Sedikides, 2007; Marcus, 1983; Marcus, 1987; Baumeister & Vohs, 2004). Self-knowledge reflects stored knowledge about the self, including feared or ideal selves, goals, and action plans (Fleury & Sedikides, 2007). In this study, midlife women reflected upon their health, goals, and dreams for their future in the themes Envisioning the Future, Taking Inventory, and Considering Possibles.

Envisioning the Future. Envisioning the future reflects the construction of desired ways of being, based on the unique values and perspective of each woman. The initiation and maintenance of health behavior change involves recognition of the worth of health-related change as a means to achieve personally meaningful life goals. Women in this study envisioned their future, moving from 'who am I now,' to 'who and what do I want to be?' Women envisioned healthy aging, an active retirement, maintaining physical health, vitality, and strength. Some women reminisced about the lives and health of their own parents, and visualized a healthier future for themselves, and a desire to 'not be' their unhealthy parent.

Envisioning the future directed women toward desired ways of being as a basis for a more active life.

> *I want to be able to DO things once I retire…I'm hoping that retirement is achievable, and I want to be able to enjoy it, and have fun, and not just be icky and sit around, and not enjoy that time.*

I just want to be able to be active with my grandkids and hopefully reach higher in the next seeable future, and do some traveling, and be able to walk, and see things, so that's what I am looking forward to.

Through envisioning the future, women constructed personally meaningful standards for an active life, and established ideals to judge their progress. In reflecting on desired ways of being, women brought together their present, past, and future selves represented as personal goals. "I think that is why I wanted to move more, is the things that happened with my parents, and I'm like, 'Aaahhhh, I'm not going to let that happen.'"

I would love to be STRONG…I don't want to be a bodybuilder, but I just—my kids were little, I'd have these really, really defined arms, just because I'd pick them up all the time, and move them around, and I was always moving. I cannot pick my children up—one of my kids I can pick up, but I want to be STRONG.

Envisioning the future guided and sustained women in the process of initiating and maintaining an active life. Reflection on the "self as I want to be" fostered a sense of promise and purpose in change, allowing women to push forward in spite of obstacles.

I've seen this lady on television, and interviews, and online, and she is about 75 to 80, and she engineered her body where she is now muscular--she may be even older than 80, but what a beautiful body form she has, it's just amazing…That's someone that I would love to emulate. I would love to be like this lady, because she's actually turned her life AROUND, where sometimes we think of that but when we see someone who HAS,

that's just a whole—that's a—that really puts a face on it—IT CAN BE DONE!...and SHE did it so—and that's what—what I want to own in the future.

Taking Inventory. Taking inventory explains the ways in which women reflected on their current health and personally valued goals. Women shared concerns about the uncertain transitions of aging, and noted the ill effects of a sedentary lifestyle.

Women engaged in taking inventory in response to relevant information or health concerns around sedentary behavior. Many described the feeling of fatigue or profound exhaustion from sitting, identifying that excessive sitting at work made them tired and more likely to be sedentary at home. For some, sedentary behavior manifested itself as back pain, stiffness, headaches, and loss of mental focus. "I think that makes a HUGE difference, you know, doing—doing the things that prepare you for that longevity." "I feel like when I sit for a while that...my posture is just taking on a new negative form.

I'm amazed at how tired I am by the end of the day, when I think back, I think I've just been sitting though…and I get home and I am just exhausted, I don't want to exercise, I don't feel like doing ANYTHING at all.

Taking inventory also occurred as part of social comparison with others as part of the transition to aging. Women engaged in upward and downward comparison as a way of gauging "how I am" compared to both others, and "how I want to be."

Just making sure I am taking care of myself as I get older, and just seeing what's around, and how people are acting, when they are the same age as you, and how they are, as compared to how I am.

I think when I was younger, I didn't really think much about health, but as you get older, and people around you get ill, or this and that, you do think about that stuff more, so I think that might be when I started to think that the little things do add up, like walking.

Considering Possibles. In Considering Possibles, women reflected on the need to adjust priorities, shift personal philosophies, or "let go" of parts of their current identity and life to foster growth and change to new ways of life and being.

Women envisioned possibles as opportunities for moving more and sitting less, framed in light of current physical ability and resources. They began to consider new perspectives and acknowledged that moving more in mid-life might look different from a younger age. "You know, you're not 20 anymore, you can't just go out and run, you know, or do all these different things, and it's accepting it, I guess, a little bit." "I actually have had to have a shift in philosophy of what can I do now…and I am still trying to figure out what's my new way of life."

Women expressed confidence in realizing valued goals, noting the importance of importance of preparing, investment, and daily choices for a future expected return of greater health, well-being, and longevity. "I think I'm doing well, I try and get my regular annual physical, make sure I keep track of vitals like sugar levels, blood pressure, and I think I'm good." "It is the lifestyle and the—the choices that I think you make over a long period of time."

So I try to really move the best I can, and if I keep moving then I feel like I won't lose some of the skills as I get older, and try to keep my cardiovascular going in regards to that too--also, my muscle tone and

taking care of myself that way.

Motivational Appraisal

Motivational appraisal reflects the process of developing readiness to act, identified as commitment and intention formation for goal directed behavior which is consistent with personal beliefs and values, information, resources, and goals (Fleury, 1991, 1996; McMahon, 2012). Among sedentary midlife women, motivation appraisal using Wellness Motivation Theory are operationalized by exploring concerns about reducing sedentary time, and engaging in problem-solving strategies to reduce barriers. Enhancing readiness for behavior change may be achieved helping individuals connect their beliefs, values, and resources to personal valued goals, and assisting in development of skills to achieve goals. In this study, participants shared their experience of motivational appraisal as Reevaluating Priorities, Wayfinding, and Going All In.

Reevaluating Priorities. Reevaluating explains the process through which women evaluated their engagement in sedentary behavior in relation to valued ways of being. Women expressed an awareness of the need for change and a desire to have a more active life, moving them closer to their goals.

Women expressed both a desire to live more fully and an increased awareness of the passage of time.

> *I think THIS is my future. You can't think about what you're going to do in 5 years—it's NOW…in five years, who knows what. I mean, the older you get, people succumb to illness and things like that. There are things we don't have control over, so it's today or never, that's kind of my philosophy.*

Reevaluating reflects the recognition of an action/value gap. Women experienced an increasing awareness of the role of sedentary behavior as harmful. Wanting change emerged from a perceived disconnect between current behavior and ways of being, fostering motivation for more and sitting less. Women reflected upon their sedentary habits, finding them to be unacceptable or inconsistent with what they wanted for themselves and their health. "I mean, I don't MOVE, and I KNOW that's not right, and--I mean here I am telling other people to do it, and I'm not doing it myself." "You feel like 'I should be doing this, but I'm not going to today,' I don't know, I guess you just feel guilty."

