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# Participants' Perceptions of Factors in Preventing Falls

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# Participants' Perceptions of Factors in Preventing Falls

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A Thesis Proposal Submitted in Partial Fulfillment of the Requirements for the

Degree Master of Science Occupational Therapy

School of Health and Natural Sciences

Dominican University of California

San Rafael, California

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This thesis, written under the direction of Dr. Kitsum Li, OTR/L and approved by the chair of the program, Dr. Ruth Ramsey, OTR/L, 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 and research methodologies presented in this work represent the work of the candidates alone.

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### **Abstract**

Falls pose a serious threat to older adults, often resulting in physical, emotional, and financial consequences. The use of multifactorial fall prevention programs has provided community-dwelling older adults with strategies to decrease the risk of falling. Outcomes for these programs are measured in terms of such factors as fear of falling, balance and self-efficacy. One outcome of fall prevention programs that is less well understood is what the older adults themselves perceive as most beneficial. For this program evaluation project, five women participated in semi-structured interviews to understand which aspects of a multifactorial fall prevention program they found to be most beneficial. Three themes emerged in the interviews: integration of exercises into daily life, implementation of home modification recommendations, and appreciation of volunteer phone calls. Based on these themes, program enhancements were recommended.

## **Introduction**

Approximately 3.5 million community-dwelling older adults reported at least one fall in a three-month period (Boyd & Stevens, 2009). Furthermore, fall rates are predicted to increase in the next few years due to the baby boomer generation, which is one of the fastest growing age groups in the United States (Healthy People 2020, 2014). Older adults who experience falls pose as a major public health concern. Multifactorial fall prevention programs have been developed in response to the health concerns of community-dwelling older adults (Boyd & Stevens, 2009). These fall prevention programs were created to educate older adults on the risk factors of falling and provide them with strategies to decrease the risk of falling.

Occupational therapy plays a direct role in fall prevention. Due to the aforementioned effect falls have at the individual level, falling may prevent older adults from engaging in their meaningful occupations. Occupational therapists may educate older adults on the importance of physical exercise, home modifications, and medication consultation with health professionals. Multifactorial fall prevention programs, paired with guidance from occupational therapists, may help to minimize the adverse health and functional deficits. Occupational therapists may be able to obtain a more client-centered perspective by understanding which aspects of multifactorial fall prevention programs older adults perceive as beneficial. This will allow occupational therapists the opportunity to cater the needs of older adults to maximize their occupational and functional well-being.

Despite the vast amount of quantitative analyses of multifactorial fall prevention programs, little research to date has examined the effectiveness of these programs through a qualitative lens. The purpose of this qualitative program evaluation is to explore the perceptions of older adults who have participated in a multifactorial fall prevention program. By addressing

this gap in the literature, recommendations can be suggested to this particular fall prevention program in order to improve adherence in order to decrease the likelihood of falling.

## **Literature Review**

### **Risk Factors Resulting in Falls**

Older adults who are either taking multiple pharmaceutical medications, functioning in a hazardous environment, walking with impaired balance, or possessing a combination of these factors are at high risk of falling. Those three risk factors are commonly assessed and addressed in many multifactorial fall prevention programs. Other fall risk factors that are only addressed by some multifactorial fall prevention programs include improper footwear, impaired vision, and risk taking behavior. Individually, all of the above fall risk factors increase fall risk. But if any combination or grouping of those risk factors is present, literature shows that an older adult has a significantly increased likelihood of falling (Pynoos, Steinman, Do Nguyen, & Bressette, 2012). It is important to examine each of the fall risk factors and how they are interconnected to better identify the problem areas in order to facilitate effective fall prevention strategies, which will promote health, well being, and safety for older adults in the community.

**Polypharmacy.** Consuming multiple medications puts older adults at risk for a complex array of side effects that negatively affect their physiological functions and increase their risk of falls. Literature suggests that older adults who take four or more medications are categorized as being at high risk of falls (Blalock et al., 2010; Ferreri, Roth, Casteel, Demby, & Blalock, 2008). However, older adults who consume psychotropic medications, especially those that have long lasting effects, are at particularly high risk of falling (Hamrick, 2013; Jasniewski, 2006; Mehta, Chen, Johnson, & Aparasu, 2010). In a study examining the use of atypical and typical antipsychotics by community-dwelling older adults with a mean age of 70 years, there was no

correlation between the amounts or types of drugs to falls (Mehta et al., 2010). However, the findings suggested that the older adults who used antipsychotics for greater than 90 days had a significant (hazard ratio 1.81; 95% CI [1.35, 2.43]) increase in the risk of falls compared to older adults who used antipsychotics for less than 30 days (Mehta et al., 2010). This implies that the duration of medication consumption plays a more vital role than the type of medication in increasing risk of falls (Mehta et al., 2010).

However, this does not imply that the type of medication does not influence the risk of falls. In a Cochrane review entitled “Interventions for Preventing Falls in Older People Living in the Community,” two randomized controlled trials found strong evidence that stopping psychotropic medications significantly reduces the risk of falls (Gillespie et al., 2013). One of the randomized controlled trials with 93 community-dwelling adults aged 65 and older found a two-third fall risk reduction by decreasing the doses of their psychotropic drugs over 14 weeks (Gillespie et al., 2013; Hamrick, 2013). The second randomized controlled trial included 849 clients in 20 Australian outpatient practices that reduced psychotropic drug intake and then experienced a 39% reduction in falls at a 12 month check-in (Gillespie et al., 2013; Hamrick, 2013). The two above randomized controlled trials indicated that psychotropic medications have side effects that may increase older adults’ risk of falls.

The current literature about the relationship between polypharmacy and fall risk suggests that fall risk in older adults can increase in three ways: duration of medication use, medication type, or a combination of the two. Thus it is imperative for physicians and other healthcare practitioners to carefully consider the benefits and risks associated with medication duration and type when prescribing drugs to older adults. Assessing these three areas in a multifactorial fall

prevention program will help older adults identify potential risks and facilitate their well-being and safety.

**Environmental and home hazards.** The home and immediate vicinities are common locations for falls in community-dwelling older adults (Pighills, Torgerson, Sheldon, Drummond, & Bland, 2011). One third to almost three-quarters of community-dwelling older adults' falls occur in the bedroom, bathroom, living room, and kitchen (Gopaul & Connelly, 2012). Of an estimated 37,991 adults age 65 years or older treated for falling in hospital emergency departments in one year, the most common (35.7%) location for falls was the bathroom (Rosen, Mack, & Noonan, 2013). According to the retrospective analysis by Rosen et al. (2013), 99% of the falls experienced by the 37,991 older adults were associated with carpets and rugs. Older adults tended to trip when transitioning between different walking surfaces: carpet and rug, hardwood floor and rug, and dry and wet carpets or rugs (Rosen et al., 2013). Similarly, in a study conducted by Szanton et al. (2011), an occupational therapist who assessed older adults' homes found the most common safety and mobility risks to be holes in floors, uneven carpeting, and lack of railings and banisters.

