5-2015

A Matter of Balance: Program Outcomes for Community-Dwelling Older Adults

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https://doi.org/10.33015/dominican.edu/2015.OT.03

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A Thesis Submitted in Fulfillment of the Requirements for Degree

Master of Science in Occupational Therapy

School of Health and Natural Sciences

Dominican University of California

San Rafael, California

December 2014

This thesis, written under the direction of the candidates' thesis advisor and approved by the Chair of the program, has been presented to and accepted by the Faculty of the Occupational Therapy department in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy. The content, project, research methodologies presented in this work represent the work of the candidates alone.

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Acknowledgements

First we would like to thank our faculty thesis advisor Dr. Kitsum Li. This capstone project would not have been possible without her dedication and insight. She always encouraged us to dig deeper and she saw the potential in our capstone project from the very beginning. Her tireless work ethic is an example to which we will all strive to as we continue the next chapter of our lives. Thank you to the Dominican University of California Occupational Therapy Department staff for your expertise, knowledge, and guidance throughout the program.

We would like to acknowledge Deborah Bolding, PhD, OTR/L, FAOTA and Ellen Corman, BSOT, MRA, Stanford Health Care, for the opportunity to collaborate with them as well as their assistance and guidance throughout this project. In addition, we would like to thank Tricia Catiggay, OTR/L, Stanford Health Care.

I would like to thank my family and friends for their endless support and unconditional love throughout this journey. My deepest gratitude and appreciation goes to my parents, who have given me the best of everything in this world without hesitation or limits. I will always cherish my father's words of wisdom and be grateful for him reminding me every day that "You can be anything you want in this world. If you want to be a painter, then be the best painter in this world." I will also be forever indebted to my mother for her daily check-ins and making sure my health and sanity were still intact. I truly appreciate the rest of my family and friends for knowing all the right ways in making this an extraordinary journey experience. –Tiffany Lau

I am grateful for those who have stood by to support me along the way. First, I would like to thank my family for their continuous support throughout my time in graduate school. A special thanks to my husband Rob and my children Alexis and Bobby, for your patience, love and support. You continue to inspire me to follow me dreams. Also, thank you to my mom, Frances, for always believing and supporting me in all of my pursuits. To my friends, thank you for listening, offering me advice, and supporting me throughout this entire process. A special thanks to my friend Antoinette for encouraging me to pursue this degree. This journey would not have been possible without all of your dedicated support. –Victoria Reyes

Throughout this experience I have learned that family is the single most important entity in my life. I would like to thank my dad, Kris, I will never forget when you told me how proud you were of me for getting accepted into graduate school and for passing down your brilliant creativity to me, for my mom, Elaine, and her never ending love, prayers, support and smartness, and for my brother, Jason, for always making me laugh and reminding me of my inner child. Your love and encouragement has brought me to where I am today. –Leslie Hollaway

Abstract

Aims: The purpose of this program evaluation was to determine if A Matter of Balance with volunteer lay leaders (AMOB/VLL) was effective in increasing fall self-efficacy, fall control, and fall management in community-dwelling older adults.

Methods: Participants included community-dwelling older adults over the age of 60 who were concerned about falls and attended at least five of the eight AMOB/VLL program sessions. Fear of falling, pretest, posttest, and 3-, 6-, and 12- month follow-up data were collected from program participants between 2012 and 2013.

Results: Participants demonstrated overall improvements in fall self-efficacy, fall control, and fall management. Qualitative analysis also showed that participants made behavioral, environmental, and physical changes after completing AMOB/VLL. There was also an overall improvement in sit-to-stand scores from pretest to posttest ($M = 1.34$, $SD=2.49$).

Conclusions: Findings show that AMOB/VLL is effective in decreasing fear of falling by increasing fall self-efficacy, fall control, and fall management.

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Introduction

Falls can potentially cause injuries and remain a crucial health issue worldwide, specifically within the population of community-dwelling older adults (Centers for Disease Control and Prevention [CDC], 2014b). With significant advances in healthcare, the average life expectancy has improved over the past decades which subsequently mean that older adults are living longer. Many older adults are choosing to age in place and are faced with challenges of the aging process along with chronic health conditions while living within the community independently (Ewen, Hahn, Erickson, & Krout, 2014). Increased falls have been associated with older age and can result in a series of negative effects such as functional limitations, decrease in overall quality of life, and mortality. Without proper intervention to maintain health and wellness, this puts community-dwelling older adults of and over the age of 65 at an increased risk for falls.

Research has shown that fall prevention programs play an important role in reducing fall risk (Chase, Mann, Wasek, & Arbesman, 2012; Costello & Edelstein, 2008). While previous studies have consistently proven exercise programs alone to be a strong contributor in preventing falls, multi-factorial intervention programs are also known to be effective among individuals with a previous fall history and for those who are at risk for falls (Costello & Edelstein, 2008). These multi-factorial interventions typically address areas such as exercise programs, medication management, vision, diet, and home modifications. However, one distinguishing issue that is not often addressed in these multi-factorial interventions is the Fear of falling (FOF) which many community-dwelling older adults face. FOF can be developed from individuals perceiving their own health status and functional abilities as inadequate, and consequently leading to reduced or restricted activity levels (Dias et al., 2011). Decreased participation in activities can severely

impact the overall quality of life for older adults. Emerging research has shown that cognitive-behavioral therapy (CBT) can be an effective intervention that changes maladaptive behavioral patterns and has been shown to reduce fear of falling (Huang, Liu & Yang, 2010). CBT can be used to change the perception of falls by allowing individuals to view falls as a controllable event, and thus increasing participation in daily activities.

Background

This literature review explores the causes and effects in regards to falls among the community-dwelling older adult population. More specifically, the following sections discuss research related to fall incidence, consequences of falls, and potential risk factors in addition to examining a cognitive-behavioral intervention known as A Matter of Balance (AMOB).

Fall Incidence

Falls are recurrent events among community-dwelling older adults that may be prevented given the appropriate types of interventions. In the United States alone, one out of three adults of and over the age of 65 experiences a fall each year (CDC, 2014b). Stevens, Corso, Finkelstein, and Miller (2013) found that in individuals over the age of 65, incidence rate increases with age for both men and women in regards to fatal and non-fatal falls. They also discovered that in non-fatal falls, women's rates surpassed those of men within the same age range. In another study conducted among community-dwelling older adults, Sartini et al. (2009) found that falls were the leading cause of admission to the emergency department. Furthermore, they also found that community-dwelling older adults are more likely to sustain a fall than those who reside in a nursing home and that falls are also more likely to occur when individuals engage in walking when compared to other activities.

There are many factors surrounding the occurrence of falls. Falls within the community-

dwelling older adult population can vary depending on frailty, how active and mobile they are, and where they spend the majority of their time such as indoors versus outdoors. Findings show that older adults who are more active tend to have a lower fall rate than those who are less active (Perracini, Teixeira, Ramos, Pires, & Najas, 2011). Therefore, it is important that older adults continue to engage in daily activities that encourage functional mobility and promote independence around the community. However, older adults who have experienced a fall become vulnerable to various repercussions such as physical injuries and costly medical bills which may lead to avoidance of activities.

Consequences of Falls

Falls can lead to negative consequences such as high healthcare costs, vulnerability to fractures, and increased mortality rate. In addition, a larger concern among community-dwelling older adults is development of fear of falling.

Healthcare costs. A substantial portion of medical care costs result from fall-related injuries. The CDC (2014b) reported that approximately $30 billion was directed towards medical costs in 2010 for injuries sustained from falls by older adults over the age of 65. As the community-dwelling older adult population continues to increase, the amount of healthcare costs will follow suit. It has been estimated that by 2020, injuries incurred from falls will reach an annual cost of $67.7 billion (CDC, 2014a). Stevens et al. (2013) reported in their study that the costs of non-fatal falls doubled for both men and women between the age groups of 65-84 with the women's rate doubling from $3 billion to $6 billion. An increased cost of 67%, equal to approximately $53 million, was found in women in comparison to men regarding fatal falls for those ages 85 years and older (Stevens et al., 2013). Given these statistics, rising healthcare costs can put community-dwelling older adults who have experienced or are at risk for falls in

financial hardship. This can also impact their ability to receive proper healthcare in treating and preventing falls.

Fractures. Another possible outcome for older adults who experience falls is the high susceptibility of fractures. When conditions such as osteoporosis are present, calcium and minerals are not being absorbed causing the bone to become fragile (National Institute of Health Osteoporosis and Related Bone Diseases National Resource Center, 2011). Osteoporosis can affect strength and flexibility in bones which consequently affects an individual's balance and gait pattern as well as putting older adults at a higher risk for falls. Stevens and Sogolow (2005) found fractures to be the most frequent diagnosis in unintentional fall-related injuries among older adults aged 65 years and older with women's rate at 37% and men's rate at 28.3%. Women had fracture hospitalization rates that were 2.3 times higher than men. In a national sample of older adults aged 65 and older, Moudouni and Phillips (2013) found that the majority of common fall-related injuries in the emergency room consisted of fractures of the hip, upper limb, lower limb, and within the cranium.

In 2010, adults aged 65 and older accounted for 258,000 of the reported hip fractures (CDC, 2014c). Hip fractures in particular are serious injuries that may require surgical interventions at times and are known to have more severe consequences. Hip fractures led to functional impairment, decreased social interaction, and dependency on activities. Zidén, Wenestam, and Hansson-Scherman (2008) described personal experiences of 18 participants who sustained hip fractures with accidental falls listed as one of the contributing factors. Commonalties were found around limited movement, lack of self-confidence with body, dependency on others, and feelings of seclusion in home environment. Stevens and Rudd (2013) analyzed national trends of hip fractures using hospital discharge summaries as a way to predict

future hip fracture rates among men and women over the age of 65 years. Results showed an overall decline in hip fractures among men and women between the ages 75-84. When the ages were grouped, men showed a steady decline only between the ages of 75 and older, while women showed a steady decline from ages, 65 to 84. Although there is a decreasing trend in hip fractures, as the population continues to age, individuals aged 65 years and older are expected to increase over 80%, from 258,000 in 2010 to 289,000 in 2030. Men's rate is expected to increase 51.8% while women's rate is expected to decrease by 3.5% (Stevens & Rudd, 2013). Ultimately, with our aging population, fractures acquired from falls are anticipated to increase over the years which can lead to decreased levels of activity and increase the risk for further complications.