> *I need this for ME, and plus, I find that I've gained more weight, so I need that motivation to help me do SOMETHING, you know, if I'm not exercising or something else, at least the walking, get up and get going, that's what I need.*

Wayfinding. Through Wayfinding, women considered various plans of action for moving more, based on experiences, available resources, and perceived ability**.** Wayfinding reflected a process whereby women began to create action aligned with their own values.

Women "tried out" alternative plans of action thought to be effective and feasible for moving more and sitting less. Plans of action included creating new connections related to moving more and sitting less. Women described efforts to work extra steps and movement into their workday, taking advantage of the physical space layout or work environment. Women noted that they sought opportunities to move during the workday, "taking the long way" around their space or work area to get in extra steps. "I report to

two floors, so it keeps me walking at some point, like three or four times a day, I walk up, I walk down." "What I do now is I avoid the e-mails and the phone calls and I walk the flight of stairs and the flight of stairs back up as much as possible."

> *I'll do those things, taking the stairs, go to the bathroom that's not the closest, um, getting up to go to the printer, so, just trying to be up and down, in the little routine things that I'm doing.*

Wayfinding reflects the continuity inherent in attempts to move toward a more active life. Thus, moving more and sitting less is a continuing process of "figuring it out." Women reflected upon a process of iterative patterning, or "trial and error" describing how they maneuvered or changed up a strategy, which did not work for them. Women emphasized the importance of realistic expectations, fostering a sense of efficacy and control, particularly when trying new approaches to moving more and sitting less. "Like they say, just taking—making small changes…so I don't get overwhelmed." "You just have to change your mindset, that it's baby steps."

Women acknowledged obstacles in determining and enacting a plan to move more and sit less. Many characterized work, home, and family responsibilities as associated with sedentary behavior. Several women shared their continuing struggle with the iterative process of change, noting their challenges in starting up, reestablishing a routine, and "figuring out how to make life work" in light of multiple competing demands. "And then if one thing interrupts it, don't you find that—if one thing interrupts it...suddenly, EVERYTHING falls apart." "I think especially if you have changes, you know, changing your workday, your hours, whatever it may be, it's really hard to rethink how you're going to make your life work."

But if something stops that momentum--an illness-- I have something else to do that evening—it's hard for me to get back going again, and it may be a month or two before I start back.

Negative self-statements reflected some women as feeling unable to "find their way" in change or manage obstacles to change, characterized as a "rut" or "vicious cycle." "So, so just in a nutshell where I'm at, I'm trying but —I can't—I have a sedentary job." "I should know, I should know better, and I should just be able to get it done. But, I haven't been able to get it done." "I feel like I get sucked into like, this downward spiral, where it's…I don't feel good about myself, I feel like I cheated myself out of time for me or my exercise."

Going All In. In Going All In, women explored commitment to approaches to moving more and sitting less. Women accepted responsibility for desired changes and create an intention to act in ways that will lead to the realization of valued goals. Women expressed willingness to make sacrifices, and expressed determination to succeed in their efforts to sit less and move more.

Women took ownership of their plans to be more active, and expressed a firm attitude and commitment to moving more and sitting less. "I just had to get up early in the morning and make myself do it." "You know, it's finding the commitment---I think that's—for me that's what I need. I need to commit, and I need to stick to it. Because that is what I find is very difficult."

Women expressed the self-determination that comes from committing to life changes. Although Going All In is difficult, women expressed a feeling of purposefulness and enhanced efficacy in the creation of change. "Because this is MY

TIME and… I made that time for me." "I'm not going to let anybody stop me. If somebody's using that television in the family room –off!—daughter, husband, I don't care, this is my time, you're getting off, I am doing my thing."

Women expressed a sense of individual responsibility for acting on their intention to move more and sit less. While support from others was an important resource, in order to perceive ownership in change, women voiced responsibility. "I'm learning how to just do things by myself and not worry that I am by myself."

Self-Regulation

Self-regulation reflects the process of transforming goal intentions into personalized action using cognitive, affective, and behavioral strategies consistent with an individual's valued goals. Striving to achieve personal goals, and maintaining personal standards for behavior are important sources of motivation requiring internal behavior regulation. Self-regulation guides individuals in goal-directed behaviors through selective processing of information, behavioral monitoring, judging individual performance, and engaging in self-evaluation (Bellg, 2003; Maes & Karoly, 2005; McMahon, 2012). Self-regulatory mechanisms are important to understanding volitional behavior, in that they mirror ways in which individuals behave in concert with personally valued goals, particularly in the presence of conflicting goals, or when the goals present different rewards over time (Bellg, 2003; Maes & Karoly, 2005; McMahon, 2012). In this study, midlife women shared their experience of self-regulation as Recounting Benefits, Keeping On Track, and Learning New Ways.

Recounting Benefits. Recounting Benefits emerged as women reflected on, and reminded themselves about the "good they were doing" by moving more and sitting less,

as an approach to self-regulation promoting sustained change. Women recalled the general health benefits of movement, and reminded themselves of the personal benefit that would accrue by sitting less and moving more. Others noted a sense of comfort and security in knowing that they would feel better, and that their day would be better overall if they moved more. "I can tell the difference in how my day goes...If I do my walk...I just feel better, my day seems to go better… it doesn't drag, I don't start to feel tired halfway through it." "I know, I KNOW I'll feel better, you know, I do know that."

Women recognized specific symptom relief, including changes in body stiffness, fatigue, and performance. For some, stepping away from sitting produced a fresh outlook, and perhaps a new idea or innovation. By recounting specific benefits of sitting less and moving more, women established a yardstick by which to measure personal gains. Women described an "if, then" perspective, addressing "*if* I move, *then* I will hurt less, and I will have done something good for myself." "I always find if I stop--and I take a break, and go away and do something else, I come back--I've had a new idea." "I think it is a self-care thing too, to kind of do what works for you I guess, what kind of helps your body, you know, feel better, and perform better."

> *I honestly think that vacuuming, you know, you're getting your body moving, dusting right, windows, you know we make fun of that movie, wax on, wax off, but it's true, right, that in the end those movements help you.*

Keeping On Track. Through Keeping On Track, women engaged in self-regulation by monitoring their efforts to move more and sit less. Keeping On Track reflected how women evaluated the ways they engaged in moving more, and watched for signs of progress in their short, intermediate, and long-term efforts.

Women monitored movement using personal electronic equipment including cell phones, FitBit, and Apple Watch. Based on real time and summary feedback, women engaged in self-correction, to make sure that they "got in their steps." "I really depended on my Fitbit to watch how many steps I've been taking during the day."

> *Because if I walk the perimeter of our floor, it's actually 250 steps, which is really nice…for these instruments, is because every 500 you know exactly how much you're building, and it's like oh, I could do 4 laps and really get it in.*

In addition to using devices to self-monitor movement, women relied on devices to prompt action, both in the short term, and longer term, as a method for increasing movement over time.

