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Predicting Behavior to Engage in Fall Prevention Practices: The Role of Interests and Basic Psychological Needs

Jan Fay Kress
Walden University

Walden University

College of Health Sciences

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Jan Fay Kress

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Review Committee
Dr. Loretta Cain, Committee Chairperson, Public Health Faculty
Dr. Edward Irobi, Committee Member, Public Health Faculty
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Sue Subocz, Ph.D.

Walden University
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Abstract

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Jan Fay Kress

BS, Temple University, 1985

MEd, Lehigh University, 1980

BS, Barrington College, 1975

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

A fall is associated with adverse outcomes that include occupational, physical, cognitive, and psychological decline together with economic and caregiving burden. Despite the continued increase in prevalence of falls globally, most studies address the well-known risk factors of falls but exclude the behavioral risk factors associated with human actions, emotions, and everyday choices. Following the theory of self-determination and person object of interest framework, this quantitative, nonexperimental study was conducted using face-to-face and web surveys to examine the relationship between motivational, relational, and sociodemographics/medical conditions to predict engagement in fall prevention practices in a sample of 75 community dwellers, 65 years and older without cognitive or mobility limitations. Regression analyses were conducted to test the hypotheses. Results of the linear regression analysis were significant indicating a positive relationship between interests and basic psychological needs to predict behavior for engagement in fall prevention practices. Specifically, 21% of the variance in fall behavior is explainable by interests, and 38% of the variance in fall behavior is explainable by the combination of interests and basic psychological needs particularly satisfaction in relatedness and dissatisfaction of autonomy. Findings of this study can be used to bring awareness of the supportive role basic psychological needs and interests play toward engaging in fall prevention practices. Including motivation and relational concepts in population-based fall prevention assessments is a starting point for positive social change.

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If I was smart or wise enough to complete this dissertation on my own, this page would have been eliminated. However, without God's grace and gifts of intelligence and curiosity, my children's [Alexandra and Dillon] constant love, support from my mom and sister, my dear friend Martina, and current and former OT/ OTA student's encouragement—this grand accomplish would not have been possible.

From the start, my chair, Dr. Loretta Cain's enthusiasm and calm grounded and supported me, my colleague and former committee member, Dr. Jeff Snodgrass, brought clarity to my efforts to look inward instead of outward to bring forth new ideas in falls prevention research, and Dr. Edward Irobi "jumped in" to support me to the finish.

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It truly "takes a village" to scholarly pen your passion.

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Chapter 1: Introduction to the Study

Globally, researchers and community stakeholders are concerned about the growing public health problem of falls among persons 65 years and older. Across the world, the prevalence of falls is increasing (Hestekin, H., O'Driscoll, T., Williams, J.S., Kowal, P., Peltzer, K., Chatterj, S. (2013), and there is a high disparity between mortality rates from a fall in low- to middle-income countries (80%) and high-income countries (20%; World Health Organization [WHO], 2018. Since 2001, the U.S. non-fatal unintentional fall rate among persons 65 and older has shown a steady increase, making falls the number one unintentional injury of aging (Centers for Disease Control and Prevention [CDC], 2016. According to the WHO (2007), the risk factors for falls among persons 65 years and older include biological, environmental, socioeconomic and behavioral characteristics combined with health and well-being. The interaction of any or all these characteristics may result in adverse and potentially irreversible occupational, physical, cognitive, emotional, and psychological outcomes including considerable economic and caregiver burden. However, among the stated risk factors, the behavioral dimension comprised of "human actions, emotions and daily choices" is the only risk factor with limited published studies (Yardley, 2006; Roe, B., Howel, F., Riniotis, K., Beech, R., Crome, Ong, B.N., 2008; Shaw, 2012).

Due to the continued prevalence and rising morbidity resulting from these risk factors, research efforts should focus on analysis of target behaviors specific to the individual that are influenced by the social, cultural, and physical environment (Michie, van Stralen, & West, 2011), thus promoting self-management to prevent a fall among

persons 65 years and older. Determining the impact of basic psychological needs and interests that lead to engagement or disengagement in falls prevention practices is the missing step to understanding the epidemiology of the unintentional injury called a fall, as it pertains to uptake and adherence to fall prevention practices. The outcome of this study will add to the limited number of research studies focusing on the behavioral risk factors of a fall, thus encouraging awareness and inclusion of behavioral components in fall prevention practices.

Chapter 1 will provide the background of the research problem, problem statement, justification for the study, research questions guiding the study, and the conceptual model. The independent and dependent variables and their related terminology for this study are precisely defined. Additionally, the study's significance, scope, meaningful assumptions, and limitations are stated.

Background of the Study

The fall prevention literature from 1987–2018 shows that a fall experienced by an individual is defined in many ways, yet the consequences of the fall remain the same. The medical definition of a fall, according to the WHO (2007), is "an event in which an individual inadvertently comes to rest on the ground, floor or other lower level" (p.1). A seminal public health or epidemiology perspective has suggested that falls are not a consequence of "a violent blow to the head, loss of consciousness, sudden onset of paralysis due to a stroke, or an epileptic seizure" but instead are signs of disorder such as the environment (Sattin, 1992, p.491), which are intrinsic and extrinsic to the individual and can be likened to the WHO (2007) specific risk factors of falling. Clinically, falls are

the result of a factor or factors such as lifestyle or environment (Weir & Culmer, 2004, citing Tinetti, 2003) and include tripping or losing balance before landing on the floor or ground (Hauer, Lamb, Jorstad, Todd, & Becker, 2006). A general definition of a fall is an unplanned descent, which can be with or without injury and occur due to physiological reasons or environmental reasons (American Nursing Association, 2005, p. 26).

There has been substantial research on fall prevention practices to address the intrinsic and extrinsic risk factors of falls since 1987. However, there are few recent studies that address the specific intrinsic risk factors related to behavior. Research related to intrinsic risk factors of a falls include factors that reside within the individual such as demographics like age, gender, race, and biological factor that include strength, coordination, vision, hearing, balance, chronic medical conditions, cognition, perception, behavior (Stevens, 2013; WHO, 2007; Yamashita, Noe, & Bailer, 2012). Research related to extrinsic risk factors of a fall include factors outside the individual such as socioeconomic information, objects, and substances found and used in the built environment (e.g., lighting, in-home and outside the home hazards, mobility devices, slippery surfaces, footwear, assistive devices, alcohol and medications; Stevens, 2013; WHO, 2007; Yamashita et al., 2012). Because of these intrinsic and or extrinsic factors, falls among persons 65 years and older remains the number one injury of aging. Falls do not occur because of the aging process but despite the aging process; therefore, falls are not an inevitable part of aging (National Council on Aging, 2017).

Problem Statement

Despite the continued prevalence of falls among persons 65 years and older in the United States, is their varied adverse consequences and low uptake in fall prevention practices (Dickenson et al., 2011; Lovarini, Clemson, & Dean, 2013) that is causing concern among the medical and public health community around the globe (WHO, 2007). Although a fall is preventable and modifiable, this usually nonfatal unintentional injury remains the number one injury of aging in the United States (USA.gov, 2013). Its consequences include physical, psychological, emotional, and occupational decline that can threaten the older person's independence and is a burden on the economy (CDC, n.d.) and on the caregiver (Dow, Meyer, Moore, & Hill, 2013).

Regardless of U.S. national falls prevention programs encouraging older individuals to keep up to date on medications, physical exams and check home safety to prevent a fall (Stevens, citing STEADI, 2013) and programs encouraging older individuals to engage in exercise, environmental, and multi-factorial interventions to prevent a fall (Stevens & Burns, 2015), the fall prevalence and mortality rate among persons 65 years and older continues to rise. Studies have identified risk factors for falls among older adults (Ambrose, Paul, & Hausdorff, 2013). But there remains a lack of inclusion of the other risk factor of falling called behavior and the reason for the limited uptake in national, state, and community fall prevention practices. The gap in the literature shows that the behavioral risk factors of falls, called "human actions, emotions and daily choices" (WHO, 2007, p. 5) are not included in national falls prevention messages nor at the forefront in evidence-based fall prevention practices/ interventions

(Stevens, 2010). Therefore, the examination of the relationship between behavioral risk factors toward engagement in fall prevention practices will address a significant gap in the literature (Roe et al., 2008; Yardley, 2006)

The evaluation of concepts related to in this study includes basic psychological needs, objects of interests, and protective behaviors to prevent a fall. An inclusion of behavioral risk factors of falls in fall prevention screenings, evaluations and practices may improve fall self-management, reduce falls and their consequences, reduce the burden of injury and disability, and support quality of life as the older individual continues to age (Guirguis-Blake, Michael, Perdue, Coppola, & Beil, 2018).

Purpose of the Study

The purpose of this quantitative study was to explore the relationships among motivational and relational concepts to predict engagement in falls prevention practices. Measuring the relationship between motivational concepts of basic psychological needs of autonomy, connectedness, relatedness and relational concepts of object-specific interests (real objects related to falls prevention; activities related to fall prevention; topics related to falls prevention) can elevate the understanding of the less studied behavioral risk factors associated with falls among persons 65 years and older. Given the continued prevalence of falls in the United States and around the globe, it is important to examine the influence of behavior on the self-management and self-regulation process to prevent a fall and potential adverse outcomes and/or injuries in the home environment. Determining the magnitude and significance of relationships between behavioral and

relational constructs for engagement in falls prevention practices is an important step for injury prevention and falls prevention interventions.

Research Questions and Hypotheses

The following research questions highlight the relevance of basic psychological needs, interests, and sociodemographic/medical conditions on fall prevention practices among community dwellers 65 years and older:

RQ1: What is the relationship among sociodemographic variables and engagement in falls prevention practices among community dwellers 55 years and older?

$H_0$1: Participants sociodemographic information does not significantly predict engagement in fall prevention practices.

H_a1: Participants sociodemographic information does significantly predict engagement in fall prevention practices

RQ2: What is the relationship between basic psychological needs of autonomy, competence and relatedness and engagement in fall prevention practices among community dwellers 55 years and older?

$H_0$2: Participants satisfaction of basic psychological needs of autonomy, competence and relatedness does not significantly predict engagement in fall prevention practices.

H_a2: Participants satisfaction of the basic psychological need of autonomy, competence and relatedness significantly predicts engagement in fall prevention practices.

RQ3: What is the relationship between objects of interest in falls prevention practice including reference objects, topics, and activities, for engagement in falls prevention practices among community dwellers 55 years and older?

$H_0$3: Participants interest in objects, topics and activities associated with fall prevention does not significantly predict engagement in fall prevention practices.

H_a3: Participants interest in objects, topics and activities associated with fall prevention significantly predict engagement in fall prevention practices.

Theoretical Framework

The theoretical framework for this study was the self-determination theory (SDT) and person-object approach to interest framework (POI; Ryan & Deci, 2000). The SDT explains why individuals "want, choose and personally endorse" activities and the POI framework focuses the concepts of interest as the interaction between a person and object while engaging in an everyday activity (Ryan & Deci, 2000). The key elements in this study are SDT's basic psychological needs and POI's objects of interest. SDT proposes there are three basic psychological needs and an internal and self-concept that shapes an individual to be motivated toward health and well-being (Deci & Ryan, 2001). The POI framework proposes the interaction between the individual, the environment, and the objects (which surround the individual) are dynamic (Lewin, as cited in Deci & Ryan, 2001) and become interests under certain circumstances. SDT components are individual and internal to the self, and POI components are dependent on the interaction between the self and objects in the environment. In applying the SDT and POI framework to falls prevention practices, this study will bring attention to satisfaction of basic psychological

needs and interests as the foundation for health and well-being to support self-management to prevent an injury such as a fall.

Nature of the Study

In this study, quantitative research was conducted to determine the role basic psychological needs and the relational concept of interests play toward engagement in falls prevention practices. Additionally, regression analysis was used, as it is commonly used for prediction and to learn which independent variable or variables are related to the outcome of the dependent variable (Pedhazur, 1997). For the purpose of this study, I used multiple linear regression analysis and represented the relationships between the variables through scatter diagrams of residuals and normal probability plots of residuals to test assumptions. Data plots were appropriate for this research because it visually shows the pattern of the variance among the variables (Schneider, Hommel, & Blettner, 2010), which in this study was basic psychological needs and object-specific interests to predict engagement in falls prevention practices. Moreover, multiple linear regression assessed the impact the independent variables have on the outcome of engaging in fall prevention practices. The independent variables were concepts of motivation called basic psychological needs of autonomy, competence, relatedness and relational concepts related to motivation (object-specific interests) that included real objects, activities, and types of engagement and topics (Deci & Ryan, 2001) and sociodemographics/medical conditions. The dependent variables of "behavioral patterns, actions and habits" called protective behaviors, represented the individual's interaction with the environment to prevent a fall (Clemson, Cumming & Heard, 2003).

Definitions

The following list of terms defines the variables and concepts studied in this research. The independent variables are three-fold: (a) basic psychological needs of autonomy, competence, relatedness; (b) person-object approach to interests, which include interest objects called real objects, activities, and types of engagement and topics; and (c) sociodemographic and medical conditions. The dependent variable represents the protective behaviors associated with engagement in various types of falls prevention practices to include exercise, home modification, clinical/ medical and multifaceted interventions (CDC, 2015) and can be referenced as the concept of self-management to prevent a fall.

Activities and types of engagement: A set of actions with motor, cognitive, perceptual, and emotional components related to an interest that have typical procedures (Deci et al., 2001).

Adverse cognitive outcomes: Resulting from traumatic brain injury and include changes in thinking and or remembering (Person & Kegler, 2020).

Adverse economic outcomes: Include additional financial costs associated with use of emergency medical system, emergency room, hospital stay, rehabilitation, homecare services, and outpatient visits to physician (Shumway-Cook et al., 2009; Stevens, Corso, Finkelstein, & Miller, 2006).

Adverse family caregiving outcomes: Include high-risk for personal injury, continuous worry about their loved one's safety and neglect of the caregivers' own health and well-being (Dow et al.,2013; Pinquart & Sorensen, 2011; Strommen J, Fuller H,

Sanders GF, Elliott DM. (2020) ; Ringer, Hazzan, Agarwal, Mutsaers, & Papaioannou, 2017).

Adverse occupational or quality of life outcomes: Includes the self-limiting behaviors that someone experiences as a result of disengaging in everyday activities that are collectively referred to as occupations that maintain independence in the home and community (American Occupational Therapy Association, 2017).

Adverse physical outcomes: Include change in gait, fractures, bruises, and other injuries of the limbs (Uemura, Yamada, Nagai, Tanaka, Mori, & Ichihashi N.(2012; Terroso, Rosa, & Torres Marques, 2014).

Adverse psychological outcomes: Include a fear of falling, feelings of helplessness, hopelessness, horror, and/or avoidant behaviors as an individual anticipates returning to regular everyday activities (Adamczewska N, Nyman SR.(2018). Bertera & Bertera, 2008; Chung, McKee, Austin, Barkby, Brown, Cash, Ellingford, Hanger, Pais. (2009). Ob-Park, Xue, Holtzer, & Verghese, 2011).

Adverse social outcomes: Include decreased social participation and social support (Pin & Spini, 2016).

Autonomy: A basic psychological need of action or doing, guided by the self, not others (DeCharms, 1968).

Behavioral risk factors: Are "human actions, emotions or daily choices" that place the individual at risk for injury that include and may be determined by "intake of multiple medications, excess alcohol use, sedentary behavior due to lack of social,

economic and cultural participation" cultural expectations, and gender specific physical or risky behaviors" (WHO, 2007, p.5).

Biological risk factors: Pertain to the determinants found within the human body which include "age, gender, race, disease specific co-morbidities associated with chronic illness, and non-modifiable biological factors of aging" (WHO, 2007, p.4).

Clinical/medical interventions: A single intervention that addresses and assesses medications and supplements used by individuals, vision screenings and assessment of devices, cataract surgery, pacemaker usage, assessment of foot pain, and exercises that may reduce falls (Gallagher, 2007; Haran, 2010; Harwood, 2004, 2006; Kenny, 2001; Pfeifer, 2009; Pit, 2007; Spink, 2007).

Competence: A basic psychological need to successfully engage, manipulate, and negotiate the environment (White, 1959).

Environmental risk factors: The interaction with any and all structural design and nonstructural objects included in the physical environment.

Exercise: A single intervention to promote balance, coordination, muscle strength, reaction time and aerobic capacity to prevent falls (Campbell, 1997, 1999, 2001, 2005; Clemson, 2012; Freiberger, 2007; Kemmler, 2010; Kovacs, 2013; Li, 2005; Lord, 2003; McKiernan, 2005; Rubenstein, 2006 Skeleton, 2005; Stevens & Burns, 2015; Trombettti, 2011; Voukelatos, 2007; Wolf, 1996; Yamada, 2013).

Home modifications: An assessment of the home environment to identify safety hazards and unsafe behaviors, followed by recommendations to modify the home environment for safety and provide suggestions or increase safety awareness for behavior

change to prevent falls (Campbell, 2005; Cummings 1999; Liu, & Lapane, 2009; Mann, Ottenbacher, Tomita, & Granger, 1990; Nickolus, 2003; Pighill, 2011; Wahl, Fange, Oswald, Gitlin, & Iwarsson, 2009).

Individual interest: A close relationship that is formed due to the interaction between the person, an object within a "life-space" and or situation and the time (Deci et al., 2001).

Interest object: A relational concept that represents the connection between a person, an object within a "life-space," and or situation and the time (Krapp, n.d.; Lewin, 1936).

Multifaceted intervention: A single intervention provided by various healthcare providers that address clinical/medical, home modifications or hazard reduction, exercise, and education to prevent or reduce falls (Logan et al., 2010).

Object of interest: An object categorized into components to include reference objects, an activity, and topics. These objects of interest have a unique meaning that is specific to each individual (Krapp, n.d., p. 85).

Reference objects: A component described as a concrete "thing" used to engage in the activity of interest (Krapp, n.d., p. 85).

Relatedness: A basic psychological need that mirrors the need for close emotional bonds and feelings of connectedness to other in the social world (Sroufe, 1990).

Self-management: A personal effort by an individual to assume responsibility to engage in healthy behaviors to improve health outcomes (Office of the Assistant Secretary for Health, 2015; Ryan & Sawin, 2009).