Mortality rate. A more critical consequence of falling among the older adult population is mortality. Alamgir, Muazzam, and Nasrullah (2012) reported a 20% increase in fall mortality rates from years 2003-2007 during their study, particularly with fatal falls among men exceeding women. In addition, traumatic brain injuries (TBI) have been associated with falls and are a growing concern in the older adult population. According to Harvey and Close (2013), the majority of traumatic brain injury hospitalizations among older adults over the age of 65 were found to be fall-related and resulted from slipping, tripping, or colliding with another person on a leveled surface. Traumatic subdural hemorrhage is a common TBI which is associated with the highest number of deaths (Harvey & Close, 2013). Hip fractures have also been linked to morality since older adults are found to be at a higher risk for death during the first 3 months following a hip fracture (Haentjens et al., 2010). This fatal consequence may be due to the presence of multiple comorbid conditions and postoperative complications such as development of pneumonia from prolonged periods of immobility.

Fear of falling. Fear of falling is a negative effect that may lead to activity restriction among community-dwelling older adults. In a national sample, Bertera & Bertera (2008) found that age and sex had a considerable contribution to the development of fear of falling. Participants who were 85 years or older experienced more falls and were more likely to encounter fear of falling when compared to older adults that were 65-74 years of age. In addition, findings from this study showed that females were more likely to experience fear of falling in contrast to males. Overall, Bertera and Bertera concluded that participants who experienced fear of falling were more likely to avoid functional activities that consisted of movements such as lifting, bending, walking and reaching.

Fall Risks

In view of the consequences and incidence of falls, it is imperative that the population at risk as well as the general public understand the possible causes behind falling. Recognizing the fall risk factors will support the education and prevention of falls among community-dwelling older adults.

Psychosocial factors. Psychosocial factors play a considerable role in the risk of falling. Leung, Chi, Lou, and Chan (2010) examined the relationship between psychosocial factors and falls experienced by community-dwelling older adults using a cross-sectional survey with individuals who were applying for long-term care in Hong Kong. The results revealed that the following five psychosocial factors were initially correlated with falls: depressive symptoms, fear of falling, decline in social activities, informal care support given to the participants, and living alone (Leung et al., 2010). While previous studies had already identified depression and social support as risk factors associated with falls, individuals who had more social contact with their friends and family typically experienced less falls (Leung et al., 2010; Tinetti & Kumar,

2010). After further analysis of the data, results showed that living alone was the leading psychosocial factor which made community-dwelling older adults more inclined to experience a fall. Findings from this study provided evidence that an individual's psychological health is one of the influential factors that may increase the risk of falling (Leung et al., 2010).

Polypharmacy. In a study by Tinetti, Mendes De Leon, Doucette, and Baker (1994), researchers identified taking multiple medications, also referred to as polypharmacy, as a risk factor that may increase the risk of falls among older adults. The amount of health complications tends to grow as adults age which results in an increased use of medications to manage these conditions (Huang et al., 2012). As the number of medications taken increases, the risk of falling among older adults escalates as well (Tinetti & Kumar, 2010; Huang et al., 2012). Kojima et al. (2012) conducted a study with participants ages 65 years and older in order to show the influence of polypharmacy on falls over a two-year follow-up period. It was found that out of 165 participants, those who were taking five or more medications simultaneously demonstrated an increased risk for falling (Kojima et al., 2012). The necessity for using multiple medications among community-dwelling older adults also increases the side effects from these drugs which amplifies the vulnerability to other health risks such as falls.

Environment. A disorderly and crowded environment, especially within the home, is a common risk factor that increases the chances of falling for community-dwelling older adults. A cross-sectional survey was completed over a period of 12 months among 1, 398 participants who were interviewed and had their homes assessed for environmental hazards (Carter, Campbell, Sanson-Fisher, & Gillespie, 2000). The results of this study indicated that environmental hazards were associated with older adults who had experienced a fall or any other types of injurious accidents within the home (Carter et al., 2000). Stevens, Holman, and Bennett (2001)

demonstrated through their research findings that although interventions for environmental hazards within the home were useful strategies for preventing falls, the level of compliance was still relatively low. This study identified some of the most common home hazards as being loose floor rugs and mats, stopovers, poor lighting, trailing cords, and slippery floors. Participants were more likely to adhere to minimal and inexpensive recommendations such as removing throw rugs and tying up loose cords (Stevens et al., 2001). However, most participants in the study did not follow through with the recommendations completely. Therefore, educating older adults on the constituents of a safe environment and the rationale behind these recommendations are critical strategies to reduce the risk of falls.

Low vision. Difficulties with vision while walking and navigating various settings is another risk factor that heavily influences the chances of falling among community-dwelling older adults. Tromp et al. (2001) concluded from a prospective cohort study that visual impairment was strongly associated and predictive of recurrent falls and acquiring fractures. Similarly, findings from a cohort study of over 1,000 participants completed by de Boer et al. (2004) took it one step further and confirmed that impaired vision, especially visual contrast sensitivity, was an independent risk factor for recurrent falls and fractures. Ultimately, vision plays an essential role in preventing falls and fractures among community-dwelling older adults while safely engaging in everyday activities.

Balance. One of the most important factors in preventing falls among community-dwelling older adults is the physiological factor of balance. Results from a study performed by Sturnieks et al. (2013) showed that the inability to respond quickly and appropriately when a sudden disturbance in balance occurs may increase an individual's chances of falling. Being able to quickly counteract and regain balance is important in preventing falls for older adults.

However, physical attributes such as muscle weakness and poor strength may lower balance abilities in an individual and increase the chances of experiencing a fall. A study completed by de Rekeneire et al. (2003) provided evidence supporting a strong correlation between an increase in impaired balance and decreased physical strength and performance, particularly in the lower extremities. This study suggests that older adults who are not as physically strong in the lower extremities, which significantly affects mobility, may be increasing their risk for falls due to poor balance. Maintaining good balance throughout activities and safely accomplishing tasks are crucial elements in preventing falls among older adults who choose to remain independent.

Exercise. Reduced muscle strength and impaired balance and gait are additional risk factors for falls. In a systematic review and meta-analysis, Sherrington et al. (2008) searched for randomized trials in which the main intervention with older adults was exercise. The variables that were analyzed included number of falls, how many fallers, and the rate of falls. After using these specific variables to guide the review and analysis, Sherrington et al. found strong evidence that exercise programs reduce fall rates among older adults. Exercise programs that incorporated a balance-training component were found to be particularly effective.

In a randomized control trial with 317 participants, Clemson et al. (2012) designed and carried out a program called the Lifestyle integrated Functional Exercise (LiFE) where they emphasized the importance of movements that were aimed to improve balance and increase strength within everyday activities. A total of 107 participants in this intervention program learned strategies to improve balance which included reducing the base of support, applying dynamic standing balance, and pivoting. There were also various strength exercises consisting of bending the knees, standing on tiptoes, climbing stairs, sit-to-stands, and walking sideways. Aside from the LiFE approach, there was also a structured program in which 105 participants

followed specific training exercises three times a week with the purpose of increasing balance and strength. The LiFE approach and structured programs were taught over 5 sessions in addition to two-booster sessions and two follow-up phone calls over a six-month period (Clemson et al., 2012). There were 105 participants in the control program who completed flexibility exercises that were gentle and could be done while seated, standing, or lying down. The control program took place over 2 sessions, with 1 booster session and six follow-up sessions. Unlike the LiFE approach and structured program, the exercises for the control group were not modified according to each individual. At 12-month follow-up, it was found that the LiFE group experienced 172 falls whereas the structured exercise groups experienced 193 falls. The control group, on the other hand, experienced 224 falls. The LiFE approach demonstrated a clinically significant reduction in falls by 31 % when compared to the control group. The results from this study highlight the importance in increasing balance and strength exercises for older adults to reduce fall risk.

Footwear. A lesser discussed fall risk pertains to the types of shoes that community-dwelling older adults choose to walk around in and wear on a daily basis. Particular styles of shoes can impair balance and provide less support which ultimately increases the risk of falling (Sherrington & Menz, 2003). The hardness of the sole, the slip resistance of the outer sole, and the heel height are a few characteristics of shoes that have been found to impact balance (Menant, Steele, Menz, Munro, & Lord, 2008). A study completed by Menant et al. (2008) showed that an elevated heel height significantly impacted the overall performance of balance in addition to increasing postural sway. Within the same study, it was noted that shoes with high heel-collars as well as hard soles improved balance in older adults. Hence, specific shoe designs are helpful and important elements to consider when reducing fall risk among older adults.

Results from a similar study completed by Koepsell et al. (2004) discovered that going barefoot and wearing stockings or socks increased the chances of falling whereas athletic shoes lowered the risk of falls. Walking around barefooted puts the feet in a more vulnerable state for experiencing pain and sensations while socks and stockings dramatically decrease the amount of friction between the feet and the floor for resistance (Koepsell et al., 2004). Unfortunately, it is more common for older adults who are more sedentary and homebound to rely less on shoes when walking around the house which inadvertently places them at a higher risk of falling. Inappropriate or lack of footwear is a hazardous risk factor for falling that can be resolved with proper education on appropriate shoe choices.

Fear of falling. Fear of falling, a common concern in the older adult population, is a critical issue that may lead to a decline in physical functioning and decreased functional ability. Tinetti et al. (1994) introduced this concept by explaining how functioning in individuals could become more limited by fear of falling rather than experiencing an actual fall. This fear poses a psychological threat that creates negative outcomes for older adults. Zijlstra et al. (2007) provided further evidence that fear of falling is prevalent among individuals who had recently fallen as well as in individuals who have not yet experienced a fall. Instead of being solely related to a history of falls, fear of falling is often additionally linked to other factors such as aging, physical frailty, or low vision (Zijlstra et al., 2007). Fear of falling becomes a severe detriment when it affects functional ability related to balance and physical performance (Li et al., 2002). This fear may inadvertently cause individuals to become immobilized and avoid occupations that are necessary to life such as activities of daily living and other leisure activities. The psychological aspect of falling is taking a larger toll on older adults than the physical injuries acquired from actual falls, which may ultimately leading to damaging effects such as

immobility and other vital health issues.