> *It buzzes every 10 minutes to the hour to make sure that you've got up and walked around, and it—its amazing to me how fast that comes around, and I realize, 'oh my gosh, it's been another hour already.*
>
> *I guess if I look at the whole week, and I see how many miles I've walked, and how many active minutes it says I've had, it makes me feel better and to improve upon that each week, I like it when it--the little report tells me that I was this much more active this week than last week.*

While devices monitored activity throughout the day to encourage moving more, there was less attention to sitting less as a component of sedentary behavior. Many women did not take breaks from sitting, when chronic sitting during the workday or at home was an issue. Women shared a continuing struggle with monitoring and breaking up continued sitting time, with or without a monitoring device. Some participants also

reflected on excessive sitting resulting from focus on desk level projects and tasks. For these women, "time slipped away." "I find that sitting just goes on and on and on, and before you know it, it's 4 o'clock and you hardly got up to go to the bathroom, cause I eat my lunch at my desk even." "I can come in at seven, next thing I know it's noon, or it's 4, so I'm real bad about getting up from my desk and moving unless I need to."

Creating New Ways. In Creating New Ways, women reflected on the ways in which they engaged in both sustaining and exploring relevant and valued habits, routines, and approaches to sitting less and moving more.

As a temporal extension of Wayfinding in sustaining moving more and sitting less, women spoke of taking extra time to prepare for effective and sustained engagement in physical activity, and emphasized the importance of addressing obstacles to make movement nearly automatic.

> *If you can really think through all those things, and facilitate it in a way to where it just flows, I think it makes it's a lot more doable, and just takes a lot of those thinking factors out of it. So I think we can talk ourselves out of anything or make things difficult, so I just accept that taking the time to do these things to prep for something, makes me do it successfully.*

> *Now it has become a routine, and if I kind of get out of that routine, then, I find myself having to kind of force myself to do it, so, it's—I think it just becomes, you know, just like waking up, and letting the dogs out, that sort of thing, just part of my morning routine at this point.*

Some women continued to explore new approaches to moving more and sitting less, discarding strategies that had not been successful or in response to life changes. Women spoke of needing to be open to new strategies and ways of doing, embracing uncertainty, yet hopeful that new approaches might be successful. "It's just making what works for you." "Well I'm just trying to think about this, how you know, my schedule does change, there…I need to open to new things that I never even considered."

> *I changed over the holiday. I tried to change my whole schedule, so that I get the activity in before the day starts, because if I don't do that, the day gets away from me, and I still—it's every goal—my goal is at night before I go to bed I decide at what hour I'm going to do my activity, and how it's going to work, and what the day is going to look like, so I don't skip it.*

Summary

This chapter presented the results of the qualitative descriptive analysis of midlife women's motivation for behavior change to decrease sedentary behavior through the conceptual lens of the Wellness Motivation Theory. The chapter included a description of participant characteristics as well as data themes consistent with the Wellness Motivation Theory. The data themes presented characterized the theoretical constructs of social contextual resources (social support and the community/workplace/environment) and behavioral change processes of self-knowledge, motivation appraisal, and self-regulation.

CHAPTER 5

DISCUSSION AND RECOMMENDATIONS

This research explored social contextual resources and behavioral change processes leading to action as decreased sedentary time in midlife women. Wellness Motivation Theory (Fleury, 1991) provided the conceptual lens guiding this qualitative research. Chapter 5 discusses the research findings, extending and enriching the Wellness Motivation Theory as experienced by midlife women seeking to sit less and move more. The discussion of research findings is presented using the framework of Wellness Motivation Theory, including social contextual resources and behavioral change processes of self-knowledge, motivational appraisal, and self-regulation. Chapter 5 also presents discussion of contributions to nursing research and practice, with recommendations for future research.

Wellness Motivation Theory

Currently, little is known about the mechanisms involved in changing sedentary behavior, and how to best promote maintenance of sedentary behavior change. Midlife women are known to have high levels of sedentary behavior and corresponding cardiovascular risk. Theory-based interventions for reducing sedentary behavior in midlife women are needed, which reflect process, personal meaning, and person-environment interaction. The Wellness Motivation Theory extends traditional behavioral and motivational theories in explaining behavior within a complex context of personal, social, cultural and environmental influences. Wellness Motivation Theory reflects mechanisms through which individuals create and evaluate valued goals, establish

behavior standards, determine change strategies, and strengthen and regulate behavior patterns over time (J. Fleury, 1996; J. D. Fleury, 1991; Perez & Fleury, 2009). Findings of this research extend and enrich the Wellness Motivation Theory, deepening dimensions of understanding of social context and behavioral change processes of self-knowledge, motivational appraisal, and self-regulation.

Social Support

Social support is characterized as functions provided by, or perceived as available from social relationships (Holt-Lunstad & Uchino, 2015; Marcinkus, Whelan-Berry, & Gordon, 2007). Social support is also characterized as aid and assistance exchanged through social relationships and interpersonal transactions (Heany & Israel, 2002).

Social support has been characterized as including four distinct types of support: 1) emotional support, including expressions of comfort and caring; 2) belonging, encompassing shared social activities and a sense of social belonging; 3) instrumental (tangible) support, including provision of material aid; and 4) informational support, including advice, suggestions, and information (Holt-Lunstad & Uchino, 2015). Empirical findings address social support as having a protective effect on general health (Holt-Lunstad & Uchino, 2015).

In this study, midlife women reflected on the many ways in which they received emotional, informational, instrumental, and tangible support from family, friends, and household members to foster their efforts to sit less and move more. Women shared robust descriptions of encouragement received through uplifting words and actions of close family members and friends. Support was reflected in making time for family, and in the development of social relationships promoting more movement and less sitting

time. Women reflected on the importance of commitment to a valued group, and seeking accountability for activity goals as elements of support. Three themes reflected social support experiences--Raising Me Up, Timing Time, and Walking and Talking.

Raising Me Up reflects the experience of uplifting support; "how others make me better." The theme of Raising Me Up is consistent with research noting the importance of emotional, informational, and tangible support in health and health behavior change (Umberson & Montez, 2010; Cohen, 2004; Uchino, 2004; Holt-Lunstad & Uchino, 2015). This type of uplifting, encouraging support and acknowledgment of effort is thought to enhance individual motivation, reduce the impact of stress, and foster meaning and purpose in life (Cohen, 2004).

Emotional support is important in promoting successful aging (Killian & Turner, 2014; Liebler & Sandefur, 1998). Consistent with the findings in this study, Perez and Fleury (2018) report the nurturing support of family and friends as essential to promoting efforts to be more physically active among older Hispanic women. Female gender roles emphasizing emotional expressiveness and nurturing behaviors make it easier for women to engage and receive social support from close family members and relatives, as well as provide emotional support when needed (Barbee, Cunningham, Winstead, Derlega, Gulley, Yankeelov, & Druen, 1993; Liebler & Sandefur, 2002).