Socioeconomic risk factors: The "social conditions" and the influence they exert on the individual that includes the impact of "low income, low level of education, inadequate housing, lack of social interactions, lack of community resources, limited access to health and social care especially in remote areas" (WHO, 2007, p.6).

Topics: Forms of activities that a person undertakes using an object related to the topic. Engagement in these activities is contingent upon a person's goals, topics, and questions about the object itself (Deci et al., 2001).

Assumptions

Current research highlights an increased risk of falls when cognitive decline is present. Given the CDC's Healthy Brain Initiative (2108-2023) and difficulties in everyday activities when subjective cognitive decline is present (Behavioral Risk Factor Surveillance System [BRFSS], n.d.), it was important to learn predictors of engagement in fall prevention practices among persons without cognitive decline. It was presumed that the older adult, without a cognitive disability, would honestly identify and record independent and dependent variable data. With regard to ease of use and accuracy to obtain reliable results, it was assumed that a pilot study enhanced the likelihood of success of the main study (Thabane et al., 2010).

Scope and Delimitations

The scope of the study was highlighting the behavioral risk factors of falls to learn the relationship between motivational, relational, and sociodemographics/medical conditions for engagement in fall prevention practices. From a global perspective, falls are now a major public health problem and remain the leading cause of unintentional

injury death following death from road injury accidents (WHO, 2018). The rate of falls, as well as the burden of falls among persons 65 years and older is projected to increase through 2030 and beyond (Moreland, Kakara & Henry, 2020), so it is important to understand choices the older adult makes to prevent a fall. Given the importance of motivation and the relationship individuals have with objects in the environment, the awareness of the older adults self-determined behavior could be valuable in fall prevention.

The inclusion criteria for face-to-face participation in this study was limited to community dwellers 65 years and older who did not use a mobility device or assistance from a caregiver to walk and did not present with cognitive deficits. The inclusion criteria for online participation was changed to include individuals 55 years and older to obtain the sample size, but I was not able to verify the participants mobility or cognitive status prior to engaging in the google survey. Therefore, the adults who participated in this study represent a subset of the general population aged 55 years and older.

Limitations

There are potential limitations to research outcomes in the current study. Although correlational research designs are effective in discovering the relationships between variables to predict outcomes (Stangor, 2011), their limitations are also worth noting. Correlational studies often have limited ability to draw conclusions about the causal relationships between the measured variables but are able to measure the relationships in real time. I did not design the current study to learn if motivation, interests, or sociodemographics/medication conditions caused the older individual to

engage in fall prevention practices/messages but to learn the relationships between behaviors of motivation, interests, and sociodemographic/ medical conditions to predict the outcome of engagement in protective fall prevention practices. This study cannot determine whether satisfaction of basic psychological needs, objects of interest, and or sociodemographics/medical conditions caused the engagement in fall prevention practices.

Another concern pertained to the gathering of data from the sample population. Initially, face-to-face questionnaires were used with two research partners and inclusion criteria was easily determined. However, when the sample population was exhausted with one research partner, and other research partners were not able to be located, a web-based survey design was implemented to meet the sample requirements, but inclusion criteria was not determined. Although the use of web-based survey design among persons 65 and older is still not well documented (Remillard, Mazor, Cutrona, Gurwitz, & Tjia, 2014), the current study used a snowball sampling through the second research partner to identify groups with internet access. The previous mentioned factors could potentially impact validity of the findings.

Significance

Across the United States, falls are the number one injury of aging (CDC, 2020). Fall related injuries whether overt or covert, cause fear and limit independence in all aspects of everyday life in our aging society (National Council on Aging, 2018). Aging alone presents challenges due to changes physically, emotionally, financially, and socially (Yenilmez, 2015), but the awareness and behavior to prevent a fall is difficult to

sustain overtime (Dickinson et al., 2011; Gaspar, de Souza Azevedo, Reiner, Mendes, & Segri, 2017).

The results of this study may contribute to positive social change by highlighting the role motivational and relational aspects of behavior as seen in basic psychological needs and objects of interests to predict engagement in fall prevention practices. Various stakeholders such as primary care physicians, nursing, business, religious, senior centers, and rehabilitation professions are likely to benefit from this awareness, which in turn may refocus recommendations for fall prevention interventions as well as predict uptake in fall prevention practices.

Summary

There is a current gap in the fall prevention literature and fall prevention practices that focus on the role behavior plays to engage and adopt fall prevention practices (Roe et al., 2008; Shaw et al., 2012; Yardley, 2006). Currently, only five out of 40 evidenced-fall prevention interventions as cited in 2015 CDC Compendium of Effective Fall Prevention Interventions includes the aspect of behavior. These are as follows: (a) fall prevention practices of home modifications (Cummings, 1999; Pighills, 2011), (b) single interventions to assess tobacco, (c) single interventions to assess alcohol usage (Bishcoff-Ferrari et al., 2006), (d) compliance to take medications (Pit et al., 2007), and (e) multifactorial interventions included assessment of psychoactive medications (Close et al., 1999; Wagner et al., 1994). Altogether the behavioral risk factors of falls address the older individual's behavior before recommending an intervention. This quantitative study

represents the first study to explore the basic psychological needs and awareness of objects of interests in fall prevention practices.

Chapter 1 included specifics of the research problem, purpose of the study, independent and dependent variables, and the null and alternative hypotheses. Chapter 2 will provide a detailed review of literature on impact of a fall, fall self-management, motivation and relational aspects of behavior, and the current limited research on behavioral risk factors of falls. Chapter 2 also includes a detailed description of the theoretical frameworks of the study and an in-depth review of the literature. Chapter 3 includes a more detailed description of the research methodology, detailed description of the independent and dependent variables, and multiple covariates on the dependent variable.

Chapter 2: Literature Review

Introduction

Globally, stakeholders are puzzled by the low uptake to engage in fall prevention practices by community dwellers 65 years and older (Boyd & Stevens, 2009; Dorresteijn, Rixt Zijlstra, Van Eijs, Vlaeyen, Kempen, 2012), despite strong evidence that fall prevention interventions are effective to prevent a fall and the consequences incurred by the older adult (Khong et al., 2016; Stevens & Burns, 2015). This major public health problem is the leading cause of nonfatal unintentional injuries 2001 through 2018 and contributes to the economic and caregiving burden in the United States (CDC, 2017; National Council on Aging, 2017). The purpose of this quantitative study was to examine the relationship between personality and motivational constructs of basic psychological needs and interests to predict behavior for engagement in fall prevention practices. The outcomes of this study may provide insight into the behavioral aspects of a fall and reasons why older adults do not take action to avoid the consequences of a fall (Lee, Lee, & Khang, 2013). The gap in the literature shows limited published studies on the role behavior plays in preventing the unintentional injury called a fall (Butler, Lord, Taylor, & Fitzpatrick, 2015; Connell & Wolf, 1997; Roe et al., 2008; Shaw, 2012; Yardley, 2006).

Chapter 2 will begin by focusing on behavior and the conditions needed to engage in health behaviors to prevent a fall such as basic psychological needs called autonomy, competence, relatedness, and objects of interests. Additionally, the literature reviewed will highlight the fall event paradigm and fall prevention screenings that include a behavioral component. The final section includes a review of the methodologies of

research, rationale for multiple linear regression, a summary of this chapter and transition to the next chapter.

Literature Search Strategy

Information for the literature review was obtained by searching governmental websites, multiple databases, journal websites, theses and dissertations, and reference lists for relevant journal articles. The governmental websites included CDC, National Council on Aging, U.S. Department of Health and Human Services, WHO and electronic databases included Academic Search Complete, CINAHL, PsycINFO, Nursing and Allied Health Source, Medline, PubMed, and publisher's databases such as Springer. Google Scholar was used to supplement the databases. The following keywords and phrases used as search items included *falls prevention, risk factors of falling, behavior and falls, older adults, engagement in falls prevention, injury prevention, epidemiology of falls, self-determination theory,* and *person-objects of interest.* I restricted the search of fall prevention related articles published to as early as 1987 through 2018 and searched for conceptual model articles for SDT and POI as early as 1937. The SDT website (http://selfdeterminationtheory.org) was used to locate and search SDT and specific articles related to basic psychological needs, motivation and behavior. The next few sections provide a brief summary of the main topics of that will appear in the literature review.

Impact of a Fall

It is reported by the World Health Organization (2018) that falls among older people (65 years and older) are the second leading cause of unintentional or accidental

injury deaths after road traffic injuries worldwide and cause a significant loss of healthy years of life. In the United States alone, falls cause moderate to serious physical and or cognitive injuries among 20-30% of older people, are the leading cause of emergency room visits (Faul et al., 2016), and are concerning because of the rising economic burden (Haddad, Bergen, & Florence (2019). Florence, Bergen, Atherly, Burns, Stevens & Drake (2018).

Fall Self-Management

A fall can cause injury, disability, decreased quality of life, and even death among all age groups but especially among those 65 and older (CDC, 2017; WHO, 2018). Personal injury from a fall includes humeral, forearm, hip, pelvic and rib cage fractures (Edgerly, 2011); hematoma; joint dislocation; lacerations; soft tissue injuries; and head trauma (Gill, Murphy, Gahauber, & Allore, 2013). Disability after a fall is directly related to the type of injury, pre-fall comorbidities, and length of restricted activities days. Restricted activity days include loss of independence in basic self-care (bathing, dressing, walking, and transferring), instrumental activities in daily living (shopping, housework, meal preparation, taking medication, and managing finances), and mobility (walking one-fourth mile, climbing steps, and lift/carry 10 lbs; Gill et al., 2013).

Pre-fall comorbidities that represent strong risk factors to fall include Parkinson's disease; dementia; incontinence; ADL, IADL, mobility limitations; past history of falls; decreased hip, knee, ankle strength; decreased grip or hand strength; impaired vision; gait abnormalities; reduced walking speed; impaired dynamic balance; difficulty rising from a seated position; impaired cognitive status; depression; taking multiple medications; and

sedative, hypnotic or anxiolytics usage (Berg & Cassell, 1992; Phelan, Mahoney, Voit, & Stevens, 2015). Pre-fall comorbidities that represent moderate risk factors to fall include arthritis, stroke, hip or knee pain, postural sway, impaired balance on one leg, taking antidepressants (Berg & Cassell, 1992), advanced age, female gender, and environmental factors (Amborose, Paul, & Hausdorff, 2013; Paliwal, Slattum, & Ratliff, 2017).

Although the benefits of preventing the physical and or psychological consequences of a fall are numerous, it is unclear what older adults' perceptions are on fall prevention practices (Dickerson et al., 2011; Yardley, Donovan-Hall, Francis, & Todd, 2007). However, the available literature is beginning to show the reasons for low uptake of fall prevention practices. These reasons include engaging in falls prevention not being relevant to an individual's health, falls prevention materials are not appropriate (Khong et al., 2015), or practices to prevent a fall are seen as a threat to the person's autonomy (Yardley et al., 2006). Solutions to address this low uptake to engage in falls prevention practices may be found within peer education and increased awareness of the benefits to refer to rehab professions and nursing post hospitalization (Calhoun, Meischke, & Hammerback, 2011; Khong et al., 2015; Stevens, Sleet, & Rubenstein, 2018).

Behavior

In this study, behavior was explored as a process as well as an outcome guided by factors that reside within the individual and are influenced by contexts that are outside the individual. Behavior in general is a complex construct that, is defined as an overt act of doing or not doing something. It is not always voluntary or consciously done, nor is it

being acted upon by another individual (Gochman, 1988). Subsequently, health behavior, is the overt *act of doing or not doing something* for the purpose of health maintenance, health restoration and health improvement (Gochman 1982, p. 169). Further, behavior as a process is guided by factors such as personal attributes of attitudes, beliefs, expectations, motives, values, personality characteristics, cognitive processes of decision making, affect and emotional traits, experiences with social pressure, and an individual's perception of ease or difficulty in doing. Behavior as an outcome is seen as overt behavior patterns manifested in everyday choices and habits (past and present) related to health maintenance, to health restoration, and health improvement (Aarts, Verplanken, & Van Knippenberg, 1988; Gochman, 1982, p. 169; Ronis, Yates, & Kirscht, 1989).

Behavior operates on a conscious or rational level guided by cognition and a subconscious or experiential level guided by emotions (Krapp, 2002). Together, these systems include constructs cited in Krapp's (1993) POI framework and Deci & Ryan's (2002) SDT. The yin and yang of the overt act *to do or not do something*. The following theory and framework will draw attention to types of motivated behavior an individual chooses daily to control what they want to do (Deci et al., p. 408).

Theoretical Foundation

The SDT was used to focuses the human need for active engagement in everyday life activities called motivation, which occurs through satisfaction of factors called basic psychological needs toward development of the self (Deci et al., 2001). In SDT, the satisfaction of three basic psychological needs of competency, autonomy, and relatedness either supports or thwarts behavior (*the act to do or not to do*) and determines intrinsic or

extrinsic motivation to engage in activities, personal growth, and well-being. Figure 1 provides a diagram of the SDT.

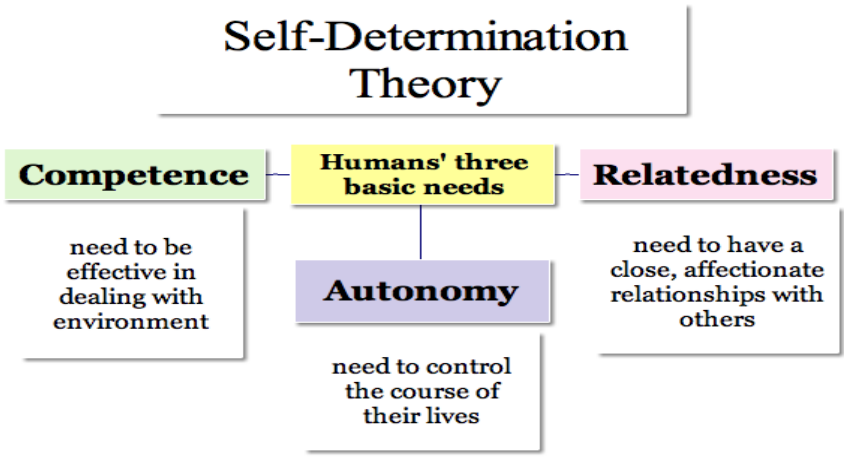

Figure 1. Self-determination theory.

The POI framework was used to focus the interaction between the individual and the objects they choose to interact with or have a relationship within their environment (Deci & Ryan, 2002). In POI, the development of the self depends on an interaction with the social and physical environments. This interaction is called an interest and represents a relationship between the individual and objects within their "life space"—the person-object relation (Deci et al., p. 410). In this research, objects of interests called real objects, activities, and types of engagement and topics were catalysts for the individual to engage in health behaviors to prevent a fall. An individual will engage and continue to engage with the object of interest only if the object of interest provides a positive and emotionally satisfactory experience (Deci et al., p. 418). Therefore, the characteristics of objects of interest include an emotional and value component (Deci et al., 2001). Figure 2 provides a diagram of the POI framework.

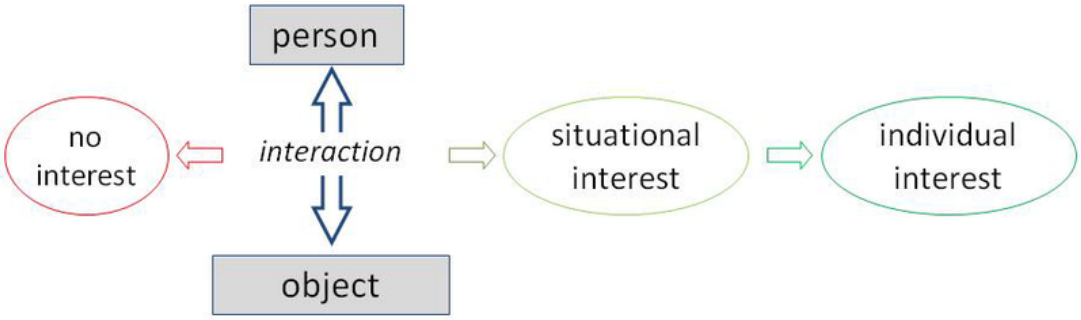

Figure 2. Person–object approach to interest framework.

The next section of this review presents literature pertaining to SDT and POI that is applied to falls prevention, focusing on autonomy, motivation, competency, relatedness and objects of interest.

Literature Review Related to Key Variables

Autonomy

Within SDT, autonomy is defined as a basic psychological need that originates from the individual's personal interests and values (Deci & Ryan, 2002). An individual demonstrates autonomy through behaviors that require the individual to choose and to be moved to do something. This choice or action toward doing, which is regulated by the self and or external factors (Sheldon, Williams, & Joiner, 2003), is called motivation (Ryan & Deci, 2000). The constant of SDT is that motivation varies by intensity (how much action is taken) and orientation (why the action is taken). Orientation to act or to do is represented by two contrasting forms of motivation: (a) intrinsic motivation and (b). extrinsic motivation. An individual is intrinsically motivated autonomously motivated when a deep-rooted interest in something and takes action, because of the importance of a

personal goal, feels volition or has a choice, is satisfying or enjoyable is evident. Conversely, a person is extrinsically motivated when doing is for the sake of an outcome, such as a health behavior, from feeling pressure from within or from others and behavior is rewarded from their actions (Sheldon et al., 2003, p. 20). Acting autonomously then is dependent on the intensity and orientation of motivated behavior which is aligned with the individual's sense of self within their circumstances. According to SDT, behavior moves along a continuum from non-self-determined to self-determined with motivation representing a variance of degrees in regulatory styles, loci of causality, and regulatory processes (see Figure 3; Ryan & Deci, 2000, p. 72). The concept of autonomy in fall prevention research sheds light on fall prevention advice as useful but not personally relevant or appropriate, and engagement in falls prevention is seen as a threat to identity even though personal risk for falling was known (Yardley, 2006).