Other potential environmental risk factors in the home include inadequate lighting, clutter, slippery surfaces, improper use of assistive devices, unsupportive or poorly arranged furniture, staircases without railings, and pets underfoot (Letts et al., 2010; Peterson & Clemson, 2008; Pynoos et al., 2012). A review of literature by Paul and Yuanlong (2012) concluded that older adults may experience pathological kyphotic posture, unsteady gait and balance, and a slower reaction time from the single factor of poor lighting. A study by Kesler et al. (2005) compared the walking patterns of 22 older adults with gait disorders against 20 older adults without gait disorders in a typical lighting condition and a near-dark condition. The results

revealed that older adults with gait disorders walked notably slower and more unsteadily in the near dark condition compared to when they walked in typical lighting condition (Kesler et al, 2005).

While the presence of more environmental hazards increases potential fall risk, a systematic review on assessing the physical environment as a fall risk factor suggested that it is the poor fit between the environment and the older adult's ability to adapt that increases the likelihood of falls (Letts et al., 2010). Some older adults can easily physically adapt to their home hazards while others cannot compensate for the environmental barriers (Letts et al., 2010; Pynoos et al., 2012). Similarly, an older adult who is more physically active is less likely to fall in a hazardous environment than an older adult who is less physically active (Pynoos et al., 2012). Regardless, it is important to understand that there is a strong correlation between environmental hazards and falls in community-dwelling older adults. Environmental hazards continue to pose as stumbling blocks for older adults and increase their risk of falling. While many studies examined the quantitative correlations between environmental hazards and falls, few research studies explored the older adults' perceptions of the potential environmental hazards in their homes or the older adults' likelihood of follow through with the recommendations made by a practitioner after safety assessments.

**Balance.** Balance is one of the many intrinsic fall risk factors and is commonly addressed in multifactorial fall prevention programs (Peterson & Clemson, 2008; Pynoos et al., 2012). Reported to have the strongest association with falls, poor balance presents itself in shuffling gait, atypical postural sway, and gait asymmetry (Makizako et al., 2013). Muir, Berg, Chesworth, Klar, and Speechley (2010) conducted a prospective study that considered the modifiable risk factors in older adults who transition from not falling to falling. Muir et al.

(2010) calculated a significantly high fall risk (95% CI [1.18, 4.28]) due to balance impairment, which indicated that balance impairment precedes falls. In a pilot study, 34 older adults underwent the Lifestyle approach to reducing Falls through Exercise (LiFE) program, which targets fall prevention by integrating balance and strengthening exercises into daily living activities (Clemson et al., 2010). The implementation of the LiFE program demonstrated significant effects in reducing falls, implying that addressing balance plays a notable role in decreasing falls (Clemson et al., 2010). A randomized controlled trial by Ullmann, Williams, Hussey, Durstine, and McClenaghan (2010) examined the effectiveness of an exercise program on balance and mobility in community dwelling older adults with a mean age of 75 years and reached similar conclusions: exercises effectively improve balance and mobility, thus reducing the risk of falling. Clearly, assessing and strengthening the neuro-muscular skeletal functions of older adults can improve their balance and decrease fall risk.

**Behavioral fall risk factors.** Older adults' balance may be negatively affected by "behavioral fall risk factors," a term coined by Pynoos et al. (2012), which includes improper footwear, inappropriate or outdated prescription eyewear, and risk taking behaviors. Older adults wearing unsafe footwear may be more likely to trip, slip, or stumble, increasing their risk of falls (Pynoos et al., 2012). Visual impairment is the one of the top three most common chronic diseases along with arthritis and heart disease, and can hinder an older adults' mobility, independence, and psychosocial health (Reed-Jones et al., 2013). Risk taking behaviors include performing behaviors that can decrease safety (i.e. such as standing on top of furniture to reach a high shelf) or failing to perform safe behaviors (i.e. neglecting to turn on lights while walking down stairs) (Pynoos et al., 2012). The various components associated with behavioral fall risk factors suggest the need for a multifactorial approach to reduce the risks contributing to falls.



Considering that multiple factors influence older adults' risk for falls, it seems appropriate to select interventions to effectively address these health issues. In regards to footwear, a study including 29 community-dwelling older adults showed that raised heels, shortened heel-collars, and soft soles compromised postural sway, balance range, stability, and reaction time (Menant, Steele, Menz, Munro, & Lord, 2008a). Results of a systematic literature review recommended that older adults wear shoes with low heels and slip-resistant soles to prevent slips and enhance balance inside and outside of the home (Menant, Steele, Menz, Munro, & Lord, 2008b). In regards to visual impairments, a study examined 156 male and female community dwelling older adults and showed that multifocal glasses wearers were at a significantly higher risk for falling compared to their non-multifocal glasses wearing peers (Lord, Dayhew, & Howland, 2002). Results from the study indicated that multifocal glasses impaired depth perception and edge contrast sensitivity, which are skills needed to navigate around environmental fall hazards (Lord, Dayhew, & Howland, 2002). In regards to risk taking behaviors, Pynoos et al. (2012) defined it to include actions that compromise safety as well as failing to perform behaviors that can reduce fall risk. Such actions include standing on unstable furniture to reach items on high shelves, neglecting to turn on lights when it is dark, and not using available grab bars (Pynoos et al., 2012). Each aspect alone (poor footwear, impaired vision, risk taking behavior) compromise older adults' safety; the combination of the three factors heightens their risk of falling.

**Conclusion.** In conclusion, research literature strongly suggests that there are numerous fall risk factors that compromise the safety of older adults. Taking a cocktail of four or more pharmaceutical medications inhibits older adults' cognition and perception, which affects their safe interactions with the environment safely and makes them more susceptible to environmental

hazards. Older adults with poor balance may further compromise their instability by wearing inappropriate footwear. Vision complications and risk taking behavior also put older adults at greater risk for falling. Clearly, older adults who have one or more of the above risk factors may have a higher likelihood of falling, which causes injury.

### **Consequences of Falling**

Experiencing a fall can result in various consequences, including physical, psychological, and financial consequences. Falls, which increase the likelihood of injuries such as fractures and traumatic brain injuries (TBI) in older adults, can incur an astounding cost. Furthermore, older adults who experience one or multiple falls may consequently develop a fear of falling, and thus potentially decrease participation in meaningful activities. It is imperative to examine the multitude of ways by which older adults can be affected by falls in order to better understand potential implications for fall victims, their families, and society.

**Cost of falls.** Physical and psychological consequences related to falls carry a high price. Falls are a major public health problem for older adults and can inflict a financial burden on fall victims, their families, and society. According to Teresi et al. (2013), the estimated cost for falls with multiple injuries or those requiring surgical intervention is between \$20,000 and \$22,368, and costs can be as high as \$65,000 per case. The overall annual cost of falls is estimated to be over \$20 billion (Elliott, Painter, & Hudson, 2009; Teresi et al., 2013). Costs related to falls include hospital and nursing home care, rehabilitation, equipment, and medications. While some older adults may only require inpatient hospital care, others may require additional medical and rehabilitation care at a skilled nursing facility, thus resulting in additional health care costs (van Harten-Krouwel, Schuurmans, Emmelot-Vonk, & Pel-Little, 2011). Such costs are not always

entirely covered by insurance companies and, as a result, fall victims and their families may potentially be faced with financially stressful situations.