Women spoke of the need for someone to "push" them, and acknowledged the mutual benefits of "holding each other to it," in attempts to move more and sit less. Different from other dimensions of social support that provided comfort, encouraging words, or instrumental aid, the need for accountability to others was seen as an important part of received and perceived support among midlife women in this study.

Several studies have acknowledged the role of accountability; a relatively recent consideration in characterizing dimensions of social support (Holt-Lunstad & Uchino, 2015). Sriram and colleagues (2018) identified accountability as a key theme when exploring peer influences on physical activity. Individuals knowing that they are externally monitored and "held accountable" increases the sense of personal accountability, perhaps in an effort to take ownership of health, or to not disappoint the monitor (Sriram, Morgan, Graham, Folta, & Seguin, 2018; Liddy, 2015). Perhaps because women know they "should" sit less and move more, but do not intrinsically value a particular activity (one perceived as socially acceptable—such as attending a gym), they may need other dimensions of support to help "push" them, or provide the extra motivation needed to engage in what would otherwise be unenjoyable.

Timing Time reflects a theme of shared social activities and a sense of social belonging through making time for family members and friends. Women in this study discussed close relationships with family members and the role of physical activity in staying connected as a family. Women noted that support for reducing sedentary time was enacted by scheduling and planning time for activity with others. Women expressed that the support of others in "making time for them" was essential to moving more and sitting less. This theme is consistent with research identifying experiences of sharing time with family as a way to support and motivate continued activity (Perez & Fleury, 2018). In a study of sedentary adults, Sriram and colleagues (2018) identified family obligations as a common barrier to engaging in activity-- communal activity was identified as a way to incorporate sitting less and moving more into routines without sacrificing family time (Sriram et al, 2018).

Walking And Talking exemplifies shared social activities as bonding, and the cultivation of valued connections and relationships. Walking and Talking is consistent with other contemporary research identifying shared social activity as a critical contextual resource for women. For women in this study, the importance of commitment to sitting less and moving more extended to commitment to others, as part of a larger group. Women expressed finding great sustenance, meaning, and motivation in seeking deep social connections with other women who shared a common interest in a valued activity. These lasting, supportive friendships, camaraderie and connections emerged from a sense of belonging—and feeling valued as part of the group, not just as a short-term association or activity partner.

Research finds that for women, social friendships are perhaps more important and motivating than family support, reflecting the adage that one cannot choose a family member, but they can choose their friends. Many sociological studies indicate that women have larger social networks than men (Umberson & Montez, 2010; McPherson, Smith-Lovin, and Brashears, 2006). Women are also more likely to receive social support, reciprocate social support received, as well as have more exchanges of social support outside the nuclear family (Barbee, et al.,1993; Liebler & Sandefur, 2002). Female gender roles which emphasize nurturing, tending to others, emotional expression, may explain why women meaningfully seek to befriend other women, even in the context of seeking to sit less and move more (Barbee et al., 1993; Taylor, 2012).

Many studies have shown that close friendships are especially important in middle and later years. Evidence suggests that successful aging (attaining old age and feeling good about it) is related to social support, and feeling a sense of connection

through strong, positive relationships (Huyck, 2018). Expanding friendship networks in midlife may help mitigate losses suffered in later life, supporting healthy aging (Martire, Franks, & Kazak, 2014; Bookwala, Marshall, & Manning, 2014; Chang, Wray, Lin, Kazak, Martire, & Franks, 2014).

Shearer and Fleury (2006) described emotional sharing in older women as reflecting communication and shared feelings in fellowship and within close personal relationships. Collectivism and connectedness with others was an integral part of promoting health through its focus on individuals continually interacting within in a socially supportive contextual environment (Shearer & Fleury, 2006). A study to explore motivation for physical activity among Hispanic women, found that beyond health benefits, women emphasized opportunities to care for themselves while connecting with others in their community, to build upon valued relationships (Perez & Fleury, 2018). Qualitative research by Hendry and colleagues (2010) found that social support and a sense of camaraderie was a powerful influencer in engaging in activity, movement, or wellness programs, while lack of this supportive network was a barrier (Hendry et al, 2010).

The development of close friendships and a sense of belonging with those who share activity interests is a key motivator for women, to help them engage in more movement, and subsequently reduce their sitting time. Sriram and colleagues (2018) studied social influences on health behaviors in rural adults, and found that social interaction and friendship bonding, especially in women, was an important facilitator for an active lifestyle. Organized groups offered opportunities for women to socialize with others while walking, creating a sense of connectedness and enjoyment which gave

women more incentive to move through a valued activity (Sriram et al, 2018). The "walking" had importance and meaning for women as it was associated "talking" and social connection that accompanied it.

Contextual Resources

Understanding of the social and environmental determinants of excessive sitting behavior is emerging (Owen, et al, 2011, Owen, 2012). The community, environment, and workplace dimensions of contextual resources capture resources unique to the environment. Women shared their experiences of community, environment, and workplace support as Seeking Place, Stepping Up, and Walking the Talk.

Seeking Place is supported by literature testing ecological models of behavior; suggesting that sedentary behavior occurs in a complex environmental and social context. Through Seeking Place, women reflected upon factors in the workplace physical space and environment that were either conducive to reduced sitting time, or promoted excessive sitting time. A large, expansive, city-like main campus, as well as a thriving urban downtown campus promoted opportunities to take breaks from sitting. Individual differences in roles and responsibilities, as well as physical configurations of desk and office space influenced patterns of sitting and movement during work. While many women spoke of "taking the long way" around their space or work area to get in extra steps, or adjusting procedures or tasks at their desks to force, women also noted the negative effects of technology on moving more and sitting less in the work environment.

The experiences of midlife women in this study are consistent with other research in which women reported "walking while working" in order to integrate more steps and less time sitting into workday practices (Ferney, Marshall, Eakin, & Owen, (2009). In a

study of Australian office workers conducted by Hadgraft and colleagues (2016), furniture designed for seated posture, and the nature of computer work were the main influencers of excessive sitting (Hadgraft, Brakenridge, Lamontagne, Fjeldsoe, Lynch, Dunstan…& Lawler, 2016).

Stepping Up reflected instrumental aid, and informational support or encouragement exchanged among co-workers as a resource for moving more and sitting less during work hours. These findings are consistent with a study of 1089 midlife women, describing the nature of social support for midlife women in organizations, and relationship to work-family balance and work outcomes (Marcinkus, Whelan-Berry, and Gordon, 2007).