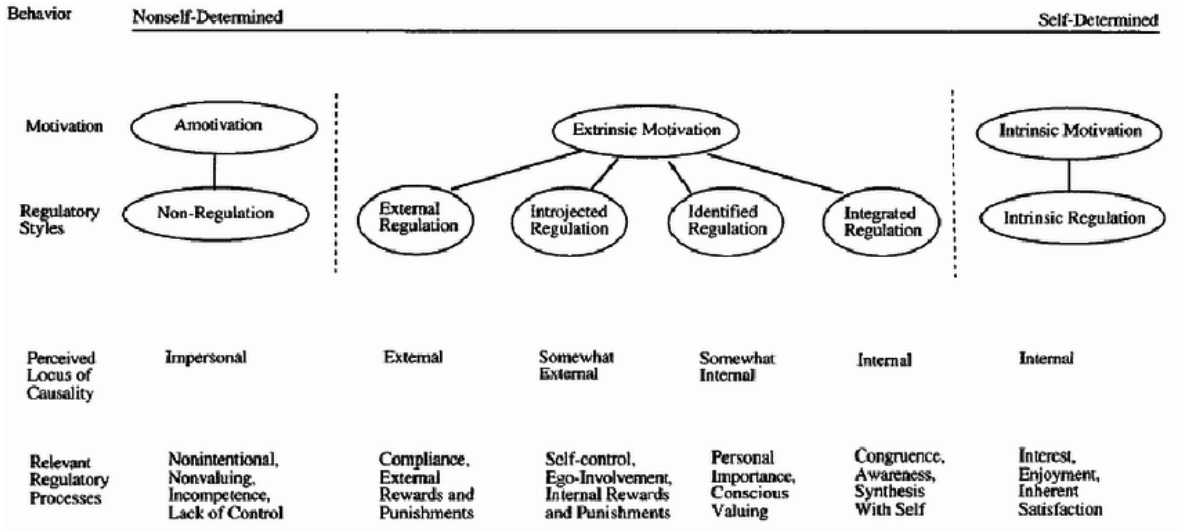

Figure 3. Self-determination continuum.

Competence

Within SDT, Deci and Ryan (2001) define competence as a basic psychological need that reflects an individual's feeling of being effective when interacting within the social environment and daily activities to reinforce and challenge their capacities. Therefore, competence is an internal sense of confidence to understand and know how to effect one's self, others and the environment to carry out necessary actions. SDT research shows that competent behavior opens the door for autonomous functioning, adherence to health behaviors, and new learning when and only when, an individual act volitionally (Ryan, Patrick, Deci & Williams, 2009).

Relatedness

Within SDT, Deci & Ryan (2000) define relatedness as a basic psychological need that refers to caring and belongingness with others and one's community. It includes the ability to be connected to, mutually share, be accepted by others (Deci & Ryan, 2000,

citing Baumeister & Leary, 1995; Bowlby, 1979; Harlow, 1958; Ryan, 1995). Although relatedness does not play as an important role as autonomy and competence for intrinsic motivation (Deci & Ryan, 2000), it is vital for promoting internalization. Within SDT, internalization is process along the self-determination continuum, that describes how an individual who is extrinsically motivated becomes autonomous/intrinsically motivated. Partial internalization called introjection, are regulations received by the individual, but the individual does not autonomously assume responsibility. Complete internalization called integration, are regulations identified as important to the individual and are autonomously carried out (Deci & Ryan, 1991). Therefore, according to SDT motivational model (figure 1.4), social and physical contexts that surround the individual, provide opportunities to interact with others to fulfill the need of relatedness (Deci & Ryan, 2000). Physical contexts are important aspect in understanding fall prevention, as the faller is an occupant of space and time on a daily basis but interacts with the physical contexts when a fall occurs. Social contexts, in particular social support and older adult falls, has not been well researched to date (Durbin, Khanrrazi, Graber, Mielenz, 2016).

Objects of Interest

Within POI and its relation to SDT, Krapp (1993, 1999); Prenzel, Krapp & Schiefele, (1986); Prenzel (1988, 1992), an individuals' objects of interest can be described according to three components:

1. Real objects are describable objects that are used for engaging in the object of interest. In falls prevention these objects of interest relate to home

modifications such as grab bars, safety equipment, raised toilet seat and night lights (Burns, 2015, pp. 55-68; Russell, K., Taing, D., & Roy, J. (2017).

2. Activities and types of engagement are procedures included in the interest-related task. In fall prevention these procedures related to interest-related task include talking about topics related to fall prevention practices such as improving a person's balance, modifying the home to prevent a fall; engaging in a fall prevention seminar or class (Burns et al., 2015, pp. 5- 52).
3. Topics represent the specific domain of knowledge surrounding fall prevention practices. In fall prevention, these topics include concerns assessed on fall prevention screens and practices (Burns et al., 2015, pp. 69-146).

Krapp (2002), references the value component of an interest is likened to the concept of self-intentionality. Therefore, the goals and intentions related to the object area of an individual's interest are compatible with the attitudes, expectations, and values of the person's self-system. Considering motivation along the life course of human development, a person is aware of himself or herself, and that the "object" of this awareness is some sort of representation of the individual's personal "self".

Fall Event Paradigm

Globally, a fall is generally described as "inadvertently coming to rest on the ground, floor or other lower level, excluding intentional change in position to rest in furniture, wall or other objects" (WHO, 2007, p. 1). The circumstance under which a fall occurs encompass all health determinants, inclusive of biological, socioeconomic, environmental, and behavioral (WHO, 2007, p. 2); the individual's personal perception or

cause of the fall, which ultimately remains is in the “eyes of the faller”; and the opinion of the caregiver and or medical professional (Yoshida, S., n.d).

A fall is called biological due to the individual’s age, gender, race, chronic illness; socioeconomic due to lack of income, education or resources; environmental due to a poor fit between the individual and environment; and or behavioral due to under or over estimating personal actions, emotions and or daily choices (WHO, 2007, p.4). To place a fall in a behavioral framework, a Haddon Matrix for injury prevention will be presented in Figure 1.

Pre-fall event. The pre-fall event includes interventions of self-management and injury preparedness that can be used to prevent a fall. Self-management interventions sited in the CDC’s Compendium of Effective Fall Prevention Interventions (Steven & Burns, 2015) include biological interventions to improve strength, and management of chronic illness; socioeconomic interventions include accessible and culturally sensitive community information, support and resources on falls prevention; environmental interventions include use of grab bars, non-slip surfaces, declutter within the home, limit safety hazards, improve lighting; and behavioral interventions include avoidance of risky behaviors related to medications, alcohol and everyday activities, plus lack of exercise.

Fall event. The event of a fall includes interventions/ behaviors that an individual chooses to do, to reduce the severity of injury from a fall to include wearables and technology. Fall-risk wearables can be worn to prevent a hip fracture (Ted Med, 2106); Yaktrax Walker, a device to secure footing on ice and snow; technology such as smart phone accelerometer to warn the individual of a potential fall (Silva, 2013), pre-fall

intervention systems (Danielsen, Olofsen, Bremdal, 2016) and foot sensors (Van de Ven, O'Brian, Nelson &Clifford, 2015) to detect a fall before or after it occurs.

Post-fall event. Post-fall event interventions are used to restore health and well-being after the physical, or cognitive, and or emotional consequences of a fall. Interventions such as nursing, and rehabilitation services may be used to improve self-management and prevention of another fall. Therapy services include occupational therapy to find safe solutions to improve occupational performance in everyday activities; physical therapy to improve mobility and physical strength; social work to connect individuals and families to community resources; and nursing to manage medical and health conditions related to the fall (Stevens et., al, 2015).

Table 1

Haddon Matrix representing Behavioral Risk Factors of a Fall

	Host (person affected)	Agent or vehicle	Physical environment	Social environment
Pre-event (→ primary prevention)	Knowledge about a fall and fall prevention practices, awareness about personal fall risk factors, do you know what to do if you fall?	Wearing proper shoes, checking vision, Self-management of mediations, taking action increase balance, strength	Is your home safe as you age? Use of safety equipment, modifying the home environment	Has on going conversation about aging and personal risk factors with medical and non-medical personnel
During the event (→ secondary prevention)	Wearing proper shoes, Using preventative behaviors, Wearables Technology	Proper and regular usage of hip protectors, technology	Where the fall occurred in the home environment, how far the person fell, where they landed (floor type), what type of fall was it? Slip/trip or medial fall?	Quality of emergency assistance; Has the person designated an emergency contact in case of a fall. Timely, knowledgeable assistance from emergency contact
Post-event (→ tertiary prevention)	Fallers Ability to call for help, use of technology to detect a fall, identify Fractures, wounds, fear of falling	Fallers ability to get off the floor, technology detection of the fall	Timely response to fall emergency by EMS or emergency contact person, how long was the person on the floor	Communication and conversation with support system (friends/ family) and health professionals (MD refers to health professionals)

Behavioral Risk Factors of a Fall

According to the WHO (2007), behavioral risk factors of falls are defined as "those concerning human actions, emotions or daily choices". According to Clemson et al., 2003 citing Gochman (1989), behavior is something people "do or refrain from doing, although not always consciously or voluntarily", in turn, relates to observable behavior patterns, actions, and habits. The emotions associated with behavior include "mental events and feeling states that are 'observed' or measured indirectly" (Clemson et al., citing Gochman (1989) and are related to decision making (situational cues) and environmental cues during everyday activities (Clemson et al., citing Ronis, Yates, & Kirscht, 1989). Although behaviors are guided by intention (Ouellette & Wood, 1998), it is the act of mindfulness or "paying attention on purpose" (Reid, 2011 citing Kabat-Zinn, J. (2003) that focuses the behavioral risk factors of falls. Clemons (2015) references "emotions" in the context of personal factors that relate to attitudes, fear of falling, coping with falling, and "daily choices", whether habitual or intentional (Clemons et al, 2015) are referenced to in the context of engagement in physical activity, healthy eating, use of medications, alcohol intake risk taking behaviors (WHO, 2007).

Supported by the motivational and personality concepts in found in STD and POI, humans have a basic need to be active through "doing". This human action or "doing", is defined as engagement in an activity [parts of an occupation/ daily choices] or an occupation [the entire task or dail0y choice] which occupies space and time, has personal meaning to the individual (Zemke, 2004); and is "instinctual, habitual, guided by interests, experiences and the individual's capacities" (Meyer, 1908, p. 98). This "doing"

has the potential to affect health and well-being, develops interests and skills and a sense of self- worth through performance and accomplishment (Meyer, 1922). During the aging process, the individual desire "to do", does not change unless cognitive and or physical challenges prevent "the doing" (Muir, Gopaul, Odasso Montero, 2015). Conversely, the older adult's perception of their "ability to do" may change due to a cognitive change.

Fall Prevention Screenings

The section discusses falls prevention interventions that are evidenced-based including their respective focus. The goal of this section is to show the limited presence of the behavioral factors of falls in national, community, medical practices and research studies that may be contributing to poor uptake of falls prevention messages. The following programs are provided by healthcare providers or trained community personnel that require the older adult to attend the community-based program/outside the home or require a referral from a physician for a rehabilitation professional to visit the individual in the home environment.

National falls prevention messages include a). National Falls Prevention Action Plan *Falls Free* and Healthy People 2020 promotes physical activity, safety and education through Falls Prevention Day; b). CDC's fall prevention screening called STEADI (Stopping Elderly Accidents, Deaths and Injuries) promotes "speak up, keep moving, get annual physical exams, check medications, check for home safety"; c).National Institutes on Aging, *Go 4 Life*, promotes exercise, strength, endurance and balance.

Community evidence-based fall prevention programs as cited in CDC's

Compendium of Falls Prevention Interventions (Stevens & Burns, 2015), promote exercise, environmental and multi-factorial interventions of medication and vision management, foot care and cardiac care which include: (a) YMCA Moving for Better Balance (strength, mobility, flexibility, and balance for enhanced overall physical health and better functioning in daily activities); (b) Tai Ji Quan: Moving for Better Balance (exercise); (c) Tai Chi for Arthritis (muscular strength, flexibility, balance, stamina); (d) Stepping On (strength and balance exercises, role vision plays in keeping your balance, medications can contribute to falls, ways to stay safe when out and about in your community, what to look for in safe footwear, how to check your home for safety hazards); (e) Stay Active and Independent for Life (SAIL) (strength, balance and fitness program; (f) Otago Exercise Program; (g) Pennsylvania Department of Aging: Healthy Steps for Older Adults (raise awareness of falls, introduce steps on how to reduce falls, improve overall health, and provide referrals and resources); (h) Fit and Strong (multiple component exercise program with group problem solving/education using a curriculum designed to facilitate arthritis symptom management, confidence in ability to exercise safely with arthritis, and commitment to lifestyle change); (i) Fall Scape (helps an individual prevent falls in their own unique situation/ behavioral awareness); (j) Falls Talk (personal FallsTalk Interview in-home or community space to discuss an individual's unique situation); (k) Enhance Fitness (focusing on four key areas important to the health and fitness of mature participants: low impact cardiovascular; dynamic/static balance work, strength training and stretching); (l) CAPABLE (structured program delivered at home to community dwelling older adults to decrease fall risk, improve safe

mobility, and improve ability to safely accomplish daily functional tasks); (m) Matter of Balance (emphasizes practical strategies to reduce fear of falling and increase activity levels Participants learn to view falls and fear of falling as controllable, set realistic goals to increase activity, change their environment to reduce fall risk factors, and exercise to increase strength and balance) (National Council on Aging, 2018)

Summary and Conclusions

Research studies predict falls among older adults (Nicklett & Taylor, 2015; Schepens, 2015; Kaur, 2013; Dollard, 2012; Mcinnes, 2011; Steven, Noonan & Rubenstein, 2010; Roe et al., 2008; Yardley et al., 2006; Roe et al., 2008) secondary to medical, environmental and biological factors. However, assessment of behavioral risk factors associated with human actions, emotions and daily choices (WHO, 2007) are only included in select assessments that are used on a community level not national level. These assessments used include the Falls Behavioral Scale (Clemson et al., 2003) for protective falls prevention behaviors; Plank walking choice task (Butler et al., 2015) assesses risk taking behavior associated with a walking task; Fall Risk Self-Assessment (Vivrette, Rubenstein, Martin, Josephson & Kramer, 2011); Morse Fall Scale (Morse, J, 1985); Home-Screen Scale (Erkais, 2010); Fall Efficacy Scale (Tinetti, 1990); Activities-Specific Balance Confidence Scale (Powell et al., 2007, 1995); Survey of Activities and Fear of Falling in the Elderly (Lachman, 1998); Falls Efficacy Scale International- I (Yardley et al., 2005).

This chapter included a review of current literature that addresses concepts within fall prevention practices, the fall event, conceptual models, behavior risk factors of falls

and fall prevention screenings related to factors related to engagement in fall prevention practices. In Chapter 3, the research will address the research methodology and research design.

Chapter 3: Research Method

The main purpose of this study was to (a) examine the relationship between autonomy, competence, and relatedness and "objects of interests" related to falls prevention to predict engagement in falls prevention practices among community dwellers 65 and older and (b) investigate the correlation between the sociodemographic/medical condition variables for engagement in fall prevention practices. The aim of the study was to engender positive social change by increasing awareness of the role behavior plays in the self-management process to prevent a fall injury in the home environment. This chapter provides information pertaining to the methodology of this study. The chapter begins with details on the research design and the population under study. Next, the chapter presents the data collection method, including the research instruments and psychometric properties with corresponding validity and reliability. Lastly, the chapter will end with the type of analysis conducted in the study as well as the ethical considerations and study limitations.

Research Design and Rationale

This study involved a quantitative design to examine the relationship between the concepts of motivation (basic psychological needs), interests, and sociodemographics/medical conditions to predict engagement in falls prevention practices. A simple linear regression was done to examine each of the predictor variables with the respective outcome variable. Multiple linear regression analysis was used to explore the relationship among six predictor variables as they relate to the dependent variable of the study, engagement in fall prevention practices.

In this regression analysis, the predictor variables were the self-determination theory's basic psychological needs and person-object approach to interest framework's object-specific interests. The dependent (criterion) variables were protective behaviors in falls prevention practices inclusive of exercise, home modifications, clinical and multifaceted interventions (Stevens & Burns, 2015). The sociodemographic variables of the study included age, gender, multiple chronic conditions, socioeconomic status, health insurance, education, marital status and residence.

Methodology

Population

In this study, I collected data from a sample of 75 community dwellers who were 55 years and older and live in Virginia, Florida, and Iowa. Initially, I targeted a sample size of 135 community dwellers 65 years and older in order to achieve statistical power of .80 at a .01 significance level (parameters that support regression analysis; Faul, Erdfelder, Buchner, & Lang, 2009) to test the hypotheses in this study. However, the continued difficulty locating community partners due to nonsolicitation policies led to exhaustion of face-to-face recruitment resources. Following approval by Walden University Institutional Review Board (IRB), a web-based survey was launched to include a change of age in participant inclusion criteria. I continued collecting data to achieve statistical power of .80 at a .05 significance level for a moderate effect size of .20. Approval to advertise the study among research partners was obtained through Walden University's IRB (approval # 03-05-19-0249731) prior to implementing sampling strategy.

Sampling and Sampling Procedures

The population of persons 65 years and older is sociodemographically and spatially diverse (Lee & Rodiek, 2017). Individuals 65 years and older live in various environments that encompass contained communities with and without nursing stations to free standing or attached residences in rural and suburban communities. Therefore, to set the stage for this research inquiry, I employed two nonprobability sampling methods. Purposive sampling was used to target individuals in the community who met the inclusion criteria, and snowball sampling was used to recruit qualified participants through a research partner to share an invitation to participate in the research study online (Dusek, Yurova, & Ruppel, 2015).

Inclusion and exclusion criteria. Individuals eligible to participate in this study were community dwellers, male or female, who are 55 years and older. Individuals who are not eligible to participate in this study are individuals 55 years and older who reside in a physical dwelling that is associated with a nursing station, present with a physical and or cognitive disability, use the assistance of caregiver or mobility aid such as walkers, canes to ambulate, or durable medical equipment such as scooters or wheelchair to move from one area to another.

Sample size and power analysis. Statistical power is a requisite to determine a sampling strategy as well as avoiding Type I and Type II errors (Faul et al., 2009). An a priori power analysis conducted using G*power analysis showed the need for a minimum sample size of 75 participants. An F-test multiple regression was used, with six

predictors, significance level of 0.05, a statistical power of 80%, and an effect size of 0.20 (see Borska et al., 2016).

Procedures for Recruitment, Participation and Data Collection

Recruitment procedures. Following Walden University's IRB approval of this study, recruitment of participants took place between March 2018 and January 2019. Potential research partners were contacted via email and letters of cooperation were signed. Potential participants responded to recruitment flyers via e-mail or through voicemail.