Relationship between fear of falling and balance. Community-dwelling older adults may experience challenges in balance performance and functional mobility as they age. Individuals with impaired balance not only have reduced confidence, but are also fearful that their balance limitations may cause them to fall (Hatch, Gill-Body, & Portney, 2003). On the contrary, those who are physically active demonstrate improved balance and minimal fear of falling (McAuley, Mihalko, & Rosengren, 1997).

In a study conducted by Binda, Culham, and Brouwer (2003), researchers found that community-dwelling older adults who reported a fear of falling demonstrated a significant decrease in balance confidence when compared to the control group. These findings implicate that fear of falling can be developed within an individual when decreased confidence is present due to balance limitations. Hatch et al. (2003) were pioneers in successfully correlating balance confidence and functional balance ability by comparing the scores of the Timed-Up & Go Test (TUG) and Berg Balance Scale (BBS) with Activities-specific Balance Scale (ABC) scores. Southard (2006) further confirmed the relationship between balance confidence and performance by comparing the scores of the ABC with BBS scores. Through pre-test and post-test measures, participants who received the highest marks on the ABC also claimed the top BBS scores (Southard, 2006). This linear relationship between balance impairment and diminished balance confidence plays an important role in managing falls and fear of falling among older adults.

Activity avoidance. Inactivity and avoidance of meaningful occupations remain pervasive problems in the older adult population. Bertera and Bertera (2008) assessed the link between fear of falling and activity avoidance by examining nine everyday activities crucial to independence among community-dwelling older adults. Bertera and Bertera found that fear of

falling was the greatest predictor of activity avoidance which often leads to decreased physical performance, muscle strength and postural performance. Some of these everyday activities that are typically avoided include walking, reaching, bending, and going outside (Bertera & Bertera, 2008). Unfortunately, there are severe consequences associated with staying away from these common physical activities. Factors such as quality of life and physical capabilities are compromised as a result of activity avoidance, which create a cyclical effect that can lead to falls as well as increased fear and avoidance (Delbaere, Crombez, Vanderstraeten, Willems, & Cambier, 2004).

Fall self-efficacy. Self-efficacy in relation to falls is defined as the amount of confidence an individual possesses when performing activities without falling (Tinetti et al., 1994). When studying a cohort of community-dwelling older adults, Tinetti et al. (1994) discovered that fall self-efficacy proved to be a better determinant of functioning in an individual when analyzing and predicting function. Tinetti, Richman, and Powell (1990) recommended promoting fall self-efficacy as a critical component to prevent functional decline in older adults since individuals with low self-efficacy tend to avoid activities. Tinetti et al. (1994) also reported that in addition to affecting activities of daily living, fall self-efficacy is strongly associated to the level of physical functioning in older adults.

Li et al. (2002) confirmed that self-efficacy has a significantly stronger influence on balance and physical functioning than fear of falling. The authors further stated that interventions focused on directly reducing fear of falling may be misguided. Instead, their results suggested that interventions should concentrate more on physical skills and mobility in order to improve self-efficacy. McAuley et al. (1997) also supported the finding that using physical activity to increase fall self-efficacy could be effective in improving physical function

and reducing physical limitations. Activities that focus on enhancing balance, strength, and flexibility combined with aerobic activities such as walking are key components in physical activity programs for older adults.

Fall efficacy assessments. The ability to measure fall efficacy plays a significant role in determining whether an individual is at higher risk for falling. The Falls Efficacy Scale (FES) is an assessment that uses 10 activities of daily living to evaluate the degree of perceived efficacy at avoiding falls while performing these activities (Tinetti et al., 1990). The FES examines how the individual's level of fall efficacy relates to his or her physical functioning. However, Hatch et al. (2003) pointed out that the FES has a ceiling effect for higher functioning community-dwelling older adults and causing FES scores to be skewed for this sub-population within older adults.

In order to address the ceiling affect in the FES, the Modified Falls Efficacy Scale (MFES) was created and it is a 14-activity questionnaire (Hill, Schwarz, Kalogeropolous, & Gibson, 1996). The modified version has four additional activities on the scale which include outdoor activities. Hill et al. (1996) found the MFES to be internally consistent (Cronbach's alpha.95) when compared to the original FES which means the scores were more accurate and reliable. Validity was tested by comparing assessment results between a group of healthy older adults and a group of individuals attending a falls and balance clinic. A significant difference was found when comparing the MFES of the two groups ($p<.05$) (Hill et al., 1996). According to Hill et al. (1996), the MFES is a valid and reliable measure of falls self-efficacy and can be used in assessing community-dwelling older adults with impaired balance or falls.

The Activities-specific Balance Confidence Scale is another fall efficacy assessment which consists of a 16-item questionnaire that asks participants to score their level of confidence

while performing various tasks (Hatch et al., 2003). In 2005, Botner, Miller, and Eng completed a study using the ABC with 77 community-dwelling older adults who had experienced a stroke and remained ambulatory. The results of the assessment proved to be useful in measuring the participants' level of confidence when performing basic activities of daily living by separating items according to different levels of perceived risk. Hatch et al. (2003) also pointed out that in comparison to the FES, the ABC showed greater scale responsiveness for community-dwelling older adults between the ages of 65-95. Furthermore, Botner et al. (2005) discovered that the ABC pointed out which activities rank lower in confidence for participants which may help occupational therapists and other healthcare professionals formulate intervention strategies to build confidence.

The Survey of Activities and Fear of Falling in the Elderly (SAFFE) is another fall efficacy assessment that identifies the extent to which activity restriction is tied to fear of falling in community-dwelling older adults. It assesses 11 activities to determine if activity avoidance is related to fear alone, fear along with other factors, or other reasons besides fear. The SAFFE also measures where the activity avoidance is originating from and examines the level of engagement from an individual in an activity despite the factor of fear (Lachman et al., 1998). According to Lachman et al. (1998), there is an evident relationship between fear of falling and lower quality of life among community-dwelling older adults. This fall efficacy assessment would be useful in identifying where and how the fear of falling originates within community-dwelling older adults. By distinguishing the factors that cause the fear of falling, the most effective and appropriate types of interventions may be provided for older adults in order to decrease the risk for falling.

Cognitive-Behavioral Therapy

Fear of falling is a psychological risk factor that can produce negative consequences such as activity avoidance, social isolation, and physical inactivity. These adverse outcomes typically arise from individuals who avoid activities due to lack of confidence in physical strength and good balance. However, this lack of confidence is typically subjective and based on the individual's perception of his or her own physical abilities. With perception as the primary influence, it is important to understand the effects and use of cognitive restructuring, the essential element behind Cognitive-Behavioral Therapy (CBT), in fall prevention programs.

Cognitive-Behavioral Therapy is a frame of reference that focuses on empowering an individual with knowledge and using that information for problem solving, skill building, and modifying maladaptive behaviors (Bruce & Borg, 2002). CBT theorizes that a person's beliefs affect their thinking which will ultimately affect their behavior as well. CBT also operates on verbal and behavioral strategies to change an individual's thought process in hopes of restructuring maladaptive behaviors (Bruce & Borg, 2002).

From a CBT standpoint, it is expected that the methods and techniques used for cognitive restructuring will increase an individual's self-efficacy and ultimately alter dysfunctional behaviors such as avoidance of activities. Therefore, fall prevention programs such as A Matter of Balance (AMOB) are being implemented in the community-dwelling older adult population to reinforce fall self-efficacy and encourage continued participation in activities.

A Matter of Balance. As discussed earlier, fear of falling is a risk factor that may result in a number of consequences which include physical and psychological trauma as well as activity avoidance (Tennstedt et al., 1998; Zijlstra et al., 2009; Zijlstra et al., 2011). More importantly, Tennstedt et al. (1998) found through their study that individuals who had a fear of falling were

more reluctant to participate in activities and were typically less active. These individuals were considered to have a lower fall self-efficacy which means lacking the confidence to participate in daily activities without experiencing a fall (Tennstedt et al., 1998). In response to these findings, a multi-component fall risk prevention program called A Matter of Balance was developed. The main objective of this program is to decrease fear of falling and increase participation in physical, social, and functional activities. To achieve these goals, AMOB works towards increasing an individual's self-efficacy and the belief that falls are controllable. In order to determine the effectiveness of AMOB, Tennstedt et al. conducted a seminal study to explore the impact of AMOB on its participants.

Participants. Community-dwelling older adults aged 60 years or older in the Boston area were recruited in the randomized controlled trials (Tennstedt et al., 1998). Older adults that participated must have expressed a concern of falling that was disclosed through a self-report. The study excluded participants who had any major or chronic health problems that would hinder their participation in the study. Participants were recruited through referrals by managers, social workers, and case managers as well as notices posted within the community. There were a total of 434 participants with 216 individuals assigned to the intervention group and 218 older adults in the control group.

Intervention. A Matter of Balance is a group program consisting of four bi-weekly sessions with each meeting lasting for two hours. The sessions include activities such as group discussions, videos, group problem solving, role playing, exercises, home assignments, and behavioral contracts that are led by nurses trained as group facilitators (Tennstedt et al., 1998). The goal of the first few sessions is to introduce the idea that falls are controllable by increasing the participant's self-efficacy. To address this issue, cognitive restructuring intervention is

utilized which involves changing the perception of falling to be seen as manageable. In addition, these sessions attempted to increase the participant's level of confidence and maintain a pragmatic view of setbacks if a fall were to occur. Additionally, participants watched videos of older adults relaying their views of falling including both positive and negative reactions in order to emphasize the differences between the two. After participants viewed these recordings, they completed exercises and activities that typically increase the risk of falls. This portion of the curriculum provided participants with learning material that incorporated facts about falls, the significant role exercise plays in decreasing fall risk, and the negative consequences of restricted activity. Balance and strengthening exercises were taught during these sessions. Participants were also educated on how to empower and advocate for themselves when dealing with healthcare professionals through assertiveness training. Additionally, the program facilitated discussions between the participants and their caregivers regarding their fear of falling and the falls they may have experienced. The last step of the program comprised of goal setting, discussions of behaviors, and addressing individual needs and concerns.