Women in this study uniquely characterized social support from home and family members from that of work colleagues and administrators, as to both domain and quality. Some women reflected that they received much support from family and interests outside of the workplace for sitting less and moving more. Others sought support from co-workers as walking buddies or partners exclusively when they knew they would not have support at home. This finding is consistent with research differentiating primary and secondary social support, as well as acknowledging differences in the quality, purpose, and context of relationships and social support derived (Holt-Lunstad & Uchino, 2015). While co-workers are generally viewed as a secondary support system, after family and other significant others (Marcinkus, 2007), some women viewed the workplace as a primary source of social support to reduce their sedentary time—as most of problematic sitting behavior occurred during work hours.

Walking The Talk reflected views of administrative and leadership investment in workplace movement as a significant contextual resource. Administrators actively supported workplace movement by developing and implementing supportive policies or programs. Participants expressed a disconnect between administrative talk, which emphasized health and movement, and workplace social and cultural norms, which promoted excessive sedentary time through explicit or implicit expectation for women to remain seated at their desks and available at all times during the workday.

The disconnect between organizational leadership support for health and movement, and cultural norms for professionalism and productivity in office environments is reflected in studies of work environments for midlife women office workers (Das, Mailey, Murray, Phillips, Torres, & King, 2016; Hadgraft et al., 2016). Das and colleagues (2016) identified a long term need and strategy to improve the cultural norms in workplaces, to make sitting less and moving more less effortful, and more automatic—shifting the workplace movement paradigm (Das et al, 2016).

Implied or actual social pressure to remain productively seated at desks was viewed by women in this study as a barrier to taking breaks from sitting during the workday, with the general claim that 'if you're not at your desk, you're not working'. This finding is consistent with a study of office workers (Hadgraft, et al, 2016), which identified similar organizational social norms influencing the feasibility of breaking up sitting time. Women's concerns that movement at their desks might appear unprofessional or unproductive is also consistent with the findings of Hadgraft and colleagues (2016), where perceived social norms for workplace behavior impacted the uptake of available strategies to reduce workplace sitting time.

Behavioral Change Processes

In the Wellness Motivation Theory, behavioral change processes include self-knowledge, motivation appraisal, and self-regulation. These processes reflect the ways in which individuals identify and evaluate personal goals, establish standards for behavior change, develop and implement strategies to enact change, and regulate and strengthen patterns of behavior, leading to sustained behavioral change and new ways of doing and being. These behavior change processes reflect the human tendency to move beyond existing achievements and strive for new goals and dreams for the future (Fleury, 1991,1996; Fleury & Sedikides, 2007).

Self-Knowledge

The self is the central reference point for cognition, emotion, motivation, and social behavior (Sedikides & Strube, 1997; Fleury & Sedikides, 2007). Self-knowledge has been explored as a component of the self-system, which is a significant correlate and antecedent of motivation in behavioral change (Fleury & Sedikides, 2007; Marcus, 1983; Marcus, 1987; Baumeister & Vohs, 2004). Self-knowledge reflects stored knowledge about the self, including feared or ideal selves, goals, and action plans (Fleury & Sedikides, 2007). The behavioral change process of attaining self-knowledge is the conceptual foundation for assigning personal significance and meaning to life events (Fleury & Sedikides, 2007). Through imaging, individuals imagine valued ways of being, construct an implicit set of standards for behavior and establish ideals from which to judge their performance (Fleury, 1991). In this study, midlife women reflected upon their health, self-representations, goals, and dreams for their future in the themes Envisioning The Future, Taking Inventory, and Considering Possibles.

Envisioning The Future reflects construction of desired future selves—desired ways of being, based on unique perspectives, values, and meaning. The theme of Envisioning The Future emerged through women moving beyond current self-representations to identifying potential valued and personally meaningful goals consistent with moving more and sitting less.

Envisioning the Future is consistent with prior research describing imaging as a key part of the process of empowering potential (Fleury, 1991). Envisioning the Future is consistent with research supporting the role of possible selves—cognitive representations of future selves that are instrumental in motivating planning and behavior change (Markus & Nurius, 1986; Fleury, 2001; Fleury & Sedikides, 2002; Molden & Dweck, 2006; Segar, Eccles, & Richardson, 2011; Dweck, 2012).

For some women, feared selves emerged as they envisioned their future and future consequences of too much sitting or inactivity. Feared selves represented a set of qualities, or an individual that women did not want to emulate, but were concerned about possibly becoming, such as a parent who had unhealthy habits or poor health outcomes (Markus & Nurius, 1986; Carver, Lawrence & Scheier, 1999; Oyserman, Bybee, Terry, & Hart-Johnson, 2004). This finding is consistent with research capturing the role of self-knowledge in cardiovascular risk modification in older adults (Fleury & Sedikides, 2007), and the role of the self in women's experiences in healing following a cardiac event (Fleury, Sedikides, & Lansford, 2001).

Taking Inventory explains ways in which women assess their current health and valued goals. The process of taking inventory allows for comparisons to desired, hoped-for, or possible selves (Markus & Nurius, 1986). Women visualized various plans of

action in relation to perceived ability, potential barriers, and past experiences to determine a plan of action they thought to be both effective and feasible in leading to desired goals.

As part of assessing current experiences with excessive sitting time, women shared concerns about aging transitions, and ill effects of excessive sitting. Perceptions of back pain, headaches, fatigue, and mental confusion were common, as well as negative feelings of being “fat”, “lazy”, and “sluggish”. These experiences are consistent with other studies reporting negative effects and consequences from sitting.

Gilson and colleagues (2011) noted that employees associated excessive workplace sitting time with poor health, citing fatigue, musculoskeletal issues, and de-motivation. The risk of sitting time was independent of the amount of physical activity achieved during a day. Breaking up sitting time in a study by Thorp and colleagues (2014) significantly improved fatigue and musculoskeletal discomfort (lower back pain), without changing productivity. Chester, Rys & Konz (2002) noted lower extremity swelling with excessive sitting, a consequence not specifically mentioned by participants in this study. A qualitative exploration of issues related to excessive sitting found that office workers experienced body soreness, lethargy, and problems with concentration, focus, and fatigue from excessive sitting (Hadgraft et al, 2016).

In Considering Possibles, women reflected on needs to adjust priorities, shift personal philosophies, and let go of old ways of their identity and life in order to foster growth and change. Women engaged in self-reflective processes for evaluating the meaning of health goals to sit less and move more, and reflected upon their personal self-efficacy and self-confidence for achieving valued goals. Making an investment is

consistent with the literature regarding self-efficacy, self-knowledge concepts, and dynamic processes by which knowledge of the self is transformed as a mechanism for personal growth (Fleury & Sedikides, 2007, Fleury, 1991).

Several participants suggested the importance of preparation, current investment, and 'ownership' in self-care and lifestyle choices for a future expected return of greater health, well-being, and longevity. These self-conceptions of perceived efficacy guide goal choices that are relevant and meaningful, and influence motivation for strategies to achieve personal goals (Fleury, 1991; Fleury & Sedikides, 2007; Frazier, Hooker, Johnson, & Kaus, 2000; Kerpelman & Dunkel, 2014).