**Injuries and fractures.** Falls can impact the physical functioning of older adults by causing injuries and fractures that require medical attention (Nachreiner, Findorff, Wyman & McCarthy, 2007). According to Kwan, Close, Wong, & Lord (2011), injuries related to falls include brain contusions, subdural hematomas, joint dislocations, and lacerations. Older adults may also sustain fractures as a result of falling, with hip and wrist fractures being some of the most common (Berry and Miller, 2008). At the time of their study, Boyd and Stevens (2009) found that 3.5 million older adults, nearly 10% of the older adult population in the United States, experienced a fall within the three months prior to the study. Out of those who fell, 1.7 million were injured and 875,000 required medical attention (Boyd & Stevens, 2009). To further support the adverse consequences of falls, Kwan et al. (2011) explained that injuries and fractures related to falls result in a decline in function, and thereby inhibit older adults' ability to participate in meaningful occupations. Understandably, such outcomes may also take a toll on families of fall victims and potentially require them to seek alternative living arrangements and resources for the older adults.

**Traumatic brain injury.** Experiencing a fall also increases the risk of older adults acquiring a TBI. According to Kinsella (2011), the occurrence of TBI in older adults is most frequently associated with falls. Thomas, Stevens, Sarmiento, & Walk (2005) examined fall-related TBI hospitalizations and deaths in the United States and found that in 2005, approximately 56,423 hospitalizations among individuals aged 65 and older were a result of non-fatal fall-related TBI. Additionally, this study revealed that almost 8,000 fall-related TBI cases in this age group were fatal (Thomas et al, 2005). Majdan et al.(2011) also found a relationship

between TBI and falls and proposed that falls are one of the leading causes of TBI in older adults. Acquiring a TBI can be detrimental to older adults who are already at a higher risk for developing various medical conditions due to their advanced age.

Older adults who experience a TBI may require extensive medical attention including surgery and prolonged rehabilitation (Kinsella, 2011). It is common for personality, communication, language, sensory and emotional disorders to develop following a TBI (McKechnie, Pryor, & Fisher, 2014). Cognition may also be affected after a TBI, with post-traumatic amnesia (PTA) being one of the most noticeable side effects (McKechnie, Pryor, & Fisher, 2014). PTA entails a period of neurorecovery, which may contribute to older adults exhibiting at-risk behaviors and an increased risk of falling (McKechnie, Pryor, & Fisher, 2014). Consequently, the emotional, cognitive, and physical functions of older adults who experience a fall-related TBI may be compromised (Thomas et al., 2005).

**Fear of falling.** In addition to understanding the physical consequences of falls, it is also vital to recognize that older adults can be affected on a psychological level. Fear of falling is a psychological symptom that is prevalent in 35%-55% of community dwelling older adults, regardless of whether or not they have experienced a fall (Boyd & Stevens, 2009; Delbaere, Crombez, Van Den Noortgate, Willems, & Cambier, 2006; Zijlstra et al., 2007). According to the Centers for Disease Control and Prevention [CDC] (20), fear of falling has been independently linked to the following contributing factors: women, multiple medications, fall history, fall-related injuries, age, decreased activity of daily living (ADL) performance, activity restriction, physical deconditioning, social isolation, decreased quality of life, and sedentary lifestyle. Though some older adults who experience a fall may not acquire physical injuries, they may develop a fear of falling, and thus establish a modified daily routine compared to the one

they had prior to falling. Consequently, an initial fall can result in significant declines in ADLs and instrumental activities of daily living (IADLs) (Kwan et al., 2011).

Fear of falling among older adults can also result in loss of confidence, decreased participation in both physical and social activities, physical frailty, and loss of independence (Zijlstra et al., 2009). In a study by Painter et al. (2012), the researchers examined the relationship between community-dwelling adults (aged 55 and older) and depression, anxiety, and activity level. A sample of 99 participants completed questionnaires which focused on matters including fall history, mood, fear of falling, and activity levels. Results revealed that 38.4% of the participants reported a fear of falling, which is consistent with the national average. The findings of the study also indicated that participants who were more fearful, depressed, and anxious had restricted activity levels. This study provides practical considerations for occupational therapists, including the importance of incorporating the psychological component into treatment as it can tremendously impact older adults' activity participation and overall quality of life.

**Conclusion.** Due to the multitude of consequences associated with falls, it is apparent that fall prevention programs are needed in order to minimize the occurrence of falls and provide older adults with effective strategies for maximizing their independence and participation in meaningful activities.

### **Multifactorial Fall Prevention Programs**

The use of multifactorial fall prevention programs has been recommended by the American Geriatrics Society (AGS) and the British Geriatrics Society (BGS) (2010). Using a multifactorial fall prevention program can result in reducing the risk and rate of falls in older adults (Chang et al., 2004). Effective multifactorial fall prevention programs incorporate aspects

such as medical management, exercise programs, environmental and home modifications, and medication reviews (AGS and BGS, 2010).

**Medical examinations and management.** In order to reduce the risk of falls among older adults, complete medical examination and management is necessary. Medical examination can allow the older adult and the multidisciplinary care team to better understand medical factors that may pose as fall risks. In a randomized control trial by Davison, Bond, Dawson, Steen, and Kenny (2005), 313 older adults who had recurrent falls were given either a multifactorial fall prevention program to help reduce the risk of falling or were part of the control group that did not receive the fall prevention program. The 159 older adults who received the multifactorial fall prevention program received an in-depth medical assessment that focused on comprehensive cardiovascular assessment to evaluate orthostatic hypertension, carotid sinus hypersensitivity, and vasovagal hypersensitivity. The medical review allowed participants to better understand their health risks that may result in falling. Compared to the control group, the intervention group had 36% fewer falls (Davison et al., 2005). In another study conducted by Close et al. (1999), 184 community-dwelling older adults participated in a multidisciplinary fall prevention program that focused on visual screenings, balance, cognition, and a comprehensive medical assessment. The 184 adults were compared to 213 other community dwelling older adults in the control group who did not receive the medical examination (Close et al., 1999). The study showed that the intervention group had fewer falls than the control group (Close et al., 1999). The medical examination enhanced the multifactorial fall prevention program and helped to lower the number of falls in the older adults. Clearly, the medical examination is an important component to have in a multidisciplinary fall prevention program as it may allow the older adult and doctor to understand which health factors pose a risk of falling.