Provision of informed consent. Prior to administration of face-to-face questionnaires, participants were provided with verbal information about the study and written information about the informed consent process. Following review of the risks and benefits of participation in the study, I provided participants with a research packet and information about the process to complete the study's questionnaires. The process included meeting with me (in a quiet room) either before or after completing four questionnaires to engage in the 6-item Cognitive Impairment Test (6-CIT) to determine inclusion criteria. The research packet contained the following: sociodemographic questionnaire, BMPN questionnaire, SIQ, FaB Scale, CDC fall prevention pamphlet, and Walden University debriefing form, which detailed additional information about how to contact me to ask additional study questions or to learn about the results of the study.

The online format for participation in the study began with the research partner sharing the survey URL with qualified participants. Participants were immediately directed to the study's informed consent, debriefing form, and CDC fall prevention

brochure. Once these were reviewed, participants were directed to complete four study questionnaires, then submit back to me.

Mode of data collection. I recruited individuals to complete written and web-based questionnaires regarding sociodemographic information, satisfaction of basic psychological needs, interests, and protective behaviors related to fall prevention. To determine the study's inclusion criteria face-to-face, I visually observed ambulation status and administered the 6-CIT to determine cognitive status. Determining the study's inclusion criteria online was a limitation of the study. Current evidence about use of online questionnaires with persons 65 years and older reveals that online questionnaires are a feasible method to survey older adults; however, not all geographic regions or subsets of the population under study may have access to the Internet, which often limits study (Remillard, Mazor, Cutrona, Gurwitz, & Tjia, 2014) .

Pilot study. A pilot study was conducted via Zoom with individuals 65 years and older to test research protocols and correctness of instructions given, assess questionnaire ease of use, assess errors in the questionnaires and presentation, and assess flow of questionnaire administration (Hassan, Schattner, & Mazza, 2006).

Study variables. Independent variables measured in this study include basic psychological needs, person-object of interests, and sociodemographic/medical condition variables. Protective behaviors to prevent a fall was the dependent variable of the study.

Instrumentation

Table 2 shows the study's five instruments and their psychometric properties. One questionnaire was used to determine participants' inclusion criteria, and four

questionnaires were used to measure study variables. Although the selected instruments are available in the public domain, I obtained permission from the authors of the SIQ and Falls Behavioral (FaB) Scale to use in academic research. The SIQ was the only instrument modified to include language of the study (falls) versus language stated in the questionnaire (area of study). The instruments are detailed in the following sections.

Table 2

Instruments and Corresponding Variables

Variable	Instrument	Number of items
Sociodemographic information /medical conditions	Socio-demographic Scale (BRFSS, n.d.)	11
Basic Psychological Needs	The Balanced Measure of Psychological Needs Scale (Sheldon, K.M. & Hilpert, J.C. (2012)	21
Objects of Interest	Modified Study Interest Questionnaire (Krapp, 1992)	18
Protective Behaviors related to falls	The Falls Behavioral (FaB) Scale for older adults (Clemson, Cumming & Heard, 2003)	30
Cognition	6-CIT (Six-item Cognitive Impairment Test) (Woodford, H., & George, J., 2007).	6
Total items		86

Cognitive measure. The 6-CIT is a 6-question scale that was administered with face-to-face participants to obtain a general cognitive profile of orientation-memory-concentration (Woodford & George, 2007). As a cognitive scale, it is similar to the Mini Mental State Examination (30 questions); however, its psychometric properties are preferred for primary care usage to screen for dementia. In comparison to the Mini-Mental State Examination sensitivity of 79.7% and specificity of 86.4% (cut-off 23/24), the 6-CIT has a sensitivity and specificity of 82.5% and 90.9% respectively (cut-off

10/11). The sensitivity of the 6-CIT increases to 90.2% at a lower cut-off of 9/10, but the corresponding specificity drops to 83.3% (Uadhyaya, Rajagopal, & Gale, 2010).

Demographic measure. The sociodemographic questionnaire collected information on sex, age group, race/ethnicity, socioeconomic status, marital status, annual household income, educational level, health status and medical conditions (Appendix A). These items were selected for this study because of their presence in research related to fall injuries among adults 65 and older such as data provided by the BRFSS (Bergen, Steven, & Burns, 2016). The BRFSS prevalence rates are also comparable to other national self-reported surveys (Pieramunzi, Hu & Balluz, 2013) "overall findings indicated that BRFSS prevalence rates were comparable to other national surveys which rely on self-reports, although specific differences are noted for some categories of response. BRFSS prevalence rates were less similar to surveys which utilize physical measures in addition to self-reported data. There is little research on reliability and validity for some health topics, but a great deal of information supporting the validity of the BRFSS data for others.

Basic Psychological Needs Measure. The Basic Psychological Needs Measure is a self-administered survey constructed from the SDT to measure the degree of satisfaction or dissatisfaction of basic psychological needs of competence, autonomy and relatedness (Deci & Ryan, 2000; Gagné, 2003). It is a 21-item scale with 5-point Likert scale type answers ranging from *not at all true* to very true. The higher the score is indicative of a higher level of satisfaction of needs (Johnston & Finney, 2010). However, this survey does not have validated psychometric properties; therefore, the Balanced

Measure of Psychological Needs (BMPN) Scale (Appendix B) was used because it has been determined to reliably measure competence, autonomy, and relatedness (Neubaur & Voss, 2016).

Interests measure. The Study Interest Questionnaire (SIQ; Appendix C), an 18-item self-administered tool measures feeling- related valences, value-related valences and intrinsic motivation related to an individual's area of study. The SIQ total score assesses the level of interest in a specific topic of interest. For this study, the topic of interest will be falls prevention. Permission to modify to meet the study' needs, was obtained via email correspondence with by the author, Schiefele. Modifications from focus on "study of interest" to focus on "fall prevention practices" will include the three forms of objects of interest (real objects, activities and types of engagement/topics). There may be imitations cited in this research due to modification of an original questionnaire.

Protective behavior measure. The FaB scale (Appendix D) was used to identify the older person's awareness of protective behaviors to prevent a fall during everyday activities. In an effort to predict behavior to engage in fall prevention practices, it is important to understand the human actions, emotions and habits that protect an individual from falling. The questionnaire addresses ten areas that clarify behavioral factors and falls, these include cognitive adaptations, protective mobility, avoidance, pace, awareness, practical strategies, displacing abilities, being observant, changes in level and getting to the phone (Clemson, Cumming & Heard, 2003). The strengths and limitations of this measure specifically rely on the older person's perceptions of their behaviors. Construct Validity was supported by scores positively associated with increased age

(r=.46) and negatively associated with physical mobility (r= -.68) and leaving home during the week (r= -.51). Research findings support the FaB as an appropriate epidemiological assessment for an individual's use of protective behaviors, pre and post fall prevention interventions to discuss risk taking or safe behavior strategies, a goal setting tool, and an evaluative measure in rehabilitation (Clemson et al., 2003).

Table 3

Operationalization of Variables and Coding

Variable Category	Variable	Level of Measurement	Description	Code
Independent	Basic psychological need: autonomy	Continuous	Likert Scale 1= strongly disagree 5- strongly agree	AUT
Independent	Basic psychological need: competence	Continuous	Likert Scale 1= strongly disagree 5- strongly agree	COMP
Independent	Basic psychological need: relatedness	Continuous	Likert Scale 1= strongly disagree 5- strongly agree	REL
Independent	Interests: Real objects *Feeling valance*	Continuous	Likert Scale 1= not at all true 2= somewhat true 3= often true 4= completely true	IRO
Independent	Interests: Activities or types of engagement *Intrinsic orientation*	Continuous	Likert Scale 1= not at all true 2= somewhat true 3= often true 4= completely true	IA
Independent	Interests: Topics *Value valance*	Continuous	Likert Scale 1= not at all true 2= somewhat true 3= often true 4= completely true	IT
Independent	Sociodemographic data	Categorical	Assigned labels such as	Individually coded S, Age, race, SES, MS, ED, HS, HI, HS
Dependent	Protective behaviors to prevent a fall	Continuous	Likert Scale 1= never, 2=sometimes, 3=often, 4=always	PB

Data Analysis Plan

The data for this study was obtained through administration of five questionnaires. In order to test the research hypotheses, I used Intellectus Statistics [Online computer software] to perform statistical analysis of questionnaire data in this study. Prior to analysis, a simple linear regression was conducted to analyze the relationship between the independent variables to assess for multicollinearity, followed by multiple linear regression to examine the predictive impact that the independent variables (basic psychological needs and interests in falls prevention) have on engagement in fall prevention practices.

Basic descriptive statistics was obtained to assess the sociodemographic make-up of the study sample. Demographic variables of sex, age, race/ethnicity, socioeconomic status, marital status, education level, annual household income, and health status will be assessed as categorical data. Frequency and percentages will be used to summarize categorical data. Chi-square analysis will be used to assess significant differences in categorical variables of gender.

Age, household size and income were assessed as continuous variables. Means and 95 percent confidence intervals were obtained to summarize continuous variables. Age will be coded in Intellectus Statistics in the following US Census categories: 55 to 64, 65 to 69 years, 70 to 74 years, 75 to 79 years, 80 to 84 years, 85 years and over (Ortman, J., Velkoff, V.A., Hogan, H., 2014).

Descriptive analysis was conducted on motivational variables within the sample including autonomy, competence, relatedness, and objects of interest. Each motivational variable is assessed as a continuous variable.

The study conducted a linear regression to assess bivariate associations between basic psychological needs of autonomy, competence, relatedness and interests. A beta estimate will determine strength of the associations and direction of the association among continuous variables in the dataset. The level of significance will be set at $p \leq .05$ for regression analysis.

Table 4

Statistical Analyses Conducted per Research Question and Corresponding Null Hypothesis

Research Question	Null Hypothesis	Statistical Procedure
RQ1: What is the relationship between basic psychological needs of autonomy, competence, relatedness, [as measured by the Balanced Measure of Psychological Needs Scale] and engagement in falls prevention practices [as measured by the Falls Behavior Scale] among community dwellers, 65 years and older without a cognitive and physical disability?	There is no relationship between participants satisfaction of the basic psychological needs (autonomy, competence, relatedness) and engagement in fall prevention practices	Simple linear regression, Pearson's Correlation Co-efficient
RQ2: What is the relationship between interest in falls prevention including reference objects, topics, and activities [as measured by the Study Interest Questionnaire] and engagement in falls prevention practices, [as measured by Falls Behavioral Scale] among community dwellers, 65 years of age and older without a cognitive and physical disability?	There is no relationship between an interest in falls prevention and engagement in fall prevention practices	Simple linear regression Pearson's Correlation Co-efficient
RQ3: What is the relationship among sociodemographic factors [as measured by a demographic scale] and engagement in falls prevention practices [as measured by Falls Behavioral Scale) among community dwellers, 55 years of age and older without a cognitive and physical disability?	There is no relationship among participants sociodemographic information and engagement in fall prevention practices	Descriptive statistics Chi -square measure

Outcomes analysis. Hypothesis one through seven was tested using regression analysis. The application of multiple linear regression was used because it enables: (a) discovery of relationships among the dependent and independent variables through regression analysis, (b) estimation of the dependent variable from the observations of the independent variables, (c) prediction of the impact of the independent variable on the dependent variable (Schneider et al., 2010).

The application of regression as a predictive technique is documented in the falls prevention domain; in a study by Smee, Anson, Waddington & Berry (2012) that examined physical functionality and fall risk in community dwellers; Gaspar, Azevdo, Reiners, Mendes, Segri (2017) examined factors associated with fall prevention practices; Smith, de Lurignan, Mullett, Corren, Tickner, Jones (2016) examined an individual's *risk to fall* in order to fall prevention interventions; Yotaka, Morita, Mimura, Uzawa, Liu (2017) examined the best method to present fall prevention messages.

Threats to Validity

External Validity

As discussed by Stechler and McLeroy (2008), potential threats to external validity [relating to the health of the public] should be emphasized and strengthened which include: (a) generalizability to diverse populations, (b) varied physical dwelling settings and contexts that surround the individual, and (c) across time. In addition, threats to external validity have been compromised for the sake of internal validity therefore jeopardizing the translation of research to public health practice (Stechler et al., 2008 citing Campbell and Stanley, 1966). In this current study, a threat to external validity

pertains to the individual's intrinsic factors which include injury history, personal characteristics and cognitive variables, and extrinsic factors which include social influences and awareness of fall prevention practices. In attempts to control for the external threat/ cognition, scores on the 6-CIT will be used as one of the inclusion criteria; to control for generalizability to diverse populations.

Internal Validity

As suggested in the seminal work of Stanley and Campbell (1957, 1963), Huck and Sandler (1979), and McMillan (2000), quantitative research study variables must measure what they say they are going to measure. Threats to internal validity of the current study include: (a) maturation as seen in the age of the individual over time, (b) selection bias represented in various ages of older adults 55 years and older and individual demographic variables, (c) attrition to complete all questionnaires, (d) active or passive researcher bias representing the internal qualities such as values and attitudes, and external features such as age, gender, ethnicity, or clothing worn during this research. In attempts to control for threats to internal validity/selection bias, the researcher recruited participants from community venues (senior groups, college faculty/ staff, senior exercise groups and specific facebook groups); to control for attrition related to cognitive status, the researcher carefully screened face-to-face participant's cognition/ attention during administration of the 6-CIT; to control for researcher bias, I will prepare a script to introduce the research study (face-to-face and web-based).

Construct Validity

In this current study, I took active measures to avoid the threats to construct validity as discussed by Cook and Campbell (1979) through the use of peer-reviewed operational definitions of the concepts under study, homogeneity of the study instruments to ensure each measures specific concepts, stating propositions according to the Theory of Self-Determination and Person-Object of Interest Framework to measure motivational, relational and protective falls prevention behavior constructs, sensitivity to participants that did not want to participate in the study and or ask questions about the questionnaires to create an atmosphere conducive to engagement.

Ethical Procedures

In this study, I adhered to Walden University's ethical guidelines as set forth by the IRB, as well as, regulations/ policies set forth by all participating research partners. During the informed consent process (online and face-to-face), I concisely provided the participants with information as stated on Walden's Informed Consent Form to address: (a) participation in and withdraw from participation in the study without repercussions, purpose of the study, risk and benefits of the study, privacy, payment, contacts and questions during and after the study and means to obtain a copy of the consent form (b) participant anonymity when engaging in the studies questionnaires and when data was entered into Intellectus Statistics [Online computer software].

Next, I gathered the data which was coded and saved in Excel (Microsoft Office, 2016) then transferred into the online computer software for statistical analysis. All data compiled in Excel and Intellectus will be stored on a dedicated external hard drive, with

restricted access by a password-protected administrative lock. According to Walden University's IRB, this research data will be stored in this location for 5 years and its disposition will be at the discretion of Walden University.

Summary

In chapter 3, I discussed the correlational design of this study. Given the continued prevalence and mortality from falls and low uptake of fall prevention practices among individuals 65 years and older, I blended empirically validated rehabilitation and theory-based psychological measures to capture behaviors that may lead to self-management/ engagement in falls prevention practices to prevent non-intentional injuries thus promoting health and wellness.

I conducted a bivariate analysis to learn the relationship among the motivational and relational variables and regression analysis to learn their impact on engagement in falls prevention practices. The comprehensive informed consent process will ethically protect all participants and comply with Walden University's IRB process.

In Chapter 4, I report the finding of this research study which will include the time frame for data collection, outcomes of data analysis, specifics of the study sample inclusive of socio-demographics, and lastly generalizability of this study to the U.S. population of adults 65 years and older without a physical and cognitive disability. Overall, I will explain the relationship between basic psychological needs, interests and sociodemographics/medical conditions related to fall prevention and their impact on engagement in fall prevention practices.

Chapter 4: Results

Introduction

I examined the relationship among motivational concepts, relational concepts and sociodemographics/medical conditions to predict engagement in fall prevention practices among community dwellers 55 years and older without cognitive or physical limitations. This study was an opportunity to determine whether sociodemographics/medical conditions; motivational concepts of autonomy, competence, and relatedness; and relational concept of interests found in the SDT and POI framework explained the variance to predict engagement in fall prevention practices.

In this chapter, I begin by discussing the time frame of the study and report the data collection process. Next, I present descriptive and sociodemographic/medical characteristics that provide an insight into the heterogeneity of the sample. Lastly, I present the results of the linear regression analysis to determine the role of basic psychological needs and objects of interests to predict behavior to engage in fall prevention practices. The statistical findings are organized and presented in relationship to each research question and hypothesis. I then summarize the answers to research questions and provide transitional material from the findings to introduce the reader to the prescriptive material found in Chapter 5.

Pilot Study

In February 2019, I piloted the study with two individuals 65 years of age and older. These individuals received the research materials via U.S. mail. After the individuals' review of the materials, which included the consent form, four

questionnaires, debriefing form, and CDC pamphlet, I scheduled a Zoom meeting to introduce the study, answer questions, administer the cognitive screen, and review the study questionnaires and the method of how to return the study materials to me. During the Zoom meeting, I was available to answer any questions and recorded the time each individual took to complete each questionnaire. The results of each individual's feedback revealed the following: (a) Individuals were able to compete each questionnaire under 10-15 minutes, (b) the size of the font used on each questionnaire was large enough to read easily, (c) my introduction to the study was too lengthy, (d) fall prevention material from the CDC were appreciated, and (e) questionnaires were easy to understand and complete. As a result of the pilot study, I shortened my introduction to the study for efficient presentation at community venues.

Data Collection

Time Frame, Actual Recruitment, and Response Rates

Community participants accessed four questionnaires (research packet) in a face-to-face forum between March to May 2019. Due to difficulty locating other community partners, the same questionnaires were sent electronically to participants via Google forms between May-December 2019. Based on the power analysis for sample size discussed in Chapter 3, I initially sought a sample size of 135. Between March and May 2019, 35 community dwellers located in Virginia completed face-to-face questionnaires at two IRB approved community-based venues. In May 2019, I exhausted my participant pool and subsequently could not locate additional community venues to partner with due to their nonsolicitation policies. In July 2019, Walden University's IRB approved an

alternate data collection method using an online format and participant age changed from 65 years and older to 55 years and older. I uploaded all survey questionnaires into Google forms and used a snowballing sampling technique to locate additional participants 55 years of age and older. An additional 40 participants completed the online survey questionnaires. In December, I confirmed a final sample size of 75 community dwellers 55 years of age and older. This sample size was a homogenous sample consisting of mostly White, non-Hispanic men and woman who live in the suburbs of Virginia, Iowa, and Florida. It is not proportional to the larger population of older adults in the United States.