Motivational Appraisal

Motivational appraisal reflects the process of developing readiness to act, identified as commitment and intention formation for goal directed behavior consistent with personal beliefs and values, information, resources, and goals (Fleury, 1991, 1996; McMahon, 2012). In enhancing readiness for behavior change, individuals connect their beliefs, values, and resources to personally valued goals, and develop skills to achieve goals. In this study, participants shared their experience of motivational appraisal as Reevaluating Priorities, Wayfinding, and Going All In.

Reevaluating Priorities explains processes of evaluating engagement in sedentary behavior in relation to valued ways of being. Through this process, women developed meaningful intention to sit less and move more. This process is consistent with appraising readiness in the grounded theory of empowering potential, whereby individuals form intentions to change behavior and then transform those intentions into personalized goals and actions. (Fleury, 1991). Women reflected upon their sedentary

habits, finding them to be unacceptable or inconsistent with values and priorities. Wanting change emerged from a perceived disconnect between current behavior, and ways of being, based on preferences and values. Dissonance, or inconsistency, between beliefs and behaviors is a powerful incentive and motivator for health behavior change, and has support among behavioral change researchers. (Cooper, 2015; Anshel, 2008).

Wayfinding, as experienced by women in this study, is consistent with the findings of Fleury (1991), conceptualizing a key component of motivational appraisal as the recognition, acknowledgment, and resolution of potential barriers to enacting health behavior or lifestyle change. According to Fleury (1991), identifying and finding ways to overcome barriers provides a mechanism for choosing among goal and action alternatives, and determines perceived control for initiating behavior change.

Through Wayfinding, women considered plans of action for sitting less and moving more to improve their overall health. According to Fleury (1991), imaging reflects potential through conceptualizing valued ways of being, and creating proposed action statements based on those values and preferences. This imaging process involved self-reflection on high level goals and dreams for their future, as well as valued ways to fit more movement into life. In the process of appraising readiness for behavior change, women evaluated their preferences, and weighed the risks of continuing current sedentary behavior, while considering engaging in new behaviors to sit less and move more.

Wayfinding is characterized in research exploring motivational processes surrounding behavior change in midlife women. A qualitative study of personal values in midlife women reported by Howell (2001) identified an emergent and iterative process of change among midlife women, with the intent of achieving life satisfaction in the context

of values clarification. Women adjusted life situations and circumstances to find a way to bring themselves into life balance—behaving in line with personal values. Cognitive behavioral research using disconnected values models facilitate examination of benefits, costs, and consequences of unhealthy habits, evaluating disconnects between values and behavior, removing barriers, and initiating action plans—essentially 'finding ways' to connect, or reconnect values with behavior (Anshel, 2008).

Teychenne and colleagues (2012) reported preferences for interventions to reduce sedentary time among socioeconomically disadvantaged adult time as reflecting personal values, needs and lifestyles. Study findings are consistent with research by Segar and colleagues (2011), studying motivational aspects of superordinate, focal, and subordinate goals in understanding value, meaning, and intention in goals related to health and health aging (Segar, Eccles, & Richardson, 2011).

In this study of midlife women, Wayfinding represented a challenge for many, in that in that women often struggled to find their way around a variety of perceived barriers to changing their sedentary habits. Empowering potential research findings also recognized barriers to enacting change, which included perceived control over self, or other social contextual factors in managing threats (Fleury, 1991).

Wayfinding is consistent with studies supporting motivational appraisal and readiness processes for identifying and overcoming barriers to change (Fleury, 1991; Fleury, 1996, 2001, 2002; Fleury & Sedikides, 2007; McMahon, 2012). Some women were able to visualize ways to overcome barriers, and successfully enact change. Others expressed guilt for not feeling able to change, or not meeting their own goals because of outside social contextual circumstances beyond their perceived control.

Thus, a perceived inconsistency between valued goals and current behaviors motivated some women to implement changes in moving more and sitting less. Other women were not ready to change, and acted to preserve self, through providing explanations and reasons as to why efforts to sit less and move more were influenced by factors out of their control. Those who were able to resolve barriers and initiate a process of purposeful change, "found a way" to make things work for them—in a meaningful way.

Some women struggled with the iterative process of change, voicing life imbalance and guilt, describing themselves as "stuck" or "in a rut". Women describing themselves as less sedentary and more active reflected on a process of integrating behavior change (Fleury, 1991). Women who had identified as sedentary, in relapse, or not regularly active were more likely to experience motivational barriers to readiness, expressed as explanations of fatigue, or lack of time.

Snyder and colleagues (1983) explored the phenomenon of explanations, or reasons for non-action as mechanisms to lessen negative implications of performance (or lack of performance) and protect threats to self-image created by dissonance. Dissonance theory supports mechanisms to protect self, as well as close the gap between beliefs and values, and perceived action (Snyder, Higgins & Stuckey, 1983; Anshel, 2007; 2008; 2010; 2013; Chatzisarantis, Hagger, & Wang, 2008; McLeod, 2014). According to Snyder, those more likely to offer explanations for excess sedentary time are those who view themselves as having less control over their lives or circumstances (Snyder, 1983; Golman, 1984). Those who view themselves as in control of themselves and their lives, view misfortunes as the result of their own mistakes (Snyder, 1983; Golman, 1984). In

this study, approaches to dissonance explain why women offering excuses for excess sitting and inactivity felt less in control of their own lives.

A qualitative study of views of health and health behaviors in midlife women conducted by Smith-DiJulio and colleagues (2010) echoed themes of wayfinding in women who sought life balance, as a process of realizing potential (Smith-DiJulio, Windsor & Anderson 2010). Women in the study described feelings of guilt when not doing enough to be healthy, however those who maintained a strong sense of self, and personal power, were better able to choose and enact valued behaviors.

Mattingly and Sayer (2006) explored gender differences in the perception of time, finding that women feel rushed for time, express time poverty, and experienced time pressure in the performance of life tasks. The authors noted that women commonly expressed "time" factors as a reason for not being able to enact approaches to sitting less and moving more (Mattingly & Sayer, 2006). Women are more likely to view themselves as integrally connected with others; however, providing social support and care for others (Liebler & Sandefur, 2002) may take time away from self-care, impacting a sense of life balance and struggle with the process of change. Consequentially, women may be "stuck" in a pattern of appraising readiness without successfully resolving barriers to initiating behavior change, and owning change (Fleury, 1991).

Going All In characterized the experiences of midlife women in appraising readiness through owning change (Fleury, 1991). In Going All In, readiness appraisal had moved beyond the identification and assessment of barriers, to accepting responsibility for desired change. Women were willing to make sacrifices, commit to a goal, and take responsibility for change. Women expressed self-determination to succeed

in their efforts to sit less and move more, and identified strategies to overcome barriers, especially those related to time.