**Exercise program.** Utilizing exercise programs in a multifactorial fall prevention program can help increase balance, coordination, and strength in older adults (Lord et al., 2005; Salminen, Vahlberg, & Kivela, 2009; Salminen, Vahlberg, Salonoja, Aarnio, & Kivel, 2009). In a randomized control trial, Lord et al. (2005) found that older adults who participated in a fall prevention program focusing on exercise and vision problems had reduced fall risk factors compared to those who only received the exercise or vision components alone. The 210 older adults who received an extensive intervention focusing on exercise and vision showed fewer fall risks compared to the 204 older adults in the control group (Lord et al., 2005). In a randomized control trial conducted by Day et al. (2002), 1,090 community dwelling older adults over the age of 70 were given a multifactorial fall prevention program. The study found that exercise was most effective in reducing falls in older adults compared to environmental modification or vision improvement (Day et al., 2002). Similarly, in a randomized control trial conducted by Salminen, Vahlberg, and Kivela (2009), the researchers placed 293 community dwelling older adults in an intervention group that consisted of a group exercise program. The 45- to 50-minute exercise session focused on walking, balance, weight shifting, coordination, and circuit training. The 298 community dwelling older adults in the control group did not receive the exercise component. The study showed that there were a decreased number of falls that required medical attention in the intervention group. Thus, physical exercise is a pertinent component to a multifactorial program because it facilitates improvement in older adults' balance and strength to decrease the likelihood of falling.

**Environmental and home modification.** Another important aspect of multifactorial fall prevention programs is environmental modification. A health professional, often an occupational therapist, will visit the older adult's home to assess possible fall risk factors in the

home and suggest modifications. This may include removing throw rugs, increasing the lighting, and installing grab bars into the shower to help prevent falls. In a randomized control study conducted by Close et al. (1999), an occupational therapist visited the homes of 184 older adults in the intervention group to suggest environmental changes. The 213 older adults in the control group did not receive this intervention. The occupational therapist suggested environmental changes including removing rugs and referring adaptive equipment, such as handrails. At the 12-month follow up, the intervention group had a total of 183 falls, and the control group had 510. Similarly, Davison et al. (2005) used an occupational therapy assessment to check for home environmental hazards in an intervention group of 159 community-dwelling older adults who had recurrent falls. The 154 community-dwelling older adults in the control group did not receive the environmental modifications. The study showed that there were 36% fewer falls in the intervention group compared to the control group. In a prospective randomized controlled pilot study, Szanton et al. (2011) implemented the Community Aging in Place, Advancing Better Living for Elders (CAPABLE) program with community dwelling older adults. The 24 older adults in the intervention group were given a comprehensive home evaluation. Following consultation with an occupational therapist, the suggested home modifications and assistive devices were installed by a handyman. The 15 participants in the control group did not receive the home modifications. Upon completion of the study, 100% of the older adults in the intervention group reported benefits from the CAPABLE program, which was supported by statistical improvement in all outcomes. The use of the home and environmental modifications may help to reduce the number of falls in older adults. By assessing and modifying fall risk factors in the home, older adults may be able to increase safety in the home and decrease the number of falls that may occur at home.



**Medication Review.** Many medications have side effects that include dizziness, which increases fall risk in older adults. A fall prevention program that includes a medication review can help to reduce the likelihood of falling. A pharmacist can review and suggest alternative medicine to minimize dizziness. In a randomized control trial by Tinetti et al. (1994) a group of 153 older adults received a multifactorial fall prevention intervention. This program included review and alterations of medicines as a part of the multiple-risk-factor intervention strategy in older adults. Compared to the 153 older adults in the control group, there were fewer falls in the intervention group (Tinetti et al., 1994). Similarly, in a randomized control trial, Palvanen et al. (2014) included reduction and withdrawal of psychotropic medicines for home-dwelling older adults in a multifactorial fall prevention program due to their increased risk for falling. Of 1,314 participants, 661 home-dwelling older adults were given the intervention. At the one-year follow up, there were 96 falls for every 100 participants in the intervention group while there were 113. This study showed a  $p$  value of  $p = 0.002$  when comparing the two groups. This study reaffirms that fall prevention programs with a medication review can help to reduce falls.

**Successful Multifactorial Fall Prevention Programs.** Stepping On, a multifactorial fall prevention program by Clemson et al. (2004), used multifactorial fall risk interventions with adults over the age of 70. The intervention group of 157 older adults received lower-limb balance and strengthening exercises, visual screenings, medical management, home modifications, and safety tips for being out in the community. The Stepping On program was found to reduce falls by 31% in the intervention group as compared to the control group. Davison et al. (2005) found 36% reduction in falls when using another multifactorial fall risk program with cognitively intact older adults who had reoccurring falls. The 159 older adults in the intervention group received medical, physiotherapy, and occupational therapy interventions

(Davison et al., 2005). The control group received typical care following their fall. Receiving the multifactorial fall prevention program allowed the intervention group to reduce the number of falls. Similarly, Close et al. (1999) used a multifactorial fall prevention program with community-dwelling older adults. The 184 older adults in the intervention group received a program called PROFET (Prevention of Falls in the Elderly) (Close et al., 1999). This program combined medical and occupational therapy assessments to help reduce falls. At the one-year follow-up, the intervention group had a total of 183 falls and the control group had 510 (Close et al., 1999).

**Conclusion.** In summary, using a multifactorial fall prevention program in older adults can help to prevent the risk of falling. A multifactorial program focusing on a medication review, along with a home modification and exercise program can aide in reducing falls and fall related consequences in older adults. Although the literature suggests that multifactorial fall prevention programs can be effective in reducing the risk of falling, there is limited knowledge on which aspect of the program participants consider as a facilitator in applying the knowledge to prevent falls.

### **Factors that Impact Adherence**

Multifactorial fall prevention interventions have proved efficacious in reducing falls and fall-related injuries. Although there is an abundance of research on quantitative evaluations of their effectiveness, very little research to date addresses older adults' perceptions about fall prevention programs. Moreover, the little amount of qualitative research that examines older adults' views and attitudes with fall prevention interventions has been conducted in countries outside of the United States (Calhoun et al., 2011). Due to a paucity of information on what promotes participation and follow through in fall prevention interventions, little is known on how

to improve adherence in fall prevention interventions (Bunn, Dickinson, Barnett-Page, McInnes, & Horton, 2008; Kruse et al., 2010).

There are a number of factors that may either facilitate or hinder older adults' adherence to fall prevention interventions. Identified factors in current research that encouraged or prevented older adults from participating in fall prevention interventions included fall history, social support, autonomy, and fatalism.

**Fall history.** Fall history is an important factor in older adults' participation in fall prevention interventions. However, there is mixed evidence in regards to the effect of fall history on attitudes towards fall prevention. Some studies suggested that older adults who had fallen in the past were more likely to participate in fall prevention programs, accept home modifications, and engage in home or group exercises (Nikolaus & Bach, 2003; Yardley, Donovan-Hall, Francis, & Todd, 2006). For example, a study by Nikolaus and Bach (2003) examined the effectiveness of a fall intervention program and home assessment in reducing falls in older individuals' homes. The researchers found a higher compliance rate with recommendations in the subgroup of people who had experienced a fall twice or more before the study, compared to the control group who did not receive any type of home visit (Nikolaus & Bach, 2003). To control for the occasional fall that may not be the best indication of the intervention's effectiveness, a subgroup analysis compared individuals with no or one fall against individuals with two or more falls (Nikolaus & Bach, 2003). This evidence suggests that older adults who have had a fall in the past are more likely to adhere to fall prevention interventions. However, another study that examined adherence to home modification recommendations found no associations between home modifications and history of falls

(Cumming et al., 2001). Inconsistent findings suggest additional research is needed to arrive at more definitive conclusions on older adults' participation in fall prevention programs.