Measures. A few assessments were used in the original study to measure if the fear of falling decreased while physical, social and functional activity increased after participation in the program. In addition to the Fall Efficacy Scale (FES), the assessments utilized by Tennstedt et al. (1998) included the Sickness Impact Profile (SIP) and the Intended Activity Scale (IAS). The SIP measures if an individual's behavior changes due to health issues. It is a list of 68 behaviors that the respondent uses to self-record and review for any changes in behavior when carrying out daily activities with the onset of an illness. Lastly, the IAS measures the degree of certainty an individual feels that he or she will participate in certain activities for the upcoming week (Tennstedt et al., 1998). Self-reported data were collected at 6 weeks, 6 months, and 12 months

following completion of the program. The surveys included questions regarding self-efficacy, engagement in activities, and whether or not the participant experienced a fall after the intervention.

Results. There was an attrition rate of over 19% for the intervention group and 30% for the control group in the study conducted by Tennstedt et al. (1998). Immediately after the program, the intervention group showed greater levels of intended activity, less health-related problems with mobility, and improved attitudes towards the ability to control falls. After data was analyzed for statistical significance, Tennstedt et al.) discovered that participants who attended less than five sessions scored higher on the Physical and Psychosocial Subscales of the SIP and had a higher overall score of the SIP which implied increased limitations in behavior. Moreover, those who attended less than five sessions scored lower on the IAS which indicates decreased activity levels.

Participants from the intervention group that attended five sessions or more increased their participation in daily activities, fall self-efficacy, and belief that they could control falling (Tennstedt et al., 1998). They also experienced increased levels of intended activity and demonstrated less activity limitations due to health problems. However, six months after completing the program, Tennstedt et al. found that the benefits of the intervention weakened and the positive gains of increased activity and mobility slightly decreased among the intervention group. Despite this drawback, the AMOB group continued to show overall improvements in functioning 12 months post-intervention while the control group reported increased maladaptive behaviors and problems. Therefore, participation in AMOB may have resulted in positive lasting outcomes in changing participants' attitudes about falls. The researchers concluded that although cognitive restructuring was the most difficult concept to

implement out of all the intervention methods in AMOB, it had the most immediate and long lasting effects for those that attended the majority of the sessions.

Impacts of a booster session. Since the study performed by Tennstedt et al. (1998) noted a decrease of the intervention effects on self-efficacy and the attitude of falls after six months, the authors suggested a booster session three months post-intervention may be beneficial in maintaining the gains from participation in AMOB. Zijlstra et al. (2009) conducted a randomized controlled trial study with a multi-component cognitive behavioral group similar to A Matter of Balance. The elements of the program as far as content and activities were identical to AMOB. However, Zijlstra et al. added a booster session six months after the last session as well as changing the frequency of classes to once a week over eight weeks instead of bi-weekly sessions over four weeks. The researchers reasoned that it would give participants more time to integrate the elements of the intervention into their daily lives, and that the participants were more likely to attend the classes if it took place over an eight-week period rather than a four-week period. There were a total of 540 participants in this study with 280 in the intervention group and 260 in the control group. The participants in this study were similar to the group from the study by Tennstedt et al., except these community-dwelling older adults were over the age of 70 residing in the Netherlands.

The results of the study were similar to the findings reported by Tennstedt et al. (1998) study. Participants from the intervention group experienced a decrease in their fear of falling, activity avoidance, and concerns about falling. These participants also increased their perceptions of control over falling and engagement in daily activities, especially for those who followed the regimen including home exercises (Zijlstra et al., 2009). Furthermore, the incidence and recurrence of falls among participants in the control group increased after 14

months when compared to the intervention group. This encouraging outcome may be explained by the modified scheduling of the program taking place over an eight-week period which allowed the participants to transfer the skills they learned during the classes into home environments. Participants from the intervention group during the Zijlstra et al. study also experienced a decrease in the number of recurrent falls one year after the intervention. Even the individuals who experienced a fall 12 months after termination of the program demonstrated a reduction in the overall fall rate.

Mediating psychosocial factors in A Matter of Balance. Zijlstra et al. (2011) further analyzed the results from the previous study conducted by Zijlstra et al. (2009). The authors of this study wanted to follow up with surveying the mediating effects of psychosocial factors in regards to falling. The study analyzed how specific psychosocial factors such as control, self-efficacy, outcome expectations, and social interactions interacted with the intervention. Part of the examination also included the participant's views on falling and their level of participation in daily activities. Zijlstra et al. (2011) hypothesized that improvements in control and self-efficacy beliefs may have increased the participants' ability to cope with and understand how fear of falling may have interfered in their daily life activities. To measure each psychosocial factor, detailed questionnaires were developed to record the participants' responses for control of fall risk, self-efficacy and its components of outcome and social expectations. The results showed that all of these psychosocial factors had moderate effects on the participants' success in the intervention as well as their concerns about falls and participation in daily activities, but these gains started to decrease after eight months. On this note, the authors recommended further research to discover ways to increase these mediating effects immediately after intervention in order to sustain the positive gains over time.

Lay Leader Model. Healy et al. (2008) looked at the feasibility of translating the leadership role for A Matter of Balance from trained health professionals to a lay leader model. The aim of this study was to determine if A Matter of Balance intervention led by volunteer lay leaders (AMOB/VLL) could achieve comparable outcomes with the AMOB program led by a professional. The implications of this study are critical because if the AMOB/VLL model can show comparable results to the original AMOB, it may allow the intervention to be replicated by community-based organizations. This study employed a single group repeated measure design. To measure if the outcomes were comparable, the Healy et al. decided to measure the results of fall self-efficacy, fall control, and fall management. Fall self-efficacy is defined as the participants' belief that they can safely engage in everyday activities. Fall control is characterized as viewing falls as a controllable event and overcoming the fear of falling. Fall management is described as the ability to effectively manage fall risks. Scoring highly on all three tests would indicate a decreased fear of falling. These measurements were collected immediately after the intervention as well as 6 weeks, 6 months, and 12 months after the intervention.

Volunteers. The coaches of the AMOB/VLL intervention were recruited by volunteer coordinators of collaborative organizations and were required to undergo a standardized two-day training. These coaches were given a manual tailored for the AMOB/ VLL model that was adapted from the original AMOB manual (Healy et al., 2008). Furthermore, mentor relationships were established between new coaches and experienced coaches to provide feedback to the newly-trained facilitators. An important component of the AMOB/VLL was the introduction of fidelity monitoring to help ensure that the elements of the original A Matter of Balance program were maintained. The fidelity monitoring included contacting the developers

of A Matter of Balance to ensure that the integrity of the core curriculum was preserved despite the changes made to the program. Modifications included professional supervision during the sessions, mentor and mentee relationships, a simplified handbook for volunteers, and closely monitoring participants' attendance. All of these factors helped guarantee that the key elements of the program were maintained during the study conducted by Healy et al.

Results. The outcomes of this study were measured using the Fall Efficacy Scale (FES), the Fall Control Scale (FCS), and the Fall Management Scale (FMS). Higher scores in all assessments indicate a more positive view of self-efficacy as well as enhanced control and management of falls. Another assessment used was an adapted version of the Physician- Based Assessment and Counseling on Exercise (PACE) to record activity levels and social activity. Participants' attendance to the program was also monitored and noted. The results of the study demonstrated that there were increases in all scores of the FES, FCS and FMS provided at 6 weeks, 6 months, and 12 months after the intervention (Healy et al., 2008). More importantly, there was a decrease in self-reported falls at the sixth month and twelfth month follow-ups. After the intervention, participants scored higher on the PACE indicating improvements in exercise levels and social activity. The results from the study by Healy et al. showed that it was possible to have an AMOB/VLL model implemented in the communities and the intervention would yield similar benefits as a professionally led model. These implications are significant because it would allow A Matter of Balance to reach a greater number of community-dwelling older adults residing in various locations and settings.

A Matter of Balance in the minority population. There are well-documented discrepancies in access to health care and the quality of care received by minorities of different ethnicities (Lee Smith, Ahn, Mier, Jiang, & Ory, 2012). However, there has been little research

explaining how these health disparities and ethnic characteristics affect access to fall risk prevention programs. This issue needs to be addressed because minority populations, especially the Hispanic population, are rapidly increasing in the United States. The older Hispanic population is also growing faster than older non-Hispanic whites (NHW). In a study completed by Lee Smith, Ahn, Mier, et al., they implemented the study to analyze the effectiveness of the AMOB/VLL on NHW and Hispanic populations in Texas. Data was collected from the AMOB/VLL program that was implemented by community agencies around Texas. This study analyzed 1,233 people who were aged 65 and older and participated in the AMOB/VLL program during 2006-2009. Demographic characteristics as well as FES scores from before and after the intervention were collected. The results revealed that Hispanics were younger, poorer, and less educated than their NHW counterparts. Both NHW and Hispanic participants showed a significant increase in self-efficacy scores from baseline to post-intervention (t = -15.90, p < 0.001; t = -9.13, p < 0.001 respectively). In addition, the number of days when participants had limited activity (t = 1.99, p = 0.049) and difficulty with mental health (t = 2.51, p = 0.013) significantly decreased. When compared to the NHW, the Hispanics with chronic health conditions scored 0.99 points higher in the FES post intervention (Z = 2.88, p = 0.04) than NHW which indicated a greater increase in self-efficacy post-intervention when compared to their NHW counterparts. This study revealed that while the AMOB/ VLL model benefitted both NHW and older Hispanic adults, the Hispanic participants demonstrated greater positive effects than the NHW participants.

A Matter of Balance in rural and urban populations. Environmental factors play a significant factor in access to health care and resources. For instance, rural settings have a greater population of older adults compared to the urban population which may suggest that

individuals in rural settings can face challenges such as lower levels of health support and limited community resources. There are also issues specific to rural areas including underdeveloped transportation infrastructures, less hospitals, and less health prevention programs available (Lee Smith, Ahn, Sharkey, et al., 2012). Lee Smith, Ahn, Sharkey, et al. analyzed data during a two-year period among 1,482 older adults who participated in the AMOB/VLL program in Texas. The objective of the study was to identify any differences in outcomes between rural and urban older adults. Participants were recruited through local agencies and the AMOB/VLL model was implemented over either four or eight weeks. The postal codes of the participants were recorded and they were then grouped into either the rural or urban population. The two assessments that were used to measure the outcomes were the FES and the Health Interference Scale (HIS). The FES scale is the same assessment utilized from the studies previously discussed. The HIS measures how different activities are limited and affected by certain health conditions. Personal characteristics of the participants were also recorded during this study. It was found that a higher percentage of individuals who lived in rural areas were non white, less educated, and had a greater incidence of chronic health problems.