Self-Regulation

Self-regulation reflects the process of transforming goal intentions into personalized action using cognitive, affective, and behavioral strategies consistent with valued goals. Striving to achieve personal goals, and maintaining personal standards for behavior are important sources of motivation requiring internal behavior regulation. Self-regulation guides individuals in goal-directed behaviors through selective processing of information, behavioral monitoring, judging individual performance, and engaging in self-evaluation (Bellg, 2003; Maes & Karoly, 2005; McMahon, 2012). Self-regulatory mechanisms are important to understanding volitional behavior, in that they mirror ways in which individuals behave in concert with personally valued goals, particularly in the presence of conflicting goals, or when the goals present different rewards over time (Bellg, 2003; Maes & Karoly, 2005; McMahon, 2012). In this study, midlife women shared their experience of self-regulation as Recounting Benefits, Keeping on Track, and Creating New Ways.

Recounting Benefits in this study emerged as a way for women to identify and acknowledge valued behaviors, and foster self-regulatory intent. Recounting benefits is consistent with Wellness Motivation Theory, reflecting the category of affirming change, a dimension of change within the grounded theory of empowering potential (Fleury, 1991). Fleury (1991) found that older adults with CVD reinforced behavioral intent by positively focusing on life changes. In this study, recounting benefits and worth of sitting

less and moving more helped women increase their intention, and enhance their motivation to sustain the behavior.

Through Keeping on Track, women engaged in self-regulation processes by monitoring their efforts to sit less and move more. Women kept track of the various ways they stayed active through movement, and watched for signs of progress in their short, intermediate, and long-term efforts. Keeping on Track reflects self-monitoring processes, which are assessments of individual performance compared to self-determined standards and goals (Fleury, 1991). These processes help identify when performance is inconsistent with a goal target, thus helping women to self-correct, or adjust behavior to get 'back on track', and maintain a behavioral change over time.

Much is in the literature about self-monitoring and self-regulation processes (Fleury, 1991; Fleury, 1996; Yeom, Fleury, & Belyea, 2011; Karoly, 1993; Bandura, 2005; Vohs & Baumeister, 2013). For women in this study, preferred methods to keep track of movement or sitting time included personal electronic devices and monitors. The growing prevalence and general popularity of these devices is well known; the literature supports the use of these devices for self-monitoring purposes (King, et al, 2013; McMahon, 2014; Teychenne, 2012; Das, 2016).

Although sedentary behavior research advocates breaks from sitting as a mechanism to reduce the impact of extended sitting time (Healy, Dunstan, Salmon, et al, 2008), most women had more difficulty keeping track of sitting time compared to steps taken. In a qualitative study of Australian office workers, activity trackers, smart phone apps, and competition among co-workers were evaluated for feasibility and acceptability. Participants noted that activity trackers or competitions could be helpful by providing

real-time feedback to motivate people to reduce their sitting time, but questioned the sustainability of such approaches, citing a possible drop in use when the novelty and excitement of the approach wore off (Hagraft, 2016).

Creating New Ways reflected engagement in sustaining and exploring valued habits, routines, and approaches for sitting less and moving more. Women spoke of needing to be flexible and open to new ways of doing, embracing uncertainty, but hopeful that new strategies or approaches might succeed. Creating New Ways is about integrating change, a process of wellness motivation and empowering potential, which includes establishing rituals, achieving harmony, and transforming change (Fleury, 1991). Creating New Ways reflects a higher level of conceptualization and complexity than self-maintenance or creation of a habit. Through the patterning process of Creating New Ways, lifestyle changes become part of the individual's routines and "new ways" are integrated as a 'new normal', so that they are automatic. Creating New Ways can be described as actualized meaning—women perceive order and harmony, beyond finding "what works for me". Valued behaviors are internalized, and become a "new me". Creating new ways also reflects a simultaneity paradigm, considering human behavior as a process of mutual, continuous, and rhythmic interaction with the environment, in an act of co-creating health (Parse, 1981; Fawcett, 1993; Wright, 2006).

Contribution to Nursing Science

Nursing science reflects human-environment processes (Reed, 1997; Sidani & Braden, 1998), and encompasses the development, implementation and evaluation of theory and interventions fostering individual potential. Contemporary perspectives guiding interventions to reduce sedentary behavior are grounded in deficit-based views of

behavior, restricting the development and implementation of perspectives focused on personal strengths, meaning, and growth. Contemporary approaches to reducing sedentary behavior view behavior as a mechanistic and predictable response to a stimulus. A focus on deficits limits the exploration of individual and community strengths, compounding the risk for vulnerability to diminished health and wellness in midlife and older adults (Holstein & Minkler, 2003; McMahon & Fleury, 2012).

While contemporary perspectives have achieved modest success in reducing sedentary behavior, research is needed examining themes of interest to nursing science, including knowledge related to the optimal function of human beings; the patterning of human behavior in interaction with their environment; and processes through which changes in health behavior occur (Donaldson & Crowley, 1978).

Contemporary perspectives provide some understanding of the decision-making processes involved in reducing sedentary behavior. However, these perspectives are limited in capturing behavior change as a process. Contemporary approaches provide a theoretical structure to observe and predict behavior, but do not allow for an investigation of the processes characterizing both intention and volition in change. The variables involved in the prediction of behavior, the weights they receive, and the ways variables interact are presumed to remain constant from the moment an individual perceives a need through the time when behavior is initiated. The development of relevant theory-based interventions must include awareness of the processes guiding a reduction in sedentary behavior. The decision processes guiding the initiation and maintenance of health behaviors may be very different, and require differing interventions.

The development of relevant theory-based nursing interventions must include awareness of the processes through which a reduction in sedentary behavior is initiated and sustained over time. The Wellness Motivation Theory provides a unique nursing perspective to the study of sedentary behavior, recognizing non-linear patterns of behavior change and growth over time. The research literature on sedentary behavior contains few studies advancing a nursing perspective (SBRN, 2012). Thus, perspectives advancing nursing science are essential.

This study advances nursing science by extending knowledge of human-environment nursing perspectives that can inform development of interventions to address motivation to reduce sedentary behavior in midlife women. Research findings extend and enrich Wellness Motivation Theory (Fleury, 1991) and further our understanding of dimensions of social contextual resources and behavioral change processes experienced by midlife women in their efforts to sit less and move more. In midlife and older adults, there is a lack of qualitative research related to sedentary behavior, as well as a lack of studies examining motivational and contextual processes and resources in reducing sedentary behavior (Brug, 2015).

The nursing knowledge generated from this research facilitates the recognition of resources, experiences, strengths, and growth in midlife women, for reducing sedentary behavior. Building upon individual strengths--optimizing and empowering potential--advances nursing knowledge about promoting continued growth as part of healthy aging, while simultaneously guiding care for individuals with changing and diverse needs (McMahon & Fleury, 2012).