**Social support.** Relationships with family, friends, and healthcare professionals can impact older adults' views on participating in fall prevention programs. Grossman and Stewart (2003) found family to be a motivational factor for older adults to remain healthy and active in order to keep up with grandchildren and not be a burden to the family. In addition to family's role in encouraging participation in fall prevention interventions, support from health professionals is also important to adherence. For instance, Dickinson et al., (2011) explored older adults' experiences and perceptions of fall prevention interventions. Researchers of this study used semi-structured interviews and focus groups with older people who were currently attending or had previously attended a fall prevention program in England. Results found that the qualities of health professionals and facilitators made a significant difference upon whether older adults continued with an intervention or not. In some instances, participants spoke positively about the health professional that treated them in a person-centered manner and appreciated facilitators who expressed caring qualities (Dickinson et al., 2011). This study illustrated that health professionals have a substantial impact on continued adherence to fall prevention interventions.

**Autonomy.** In addition to social support, maintaining autonomy and independence was a critical factor for adherence in fall prevention interventions (Kruse et al., 2010). While home modifications can be effective in decreasing falls, some studies have found that older adults are unwilling to follow recommendations to improve safety (Kruse, et al., 2010). Various researchers have sought to find out older adults' attitudes toward fall risks and potential home modification. Kruse et al. (2010) interviewed ten adults aged 60 and older with varying physical

abilities and identified several themes regarding participants' contrasting attitudes toward home modification. Some older adults viewed home modifications as simple changes to improve function and increase independence while other older adults considered modifications as a disruption to their home environments. Similarly, a qualitative study by Yardley et al. (2006) also showed participants' mixed feelings about fall-related recommendations. Yardley et al. (2006) explored older adults' perceptions of fall prevention advice by implementing focus groups and semi-structured interviews with 66 community-dwelling adults from diverse settings in the United Kingdom. Some participants found that retaining independence was more important than accepting recommendations about assistive devices. However, some participants perceived that advice and assistance was considered an unacceptable loss of independence and self-confidence.

While some older adult participants have reported positive attitudes, other studies highlight more negativistic attitudes towards home modification recommendations. For example, findings from a qualitative study by Simpson, Darwin, and Marsh (2003) indicated that the recommendations for home modifications were perceived as intruding on personal choice and threatening to the older adults' sense of control. In addition, research participants reported that following home modifications was seen as giving up some degree of independence, regardless of familial and health professional suggestions (Kruse et al., 2010). Furthermore, older adults perceived that their personal identity was threatened due to the recommendations (Kruse, et al., 2010). The degree to which participants felt stigmatized was a dominant influence on their acceptance or rejection of the health-related recommendations.

Research literature illustrates that some older adults believe that fall prevention programs restrict their autonomy, independence, self-confidence, and sense of control, which taints their

program adherence. However, literature also reveals that other older adults view the programs as a means to help increase their independence and safety. Evidenced by the mixed attitudes reported from older adult participants, there is still a need to better understand how to respect older adults' autonomy and independence while promoting fall prevention program adherence to reduce fall risk.

**Fatalism.** Related to the issue of identity is the perception of fatalism. Fatalism is the belief that events are predetermined and therefore inevitable (Merriam-Webster, Incorporated, 2014). Fatalistic attitudes have commonly been shown to impact adherence in fall prevention intervention programs. Falls were not viewed as preventable because several older adults attributed falls to chance or other uncontrollable causes (Bunn et al., 2008; Faes et al., 2010; Yardley, et al., 2006). A qualitative study from the Netherlands explored the views and experiences regarding falling in community-dwelling older adults with and without cognitive impairments (Faes et al., 2010). Ten patients and ten caregivers participated in the study (Faes et al., 2010). Results from the study showed majority of participants had a negative view of fall prevention and that falling was considered inevitable and that nothing could be done to reduce it (Faes et al., 2010). Similarly, falls were also perceived as not preventable because they were often attributed to bad luck (Bunn et al., 2008). Another perspective revealed that older adults view physical decline as an inevitable part of aging, and therefore falling cannot be prevented (Faes et al., 2010; Yardley et al., 2006).

Other older adults felt that fall interventions were unnecessary for them because they had not yet reached the point in needing the intervention (Calhoun et al., 2011). Others underestimated their personal risk of falls and rationalized falls as a problem for others instead of for themselves (Yardley et al., 2006). There is also evidence that it may be difficult to persuade

older people to undertake physical exercise if they do not perceive it as an immediate and pressing need (Simpson et al., 2003). Although fatalistic attitudes have been found to interfere with adherence in fall prevention programs, there is little research that explores what social factors influence these perspectives.

Lack of attention to demographic variables is another limitation of the research on factors that impact older adults' program adherence. Although there is a growing body of research on older adults' perceptions of facilitators to participation in fall prevention programs, there is little evidence in integrating participants' feedback to enhance the effectiveness of a program. Understanding and integrating the perspectives of older adults participating in a specific program may provide the insight needed to enable participation in the fall prevention program.

### **Conclusion**

While there are a number of literary resources regarding falls, older adults, and multifactorial fall prevention programs, there is little research specifically analyzing the incorporation of participants' feedback to enhance multifactorial fall prevention programs in the United States. As explored above, there is limited research on which portion of the multifactorial fall prevention program participants find to be most beneficial. Few literary sources to date consider older adults' perceptions of the variables associated with fall prevention programs: environmental hazards, likelihood of follow through with recommendations, facilitators in preventing falls, autonomy, independence, and even fall prevention programs themselves. Obtaining the participants' perspectives in the context of the United States may help health professionals and program developers enhance existing fall prevention programs to address their clients' needs.

### **Statement of Purpose**

Multifactorial fall prevention programs that include education about fall prevention, home safety, medication review, vision, and exercise have been shown to reduce the rate of falls in older adults. While many older adults have completed and found a multifactorial fall prevention program beneficial, it is unknown which aspect of the fall prevention program had the most significant influence on their successful reduction in falls. The purpose of this program evaluation is to explore the perceived benefits from the participants' viewpoint of a multifactorial fall prevention program.

### **Theoretical Framework**

The Person-Environment-Occupation (PEO) model describes the transactional relationships between the person, environment, and occupation. Another key term in the PEO model is "fit," a concept introduced by Lawton, Nahemow, and Csikszentmihalyi (as cited by Crist, Basic Royeen, & Schkade, 2000). The PEO model theoretical framework sets the foundation and underlying tone for this program evaluation because we are determining the persons' perceptions of the fit between themselves and their participation in a multifactorial fall prevention program in their unique environments.