Results

To begin analysis of survey data, I first entered the data into a Microsoft Excel spreadsheet to prepare the data for the import into Intellectus Statistics (Online computer software) where data cleaning was used to correct coding errors, followed by the creation of new variables for the regression analysis. The research questions and hypotheses tested in this study were:

RQ1: What is the relationship among sociodemographic variables and engagement in falls prevention practices among community dwellers 55 years and older?

$H_0$1: Participants sociodemographic information does not significantly predict engagement in fall prevention practices.

H_a1: Participants sociodemographic information does significantly predict engagement in fall prevention practices

RQ2: What is the relationship between basic psychological needs of autonomy, competence and relatedness and engagement in fall prevention practices among community dwellers 55 years and older?

$H_0$2: Participants satisfaction of basic psychological needs of autonomy, competence and relatedness does not significantly predict engagement in fall prevention practices.

H_a2: Participants satisfaction of the basic psychological need of autonomy, competence and relatedness significantly predicts engagement in fall prevention practices.

RQ3: What is the relationship between objects of interest in falls prevention practice including reference objects, topics, and activities, for engagement in falls prevention practices among community dwellers 55 years and older?

$H_0$3: Participants interest in objects, topics and activities associated with fall prevention does not significantly predict engagement in fall prevention practices.

H_a3: Participants interest in objects, topics and activities associated with fall prevention significantly predict engagement in fall prevention practices.

Descriptive Statistics for Demographic/Medical Characteristics

Table 5 shows descriptive statistics for the 75 individuals who participated in the study. The participants' ages ranged from 55 to 92 years of age. The most frequently observed in each of the categories were age of 65-74 (n = 43, 57%), female (n = 48, 64%), Medicare for insurance (n = 33, 44%), not employed (n = 49, 65%), married/partnered (n = 54, 72%), household size was living with 1 or more persons (n =

60, 80%), personal annual income was greater than 75,000 (*n* = 36, 48%), and educational level was graduate school (*n* = 35, 47%). Table 6 shows descriptive statistics for the 75 individuals who participated in the study. The most common chronic medical conditions were stated as arthritis (*n* = 29, 39%), high blood pressure (*n* = 27, 36%), and back pain (*n* = 22, 29%).

Table 5

Socio-demographics for Overall Sample (N=75)

Variable	*n*	%
Sex		
Male	26	34.67
Female	48	64
Age		
Mean (65-74)	43	57
Insurance		
Medicare	33	44
Employment		
Not employed	49	65
Marital status		
Partnered	54	72
Household size		
Living with 1 or more persons	60	80
Personal annual income		
Greater than 75,000	36	48
Educational level		
Graduate school	35	47

Table 6

Medical Conditions

Variable	*n*	%
Arthritis	29	39
High blood pressure	27	36
Back pain	22	29

Research Question 1

The analysis of the data began with Research Question 1, where I examined the relationship of sociodemographics/medical conditions toward engagement in protective behaviors, fall prevention practices using the modified CDC sociodemographic survey. Table 7 shows descriptive statistics of frequencies and percentages for age, gender, insurance, and employment. Participants' ages ranged from 55 to 92 years of age. The most frequently observed category of age was 65-74 (n = 43, 57%). The most frequently observed category of gender was female (n = 48, 64%). The most frequently observed category of insurance was Medicare (n = 33, 44%), and the most frequently observed category of employment was no/ not employed (n = 49, 65%).

Table 7

Frequency and Percentage Table for Age, Gender, Insurance, and Employment

Variable	*N*	*%*
Age		
greater than 85	2	2.67
55-59	7	9.33
65-74	43	57.33
60-64	10	13.33
75-84	11	14.67
Missing	2	2.67
Gender		
Female	48	64
Male	26	34.67
Missing	1	1.33
Insurance		
Medicare	33	44
private insurance	19	25.33
Medicare and private insurance	21	28
None	1	1.33
Missing	1	1.33
Employment		
No	49	65.33
yes full-time	16	21.33
yes part-time	8	10.67
Missing	2	2.67

Note. Due to rounding errors, percentages may not equal 100%.

Descriptive statistics of frequencies and percentages for marital status, household size, income and educational level are presented in Table 8. The most frequently observed category of Marital status was married/partnered (*n* = 54, 72%). The most frequently observed category of household size was living with 1 or more persons (*n* = 60, 80%). The most frequently observed category of personal annual income was greater than 75,000 (*n* = 36, 48%). The most frequently observed category of educational level was graduate school (*n* = 35, 47%).

Table 8

Frequency and Percentage Table for Marital Status, Household Size, Income, and Educational Level

Variable	*N*	*%*
Marital status		
Married/ partnered	54	72
Divorced	6	8
Never married	2	2.67
Widow	10	13.33
Missing	3	4
Household size		
Living with 1 or more persons	60	80
Living alone/ 1- person household	12	16
Missing	3	4
Income		
Greater than 75,000	36	48
50,000-74,000	17	22.67
25,000-34,000	5	6.67
35,000-49,000	8	10.67
Missing	9	12
Educational level		
College undergraduate	30	40
Graduate school	35	46.67
High school graduate	7	9.33
Missing	3	4

Note. Due to rounding errors, percentages may not equal 100%.

Descriptive statistics of frequency and percentage for medical history are represented in Tables 9, 10, and 11. The participants reported the most common chronic medical conditions as arthritis (*n* = 29, 39%), high blood pressure (*n* = 27, 36%), and back pain (*n* = 22, 29%).

Table 9

Frequency and Percentage Table for Medical Conditions

Variable	*N*	*%*
Arthritis		
No	35	46.67
Yes	29	38.67
Missing	11	14.67
Hard of Hearing		
Yes	19	25.33
No	45	60
Missing	11	14.67
Low Vision		
No	59	78.67
Yes	5	6.67
Missing	11	14.67
Cancer		
No	55	73.33
Yes	8	10.67
Missing	12	16
Diabetes		
No	55	73.33
Yes	9	12
Missing	11	14.67
Kidney and Bladder Problems		
No	61	81.33
Yes	3	4
Missing	11	14.67
Lung Disease		
Yes	4	5.33
No	60	80
Missing	11	14.67
Cataracts		
No	57	76
Yes	7	9.33
Missing	11	14.67

Note. Due to rounding errors, percentages may not equal 100%.

Table 10

Frequency and Percentage Table for Pain

Variable	*N*	*%*
Pain in Arms		
No	61	81.33
Yes	3	4
Missing	11	14.67
Pain in Legs		
No	56	74.67
Yes	8	10.67
Missing	11	14.67
Pain in Back		
No	42	56
Yes	22	29.33
Missing	11	14.67
Pain in Neck		
No	55	73.33
Yes	9	12
Missing	11	14.67

Note. Due to rounding errors, percentages may not equal 100%.

Table 11

Frequencies and Percentage Table for Blood Pressure, High Cholesterol, Pulmonary Problems, Depression, Lung Disease, and Heart Disease

Variable	*N*	*%*
High blood pressure		
No	37	49.33
Yes	27	36
Missing	11	14.67
Low blood pressure		
No	61	81.33
Yes	3	4
Missing	11	14.67
High Cholesterol		
No	46	61.33
Yes	18	24
Missing	11	14.67
Pulmonary Problems		
No	57	76
Yes	6	8
Missing	12	16
Depression		
No	60	80
Yes	4	5.33
Missing	11	14.67
Lung Disease		
Yes	4	5.33
No	60	80
Missing	11	14.67
Heart Disease		
No	58	77.33
Yes	6	8
Missing	11	14.67

Note. Due to rounding errors, percentages may not equal 100%.

Linear regression. A linear regression analysis was conducted to assess whether gender, age, insurance, employment, private home, marital status, household size, income, educational level, high blood pressure, pain in arms, pain in legs, pain in back, pain in neck, low vision, hard of hearing, arthritis, cancer, diabetes, cataracts, high cholesterol, depression, heart disease, and pulmonary problems significantly predicted FaB total.

The results of the linear regression model were not significant, $F(31,19) = 1.00$, $p = .513$, $R^2 = 0.62$, indicating gender, age, insurance, employment, private home, marital status, household size, income, educational level, high blood pressure, pain in arms, pain in legs, pain in back, pain in neck, low vision, hard of hearing, arthritis, cancer, diabetes, cataracts, high cholesterol, depression, heart disease, and pulmonary problems did not explain a significant proportion of variation in FaB total. Since the overall model was not significant, the individual predictors were not examined further.

I accepted the null hypothesis at the 95% level of significance that socio-demographic and medical history does not significantly predict engagement in fall prevention practices. Table 12 summarizes the results of the regression model.

Table 12

Linear Regression for Sociodemographics and Medical Conditions

Variable	*B*	*SE*	CI	B	*T*	*P*
(Intercept)	2.14	0.39	[1.33, 2.96]	0.00	5.52	< .001
Gender Male	-0.07	0.14	[-0.36, 0.21]	-0.11	-0.53	.599
Age 60-64	-0.23	0.27	[-0.80, 0.33]	-0.24	-0.87	.396
Age 65-74	0.17	0.29	[-0.44, 0.79]	0.26	0.58	.567
Age 75 and greater	0.10	0.31	[-0.55, 0.75]	0.12	0.32	.749
Insurance private insurance	0.01	0.23	[-0.48, 0.50]	0.02	0.05	.959
Insurance Medicare and private insurance	-0.17	0.16	[-0.50, 0.15]	-0.25	-1.10	.283
Employment yes full-time	0.11	0.20	[-0.32, 0.53]	0.15	0.53	.601
Employment yes part-time	0.11	0.25	[-0.42, 0.64]	0.11	0.44	.666
Private Home no	-0.14	0.15	[-0.46, 0.18]	-0.21	-0.94	.361
Marital status divorced	-0.36	0.57	[-1.54, 0.83]	-0.33	-0.63	.538
Marital status widow	-0.00	0.70	[-1.46, 1.46]	-0.00	-0.00	1.000
Household size living alone/ 1-person household	0.49	0.64	[-0.85, 1.84]	0.57	0.77	.450
income50,000-74,000	0.10	0.26	[-0.45, 0.65]	0.14	0.40	.695
Income greater than 75,000	0.25	0.22	[-0.21, 0.72]	0.39	1.14	.268
Educational level college undergraduate	0.19	0.24	[-0.32, 0.69]	0.29	0.78	.447
Educational level graduate school	0.06	0.23	[-0.42, 0.54]	0.10	0.28	.783
HBP yes	0.08	0.13	[-0.19, 0.35]	0.12	0.61	.552

(table continues)

Variable	*B*	*SE*	CI	B	*T*	*P*
Pain in Arms yes	-0.47	0.26	[-1.02, 0.08]	-0.35	-1.77	.092
Pain in Legs yes	0.30	0.19	[-0.09, 0.69]	0.35	1.62	.122
Pain in Back yes	0.05	0.13	[-0.23, 0.33]	0.08	0.37	.713
Pain in Neck yes	-0.02	0.21	[-0.46, 0.42]	-0.02	-0.09	.926
Low Vision yes	0.12	0.22	[-0.35, 0.58]	0.11	0.53	.604
Hard of Hearing yes	-0.06	0.15	[-0.37, 0.26]	-0.08	-0.38	.709
Arthritis yes	-0.19	0.13	[-0.46, 0.07]	-0.30	-1.53	.143
Cancer yes	-0.07	0.20	[-0.48, 0.35]	-0.07	-0.33	.744
Diabetes yes	0.04	0.16	[-0.29, 0.37]	0.04	0.26	.800
Cataracts yes	-0.05	0.22	[-0.51, 0.41]	-0.05	-0.22	.830
High Cholesterol yes	-0.17	0.14	[-0.46, 0.12]	-0.25	-1.23	.233
Depression yes	0.14	0.53	[-0.97, 1.24]	0.10	0.26	.800
Heart Disease yes	0.11	0.29	[-0.50, 0.71]	0.08	0.36	.722
Pulmonary Problems yes	0.04	0.23	[-0.45, 0.53]	0.04	0.18	.860

Note. CI is at the 95% confidence level. Results: $F(31,19) = 1.00$, $p = .513$, $R^2 = 0.62$
Unstandardized Regression Equation: FAB_Total = 2.14 - 0.07*Gender Male - 0.23*age60-64 + 0.17*age65-74 + 0.10*age75 and greater + 0.01*Insurance private insurance - 0.17*Insurance Medicare and private insurance + 0.11*employment yes full-time + 0.11*employment yes part-time - 0.14*PHno - 0.36*maritalstatusdivorced - 0.00*maritalstatuswidow + 0.49*householdsizeliving alone/ 1 person household + 0.10*income50,000-74,000 + 0.25*incomegreater than 75,000 + 0.19*educationallevelcollege undergraduate + 0.06*educationallevelgraduate school + 0.08*HBPyes - 0.47*PainInArmsyes + 0.30*PaininLegsyes + 0.05*PaininBackyes - 0.02*PaininNeckyes + 0.12*LowVisionyes - 0.06*HardofHearingyes - 0.19*Arthritisyes - 0.07*Canceryes + 0.04*Diabetesyes - 0.05*Cataractsyes - 0.17*HighCholesterolyes + 0.14*Depressionyes + 0.11*HeartDiseaseyes + 0.04*PulmonaryProblemsyes

Assumption of normality. The assumption of normality was assessed by plotting the quantiles of the model residuals against the quantiles of a Chi-square distribution, also called a Q-Q scatterplot (DeCarlo, 1997). The assumption of normality was met, as the quantiles of the residuals do not strongly deviate from the theoretical quantiles. Strong deviations could indicate that the parameter estimates are unreliable. Figure 4 presents a Q-Q scatterplot of the model residuals.

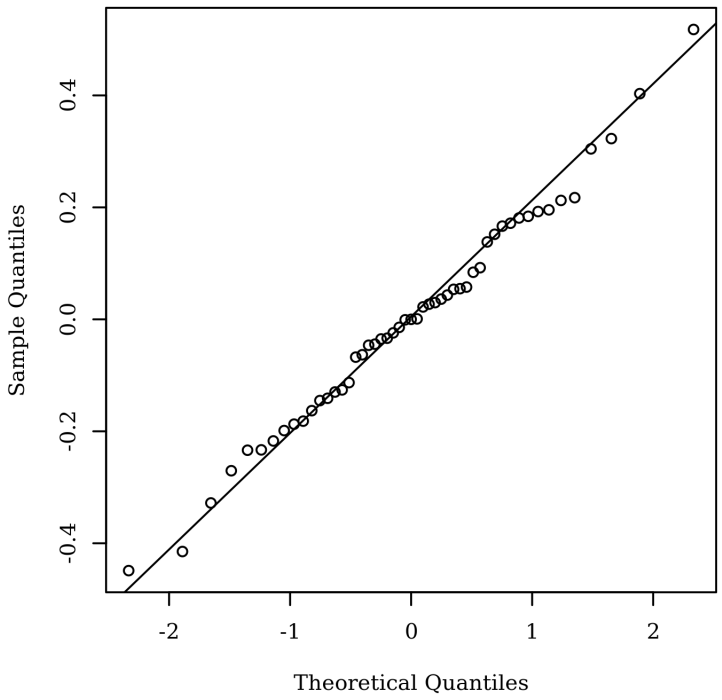

Figure 4. Q-Q scatterplot for normality of the residuals for the regression model.

Homoscedasticity. Homoscedasticity was evaluated by plotting the residuals against the predicted values (Bates et al., 2014; Field, 2013; Osborne & Walters, 2002). The assumption of homoscedasticity is met if the points appear randomly distributed with a mean of zero and no apparent curvature. Figure 5 presents a scatterplot of predicted values and model residuals.

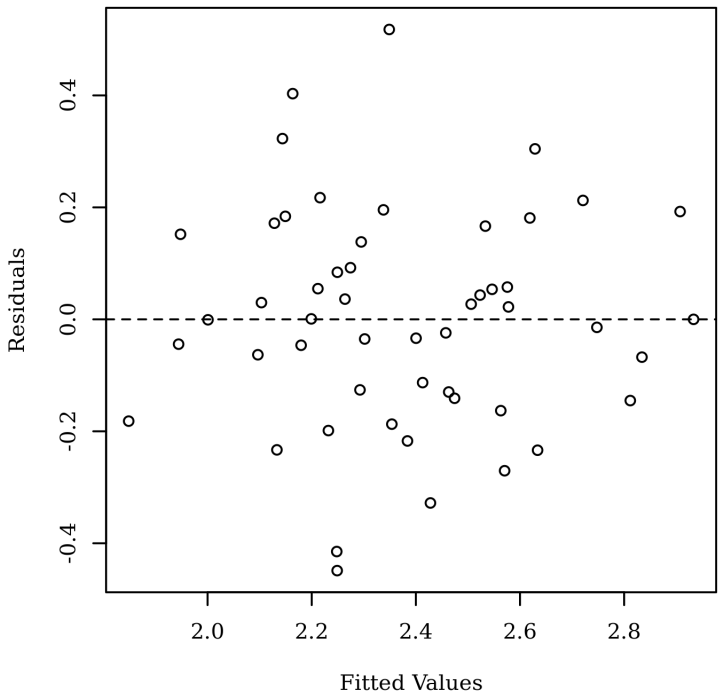

Figure 5. Residuals scatterplot testing homoscedasticity.

Multicollinearity. Variance inflation factors (VIFs) were calculated to detect the presence of multicollinearity between predictors. High VIFs indicate increased effects of multicollinearity in the model. VIFs greater than 5 are cause for concern, whereas VIFs of 10 should be considered the maximum upper limit (Menard, 2009). The following predictors had VIFs greater than 10: age, Insurance, employment, marital status, and household size. Table 13 presents the VIF for each predictor in the model.