The findings from the study revealed that when compared to baseline, participants in the rural areas improved their fall efficacy scale to a larger degree than their urban counterparts (Lee Smith, Ahn, Sharkey, et al., 2012). Both rural and urban participants showed a decrease in activity limitations after the intervention. However, the rural population showed twice the decrease in activity limitations from baseline as compared to a ¾ decrease in the urban population. The rural population also scored 1.58 lower on the efficacy scale than the urban population. This indicates that the rural populations had greater improvement in their fall efficacy than the urban population. These findings also suggested that while both rural and

urban populations experienced an increase in falls efficacy in addition to lower health interference scores and less days of limited daily activity, it was the rural population that made the most gains in all areas after participating in the AMOB/VLL intervention. These findings are an important implication in that the AMOB/VLL intervention may be a valuable tool in rural settings where health care services are not as accessible compared to urban settings.

All of these studies highlight the effectiveness of A Matter of Balance in improving fall self-efficacy, fall control, and fall management. Multiple studies have revealed that AMOB can be successfully translated and facilitated by volunteers in a variety of settings and geographic locations. Positive gains have also been effectively demonstrated among different ethnicities in regards to fall efficacy, levels of physical activity and decreased days of poor health (Lee Smith, Ann, Sharkey, et al., 2012). In order to support these consistent results, a program evaluation was completed on the AMOB program implemented in an urban population in California and its effectiveness as a fall prevention program in increasing fall self-efficacy, fall control, and fall management among community-dwelling older adults.

Statement of Purpose

From the literature review, it is apparent that falling is a critical threat to older adults for numerous reasons, including financial and psychological costs of physical injuries as well as secondary health issues due to inactivity. In an effort to prevent these potentially grave consequences, fall prevention programs such as A Matter of Balance are valuable interventions for lowering fall risks and fall incidence among community-dwelling older adults. However, it is important to establish the effectiveness of these programs to ensure the success that older adults may gain from the exercises and recommendations. The purpose of this program evaluation is to determine if a volunteer lay leader model of A Matter of Balance is an effective program in

increasing fall self-efficacy, fall control, and fall management in the community-dwelling older adult population. The following questions will be taken into account during the program evaluation process:

1. Does fall self-efficacy increase after participation in A Matter of Balance?
2. Does participation in A Matter of Balance increase behaviors related to fall control?
3. Does participation in A Matter of Balance increase fall management?

Ethical and Legal Considerations

Throughout the program evaluation, investigators complied with the American Occupational Therapy Association (AOTA) *Occupational Therapy Code of Ethics and Ethics Standards (2010)* to demonstrate trustworthy and ethical practices. Prior to the data collection, exempt status approval from the Institutional Review Board (IRB) at Dominican University of California (IRBPHP Application, #10227) (see Appendix A) and Stanford University were obtained to ensure that the processes of this program evaluation maintained confidentiality and procedural justice.

In order to protect the privacy of the participants and appropriately interpret the information, the completed program forms used during this program evaluation remained confidential and were kept safely stored at Stanford University Community Outreach and Prevention Program, only to be accessed by the investigators and program administrators. A signed letter of consent to access the participants' program forms from Stanford University Medical Center Trauma Service was obtained prior to data collection (see Appendix B). Confidentiality was ensured by assigning numerical codes for participants in reference to the data when transferring and inputting them onto an encrypted Excel spreadsheet. The encoded

information from the program forms remained password protected during transportation to SPSS for analysis.

Furthermore, the investigators also abided by all the other principles from the AOTA Code of Ethics such as social justice, beneficence, and veracity. Aside from maintaining confidentiality of the participants' and their data, the investigators demonstrated the principle of veracity by providing the most accurate results from analyzing the data. Any and all findings from this program evaluation and the effectiveness of AMOB/VLL were recorded and shared with the program administrators at Stanford University Community Outreach and Prevention Program to benefit the future program planning process, in hopes of promoting improved fall prevention programs for the community-dwelling older adults.

Theoretical Framework

A Matter of Balance is a fall prevention program that uses cognitive restructuring to change individuals' perceptions towards fear of falling. The program was developed to change individuals' fall efficacy which may ultimately lead to decrease in risk of falling (Tennstedt et al., 1998). Given that AMOB is a multi-component cognitive behavioral group intervention, the concept of self-efficacy is a fitting framework that encompasses the fundamental aspects of this fall prevention program.

Self-Efficacy

Dr. Albert Bandura defined the concept of self-efficacy as the personal belief that an individual has in their own capabilities to perform at specific levels while accomplishing tasks which affect their lives (Bandura, 1994). These beliefs regulate how an individual thinks, feels, and behaves in addition to their level of motivation to perform and succeed. In an article called "*Self-efficacy: Toward a Unifying Theory of Behavioral Change*" (1977), Bandura introduced a

theoretical framework to explain how an individual's thought process can affect their self-efficacy as well as how he or she is able to change fearful or avoidant behaviors. Bandura stated that avoidance or fear of activities does not facilitate the development of coping skills which in turn leads to a feeling of incompetence that fosters fear in participation of activities or experiences (Bandura, 1977; Bandura, Adams, & Beyer, 1977). While Bandura believed that cognitive processes can change behaviors, he also explained that thinking is most influenced and changed by experiencing success in an activity. Exposure to success can ultimately yield long lasting changes in behavior for an individual (Bandura, 1977).

During the development of the theory, Bandura recognized that two concepts, efficacy expectation and outcome behavior, significantly affect a person's self-efficacy (Bandura, 1977). Efficacy expectation is the belief that an individual can successfully complete an activity with a positive outcome, whereas outcome behavior is an individual's belief that a particular behavior will lead to a specific outcome (Bandura, 1977). Bandura believed that these two factors can determine the strength and resilience of an individual's self-efficacy. Furthermore, efficacy expectation can establish the levels of determination and persistence in continuing with producing positive behaviors and outcomes that lead to success. Individuals tend to avoid fear threatening situations that they believe exceed their level of coping skills. In contrast, individuals behave confidently in activities where they are able to deem themselves competent in dealing with the specific situation. The expectations that individuals have of their eventual success in activities may strongly affect their coping efforts. Individuals who perceive themselves to possess strong self-efficacy will demonstrate more persistence in a difficult activity. Continued participation in activities that induce fear will consequently lead the

individual to gain corrective experiences and reinforce their sense of self-efficacy (Bandura, 1977; Bandura et al., 1977).

Bandura theorized that self-efficacy is influenced by four assumptions of personal efficacy which include performance accomplishments, vicarious experiences, verbal persuasion, and physiological states (Bandura, 1977; Bandura et al., 1977; Bandura, 1982). Bandura described performance accomplishments as the first principle to influence self-efficacy which is viewed as personal mastery of an experience (Bandura, 1977; Bandura et al., 1977). Once individuals excel in an activity, their expectations of success tend to increase with future tasks. The second principle that Bandura acknowledged is vicarious experience which occurs when an individual observes someone else accomplishing a task that he or she considers to be difficult. Witnessing someone else's success in the activity causes the individual to increase his or her own efforts and persistence in the task. In other words, if the individual notices someone else attempting the task without suffering from any negative consequences, this may influence the individual to try harder in their own endeavor (Bandura, 1977; Bandura et al., 1977). The third principle addressed by Bandura, verbal persuasion, uses verbal praise and encouragement which has gained popularity due to its ease of execution. Verbal persuasion allows individuals to believe that they are able to accomplish difficult tasks in addition to providing encouragement for completing a challenging or threatening task (Bandura, 1977; Bandura et al., 1977). Bandura's last principle involves physiological states which include emotional arousal such as feelings of stress or anxiety arising from difficult situations. These feelings can be channeled into overcoming fear they may be experiencing while involved in the task (Bandura, 1977; Bandura et al., 1977). Ultimately, Bandura believes that these four concepts interact with one another to influence an individual's efficacy expectations.

Bandura emphasizes that this theoretical framework may be used in a multitude of disciplines to help recognize the amount of effort that is put forth into completing activities, which in turn may explain why individuals engage in specific behaviors (Bandura, 1977; Bandura et al., 1977). In "*The Primacy of Self-Regulation in Health Promotion*" (2005), Bandura defined the connection between self-efficacy and the promotion of health. He stated that health management is comprised of reactive influences which include personal motivation and the appropriate social support in order to maintain a healthy lifestyle (Bandura, 2005). Being able to personally maintain health can increase an individual's self-efficacy as well as his or her sense of responsibility towards his or her own health status. Increased self-efficacy may potentially influence an individual to become more active which a key component behind A Matter of Balance and how it is an effective fall prevention program for community-dwelling older adults concerned about or at risk for falls. Therefore, self-efficacy seems to be a fitting theoretical framework in analyzing A Matter of Balance and understanding how an individual's perception of falls influences his or her engagement in meaningful activities.

Definitions and Variables

The main aspects of this program evaluation involve the understanding of what a fall is and who qualifies as a community-dwelling older adult. A fall is defined as a "sudden, unintentional change in position causing an individual to land at a lower level, on an object, the floor, or the ground, other than as a consequence of a sudden onset of paralysis, epileptic seizure, or overwhelming external force" (Feder, Cryer, & Donovan, 2000). Community-dwelling older adults are identified as individuals who are age 60 or older and live independently (Steultjens et al., 2004).

A Matter of Balance focuses on addressing fear of falling among community-dwelling

older adults, specifically through the three variables of fall self-efficacy, fall control and fall management of participants. As stated previously from a study completed by Healy et al. (2008), fall self-efficacy is defined as the participants' belief that they can safely engage in everyday activities. Fall control is characterized as viewing falls as a controllable event and overcoming the fear of falling. In addition, fall management is described as the ability to effectively manage fall risks (Healy et al., 2008). These three fundamental terms were used to guide the program evaluation of A Matter of Balance in hopes of gaining a better understanding on how to effectively promote healthier lifestyles among community-dwelling older adults.