According to the PEO model, the person is dynamic, motivated, constantly developing, and engaging in functional tasks in various environments (Law et al., 1996). Due to the course of normal aging, community-dwelling older adults as addressed in our program evaluation experience several changes: physiological, environmental, social, and mental. Much like the person defined in the PEO model, a community-dwelling older adult is experiencing changes within themselves as they complete their day-to-day occupations in their choice contexts. Whether or not these older adults compensate for these inevitable changes may increase or



decrease their risk of falls. Falls result from the interaction between the functional task the older adults are performing in their familiar home environment or a dynamic community environment.

According to Rigby and Letts (2003), the environment is “broadly defined to include cultural, socioeconomic, institutional, physical, and social domains. Each domain is considered from the unique perspective of the person, household, neighborhood, and community” (p. 23). Not only does the environment have many facets, but it also varies depending on the persons performing in it. In regards to falls for older adults, the environment may increase the fall risk with hazardous barriers or decrease the fall risk with enhancements such as adequate lighting. The environment possesses many variables that can facilitate or hinder prevention of falls. Addressing this complex interaction between the person and environment, multifactorial fall prevention programs often include education about community mobility, home assessment, or home modifications.

In the PEO model, occupation includes self-directed, functional activities that meet the person’s intrinsic needs for self-care, fulfillment, and expression (Law et al., 1996; Rigby & Letts, 2003). Community-dwelling older adults engage in a variety of occupations. How they complete those occupations or what context they choose to perform them in may or may not be safe. If performing their occupation puts them in a compromising position, they may experience a fall and inflict injury upon themselves. For instance, if older adults use a step stool to reach for a pitcher on a high kitchen shelf, they put themselves at risk for falling. Neglecting to practice safe behaviors that reduce fall risk during occupations will compromise older adults’ safety.

According to Rigby and Letts (2003), fit is defined as congruence between what the person brings to the occupational and environmental demands. It has been established that the three PEO model factors (person, environment, and occupation) all interact with each other and

are constantly shifting. Using the lingo provided by the PEO model, multifactorial fall prevention programs aim to achieve optimal fit among the dynamic interactions of the older adults, their environments, and their occupations to ensure safety and well-being during occupational performance. Thus it is appropriate to utilize the PEO model as we examine the dynamic relationship amongst persons' perceptions of their engagement in the multifactorial fall prevention program.

## **Methodology**

### **Design**

A program evaluation was used to better understand the participants' perceived facilitators of a multifactorial fall prevention program. The purpose of this evaluation is to improve program effectiveness of the multifactorial fall prevention program. Prior to the beginning of the program evaluation, approval from the administrators of the multifactorial fall prevention program was obtained (Appendix A).

**Program.** The multifactorial fall prevention program has several components. Each participant received a comprehensive medication review from the pharmacist, allowing the pharmacist to recommend changes in prescriptions, if appropriate. Another component of this program was education and discussion regarding the participants' vision. The participants also received a home assessment and modification recommendations from an occupational therapist. This included a grab bar and a nightlight to use in their home. Lastly, the participants received a home exercise program to improve balance and strength in order to prevent falls. Volunteers called the participants monthly for one year to ensure that they were complying with the recommended exercises and home modifications. Participants were referred to the program by a health professional or a family member after receiving medical clearance from their physician.

Older adults that were excluded from the multifactorial fall prevention program were non-ambulatory or wheelchair bound, have moderate to severe memory loss or dementia, and/or on hospice care.

**Recruitment procedures.** For the purpose of this program evaluation, occupational therapists who delivered the multifactorial fall prevention program recruited participants using convenience sampling. Participants were invited to participate in the program evaluation if they completed the multifactorial fall prevention program in San Mateo and Santa Clara Counties, and met the following criteria: (1) were between the ages 65-85, (2) participated in the program from the years of 2010-2012, (3) self-reported that the program was beneficial to them, and (4) agreed to be interviewed by the program evaluators.

Five participants signed a consent form (see Appendix B) to participate in a semi-structured interview. They were also provided with a copy of participants' rights (see Appendix C). The program evaluators verbally reviewed the consent form with each participant and answered any questions prior to beginning the interview. Participants were also informed that they could refuse to answer a question, take a break, or cease the interview at any time.

### **Data Collection**

The goal of this program evaluation was to obtain a deeper understanding of facilitators in the multifactorial fall prevention program through semi-structured interviews. Guiding questions based upon the components of the multifactorial fall prevention program formed the basis for the semi-structured interviews (Appendix D). However, program evaluators were also flexible with probing and asked follow-up questions that were relevant to the participants' experiences. Probing questions encouraged the participants to expand their answers and helped elicit full richness and thoughtfulness of the data (Portney & Watkins, 2009).

Face-to-face, semi-structured interviews were used to collect data. The interviews took place in the participants' homes. Two program evaluators and an occupational therapist from the agency were present during the interview. One designated program evaluator asked questions with the use of a semi-structured interview guide and another program evaluator recorded field notes during the interview. A consistent interviewer was selected to ensure consistency in the study. Descriptive field notes about the participants' actions, dialogue, and context were recorded as completely and objectively as possible by the second program evaluator present during the interview. Each interview lasted 45 minutes to one hour, was audiotaped, and then transcribed verbatim. Interview transcriptions were completed by five first-year graduate occupational therapy students, all of whom were concurrently enrolled in a research methodology course. The program evaluators met with each of the first-year students to inform them about the transcription process and emphasize consistency, fidelity and confidentiality.

### **Data Analysis**

Following transcription, program evaluators met with the faculty advisor to discuss possible broad codes based upon the components of the multifactorial fall prevention program and questions on the semi-structured interview. Next, all program evaluators simply read through all five participants' transcriptions without marking the data to obtain a broad understanding of the scope of the participants' perspectives. For the process of coding, three program evaluators were assigned one transcript each and the fourth program evaluator received two transcripts. Once the coding process began, each program evaluator read through the transcript once to gain a more comprehensive understanding of the participant's perspective and then re-read it again while grouping content according to the codes. In order to ensure integrity among the findings, investigator triangulation was used (Polit & Beck, 2008). To begin the

investigator triangulation process, the four program evaluators met, discussed general findings, and then organized all transcript content and field notes into a table according to the identified codes. During this first triangulation meeting, the program evaluators discussed findings in relation to the codes to minimize investigator biases. Then the program evaluators met with the faculty advisor, who offered consultation regarding the identified codes and derived more detailed themes. Furthermore, the program evaluators collaborated with the faculty advisor, occupational therapist from the agency, and an additional reviewer from the agency, to establish credibility.

### **Ethical and Legal Considerations**

Exempt approvals from Dominican University of California Institutional Review Board for the Protection of Human Subjects and the Stanford Institutional Review Board for the Protection of Human Subjects were obtained prior to implementation (Appendix E). The program evaluators upheld all expectations of professionalism indicated by both institutions. This included confidentiality, fidelity, and beneficence. In order to uphold confidentiality, participants were given pseudonyms in order to protect personal identification information. All forms containing personal identification information of the participants were locked in a drawer in a locked office with capstone faculty advisor, Dr. Kitsum Li, in the Occupational Therapy Department at Dominican University of California. Currently, the only person with access to this information is Dr. Kitsum Li. However, all data collected will be destroyed one year after the completion of the study. The participants gave informed consent for the interview and program evaluation. The participants were also allowed to opt out of the interview at any time. The program evaluators demonstrated fidelity by treating each other and other collaborating professionals with respect, fairness, discretion and integrity (AOTA, 2010). The Occupational

Therapy Code of Ethics and Ethics Standards (2010) further defines fidelity as being faithful, which includes obligations of loyalty and the keeping of promises and commitments.