Table 13

Variance Inflation for Sociodemographic and Medical Conditions

Variable	VIF
Gender	2.19
Age	29.31
Insurance	10.64
Employment	10.39
Private Home	2.57
Marital status	64.60
Household size	27.13
Income	8.78
Educational level	5.54
High blood pressure	2.07
Pain in arms	1.94
Pain in legs	2.27
Pain in back	2.07
Pain in neck	2.34
Low vision	2.16
Hard of hearing	2.31
Arthritis	1.98
Cancer	2.06
Diabetes	1.48
Cataracts	2.49
High cholesterol	2.03
Depression	7.67
Heart disease	2.35
Pulmonary problems	1.97

Outliers. To identify influential points, Studentized residuals were calculated and the absolute values were plotted against the observation numbers (Field, 2013; Stevens, 2009). Studentized residuals are calculated by dividing the model residuals by the estimated residual standard deviation. An observation with a Studentized residual greater than 3.26 in absolute value, the 0.999 quartile of a *t* distribution with 50 degrees of freedom, was considered to have significant influence on the results of the model. Figure 6 presents the Studentized residuals plot of the observations. Observation numbers are specified next to each point with a Studentized residual greater than 3.26.

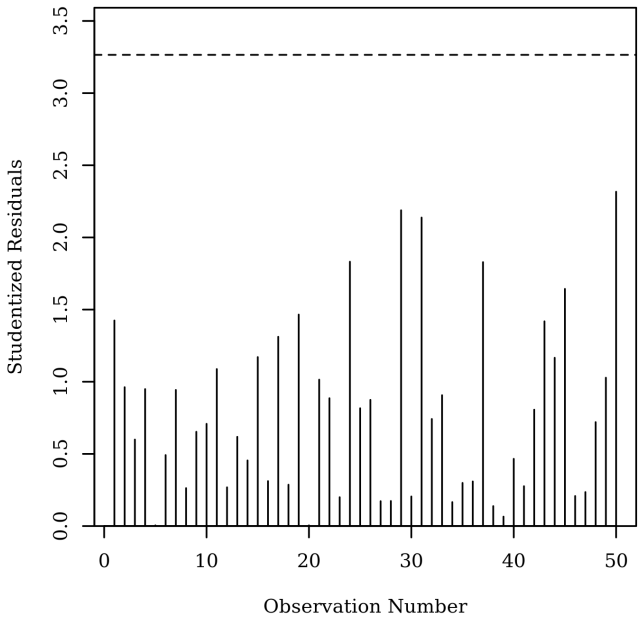

Figure 6. Studentized residuals plot for outlier detection.

Autocorrelation. A Durbin-Watson test was conducted to assess the degree of autocorrelation among the residuals. The result was not significant, $DW = 1.64$, $p = .092$, suggesting there was little to no autocorrelation among the residuals.

Research Question 2

The analysis of the data continues with Research Question 2, where I examined whether satisfaction of basic psychological needs of autonomy, relatedness, and competence predicts engagement in protective behaviors/fall prevention practices using the BMPN. A linear regression analysis was conducted to assess whether these components of the BMPN significantly predicted FaB Total.

Assumption of normality. The assumption of normality was assessed by plotting the quantiles of the model residuals against the quantiles of a Chi-square distribution, also called a Q-Q scatterplot (DeCarlo, 1997). For the assumption of normality to be met, the quantiles of the residuals must not strongly deviate from the theoretical quantiles. Strong deviations could indicate that the parameter estimates are unreliable. Figure 7 presents a Q-Q scatterplot of the model residuals.

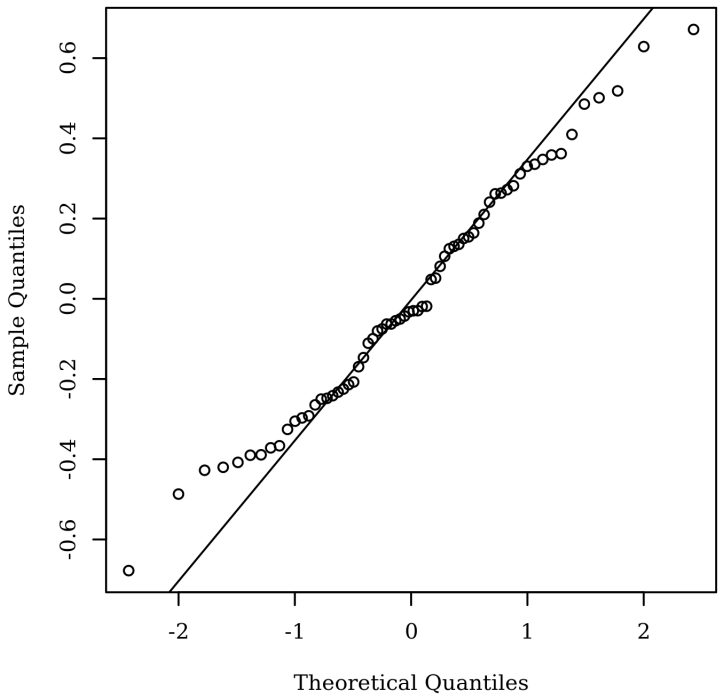

Figure 7. Q-Q scatterplot for normality of the residuals for the regression model.

Homoscedasticity. Homoscedasticity was evaluated by plotting the residuals against the predicted values (Bates et al., 2014; Field, 2013; Osborne & Walters, 2002). The assumption of homoscedasticity was met. The points appear randomly distributed with a mean of zero and no apparent curvature. Figure 8 presents a scatterplot of predicted values and model residuals.

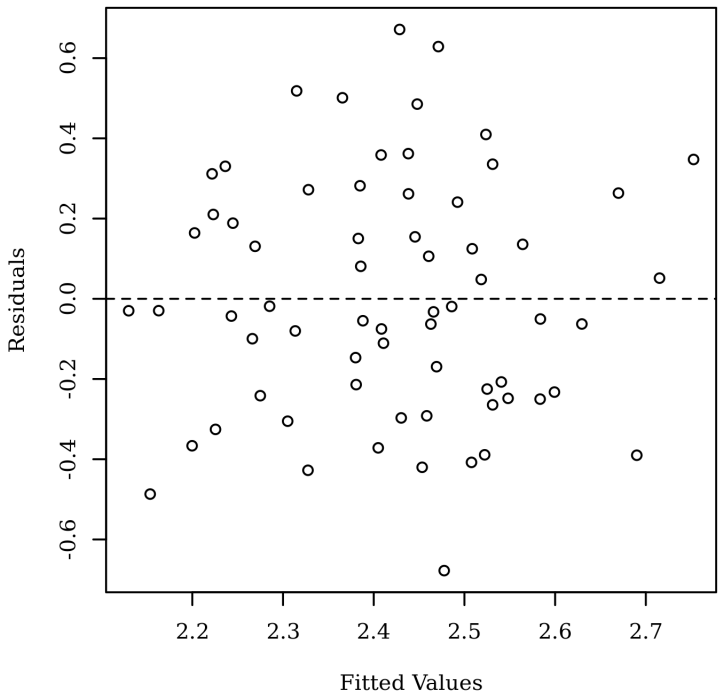

Figure 8. Residuals scatterplot testing homoscedasticity.

Multicollinearity. VIFs were calculated to detect the presence of multicollinearity between predictors. High VIFs indicate increased effects of multicollinearity in the model. VIFs greater than 5 are cause for concern, whereas VIFs of 10 should be considered the maximum upper limit (Menard, 2009). All predictors in the regression model have VIFs less than 10. Table 14 presents the VIF for each predictor in the model.

Table 14

Variance Inflation Factors for Relatedness, Competence, and Autonomy

Variable	VIF
BMPN_Relatedness_S	1.27
BMPN_Relatedness_D	1.60
BMPN_Competence_S	1.23
BMPN_Competence_D	1.41
BMPN_Autonomy_S	1.40
BMPN_Autonomy_D	1.55

Outliers. To identify influential points, Studentized residuals were calculated and the absolute values were plotted against the observation numbers (Field, 2013; Stevens, 2009). Studentized residuals are calculated by dividing the model residuals by the estimated residual standard deviation. An observation with a Studentized residual greater than 3.22 in absolute value, the 0.999 quartile of a *t* distribution with 65 degrees of freedom, was considered to have significant influence on the results of the model. Figure 9 presents the Studentized residuals plot of the observations. Observation numbers are specified next to each point with a Studentized residual greater than 3.22.

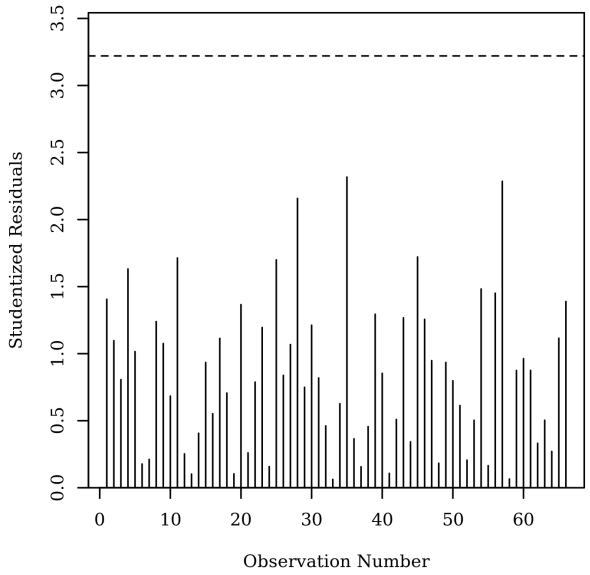

Figure 9. Studentized residuals plot for outlier detection.

Autocorrelation. A Durbin-Watson test was conducted to assess the degree of autocorrelation among the residuals. The result was not significant, $DW = 2.20$, $p = .786$, suggesting there was little to no autocorrelation among the residuals.

Linear regression. The results of the linear regression model were not significant, $F(6,59) = 2.22$, $p = .053$, $R^2 = 0.18$, indicating BMPN_Relatedness_S, BMPN_Relatedness_D, BMPN_Competence_S, BMPN_Competence_D, BMPN_Autonomy_S, and BMPN_Autonomy_D did not explain a significant proportion of variation in FAB_Total. Since the overall model was not significant, the individual predictors were not examined further. Table 15 summarizes the results of the regression model.

I accepted the null hypothesis at the 95% level of significance that basic psychological needs alone, does not significantly predict engagement in fall prevention practices.

Table 15

Results for Linear Regression with Relatedness, Competence, and Autonomy Predicting Falls Behavioral Scale Total

Variable	*B*	*SE*	CI	β	*t*	*P*
(Intercept)	1.54	0.31	[0.93, 2.15]	0.00	5.02	< .001
BMPN_Relatedness_S	0.12	0.07	[-0.01, 0.25]	0.25	1.87	.067
BMPN_Relatedness_D	0.03	0.07	[-0.11, 0.18]	0.07	0.46	.645
BMPN_Competence_S	0.00	0.05	[-0.10, 0.10]	0.01	0.04	.966
BMPN_Competence_D	-0.06	0.05	[-0.16, 0.04]	-0.17	-1.24	.220
BMPN_Autonomy_S	0.12	0.06	[-0.00, 0.25]	0.27	1.97	.053
BMPN_Autonomy_D	0.12	0.05	[0.02, 0.22]	0.35	2.37	.021

Note. CI is at the 95% confidence level. Results: $F(6,59) = 2.22$, $p = .053$, $R^2 = 0.18$

Unstandardized Regression Equation: FAB_Total = 1.54 + 0.12*BMPN_Relatedness_S + 0.03*BMPN_Relatedness_D + 0.00*BMPN_Competence_S - 0.06*BMPN_Competence_D + 0.12*BMPN_Autonomy_S + 0.12*BMPN_

Research Question 3

The analysis of the data continues with Research Question 3, where I examined whether an individual's interests in fall prevention, predicts engagement in protective behaviors / fall prevention practices using the Modified SIQ. A linear regression analysis was conducted to assess whether SIQ_Feeling, SIQ_Value, and SIQ_Intrinsic significantly predicted FAB_Total.

Assumption of normality. The assumption of normality was assessed by plotting the quantiles of the model residuals against the quantiles of a Chi-square distribution, also called a Q-Q scatterplot (DeCarlo, 1997). For the assumption of normality to be met, the quantiles of the residuals must not strongly deviate from the theoretical quantiles. Strong deviations could indicate that the parameter estimates are unreliable. Figure 10 presents a Q-Q scatterplot of the model residuals.

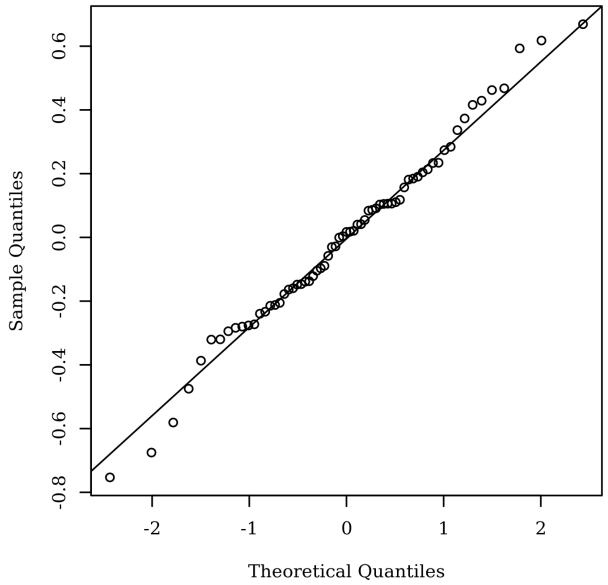

Figure 10. Q-Q scatterplot for normality of the residuals for the regression model.

Homoscedasticity. Homoscedasticity was evaluated by plotting the residuals against the predicted values (Bates et al., 2014; Field, 2013; Osborne & Walters, 2002). The assumption of homoscedasticity was met. The points appear randomly distributed with a mean of zero and no apparent curvature. Figure 11 presents a scatterplot of predicted values and model residuals.

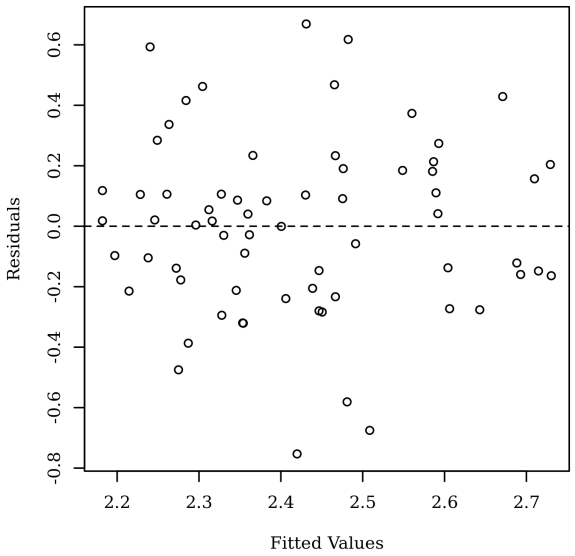

Figure 11. Residuals scatterplot testing homoscedasticity.

Multicollinearity. VIFs were calculated to detect the presence of multicollinearity between predictors. High VIFs indicate increased effects of multicollinearity in the model. VIFs greater than 5 are cause for concern, whereas VIFs of 10 should be considered the maximum upper limit (Menard, 2009). All predictors in the regression model have VIFs less than 10. Table 16 presents the VIF for each predictor in the model.

Table 16

Variance Inflation Factors for Feeling, Value, and Intrinsic

Variable	VIF
SIQ_Feeling	2.91
SIQ_Value	3.10
SIQ_Intrinsic	1.95

Outliers. To identify influential points, Studentized residuals were calculated and the absolute values were plotted against the observation numbers (Field, 2013; Stevens,

2009). Studentized residuals are calculated by dividing the model residuals by the estimated residual standard deviation. An observation with a Studentized residual greater than 3.22 in absolute value, the 0.999 quartile of a *t* distribution with 66 degrees of freedom, was considered to have significant influence on the results of the model. Figure 12 presents the Studentized residuals plot of the observations. Observation numbers are specified next to each point with a Studentized residual greater than 3.22.

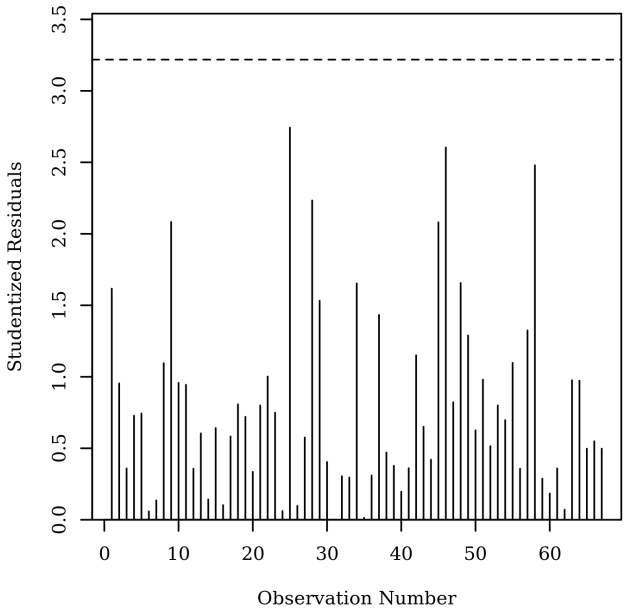

Figure 12. Studentized residuals plot for outlier detection.

Autocorrelation. A Durbin-Watson test was conducted to assess the degree of autocorrelation among the residuals. The result was not significant, $DW = 2.07$, $p = .629$, suggesting there was little to no autocorrelation among the residuals.

Linear regression. The results of the linear regression model were significant, $F(3,63) = 5.75$, $p = .002$, $R^2 = 0.21$, indicating that approximately 21% of the variance in FAB_Total is explainable by SIQ_Feeling, SIQ_Value, and SIQ_Intrinsic. SIQ_Feeling

did not significantly predict FAB_Total, $B = 0.02$, $t(63) = 0.18$, $p = .857$. Based on this sample, a one-unit increase in SIQ_Feeling does not have a significant effect on FAB_Total. SIQ_Value did not significantly predict FAB_Total, $B = 0.16$, $t(63) = 1.86$, $p = .067$. Based on this sample, a one-unit increase in SIQ_Value does not have a significant effect on FAB_Total. SIQ_Intrinsic did not significantly predict FAB_Total, $B = 0.04$, $t(63) = 0.60$, $p = .547$. Based on this sample, a one-unit increase in SIQ_Intrinsic does not have a significant effect on FAB_Total. Table 17 summarizes the results of the regression model.