Methodology

The purpose of this program evaluation was to determine if the A Matter of Balance/Volunteer Lay Leader Model is an effective program in improving fall-self efficacy, fall control, and increasing fall management behavior in community-dwelling older adults. In order to address this issue, a retrospective chart audit approach was used to explore this program evaluation.

Design

This program evaluation followed a retrospective approach by collecting data from and analyzing program forms which were completed from participants in previous years. Retrospective approach examines data collected in the past that may have been obtained from records, databases, or surveys (Portney & Watkins, 2009). The data of this program evaluation originated from multiple sources of program forms completed by participants between the years 2012 and 2013. Only participants who had attended at least five out of the eight AMOB/VLL sessions were included.

Subjects

The participants in this fall prevention program were typically self-referred. The program administrators provided brochures with program information which were received by the community-dwelling older adults while visiting their physician or passed around at the senior and community centers where the AMOB sessions took place. AMOB/VLL targeted community-dwelling older adults who were over the age of 60 and had concerns about falls. A history of falls was not required and individuals who were interested in addressing fall prevention were encouraged to join the program. Since the classes were held at senior or community centers, only community-dwelling older adults who were ambulatory and could leave their homes were included in the AMOB/VLL program and were accounted for in this program evaluation. Furthermore, participation was limited to individuals with medical clearance from their physicians to engage in the physical activities throughout the program. The participants were residents within the San Mateo and Santa Clara counties in California.

Data Collection Procedures

With consent from Stanford University Medical Center Trauma Service, the investigators gained access to participants' program files for pertinent data collection. The information for this program evaluation emerged from three structured questionnaires completed by participants enrolled in AMOB and a Sit-to-Stand assessment.

The first self-reported form was the pretest (see Appendix C) which was completed before the start of the program while the posttest (see Appendix D) was completed immediately after the program ended. The pretest form provided baseline information of the participant for the program evaluation. The questionnaire asked participants fall-related questions such as their fall concerns, current methods of fall prevention, and the participant's fall history in the past

year. Questions regarding activity avoidance and exercise patterns were also included in the form. Similarly, the posttest survey included questions regarding falls and activity levels that were found on the pretest. Information on the participant's feelings towards fear of falling after participation in the AMOB program was also included.

Follow-up program forms (see Appendix E) for 3 months, 6 months, and 12 months from the program completion date were sent to participants according to the specified follow-up period. The follow-up surveys asked more detailed questions regarding exercise, environmental, and lifestyle changes made after completing the AMOB. Aside from these program forms, participants were also assessed using the Sit-to-Stand assessment (see Appendix F) at the beginning and the end of the program. All of these completed program forms remain in participants' files at Stanford University Medical Center Trauma Service, the administrating organization/agency of the AMOB/VLL program.

Data Analysis

The primary purpose of this program evaluation was to examine the correlation between AMOB/VLL and its potential outcomes resulting from participation in the program such as fall self-efficacy, fall control, and fall management behavior. The information collected from the completed surveys was analyzed using Statistical Package for the Social Sciences (SPSS) version 12.0. The investigators used descriptive statistics, paired sample *t*-tests, Kruskal-Wallis one-way analysis of variance, Pearson product-moment correlation coefficients, and Wilcoxon signed-rank test to examine and conclude on the three variables under study. Descriptive statistics were used to depict the demographics of the participants such as their age, sex, and ethnicity. Paired samples *t*-tests were utilized to investigate the sit-to-stand changes that occurred after participation in the program. The Kruskal-Wallis one-way analysis of variance also assessed the

sit-to-stand data by comparing the change in scores among the groups when categorized by age and ethnicity. Pearson product-moment correlation coefficients were used to examine the relationships among the three variables of fall self-efficacy, fall control, and fall management behaviors with factors such as age group, sex and ethnic groups. Lastly, the Wilcoxon signed-rank test was used to determine if there were any significant changes between the corresponding first and last session survey questions

Results

During the data collection process, 328 participants' files were reviewed by the investigators. However, after further review, it was found that three participants did not meet the inclusion criteria in regards to age and were consequently excluded from this program evaluation. There were a total of 168 participants' files that were also left out from the data analysis due to attrition with less than five sessions attended (n = 52) and incomplete data on survey forms (n = 116). For the final analysis, a total of 157 participants' charts consisting of complete data sets were evaluated. The main characteristics gathered from the participants during this program evaluation include their sex, ethnicity, and the age groups they were categorized in (Table 1).

Quantitative Data

The first statistical test used was the Pearson product-moment correlation coefficient. The participants' age, sex, and number of sessions attended were correlated with the components of fall self-efficacy, fall control, and fall management within the first and last survey questions. The survey questions describing participants' concerns about falling in relation to the following: how much interference this caused with their normal social activities, their certainty about

finding ways to get up or protect themselves if they fall, how sure they feel about finding ways to reduce falls, and their intentions to increase physical strength and exercise patterns.

The results from the Pearson product-moment correlation coefficient yielded only moderate and weak correlations, but each proved to reach a statistical significant level of <.001. Areas within moderate correlation were the more comfortable participants feel when talking with others about fear of falling, the more likely they are to make changes to their environment (r = .428, p < .001) and the more comfortable they are with increasing their activity (r = .410, p < .001). In addition, the more participants feel comfortable about increasing their activity, the more likely they are to continue exercising (r = .492, p < .001).

The weaker correlations stated that the older the participant is, the less certain they feel about finding a way to reduce falls (r = -.191, p = .017) and the less comfortable they feel with becoming steady on their feet (r = -.176, p = .028). It was also found that the more the participants' concerns about falling have interfered with their normal social activities, the less certain they feel about finding a way to get up if they fall (r = -.178, p = .026), finding a way to reduce falls (r = -.198, p = .013), and the less steady they feel on their feet (r = -.170, p = .034). Weak correlations were also found in exercise and fall control and management. The more the participants exercise, the more certain they feel about finding a way to get up if they fall (r = .180, p = .025), reducing falls (r = .205, p = .010), and protecting themselves if they fall (r= .160, p = .046). Furthermore, the more concerned the participants feel about falling, the more interference there is with their normal social activities with family, friends, neighbors, or groups (r = .358, p < .001). Another weak correlation indicated that the more comfortable participants feel when talking with others about fear of falling, the more likely they will continue to exercise (r= .359, p < .001). In addition, the more sessions the participants attended, the more likely they

are to continue exercising ($r = .160$, $p = .046$). Lastly, after making changes to their environment, participants are more likely to feel comfortable increasing their activity ($r = .383$, $p < .001$) and are more likely to plan on continuing to exercise ($r = .365$, $p < .001$).

As well as exploring correlations among the variables, the Wilcoxon signed-rank test was utilized to determine any significant changes between the corresponding first and last session survey questions. This statistical test was chosen due to the nature of the responses which was nominal data. Since the surveys were formed in a Likert scale format, the responses to each question were coded with a specific number. The results of the Wilcoxon signed-rank test showed that there were improvements in participants' answers after participating in AMOB when compared to the first session survey. After completing the program, participants perceived that they felt more certain about finding a way to get up if they were to fall ($Z = -6.613$, $p < .001$), finding a way to reduce falls ($Z = -7.062$, $p < .001$), protecting themselves if they were to fall ($Z = -6.675$, $p < .001$), increasing their physical strength ($Z = -6.399$, $p < .001$), and becoming more steady on their feet ($Z = -6.656$, $p < .001$). The analysis also showed an improvement in participants' responses regarding their concerns about falling ($Z = -2.743$, $p = .006$). When analyzing how much the participants' concern about falling interferes with their normal social activities, there was a significant change in score which indicates participants had less concerns about falling and engaged more in their normal activities after the intervention ($Z = -2.680$, $p = .007$). Lastly, the amount of exercise as reported by the participants increased from the first session to the end of the program ($Z = -3.462$, $p = .001$).

The 30-second sit-to-stand assessment was given during the first and last sessions. There was complete data for 130 of the 157 participants. After the eighth session, average improvement was 1 sit-to stand (M = 1.34, SD = 2.49) (Figure 1). Using the Pearson product-

moment correlation coefficient, there was a weak correlation demonstrating that participants who had lower pretest scores for the sit-to-stand made larger improvements in the posttest scores (r = -.253, r^2 = .064, p = .004). The analysis also demonstrated a strong correlation for the youngest age group of 60-64 who made the most improvements in sit-to-stands (r = -.92, r^2.846, p < .027). Participants in the age group of 75-79 demonstrated a moderate correlation in change with improvements from pretest to posttest scores (r = -.548, r^2 .30, p < .003). Other age groups did not demonstrate significant change in scores on the 30-second sit-to-stand assessment. Through the analysis of sit-to-stand data, although there was a small effect size (η^2=.03), it was determined that the results were statistically significant and clinically significant considering the age group of the participants. The results of a two-tailed t-test showed that the sit-to-stand data was statistically significant and the improvements in self-efficacy were also affecting participants' changes in physical fitness (t = 2.878, p = .004).

Qualitative Data

After the program, there were difficulties in contacting participants over the phone and through mail in order to complete the follow-up surveys. Due to the limited amount of responses during the 3, 6, and 12 month follow-up periods, there were only a total of 25 participants with incomplete sets of follow-up data where only one or two of the follow-up surveys were completed. Therefore, these forms were strictly used for qualitative purposes due to a limited number of participants who provided complete data. This qualitative information was collected based on several open-ended questions in which one asked about the types of exercises participants were continuing with after completing the AMOB program. The other questions inquired about any home modifications participants made after the program ended and any other types of changes they made in order to reduce fall risk or become more active. Certain themes

emerged from the various types of changes being made by participants which included behavioral, environmental, and physical changes.

Among the overall responses, 54% of them were categorized as behavioral changes. More than half of the participants stated that they were being more careful when walking. Over 18% of the respondents made changes such as "always using handrails up and down stairs," "looking at the floor when walking," and "becoming more aware of their surroundings." Another important theme that emerged was the use of adaptive equipment when walking. Three participants confirmed using a cane when walking outside, using a walking stick when walking long distances, and walking with a walker in general.