Additionally, beneficence was upheld throughout the duration of the program evaluation, as program evaluators demonstrated a concern for the well-being and safety of each participant.

### **Results**

Five participants from the multifactorial fall prevention program agreed to participate in the semi-structured interviews with the program evaluators and an occupational therapist from the agency. All participants were female with a mean age of 88.4 (SD = 5.8). According to the information from the interviews, the five participants chose to partake in the multifactorial fall prevention program for a variety of reasons except participant #1. She could not remember her initial reason for participating in the program. Following a fall, two of the participants were suggested by their physicians to participate in the program. Two other participants decided to participate in the program after reading the brochure.

Through qualitative analysis of the interviews, three key themes and one incidental theme emerged. The key themes include the participants' perceived benefits of exercises, home modifications, and follow-up volunteer calls. The incidental theme is participants' perceived benefit of social support.

During the qualitative program evaluation, there were no significant findings regarding the medication review component of the program. All participants had no significant changes in their medication list. One participant, however, discussed the assistance she received from her son to manage her daily medications.

### **Integration of Exercises Into Daily Life**

Participants found the exercises provided by the multifactorial fall prevention program to be beneficial and easy to integrate into their daily routine. Participant #1 mentioned that she often completed the feet exercises while cooking and completed other tasks in her kitchen. Participant #2 expressed that she continued to execute the exercises daily, and found that they were easy to complete while eating at the table. She added, “otherwise I don’t know what would’ve happened because there’s no way of knowing if I hadn’t done the exercises.” Although Participant #3 and #5 did not indicate that they continued to complete exercises regularly, they did express that they found the exercise component of the multifactorial fall prevention program to be beneficial. Participant #4 seemed disappointed when she realized that her scheduled time with the program evaluators was for an interview rather than for new exercises.

### **Implementation of Home Modification Recommendations**

Participants believed the recommended home modifications were one of the most important aspects of the program. The multifactorial fall program offered each participant free installment of one grab bar and a night light. The participant paid for additional home modifications as needed. Four out of the five participants implemented home modification as recommended. During the interview visit, two participants took initiative in providing the program evaluators with a tour of their home. Walking through their home, they pointed out what modifications were made following program recommendations. Participant #4 had a handrail and vertical grab bar attached on a brick wall in front of her door. She also showed the program evaluators her bathrooms which included a nightlight, safety rail for the toilet, raised

toilet seats, and grab bars in the shower. Similarly, Participant #1 also had grab bars and railings installed in her bathroom.

Although the multifactorial fall prevention program offered a free grab bar to each participant, participants also felt that other home recommendations were helpful. For example, throw rugs were recommended to be either removed or adhered to the floor with double-sided tape or special carpet pads. Three out of the five participants adhered to the recommendations regarding the throw rugs. When asked which component of the program was most useful, Participant #5 mentioned that she learned about the removal of throw rugs being an important factor in preventing falls. Participant #4 perceived that the grab bars and particularly the raised toilet seats were the most helpful. She stated, “I like the riser, it helps me a lot.” Moreover, she discussed her fear of falling in public restrooms due to the lack of grab bars and low seating of the toilets. She expressed,

“I went to the restaurant and went to the bathroom and there were no bars anywhere. I mean I was lost. Took me forever to get out of there. I was afraid I was going to stay there all night.”

Changing the home environment allowed participants to be more aware of the home and external environment, which may have helped to prevent future falls and reinforce safety.

### **Appreciation of Follow-Up Volunteer Calls**

Two of the five participants believed that phone call reminders from the volunteers was a beneficial aspect of the program. The phone calls from the volunteers reminded the participants to continue with the suggested exercises. Participant #3 mentioned, “What helped me I think most was the monthly call to remind me to keep doing exercises and to be aware.” Participant #1 emphasized the importance of this program component by referring to the monthly volunteer



call as a “lifesaver.” Additionally, she found the volunteer calls to be beneficial because they provided her with social support. She expressed,

“Getting the call every month from your wonderful woman from the fall program is like a lifesaver. I knew someone was watching out for me. Someone was looking out for me, they were going to call me every month. It really helped me. It really helped me live.

Similarly, Participant #3 mentioned, “it was kind of a nice feeling that somebody really acknowledged our problem and cared about it.” The volunteer phone calls influenced the participants’ experience of the fall prevention program.

### **Incidental Theme**

Apart from the three main themes mentioned above, one incidental theme also emerged. Three out of the five participants stated that social support from family and neighbors was a beneficial factor that influenced their participation in and adherence to the fall prevention program. For example, Participant #1 stated that her neighbor was willing to listen when she needed someone to talk to, assisted when she needed help at home, and run simple errands like grocery shopping when she was not able to. Participant #5 stated that her children brought her to church and all the places that made her happy. One participant showed the program evaluators a cheat sheet that her son made for her to adhere to her medical management. The sheet contained scheduled times and colored pictures of each pill she needs to administer daily.

### **Discussion**

The qualitative results of this program evaluation helped identify five participants’ perceived benefits of the multifactorial fall prevention program. It is important to note that prior to being interviewed, all of these participants had indicated that they found this program to be beneficial. Consequently, this program evaluation obtained results which may not represent the

views and opinions of other program participants. Nonetheless, themes which emerged from participant interviews provided valuable insight and potential implications for future program planning.

### **Exercises**

The exercise component of the multifactorial fall prevention program appeared to be the most memorable among participants. While other components may have been forgotten or not necessarily perceived as beneficial, positive feedback about the exercise component was unanimous. Providing participants with an exercise program they can complete in the comfort of their own home is another factor which may contribute to participants' appreciation of and adherence to the program. Two of the participants expressed that they were able to continue to perform the exercises while completing kitchen tasks or sitting at the table, indicating that the exercises are easy to integrate into common daily activities. Although two other participants expressed that they do not regularly integrate exercise into their daily routine, they still found this component to be beneficial.

Additionally, having an occupational therapist educate participants about various exercises they can perform and provide them with resources (i.e. handouts and DVDs), helped reinforce the importance of maintaining a daily exercise routine. Exercises that can be incorporated into an already established daily routine may have increased the likelihood of exercise compliance. This finding shares similarities with recent literature embedding exercise in habitual daily routines. Developed for fall prevention, the LiFE (Lifestyle integrated Functional Exercise) study used a home-based, lifestyle integrated balance and strengthening exercise programme (Clemson et al., 2012). The LiFE programme resulted in reduced recurrent falls in community-dwelling older adults. As mentioned above, participants' perception of

exercise as a beneficial component of the program suggest that incorporating exercise into daily routines may result in successful physical activity with older adults and increase effectiveness in fall prevention.