Table 17

Results for Linear Regression with Feeling, Value, and Intrinsic Predicting Falls Behavioral Scale Total

Variable	*B*	*SE*	CI	B	*t*	*P*
(Intercept)	2.17	0.09	[2.00, 2.34]	0.00	25.35	< .001
SIQ_Feeling	0.02	0.12	[-0.22, 0.26]	0.03	0.18	.857
SIQ_Value	0.16	0.09	[-0.01, 0.34]	0.37	1.86	.067
SIQ_Intrinsic	0.04	0.06	[-0.08, 0.15]	0.09	0.60	.547

Note. CI is at the 95% confidence level. Results: $F(3,63) = 5.75$, $p = .002$, $R^2 = 0.21$
Unstandardized Regression Equation: FAB_Total = 2.17 + 0.02*SIQ_Feeling + 0.16*SIQ_Value + 0.04*SIQ_Intrinsic

Final Analysis

In the final analysis, I examined whether all the constructs in the SDT (autonomy, competence and relatedness) inclusive of the POI framework (interests) significantly predicts protective behaviors/engagement in fall prevention practices.

A linear regression analysis was conducted to assess whether SIQ_Feeling, SIQ_Value, SIQ_Intrinsic, BMPN_Relatedness_S, BMPN_Relatedness_D,

BMPN_Competence_S, BMPN_Competence_D, BMPN_Autonomy_S, and BMPN_Autonomy_D significantly predicted FAB_Total.

The results of the linear regression model were significant, $F(9,55) = 3.79$, $p < .001$, $R^2 = 0.38$, indicating that approximately 38% of the variance in FAB_Total is explainable by SIQ_Feeling, SIQ_Value, SIQ_Intrinsic, BMPN_Relatedness_S, BMPN_Relatedness_D, BMPN_Competence_S, BMPN_Competence_D, BMPN_Autonomy_S, and BMPN_Autonomy_D.

SIQ_Feeling did not significantly predict FAB_Total, $B = 0.10$, $t(55) = 0.88$, $p = .384$. Based on this sample, a one-unit increase in SIQ_Feeling does not have a significant effect on FAB_Total.

SIQ_Value did not significantly predict FAB_Total, $B = 0.11$, $t(55) = 1.31$, $p = .196$. Based on this sample, a one-unit increase in SIQ_Value does not have a significant effect on FAB_Total.

SIQ_Intrinsic did not significantly predict FAB_Total, $B = 0.03$, $t(55) = 0.45$, $p = .658$. Based on this sample, a one-unit increase in SIQ_Intrinsic does not have a significant effect on FAB_Total.

BMPN_Relatedness_S significantly predicted FAB_Total, $B = 0.13$, $t(55) = 2.20$, $p = .032$. This indicates that on average, a one-unit increase of BMPN_Relatedness_S will increase the value of FAB_Total by 0.13 units. BMPN_Relatedness_D did not significantly predict FAB_Total, $B = 0.05$, $t(55) = 0.74$, $p = .462$. Based on this sample, a one-unit increase in BMPN_Relatedness_D does not have a significant effect on FAB_Total.

BMPN_Competence_S did not significantly predict FAB_Total, $B = 0.02$, $t(55) = 0.46$, $p = .650$. Based on this sample, a one-unit increase in BMPN_Competence_S does not have a significant effect on FAB_Total. BMPN_Competence_D did not significantly predict FAB_Total, $B = -0.03$, $t(55) = -0.77$, $p = .444$. Based on this sample, a one-unit increase in BMPN_Competence_D does not have a significant effect on FAB_Total.

BMPN_Autonomy_S did not significantly predict FAB_Total, $B = 0.11$, $t(55) = 1.99$, $p = .051$. Based on this sample, a one-unit increase in BMPN_Autonomy_S does not have a significant effect on FAB_Total.

BMPN Autonomy_D significantly predicted FAB_Total, $B = 0.10$, $t(55) = 2.20$, $p = .032$. This indicates that on average, a one-unit increase of BMPN_Autonomy_D will increase the value of FAB_Total by 0.10 units. Table 18 summarizes the results of the regression model.

Table 18

Linear Regression for Basic Psychological Needs and Interests

Variable	*B*	*SE*	CI	β	*t*	*P*
(Intercept)	1.19	0.30	[0.59, 1.79]	0.00	3.96	< .001
SIQ_Feeling	0.10	0.12	[-0.13, 0.34]	0.16	0.88	.384
SIQ_Value	0.11	0.09	[-0.06, 0.28]	0.25	1.31	.196
SIQ_Intrinsic	0.03	0.06	[-0.09, 0.14]	0.07	0.45	.658
BMPN_Relatedness_S	0.13	0.06	[0.01, 0.25]	0.27	2.20	.032
BMPN_Relatedness_D	0.05	0.06	[-0.08, 0.18]	0.10	0.74	.462
BMPN_Competence_S	0.02	0.05	[-0.07, 0.11]	0.05	0.46	.650
BMPN_Competence_D	-0.03	0.04	[-0.12, 0.05]	-0.10	-0.77	.444
BMPN_Autonomy_S	0.11	0.06	[-0.00, 0.23]	0.25	1.99	.051
BMPN_Autonomy_D	0.10	0.05	[0.01, 0.20]	0.30	2.20	.032

Note. CI is at the 95% confidence level. Results: $F(9,55) = 3.79$, $p < .001$, $R^2 = 0.38$
Unstandardized Regression Equation: FAB_Total = 1.19 + 0.10*SIQ_Feeling + 0.11*SIQ_Value + 0.03*SIQ_Intrinsic + 0.13*BMPN_Relatedness_S + 0.05*BMPN_Relatedness_D + 0.02*BMPN_Competence_S - 0.03*BMPN_Competence_D + 0.11*BMPN_Autonomy_S + 0.10*BMPN_Autonomy_D

Assumption of normality. The assumption of normality was assessed by plotting the quantiles of the model residuals against the quantiles of a Chi-square distribution, also called a Q-Q scatterplot (DeCarlo, 1997). The assumption of normality was met, the quantiles of the residuals do not strongly deviate from the theoretical quantiles. Strong deviations could indicate that the parameter estimates are unreliable. Figure 13 presents a Q-Q scatterplot of the model residuals.

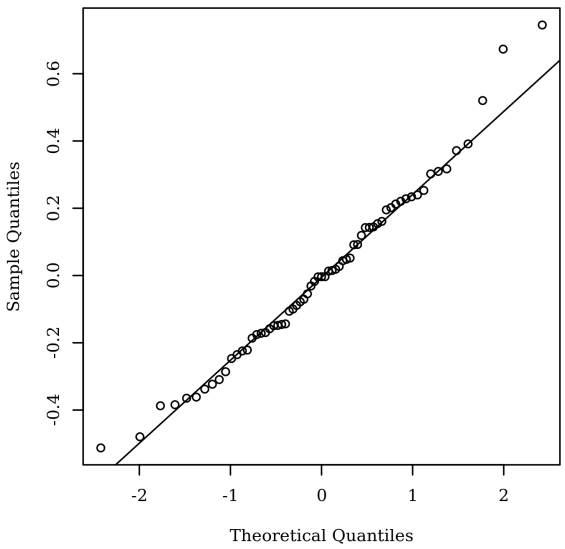

Figure 13. Q-Q scatterplot for normality of the residuals for the regression model.

Homoscedasticity. Homoscedasticity was evaluated by plotting the residuals against the predicted values (Bates et al., 2014; Field, 2013; Osborne & Walters, 2002). The assumption of homoscedasticity was met. The points appear randomly distributed with a mean of zero and no apparent curvature. Figure 14 presents a scatterplot of predicted values and model residuals.

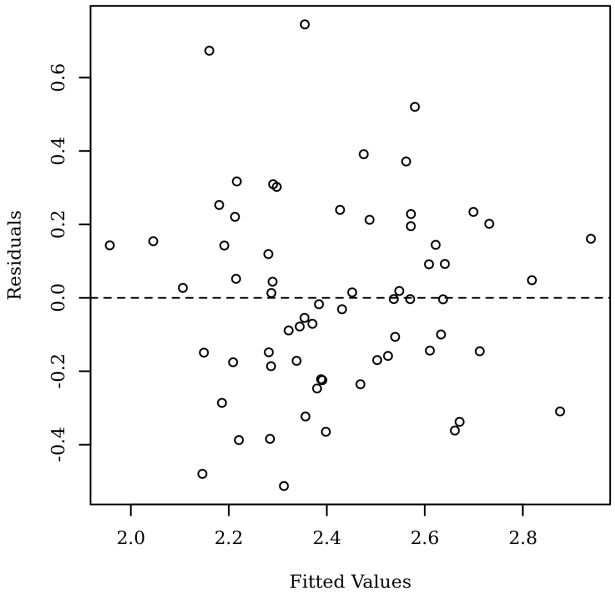

Figure 14. Residuals scatterplot testing homoscedasticity.

Multicollinearity. VIFs were calculated to detect the presence of multicollinearity between predictors. High VIFs indicate increased effects of multicollinearity in the model. VIFs greater than 5 are cause for concern, whereas VIFs of 10 should be considered the maximum upper limit (Menard, 2009). All predictors in the regression model have VIFs less than 10. Table 19 presents the VIF for each predictor in the model.

Table 19

Variance Inflation Factors for Feeling, Value, Intrinsic, Relatedness, Competence, and Autonomy

Variable	VIF
SIQ_Feeling	3.06
SIQ_Value	3.27
SIQ_Intrinsic	2.14
BMPN_Relatedness_S	1.29
BMPN_Relatedness_D	1.63

BMPN_Competence_S	1.27
BMPN_Competence_D	1.45
BMPN_Autonomy_S	1.41
BMPN_Autonomy_D	1.67

Outliers. To identify influential points, Studentized residuals were calculated and the absolute values were plotted against the observation numbers (Field, 2013; Stevens, 2009). Studentized residuals are calculated by dividing the model residuals by the estimated residual standard deviation. An observation with a Studentized residual greater than 3.22 in absolute value, the 0.999 quartile of a *t* distribution with 64 degrees of freedom, was considered to have significant influence on the results of the model. Figure 15 presents the Studentized residuals plot of the observations. Observation numbers are specified next to each point with a Studentized residual greater than 3.22.

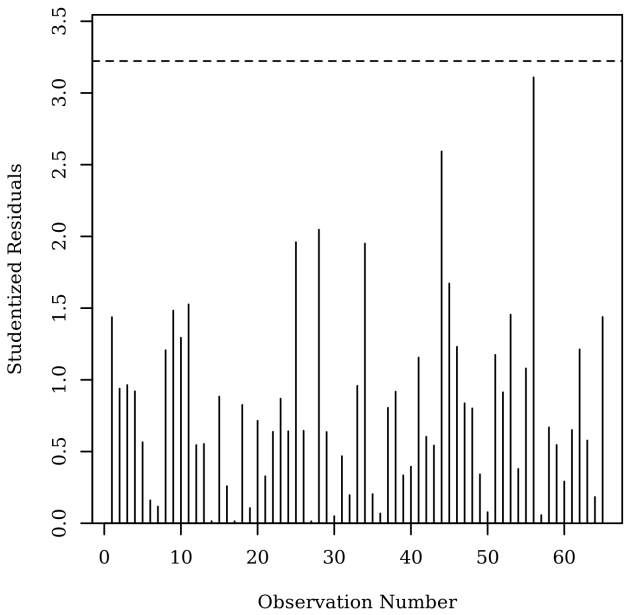

Figure 15. Studentized residuals plot for outlier detection.

Autocorrelation. A Durbin-Watson test was conducted to assess the degree of autocorrelation among the residuals. The result was not significant, $DW = 2.13$, $p = .692$, suggesting there was little to no autocorrelation among the residuals. Because of significance of these findings, I rejected the null hypothesis at the 95% level of significance and accepted the alternate hypothesis that basic psychological needs [whether satisfaction or dissatisfaction] predicts engagement in fall prevention practices.

Summary

After review of the data analysis, I noted several important findings relating to the variance of basic psychological needs and total variance of individual's interest toward engagement in fall prevention practices. Individual regressions in basic psychological needs and interests found statistically significant scores. First, an increase in scores on satisfaction of relatedness, dissatisfaction in autonomy and combined individual's interests (feeling, value and intrinsic motivation) increased the total score of protective behaviors/ engaging in fall prevention practices, indicating a positive relationship. In addition, in contrast, basic psychological needs of competence and socio-demographics or medical conditions did not predict engagement in fall prevention practices.

In Chapter 5, I provide the rationale and essence of this research study, summarize key findings, compare and contrast new findings with the literature review found in Chapter 2, describe the limitations of the study, and recommend directions for further research in national, state and community fall prevention practices. Finally, I share implications for positive social change, by focusing the awareness of basic psychological needs and interest in fall prevention practices on a population as well as

individual level. This heightened awareness about the role of motivational concepts (autonomy, competence and relatedness) and relational concepts of interests, may serve as a novel approach to slow the rate of falls and their consequences among community dwellers 65 years and older.

Chapter 5: Discussion, Recommendations

Introduction

The WHO has called a fall a major public health problem, and the CDC has shown that a fall is a silent threat to older individuals' health and well-being. But currently there is lack of attention to the risk factor of behavior in fall prevention practices. This study was implemented to learn the role of basic psychological needs and interests to predict behavior to engage in fall prevention practices. Additionally, the relationship between sociodemographic and chronic medical conditions and fall prevention practices was explored. The SDT was used to focus three basic psychological needs as conditions for motivation of human behavior and the POI was used to focus the relationship between the person and objects of interest. Given the continued prevalence of falls in the United States and around the globe (WHO, 2018), it was essential to highlight how human behavior in everyday choices effects self-management and self-regulation process to prevent a fall in the home environment. Thus, the research questions for this study were:

1. Do basic psychological needs of autonomy, relatedness and competence predict engagement in fall prevention practices?
2. Do interests in fall prevention predict engagement in fall prevention practices?
3. What is the relationship between socio-demographics and chronic medical conditions for engagement in fall prevention practices?

The study sample consisted of 75 adults who live in Virginia, Florida, and Iowa. All participants were community dwellers 55 years of age and older who lived in a rural or suburban community. Basic psychological needs were measured using the BMPN Scale, interests were measured using Modified SIQ, and the BRFSS scale measured sociodemographics and chronic medical conditions. Linear regressions were used to analyze the data and explore the hypothesis. Some findings alone were found to be not significant but in combination were significant.

Interpretation of the Findings

The results of this quantitative study revealed that the interaction between the intrinsic motivation "to do" (satisfaction of relatedness and dissatisfaction of autonomy) and extrinsic relationship between the person and object of interest predicts engagement in fall prevention practices. First, I examined the strength of the effect that basic psychological needs (motivational concepts) had on FaB scores/engagement in fall prevention practices. Results revealed that basic psychological needs of autonomy, relatedness, and competence did not explain a significant proportion of variation in FaB scores/engagement in fall prevention practice. Second, I examined the strength of the effect interests (relational concepts) had on FaB scores/engagement in fall prevention practices. Results revealed that approximately 21% of the variance in FaB total/engagement in fall prevention practices is explainable by feeling, value, and intrinsic interests. Next, I explored the relationship of sociodemographics/chronic medical conditions toward engagement in fall prevention practices. Results showed that

sociodemographics including chronic medical conditions did not explain a significant portion of the variation in the FaB scores/engagement in fall prevention practices.

Lastly, I examined whether the individual's experience of autonomy, relatedness, and competence (basic psychological needs), combined with the individual's interest in the object (fall prevention) had on FaB scores/engagement in fall prevention practices. Results revealed that approximately 38% of variance in the FaB score (fall prevention practices) is explainable by basic psychological needs of satisfaction in relatedness and dissatisfaction in autonomy and interests (feelings, value, and intrinsic). The study outcomes pertaining to motivational and relational concepts of behaviors (defined as "human actions, emotions and daily choices") are noteworthy relationships to predict engagement in fall prevention practices.

Basic Psychological Needs

Basic psychological needs are factors that must be satisfied for an individual to be motivated *to do* or *not to do*. This *to do* or *not to do* is also called *behavior*, which influences what people do on an everyday basis as well as personal growth and well-being (Deci et al., p. 5). In this study, the null hypothesis that basic psychological needs alone do not predict engagement in fall prevention practices in older adults (age 55 to 92 years) was accepted, and the alternative hypothesis was rejected. Linear regression for BMPN satisfaction and dissatisfaction of relatedness, competence, and autonomy did not explain a significant proportion of variation in the FaB total.

This finding is consistent in fall prevention literature on autonomy, a basic psychological need that originates from personal interests and values (Deci & Ryan,

2002). For example, Yardly (2006), Bunn et al. (2008), and Stevens et al. (2016) suggested that although fall prevention advice is useful, it is not personally relevant or appropriate, and engagement in fall prevention practices is seen as a threat to identity even when personal fall risk is known. Similarly, competence as a basic psychological need reflects an individual's feeling of being effective when carrying out necessary and everyday activities that reinforce and challenge their capacities (Deci & Ryan, 2002). Stevens et al. found that older individuals who were concerned about falling adjusted their daily activities and respected their limitations but did not engage in fall prevention practices. The lesser of the three basic psychological needs, relatedness, refers to caring and belongingness with others and one's community. Even though relatedness does not play an overt role as autonomy and competence, the satisfaction of this basic psychological need is critical to change external motivation from others and the environment to intrinsic motivation by the individual. Bunn et al.'s study supported relatedness/social support as a facilitator to participate in fall prevention practices.

Objects of Interests

Interests are considered a dynamic unit that constitutes interaction between the individual and objects in their "life-space" (Lewin, as cited in Deci, 2001, p. 410). Objects are considered interests when the individual has knowledge about the object and subsequently forms an emotional assessment of it to then interacts with the object with intent and purpose. Then and only then is the object considered an action of interest (Deci, 2001). In this study, the alternative hypothesis that interests do predict engagement in fall prevention practices was accepted, and the null hypothesis was rejected. The linear

regression analysis for interests accounted for 21% of the variance in the total FaB score/engaging in fall prevention practices. This study is consistent with other studies that examined interests in fall prevention practices. Yardly et al. (2006) study suggests that interests in fall prevention practices are evident in the Fall Event Paradigm: Pre-fall event where the individual engages in activities/ object of interest to prevent a fall; wearables and technology (Ted Med, 2016; Silva, 2013; Danielson, Olsfsen, Bremdal, 2016; and Van de Ven, 2015); receives information/ objects of a learner's interests (Steven & Burns, 2015).