Another area that quite a few participants made changes to was their amount of physical activity. Approximately 14% of the participants described an increase in their exercise and activity level. Generally, the participants mentioned various changes such as "being more active." Some of the specific changes that were mentioned included "walking to the grocery market now," "attending tai-chi classes more often," and "exercising more to strengthen muscles and help with balance." One participant added that she has incorporated "AMOB exercises to her tai-chi program."

Making changes to the environment was another recurrent theme from about 9% of respondents after participating in AMOB. A few of the participants mentioned "removing rugs" or putting a "non-skid rug in the bathroom." Other participants mentioned "clearing passageways" and "removing clutter." There was also one participant who explained how he "installed an electric lift at his back door" and another added night lights to more rooms after completing the AMOB program.

Discussion

Based on participants' improved responses in post and follow-up surveys, this program evaluation has demonstrated that AMOB/VLL leads to decreased concerns about falling. In addition, the intervention was effective in increasing participants' self-perceptions of fall self-efficacy, fall control, and fall management for older adults. Findings from this program evaluation indicate that participants' perceived fall self-efficacy improved and they became more active after completing the program.

Participants demonstrated an increase in fall management behaviors by increasing their exercise levels after completing the AMOB program. Participants also felt more certain about finding ways to reduce and prevent falls and for not letting their concerns about falling interfere with normal social activities. Overall, given the ages of the population being studied and the effects of the natural aging process, AMOB may potentially be seen as clinically significant upon further review. With a large number of the participants stating that they were becoming more physically active after completing AMOB/VLL, this consensus suggests that these individuals are more willing and confident in their abilities to seek out activities.

Although the sit-to-stand results do not yield significant results, the average improvement of 1 sit-to-stand indicates an improvement in functional lower extremity strength in participants after completing the program. The aims of the original AMOB was to decrease FOF by increasing self-efficacy, which would in turn increase physical and social activity. Considering AMOB is not strictly an exercise program, participants' perceived ability in improvements in self-efficacy, fall control, and fall management may have contributed to an increase in sit-to-stand scores. Improvements can be considered clinically significant for these particular older age groups and how they were able to achieve these results within such a short period of time.

The results from this study support the aims of the original AMOB study by Tennstedt et al. (1998) which were to increase physical and social activity, decrease fear of falling, and increase fall self-efficacy. In the original AMOB study, a randomized, controlled trial was completed which resulted in higher scores from the intervention group when compared to the control group. Scores from participants who attended five or more sessions gained more benefits from the intervention.

Outcomes from this study also remain consistent with Healy et al. (2008) and demonstrate the effective and successful translation of AMOB as a volunteer lay leader model. The study by Healy et al. used a single group repeated measures design and compared self-reported data from participants at 6 weeks, 6 months, and 12 months after completing the volunteer lay leader model of AMOB. Scores were significantly improved at 6 weeks and 12 months for fall self-efficacy and 6 weeks, 6 months, and 12 months for fall management. Results from Healy et al. showed that the intervention was effective in decreasing the fear of falling among community-dwelling older adults. Participants also experienced significant increases in fall self-efficacy, fall control, and fall management.

Although this was strictly a program evaluation, the results are comparable to the results and intentions of the original AMOB study. This evaluation also confirms that AMOB/VLL is just as effective in increasing fall self-efficacy, fall control, and fall management as well as reducing fear of falling among community-dwelling older adults.

Program Improvement Recommendations

Although this program evaluation has shown to be effective, there are a few areas in this program that may benefit from slight modifications in order to gain more insight and data for future analyses. The first recommended change focuses on the format and phrasing of the survey

questions. One of the initial questions for this program evaluation asked if participation in AMOB decreased the incidence of falls. However, the current structure of the survey questions prevented the investigators from having valid data as fall data were not collected in posttest and follow-up surveys. For instance, the first session survey asks participants whether or not they have had a fall in the past year and indicate the number of falls. The follow-up survey asks a similar question regarding how many falls the participant has experienced in the past three, six, or twelve months as well as what action they took to handle the situation such as calling for emergency services, contacting their primary care physician, or nothing at all. Due to the slight variation in wording, this makes it difficult to directly compare the questions from the first session survey with the follow-up survey. It is highly recommended that the first, last, and follow-up surveys contain the same question regarding how many falls each participant had experienced up until that point in time. By doing so, it would generate more substantial data and allow for further analysis to possibly conclude that participation in AMOB may actually decrease fall incidence.

Another recommendation to enhance the program is improving the protocol in reaching participants to complete follow-up surveys. Increasing the amount of follow-up data will allow for more results and findings regarding the effectiveness of AMOB interventions. Furthermore, emphasizing follow-up surveys at 3, 6, and 12 months will allow program administrators to explore how well the effects of AMOB are sustained over time. To increase the amount of follow-up data, one of the few possible solutions may include having the lay leaders that facilitate the AMOB classes stress the importance of completing the follow-up surveys during the last session. Also, increasing the number of methods and attempts in contacting the participants to complete the survey may produce more promising results. Currently, the follow-

up surveys are conducted over the phone by volunteers and lay leaders. Aside from contacting the participants over the phone, sending out surveys through paper mail or electronic mail would be other alternatives. Giving the participants different means in completing the surveys may result in an increase in the response rate.

A more constructive alternative would be to incorporate booster sessions at 3, 6, and 12 months and have participants fill out the follow-up surveys during these sessions. These booster sessions will consist of group discussions regarding participants' progress and changes they have made since the program. It would also be ideal to have a short and concise review of the fall prevention education and exercises that were provided during the original program period. In addition, any new information such as the most current studies on fall prevention, and updated resources would be presented to the participants. This information can also be put together into a handout or brochure for participants to take home. During these booster sessions, participants would take the time to complete the follow-up surveys as well as the Sit-to-Stand assessment in order to determine whether participants are improving, plateauing, or declining.

Potential Limitations

One potential limitation of this program evaluation is the subjective component of the surveys which the data originated from. The responses provided by the participants were self-reported and participants chose responses based on their personal outlook towards their progress made through the program. However, these personal views may be biased and may not accurately represent their true strengths or deficits which may translate to inaccurate responses and ultimately skew the data collected. For example, a participant who demonstrated minimal self-efficacy with falls may complete the survey with low scores despite improvement in management behavior through full compliance with the program's recommendations. Aside

from subjective data, issues with memory recall may play a significant bias throughout the program evaluation. For instance, inaccurate responses from participants who are struggling with recall deficits may essentially challenge the reliability of this program evaluation.

Another limitation of this program evaluation stems from the lack of consistent data from participants during the follow-up period. Numerous participants completed only one follow-up survey at random points in time. These incomplete data sets pose a challenge in accurately analyzing the effects of the intervention after participating in AMOB. Complete sets of follow-up data could provide investigators with more insight into the short and long-term effects of the AMOB interventions on participants, including its impact on fall risk and fall incidence.

Conclusion

The presence of fall risks among community-dwelling older adults is an issue that needs to be addressed with evidence-based interventions to prevent increased fall incidence. In addition to determining appropriate interventions for fall prevention programs, it is important that risk factors are also identified in order to effectively educate the population at risk to prevent any fall-related accidents and injuries. Aside from risk factors, the fear of falling among community-dwelling older adults needs to be addressed in order to prevent physical and functional decline as well as activity avoidance. It is important that older adults are provided with effective and evidence-based fall prevention resources with the intention of promoting long-term healthy and independent living within the community.

The results of this program evaluation for A Matter of Balance are reflective of the findings from the study of the lay leader program conducted by Healy et al. (2008) in which the AMOB program under evaluation was modeled after. Participants' self-perception of fall self-efficacy, fall control, and fall management showed overall increases after completing the AMOB

program. The original objective of AMOB was to decrease the fear of falling which in turn may potentially decrease the risk of falls. The findings from this program evaluation support the effectiveness in improving fall self-efficacy, increasing physical activity, and lessening the effects of concerns about falling on normal social activities after participation in AMOB. In addition, a few recommendations were made in this program evaluation such as improving methods of communication with participants during follow-up periods and adding booster sessions after 3, 6, and 12 months of program completion. By incorporating these recommendations, future studies on AMOB/VLL may continue to demonstrate its effectiveness in decreasing fear of falling and increasing fall self-efficacy within various settings for the older adult population. Furthermore, by collecting more in-depth data, these recommendations can potentially show how the AMOB intervention effects fall incidence and fall rates among participants.

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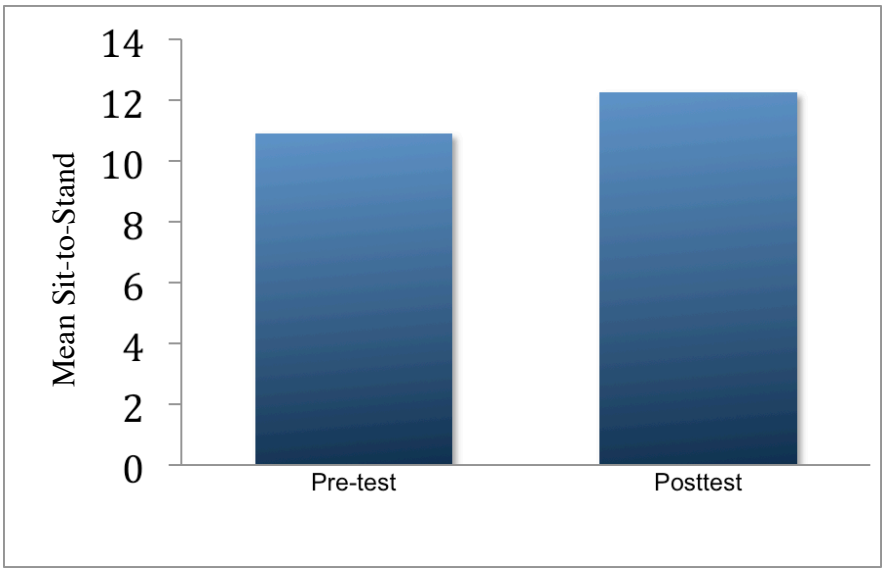
Table 1. *Demographic Data for Participants*

Sex	**Number (*N* = 157)**	**Percentage**
Male	33	21%
Female	124	79%
Ethnicity		
African American/Black	4	2%
Asian	38	24%
Caucasian/White	109	69%
Hispanic/Latin(a) White	4	3%
Native American	2	1%
Age Group (Sit-to-Stand)	**Number (*N* = 130)**	
1 (60 – 64)	5	4%
2 (65 – 69)	14	11%
3 (70 – 74)	22	17%
4 (75 – 79)	27	21%
5 (80 – 84)	26	20%
6 (85 – 89)	22	17%
7 (90 – 95)	12	10%

Figure 1. *Mean Sit-to-Stand Pre-test and Posttest data*



Appendix A

January 22, 2014

Leslie Hollaway
50 Acacia Ave.
San Rafael, CA 94901

Dear Leslie:

I have reviewed your proposal entitled *A Matter of Balance: Program Outcomes for Community-Dwelling Older Adults* submitted to the Dominican University Institutional Review Board for the Protection of Human Participants (IRBPHP Application, #10227). I am approving it as having met the requirements for minimizing risk and protecting the rights of the participants in your research.