Although contemporary perspectives identify a variety of factors, including attitudes, beliefs, and intentions underlying the individual decision to reduce sedentary behavior, they do not examine the meaning of health behavior change to the individual. In setting valued goals for change, persons adapt their world to self-generated needs and projects, rather than adapting themselves to a given world (Nuttin, 1987; Parse, 1987). Theoretical perspectives are proposed and tested based on the assumption that the variables studied are appropriate and meaningful. However, values, meanings, and priorities change across the lifespan, particularly during times of transition, and require different approaches to health behavior change. The development of interventions designed to reduce sedentary behavior in midlife women must include an awareness of the meaning driving behavior and behavior change, in order to achieve a reduction in sedentary behavior.

Contemporary approaches are limited in furthering understanding of the patterning of human behavior in interaction with their environment. Social contextual resources are acknowledged in a number of perspectives, yet have received less attention relative to individual variables. Research on the determinants of physical activity among older adults has shown that environmental social, behavioral and cognitive factors are key for the initiation, and long-term maintenance, of physical activity. However, it is not known if these same factors also determine sedentary behavior. Ecological perspectives acknowledge the need to test interventions targeting multiple levels of influence, based on the premise that intervening simultaneously at multiple levels, in multiple settings within levels, and with multiple intervention components within and across levels and settings, will produce greater and longer-lasting effects (Manini et al., 2015). However,

establishing the relevance and effectiveness of such approaches remains a challenge. A better understanding is needed regarding the role of social contextual resources in reducing sedentary behavior in midlife women, as well as the capacity of women to meet challenges posed by the environment.

Current understanding of the determinants of sedentary behavior and mechanisms of change required to decrease sedentary behavior in midlife women is lacking. Interventions designed to reduce sedentary behavior have shown variable effects, and are derived from perspectives designed to promote physical activity. Research exploring social contextual resources and behavior change processes related to sedentary behavior in midlife women, a vulnerable population, is essential. According to Holstein and Minkler (2003), exploring "How it is for me" opens narrative possibilities that trade generalizability about healthy aging for increased understanding. Knowledge generated from such approaches could influence the design of interventions to better match the needs of women.

Formative research is needed to better understand the processes through which midlife women engage in changes to decrease sedentary behavior, especially with respect to the social contextual and behavioral change processes underlying the Wellness Motivation Theory. This knowledge will facilitate the development of interventions to address motivation to reduce sedentary behavior in midlife women. In midlife and older adults, there is a lack of qualitative research related to sedentary behavior, as well as a lack of studies examining motivational and contextual processes and resources in reducing sedentary behavior (Brug, 2015).

Contribution to Nursing Practice

Knowledge gained from this study contributes to nursing practice by informing the design of theory-based interventions to decrease sedentary behavior in midlife women. The Wellness Motivation theoretical perspective for intervention explains how behavior change occurs, acknowledges processes of change, and fosters complex and continuous patterning of individuals in interaction with their environment.

In this study, women who were more fully engaged in the process of behavior change generally expressed less guilt, and had fewer excuses or explanations for not being able to sit less and move more. There were no meaningful differences among participants in this study in their experiences with sedentary behavior relative to race or ethnicity. Also, younger participants in this study typically reported that time availability was a significant factor in efforts to be more active, and sit less and move more. Women who reported amounts of sedentary time greater than 6 hours per day were also more likely to express the experience physical consequences of excessive sitting, such as fatigue, pain, and other symptoms.

One of the overarching themes emerging from this study was the recognition of motivation as meaning. Thus, individuals are motivated to act upon that which is most meaningful—we *do* what we *value*. While many common threads emerged from the focus groups in this study--each of the women who participated was a unique individual, with unique selves, social and environmental contexts, goals, hopes, dreams, experiences, and ways of thinking and being. Nursing interventions promoting optimum health for midlife women will be those centering on *meaning* for the individual woman—and those honoring her complexity and individuality.

This research challenges traditional models of self-management, adherence and compliance in the "management" of health behavior change (Ryan & Sawin, 2009; Baumann, 2012). Women in this study engaged in and continued behaviors that they valued, engaging in iterative processes of "wayfinding" to do what "worked for them"—supporting the Wellness Motivation Theory perspective that successful behavior change relies on meaning, context, and patterning of individual's behavior within a social-contextual framework.

Limitations of the Research

This study used purposive sampling to recruit midlife women between the ages of 40 and 64 who were employed by Arizona State University. Study results do not reflect the experiences of older or younger women, or women who did not self-report excessive sedentary time. Because the study included primarily Caucasian women (81%), results may not reflect the experiences of other racial and ethnic groups, or women not employed in an office setting.

Directions for Future Research

This study represents a first step in programmatic research designed to understand motivation to decrease sedentary behavior in midlife women. Findings from this research provide an exploration of processes of change, as a basis for development and testing of interventions to reduce sedentary time in women, to promote cardiovascular health and healthy aging.

Summary

Sedentary behavior is recognized as a widespread, independent risk factor for increased morbidity and mortality from chronic conditions including diabetes,

cardiovascular disease, and cancer. Midlife women (age 40-64) are known to have high levels of sedentary behavior and corresponding cardiovascular disease risk. Currently, little is known about mechanisms involved in reducing and maintaining reductions to sedentary behavior in midlife women. Theory-based nursing interventions are needed which reflect process, personal meaning, person-environment interaction, and incorporate a strength-based perspective.

Wellness Motivation Theory guided the research, conceptualizing behavioral change processes within culturally and environmentally relevant contexts, while recognizing bidirectional influences of personal and environmental factors on behavioral patterns. The Wellness Motivation Theory addresses social support and norms, community and material resources that influence behavioral choices, individual motivation and goals, and the behavioral change processes of self-knowledge, motivational appraisal, and self-regulation.

A qualitative descriptive approach was used to explore social contextual resources and behavior change processes leading to action as decreasing sedentary time in midlife women. The purposive sample included 31 midlife women, employees of Arizona State University. Participants attended a one-hour focus group to discuss their experiences with sedentary behavior, and their efforts to sit less and move more. Midlife women reflected social support as: Raising Me Up, Timing Time and Walking and Talking. Support from contextual resources reflected Seeking Place, Stepping Up, and Walking the Talk. Women experienced self-knowledge as Envisioning the Future, Taking Inventory, and Considering Possibles. Motivational appraisal was characterized as

Reevaluating Priorities, Wayfinding, and Going All In. Self-regulation was reflected as Recounting Benefits; Keeping On Track; and Creating New Ways.

Nursing knowledge gained from this research fosters a deeper understanding of motivational processes central to reducing sedentary behavior in midlife women. Research findings provide the basis for development and testing of interventions to reduce sedentary time in women, to promote cardiovascular health and healthy aging. Nursing interventions will center on *motivation as meaning,* honoring processes of change, and social contextual complexity.

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