Sociodemographics

This sample provided insight into socio-demographics and chronic medical condition characteristics. In this study, the null hypothesis, socio-demographics and chronic medical conditions do not predict engagement in fall prevention practices was accepted and the alternative hypothesis was rejected. Socio- demographics nor chronic medical conditions did not explain a significant proportion of the variation in the FaB total/engaging in fall prevention practices. The study's data supports fall-risk findings reported by Renfro, Marling, Bainbridge and Blair (2016) and Berg et al. (1992) that a person's fall risk increases with chronic conditions or co-morbidities. Arthritis, high blood pressure and back pain were identified as the most common chronic medical conditions of individuals in this study and further supported by Berg and colleague's 1992 seminal study and Renfro et al. (2016) as moderate risk factors for a fall. A gap in the literature exists to individually report on socio-demographics and chronic medical

conditions of individuals who actually engage in fall prevention practices in the home and in the community.

Self-Determination Theory and Person-Object Approach to Interest

The theoretical foundation and framework, SDT and POI focused motivational and relational concepts as the yin and yang of behavior, the *need to do or not to do something* whether that *need to do* is habitual or intentional. Separately, the basic psychological needs of autonomy, competence and relatedness do not predict behavior to engage in fall prevention practices, but together with interests, the individual and the action of interests do support engagement in fall prevention practices. In this study, the alternative hypothesis, basic psychological needs and interests, do predict engagement in fall prevention practices was accepted and the null hypothesis was rejected. The linear regression for basic psychological needs and interests accounted for 38% of the variance in the FaB total and is explainable by BMPN relatedness satisfaction and autonomy dissatisfaction. This indicates that on an average, one- unit increase of BMPN relatedness satisfaction and autonomy dissatisfaction will increase the total FaB score/ engagement in fall prevention practices. Satisfaction in relatedness supports the importance of connection to, mutually share and be accepted by others (Deci & Ryan, 2000) and as a facilitator to choose to engage in fall prevention practices. Dissatisfaction in autonomy, which is regulated by the self and or external factors (Sheldon et al., 2003) may demonstrate the nature of motivation which varies by intensity (how much action is taken/ amount of fall prevention practices an individual engages in) and orientation (why the individual is engaging in fall prevention practices/ internal or external motivation).

These findings have the potential to add to the body of knowledge specifically relating to the low uptake to engage in fall prevention practices despite effective and evidence-based interventions to prevent a fall.

Limitations of the Study

There are several limitations to this study including the small sample size, sample design, selection bias and limited geographical locations. The first limitation was the small sample size of 75 participants. Due to the strict non-solicitation policies of community venues, the researcher was only able to survey 35 participants who met the face-to-face criteria and the other 40 participants were obtained through a snowball sample with sample criteria listed in an online format. Secondly, the purposive and snowball sampling consisted of participants who were mainly white, non -Hispanic; individuals living in the suburbs of Virginia, Iowa and Florida which limits the ability to generalize the study findings. Therefore, the study's sample does not adequately represent a cross section of the total population of community dwelling older individuals [55 years of age and older] who may or may not participate in fall prevention practices. In addition, the study relied exclusively on independent self-report of questionnaires. Due to the self- reflection nature of the questions posed from the SDT and individual perceptions of protective fall prevention behaviors, I presumed that participants were responding as accurately and honestly as possible. Potential confounding factors could be the understanding of the questions asked, mood, or the time of the day the questionnaires were given. During the face- to- face administration of the questionnaires, the environment or presence of others (participants sitting in a large room) may have also

produced a confound in the results. Lastly, due to the small sample size [which impacted the study's power], a Type II error more than likely occurred. Subsequently, it is unclear what additional effects/ relationships exist among motivational and relational concepts to engage in fall prevention practices.

Recommendations

This study provides new knowledge about the motivational concepts of basic psychological needs and relational concepts of interests as a foundation for behaviors that motivate an individual to engage in fall prevention practices. As the prevalence of falls and mortality from falls among older adults continues to rise, current fall prevention intervention strategies must include education on fall preparedness before a fall occurs, as well as inclusion of focused behavioral questions relating to the basic psychological needs of autonomy and relatedness.

I recommend that future studies focus research on communities with high fall rates as well as recruitment of large number of individuals in diverse community dwellers to specifically learn: 1). who is engaging in falls prevention practices, 2). where individuals are engaging in fall prevention practices, and 3) what motivational and or relational concept propels the individual to engage or disengage in fall prevention practices. This information may serve as a catalyst for new and innovative ways to educate the community-dwelling older adults for engagement in fall prevention practices. Finally, this current study, highlights the role of the motivational concept called relatedness as the means to increase the uptake of fall prevention practices. Furthermore,

more research is warranted to discover how motivational intensity is related to autonomy dissatisfaction and the role it plays in sustaining engagement in fall prevention practices.

Implications

I designed this study to provide evidence and opportunities for positive social change to slow the rate of falls and mortality from falls among community dwellers 55 years and older. By understanding that behaviors, [which represent the action of *to do or not to do],* are as important as the other well- known risk factors of falling, this research has the potential to demonstrate the importance of behavior in national and local fall prevention evaluations and screening. The current study provides a lens to focus aspects of behavior called "human actions, emotions and or daily life choices" (WHO, 2007, p. 7). Since this study is the first to focus the motivational concepts of SDT and introduce interests in fall prevention relative to POI, there are glaring implications for individual, group and population fall prevention practices.

The implications for positive social change that can be gleaned from this study are exciting and hold promise for creative fall prevention programming at the population level through inclusion of relatedness and autonomy questions [grounded in the SDT] on the CDC STEADI evaluation. This basic motivational and relational knowledge would expand the reach of fall prevention practices through referrals throughout healthcare and community providers as well as provide a focus to organizational and community level fall prevention programs.

Conclusion

Falls among older individuals continues to be a major public health problem which is modifiable in so much, that falls are not an inevitable part of aging. Strategies to prevent the number one unintentional injury of aging is present on the national, state and community agendas in every state in the U.S. (U.S. Department of Health and Human Services, Health People 2020), yet the prevalence and mortality rates for falls in the U.S. continues to rise since the 90's. To slow the rate of falls among the growing older population, there must be a "re-set" of fall prevention interventions currently used in the CDC's "gold standard" for fall prevention interventions, The CDC Compendium of Effective Fall Interventions to include interventions that introduce satisfaction of basic psychological needs as precursors to fall self-management and wellness vs focus on injury and caregiver burden.

This study is important because it began the focus of motivational concepts/ basic psychological needs and relational concepts/ interests to predict engagement in fall prevention practices. Globally, today's society is aging at a rapid rate and falls among persons 65 and older will continue to create challenges financially, medically, socially and in everyday occupations, if fall prevention is not understood at its simplest level of behavior—*to do* or *not to do.*

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Appendix A: Six Item Cognitive Impairment Test (6CIT), Kingshill Version 2000

Participant Details:	Date: Name of Assessor:

Question	Score Range	Score
1. What year is it?	0–4 Correct - 0 points Incorrect – 4 points	
2. What month is it?	0–3 Correct – 0 points Incorrect – 3 points	
3. Give the patient an address phrase to remember with 5 components, eg John, Smith, 42, High St, Bedford		
4. About what time is it (within 1 hour)	0–3 Correct – 0 points Incorrect – 3 points	
5. Count backwards from 20-1	0- 4 Correct - 0 points 1 error – 2 points More than I error – 4 points	
6. Say the months of the year in reverse	0- 4 Correct - 0 points 1 error – 2 points More than I error – 4 points	
7. Repeat address phrase John, Smith, 42, High St, Bedford	0 – 10 Correct - 0 points 1 error – 2 points 2 errors – 4 points 3 errors – 6 points 4 errors – 8 points All wrong – 10 points	
TOTAL SCORE	0 – 28	/28

Outcome from Score

0-7 = normal	Referral to primary not necessary at present
8- 9 = mild cognitive impairment	Make recommendation to refer to primary
10-28 = significant cognitive impairment	

Appendix B: Demographic Questionnaire

Please answer the following questions by marking an X in the appropriate box.

Sex: What is your gender?	
• Female	☐
• Male	☐
Age in years: What is your age?	
• 65-74	☐
• 75-84	☐
• ≥ 85	☐
Race/ Ethnicity: What race do you most identify	
• Hispanic/ Latino	☐
• White	☐
• Black, African	☐
• Black, African American	☐
• American Indian	☐
• Asian/ Pacific Islander	☐
• Multiple/ Other	☐
Socio-economic status	
What insurance do you have?	
• Medicare	☐
• Medicaid	☐
• Private insurance	☐
• None	☐
Are you employed?	
• Yes	☐
• No	☐
Housing: Where do you live?	
• Private home: gated community, local community	☐
• Condo	☐
• Apartment	☐
• Alone	☐
• With others	☐
• 1 story	☐
• 2 story	☐

- steps to outside ☐
- no steps to outside ☐

What is your marital status?

- Married/ partnered ☐
- Divorced ☐
- Widow ☐
- Never married ☐
- Unmarried couple ☐

What is your household size?

- Living alone/ 1- person household ☐
- Living with ≥ 1 other person ☐

What is your household income?

- Less than 15,000 ☐
- 25,000-34,999 ☐
- 35,000-49,999 ☐
- 50,000-74,999 ☐
- greater than 75,000 ☐

What educational level did you achieve?

- Less than high school graduate ☐
- High school graduate ☐
- Some college ☐
- Graduate school or more ☐

Describe your health status

- Excellent ☐
- Very Good ☐
- Good ☐
- Fair ☐
- Poor ☐

Do you have any of the following medical conditions?

- High blood pressure ☐
- Low blood pressure ☐
- Pain in arms ☐
- Pain in legs ☐
- Pain in back ☐
- Pain in neck ☐

- Low vision ☐
- Hard of hearing ☐
- Arthritis ☐
- Cancer ☐
- Diabetes ☐
- Kidney and bladder problems ☐
- Cataracts ☐
- Lung disease ☐
- High cholesterol ☐
- Depression ☐
- Heart disease ☐
- Pulmonary problems ☐

What is your primary language?

- English ☐
- Spanish ☐
- Other ☐

Modified Sociodemographic Questionnaire (CDC, 2008-2009, Batra, Melchior, Seff, Frederick, Palmer, 2012; Todd, Ballinger, Whitehead, 2007)

Appendix C: The Balanced Measure of Psychological Needs Scale

1-not at all true; 3- to somewhat true; 5-to very true.

Relatedness

1. I feel a sense of contact with people who care for me, and whom I care for.
2. I am lonely.
3. I feel close and connected with other people who are important to me.
4. I feel unappreciated by one or more important people.
5. I feel a strong sense of intimacy with the people I spent time with.
6. I have disagreements or conflicts with people I usually get along with.

Competence

1. I successfully completing difficult tasks and projects.
2. I experienced some kind of failure or was unable to do well at something.
3. I take on and master hard challenges.
4. I did something stupid, that made me feel incompetent.
5. I did well even at the hard things.
6. I struggle doing something I should be good at.

Autonomy

1. I am free to do things my own way.
2. I have a lot of pressures I could do without.
3. My choices expressed my “true self.”
4. There are people telling me what I had to do.
5. I am really doing what interests me.
6. I have to do things against my will.

Appendix D: Modified Study Interest Questionnaire

In the following, you will find a number of statements related to **falls prevention**. Read each sentence and indicate to what extent these statements are true for you by placing an X in the box. There are no right or wrong answers. Remember to mark ONE box for each sentence.

	Not at all true	Slightly true	Moderately true	Completely true
1). Working to prevent a fall is not really among my favorite activities				
2). I don't' like to talk much about the things I can do to prevent a fall				
3). After a long weekend or vacation, I look forward to getting back to the things I do to prevent a fall				
4). Engaging in fall prevention practices puts me in a good mood				
5). I prefer to talk about my hobbies rather than talk about fall prevention				
6). When I am in a library or bookstore, I like to browse through magazines or books having to do with topics related to fall prevention (strengthening exercises, balance exercises, home modifications, technology related to fall prevention, non-slip shoes, assistive technology				
7). Many areas of fall prevention don't mean anything to me				
8). It is of great personal importance to me to be able to engage in fall prevention practices				
9). To be absolutely honest, I feel sometimes rather indifferent towards engaging in practices to prevent a fall*				
10) Engaging in fall prevention practices has in fact very little to do with my self-realization*				
11). Compared to other things that are of great importance to me (e.g., hobbies, social life), engaging in fall prevention practices is of markedly less significance to me*				
12). Working to engage in fall prevention practices is more important to me than leisure and amusement				
13). Even before I started engaging in fall prevention practices, preventing a fall was important to me				
14). I'm certain that engaging in fall prevention practices has a positive influence on my personality				
15). If I had enough time, I would engage more often in fall prevention practices				
16). I am confident that choosing to engage in specific fall prevention practices corresponds to my personal preferences				
17). Even before I turned 55, I voluntarily spent time thinking about engaging in fall prevention practices				

to prevent a fall (exercises, balance activities, home modifications, talking to my doctor and friends, attended lectures)				
18). I chose to engage in fall prevention practices primarily because of the interesting subject matter involved				

Appendix E: The Falls Behavioral Scale for Older Adults

The FaB Scale is a list of 30 statements that describes things we do in our everyday lives. Please read each statement carefully.
Circle how much each statement describes the things you do in your daily life. For example:
Only circle 'Doesn't apply' if the situation is something to which you are not exposed (for example, if you do not have a phone).
ID No._____
This assessment is called **The Falls Behavioural (FaB) Scale for the Older Person**.
The FaB Scale is a list of 30 statements that describes things we do in our everyday lives.

Please read each statement carefully. **Circle** how much each statement describes the things you do in your daily life.

For example: Circle Never Sometimes Often Always. Only circle 'Doesn't apply' if the situation is something to which you are not exposed

Would this describe the things you do in your daily life? Circle one that applies

1. When I stand up, I pause to get my balance.	Never	Sometimes	Often	Always	
2. I do things at a slower pace.	Never	Sometimes	Often	Always	
3. I talk with someone I know about things I do that might help prevent a fall.	Never	Sometimes	Often	Always	
4. I bend over to reach something only if I have a firm handhold.	Never	Sometimes	Often	Always	Does not apply
5. I use a walking stick or walking aid when I need it.	Never	Sometimes	Often	Always	Does not apply
6. When I am feeling unwell, I take particular care doing everyday things.	Never	Sometimes	Often	Always	Does not apply
7. I hurry when I do things.	Never	Sometimes	Often	Always	
8. I turn around quickly.	Never	Sometimes	Often	Always	

Now, these are the things you do indoors. Circle one that applies

9. To reach something up high I use the nearest chair, or whatever furniture is handy, to climb on.	Never	Sometimes	Often	Always	Does not apply
10. I hurry to answer the phone.	Never	Sometimes	Often	Always	Does not apply
11. I get help when I need to change a light bulb.	Never	Sometimes	Often	Always	
12. I get help when I need to reach something very high.	Never	Sometimes	Often	Always	

Would this describe the things you do in your daily life? Circle one that applies

13. When I am feeling ill, I take special care of how I get up from a chair and move around.	Never	Sometimes	Often	Always	Does not apply
14. When I am getting down from a ladder or step stool I think about the bottom rung/step.	Never	Sometimes	Often	Always	Does not apply

Now, these about lighting and eyesight. Circle one that applies

15. I notice spills on the floor.	Never	Sometimes	Often	Always	
16. I use a light if I get up during the night.	Never	Sometimes	Often	Always	
17. I adjust the lighting at home to suit my eyesight.	Never	Sometimes	Often	Always	
18. I clean my spectacles/ glasses	Never	Sometimes	Often	Always	Does not apply
19. When wearing bifocals or trifocals I misjudge a step or do not see a change in floor level.	Never	Sometimes	Often	Always	Does not apply

Would this describe the things you do in your daily life? Circle one that applies

Now, these are about shoes

20. When I buy shoes, I check the soles to see if they are slippery	Never	Sometimes	Often	Always	

Now, these are things outdoors

21. When I walk outdoors, I look ahead for potential hazards.	Never	Sometimes	Often	Always	
22. I avoid ramps and other slopes.	Never	Sometimes	Often	Always	
23. I go out on windy days.	Never	Sometimes	Often	Always	
24. When I go outdoors, I think about how to move around carefully	Never	Sometimes	Often	Always	
25. I cross at traffic lights or pedestrian crossings whenever possible.	Never	Sometimes	Often	Always	Does not apply
26. I hold onto a handrail when I climb stairs.	Never	Sometimes	Often	Always	Does not apply

Would this describe the things you do in your daily life? Circle one that applies

27. I avoid walking about in crowded places.	Never	Sometimes	Often	Always	
28. I keep shrubbery and plants trimmed back on the pathways to my front/back doors.	Never	Sometimes	Often	Always	Does not apply
29. I carry groceries up the stairs only in small amounts.	Never	Sometimes	Often	Always	Does not apply

Finally, these are about medications

30. I ask my pharmacist or Dr. questions about side effects of my medications.	Never	Sometimes	Often	Always	Does not apply

*Thank you for completing the Falls Behavioral Scale for the Older Person

With permission from Clemson, Cummings, and Heard (2003)

Appendix F: Permission Letter to use Falls Behavioral Scale and Study Interest Questionnaire

To: Lindy Clemson
Fri 8/3/2018 8:11 PM
To: Jan Kress
Jan,
the FaB is publicly and freely available and can be downloaded from
http://fallspreventiononlineworkshops.com.au/

so perhaps you could reference this source as well.,
Feel free to copy or reproduce for your research.
I look forward to your final report, all the best in your studies

Lindy

LINDY CLEMSON
Professor in Ageing & Occupational Therapy
Research Leader: Physical Activity, Lifestyle, Ageing & Wellbeing
Faculty of Health Sciences
Charles Perkins Centre Active Ageing Research Node lead
Investigator, Centre for Excellence in Population Ageing Research CEPAR
THE UNIVERSITY OF SYDNEY

Ulrich Schiefele
Sat 8/4/2018 7:23 AM

Dear Jan,

Of course, you can adapt the SIQ according to your needs and suggestions. The SIQ has not been published as a separate test, and therefore I think it is not protected by any copyright. Anyway, I am glad that you can use the SIQ and you are free to make any changes you think are necessary for your research goals.

Looking forward to see result from your research! Good luck!

Best regards,

Ulrich

Ulrich Schiefele
Universität Potsdam
Humanwissenschaftliche Fakultät
Department Psychologie