In your final report or paper please indicate that your project was approved by the IRBPHP and indicate the identification number.

I wish you well in your very interesting research effort.

Sincerely,

Martha Nelson, Ph.D. Associate Vice President for Academic Affairs Chair, IRBPHP

cc: Kitsum Li

SIGNATURE PAGE

Applicant Name: Leslie Hollaway

Project Title: A Matter of Balance: Program Outcomes for Community-Dwelling Older Adults

Signatures:

I acknowledge that all procedures will meet relevant local, state, and federal regulations regarding use of human subjects in research. I am familiar with and agree to adhere to the ethical principals in the conduct of research with human subjects as set forth by the Dominican University of California IRBPHS Handbook.

_____	_____
Signature of Applicant	Date
_____	_____
Signature of Department Chair	Date
_____	_____
Signature of Faculty Advisor*	Date
_____	_____
Signature of Dean of School**	Date

*Your signature indicates that you accept responsibility for the research described, including work by students under your supervision. It further attest that you are fully aware of all procedures to be followed, will monitor the research, and will notify the IRBPHS of any significant problems or changes.

**Review by Dean is required for faculty researchers but not for student investigators unless this is a procedure of the School within which the student is majoring.

Appendix B

December 5, 2013

Ms. Ellen Corman
Community Outreach and Injury Prevention Program
Stanford Hospital and Clinics
Stanford, CA 94305

Adrienne Angeles
Occupational Therapy Student
Dominican University
San Rafael, CA

This document confirms collaboration on the capstone project entitled, "A Matter of Balance: Program Outcomes for Community Dwelling Older Adults". For the project, Dominican University graduate students in occupational therapy will be analyzing program outcome data from individuals who participated in community-based education classes called "A Matter of Balance" in San Mateo and Santa Clara Counties from 2012 to 2013. The data will be examined to explore outcomes related to fear of falling, falls self-efficacy, number of falls, and strength.

The graduate students involved in this project are Adrienne Angeles, Leslie Hollaway, Tiffany Lau, and Victoria Reyes, as part of' their education in the Master of Science in Occupational Program at Dominican University of California. The graduate student advisor is Dr. Kitsum Li, Professor of Occupational Therapy, 50 Acacia Ave., San Rafael, Ca, 94901, kitsum.li@dominican.edu.

Identifying data will be redacted from the records examined by students. The students agree to uphold all expectations of confidentiality, privacy, and professionalism. All published data is subject to review and approval by Dr. Li at Dominican University and assigned personnel from Stanford Hospital and Clinics. Stanford employees assisting with data analysis and managing writing will be co-authors on published material.

Ellen Corman

Adrienne Angeles

Appendix C

First Session Survey

Your Name _____
First **Last**

Please check the box that tells how sure you are that you can do the following activities.

1. How sure are you that:	Very Sure	Sure	Somewhat sure	Not at all sure
A. I can find a way to get up if I fall	○	○	○	○
B. I can find a way to reduce falls	○	○	○	○
C. I can protect myself if I fall	○	○	○	○
D. I can increase my physical strength	○	○	○	○
E. I can become more steady on my feet	○	○	○	○

2. How concerned are you about falling?

○ Extremely ○ Quite a bit ○ Moderately ○ Slightly ○ Not at all

3. During the last 4 weeks, to what extent has your concern about falling interfered with your normal social activities with family, friends, neighbors or groups?

○ Extremely ○ Quite a bit ○ Moderately ○ Slightly ○ Not at all

4. Have you had a fall in the last year?

○ Yes ○ No

If yes, how many? _____

Please turn this paper over and fill out the other side.

First Session Survey (Continued)

5. Check ONLY ONE BOX to tell us how much you are walking and exercising now.

- ○ I do not exercise or walk regularly now, and I do not intend to start.
- ○ I do not exercise or walk regularly, but I have been thinking of starting.
- ○ I am trying to start to exercise or walk.
- ○ I have exercised or walked infrequently for over a month.
- ○ I am doing moderate exercise less than 3 times per week.
- ○ I have been doing moderate exercises 3 or more times per week.

The following questions will provide us with background information.

6. What is your date of birth? _____ / _____ / _____
Month Day Year

7. What is your Zip Code? ___ ___ ___ ___ ___

8. Are you: ○ Female ○ Male

9. How do you identify your race and/or ethnicity? (Optional)

- ○ African-American / Black
- ○ Asian
- ○ Caucasian / White
- ○ Hawaiian or Pacific Islander
- ○ Hispanic / Latino(a) Black
- ○ Hispanic / Latino(a) White
- ○ Native American
- ○ Other _____

Appendix D

Last Session Survey

Your Name _____
First **Last**

Please check the box that tells how sure you are that you can do the following activities.

1. How sure are you that:	Very Sure	Sure	Somewhat sure	Not at all sure
A. I can find a way to get up if I fall	○	○	○	○
B. I can find a way to reduce falls	○	○	○	○
C. I can protect myself if I fall	○	○	○	○
D. I can increase my physical strength	○	○	○	○
E.I can become more steady on my feet	○	○	○	○

2. How concerned are you about falling?

○ Extremely ○ Quite a bit ○ Moderately ○ Slightly ○ Not at all

3. During the last 4 weeks, to what extent has your concern about falling interfered with your normal social activities with family, friends, neighbors or groups?

○ Extremely ○ Quite a bit ○ Moderately ○ Slightly ○ Not at all

Please turn this paper over and fill out the other side.

4. Check ONLY ONE BOX to tell us how much you are walking and exercising now.

- ○ I do not exercise or walk regularly now, and I do not intend to start.
- ○ I do not exercise or walk regularly, but I have been thinking of starting.
- ○ I am trying to start to exercise or walk.
- ○ I have exercised or walked infrequently for over a month.
- ○ I am doing moderate exercise less than 3 times per week.
- ○ I have been doing moderate exercises 3 or more times per week.

5. As a result of this class, I feel more comfortable talking with others about my fear of falling.

○ Strongly Agree ○ Agree ○ Disagree ○ Strongly Disagree

6. As a result of this class, I have made changes to my environment.

○ Strongly Agree ○ Agree ○ Disagree ○ Strongly Disagree

Comments: _____

_____

7. As a result of this class, I feel more comfortable increasing my activity.

○ Strongly Agree ○ Agree ○ Disagree ○ Strongly Disagree

Comments: _____

_____

8. As a result of this class, I plan to continue exercising.

○ Strongly Agree ○ Agree ○ Disagree ○ Strongly Disagree

Comments: _____

Today's Date _____

Appendix E

Matter of Balance

Follow-Up Survey

You participated in the Matter of Balance

Name: _____ DOB: _____

MOB Class dates/site: _____

Follow-Up Survey ○ Three months ○ Six months ○ One year

1. Have you fallen in the past 3 months? ○ Yes ○ No

If Yes, did you ○ Call 911 ○ See your PCP ○ Go to Emergency Room ○ None

2. On a scale of 1-5, how concerned are you at this time, about falling?

○ Extremely ○ Quite a bit ○ Moderately ○ Slightly ○ Not at all

3. Since you participated in the Matter of Balance Class, would you say that you

   a. Exercise the same amount as before the class

   b. Exercise more than you did before taking the class

   c. Exercise less that you did before taking the class

4. In the past three months, how often do you do moderate exercise?

○ 0 Times ○ 1 Time/week ○2 times/wk ○ 3 times/wk ○ 4 or more times/wk

5. Are you doing the exercises from the MOB class? If so, how many times/week?

○ 0 Times ○ 1 Time/week ○2 times/wk 3 times/wk ○ 4 or more times

6. Are you walking for exercise? If so, how often?

○ 0 Times ○ 1 Time/week ○2 times/wk 3 times/wk ○ 4 or more times

If you're walking for exercise, how far you walking?

○ Less than ¼ mile ○ Between ¼-1/2 mile ○ ½-1 mile ○ 1-2 miles ○Not walking

When you take your walks, how long are you working?

○ 0-10 mins ○ 10-20 mins ○ 20-30mins ○ 30-60mins ○ >1hr

7. What other exercise are you doing? _____

_____

8. Did you make any changes to your home environment as a result of participating in MOB?
○Yes ○ No If so, what? _____

_____

9. Since participating in MOB, have you talked to your doctor about your falls or risk for falls?
○ Yes ○ No ○Not yet ○ Other _____
10. Can you name 2 changes you made to reduce fall risk or become more active as a result of participating in MOB?
a. _____
b. _____
11. Please provide any comments/thoughts that you have about fall prevention or the MOB class:
_____
_____
_____
_____
_____
_____

Appendix F

Sit To Stand

Site: _____ Date: _____

Name: _____

Age: _____

Number: _____

Comments (use of arms, use of chair/posture, etc) _____

_____

_____

Normal range of scores (between the 25% and 75% percentiles of the general population)

Age	Number of stands – Women	Number of stands - Men
60 - 64	12 – 17	14 – 19
65 – 79	11 – 16	12 – 18
70 – 74	10 - 15	12 - 17
75 – 79	10 – 15	11 - 17
80 – 84	9 - 14	10 - 15
85 – 90	8 – 13	8 - 14
90 – 95	4 – 11	7 - 12

The risk zone is less than 8 unassisted stands for women and men

Post Test Date:_____

Number: _____

Comments (use of arms, use of chair/posture, etc) _____

_____

_____