One aspect of occupational therapy's unique service is its focus on an individual's habits and routines necessary to perform the occupations of everyday life. Since participants perceived the exercise component of the program to be most memorable, incorporating exercise into daily routine may lead to patterns of everyday behavior. This present study demonstrated the significance of habituation, in which exercises can be organized into patterns and routines. This consistency of performance thereby constituted an important process in adaptation. Therefore, habituation supports the maintenance of patterns of everyday behavior and as a result, promotes functional performance of older adults.

### **Home Modifications**

In addition to perceived benefits of the exercise component of the program, participants highly valued recommended home modifications. Since all participants were provided with a nightlight and grab bar, they were able to utilize these modifications in their home to reduce the likelihood of falling. It was apparent that home modifications were an important aspect because many of the participants did not have clutter in their homes, which was documented in the field notes. For Participants #1 and #2 who left a few rugs in their homes, they demonstrated and verbalized awareness of strategies to avoid slipping or tripping. Changing the home environment allowed participants to be more aware of the home and external environment, which may have helped to prevent future falls and reinforce safety. One of the participants expressed a concern pertaining to the lack of adaptive equipment in public restrooms. As a result of the program's home modifications, one of the participants was able to increase her awareness not only within

her home environment, but also in the community. This demonstrated the significance of the recommended home modifications. This finding supports evidence in support of home modifications enhancing independence for older adults (Davison et al., 2005). Furthermore, one participant's attention to environmental factors allowed her to become aware of the reason behind her fear of falling, which was lack of proper environmental modifications in the community. The recommended home modifications not only emphasize safety in reducing fall risk, but may also have provided participants with an increased awareness of their environment.

Overall, recommended home modifications were perceived to be an invaluable aspect of the multifactorial fall prevention program. Findings from this program evaluation contradict with some literature in which studies found varied outcomes with adherence to home modifications among older adults. In a qualitative study, researchers identified attitudinal barriers towards adherence with home modifications. Those participants who were concerned about falling adhered to home modification recommendations. Other participants from the study who did not perceive problems in their household had no interest in home modifications to reduce their fall risk (Kruse et al., 2010). By not complying with home modification recommendations, older adults may increase the risk of falling. In another study by Cumming et al., (2001), participants did not believe that home modifications could decrease their risk of falling. In agreement with this program evaluation, participants from Nicholas and Bach (2003) study were more likely to accept home modification recommendations. Participants perceived home modifications as beneficial to reduce the likelihood of falling. However, participants' perception of valued home modifications were different from what is presented in the literature. Predominant thoughts towards adherence with home modifications varied on attitudinal barriers. We did not identify any noncompliance towards recommended home modifications. This

discrepancy between our results and present literature may be attributed to our chosen participants. All five participants were required to meet all inclusion criteria before being interviewed, including a self-report that the program was beneficial in helping them reduce their rate of falls or fall risk factors. Therefore, our participants' positive outlook toward the program may relate to their increased compliance with the recommended home modifications. Findings point to a wide range of factors that may influence older adults' perceptions of the program. Therefore, further research will be needed before it is clear whether older adults consistently value home modifications.

### **Volunteer Follow-Up Calls**

Another valuable component of the multifactorial fall prevention program was the follow-up phone calls from volunteers. Findings indicate that the program staff, including volunteers, play a role in promoting fall prevention and have the opportunity to increase their effectiveness. Participants expressed appreciation for these calls and indicated that the social support was beneficial. Incorporating this element into the program also helped remind participants to continue with the exercises. This form of social support may have allowed participants feeling someone cared about them. Consistent with the work of Dickinson et al., (2011), they explored the perceptions of older adults' perceptions of the facilitators and barriers to participation in fall prevention interventions. Researchers identified that the qualities of staff made a significant difference as to whether participants persisted with intervention or not (Dickinson et al., 2011). The importance of receiving caring qualities from staff was perceived as pivotal in encouraging uptake. These positive social support experiences, along with our findings, demonstrate the value of client-centered services, which appear to have a substantial impact on older adult's perceptions and behavior within a fall prevention program.

## **External Social Support**

In addition to the above themes and follow-up volunteer calls, social support outside of the program appears to play a significant role in encouraging participation. Participants' experiences illustrate the value and significance of social support, whether it be family or in the community. Social support, including assistance with visual aids, providing transportation, verbal reminders, or psychosocial support, have all contributed to this positive experience, which may have enhanced participation in the program. Considering how social factors were extremely important to the participants, engaging family and friends may further optimize encouragement and adherence in the program.

These findings share similarities with those reported in published studies involving the impact of social support on participation in fall prevention programs. In a study by Grossman and Stewart (2003) family was found to be a motivational factor for older adults to remain healthy. Cumming et al., (2011) found social support, such as family and friends, to act as a powerful reinforcer to increased adherence to program recommendations. Social support, including advocating for older adults' needs, is an important addition to fall prevention programs.

## **Medication**

The medication component of the program was not considered significant to all five interviewed participants. All five participants had no changes in their short list of medications. This may have been due to all five participants being in relatively good health. Therefore, the participants did not perceive the medication review portion of the program as particularly beneficial. This raises questions regarding the benefits of the medication review component of the program. Findings contradict with those published studies that prove medication review

being a key component in multifactorial fall prevention programs to decreasing falls (Kruse et al., 2010).

One participant however, mentioned her family's role in helping with medication management. This finding reinforces the value of social support being an influential factor to increase participation in the program. More significantly, this indicates that increased participation reinforces the importance of proper medication management.

### **Recommendations for Program Development**

Based on the theme *Integration of Exercises Into Daily Life*, exercises were shown to be very beneficial in this fall prevention program. Thus, the multifactorial fall prevention program should consider enhancing this component of the program. As a future suggestion, the program should consider teaching participants how to integrate exercises into everyday life. Clemson et al., (2012) found that older adults who participated in the LiFE (Lifestyle integrated Functional Exercise) had 31% fewer falls compared to older adults who participated in a gentle exercise group. The LiFE approach focused on balance and strength training in everyday activities. By incorporating exercises as part of their everyday functional activities, older adults in this multifactorial fall prevention program will have reinforcement of fall prevention strategies. Another suggestion for this component is to have exercise options for participants, catered to each participant's learning style. For example, the program may consider implementing a group exercise over internet services such as Skype. The Otago Exercise Program performed in a group setting was shown more effective in improving balance, muscle strength, and self-reported health in a group setting compared to a home setting (Kyrдалen, Moen, Røysland & Helbostad, 2013). This will allow the participant to have the choice of doing the exercise by him or herself or do it in a more supportive atmosphere.

The theme *Implementation of Home Modification Recommendations* revealed the importance of providing home modification recommendations to improve participants' safety awareness in the home and community environments. Currently, the program's home modification recommendations occur during the second visit, but the follow-up visit does not take place until one year later. Future program participants may benefit from an additional visit from the occupational therapist a month after the second visit. This will help ensure that home modifications are being implemented. If adding an additional visit for follow-up on home modifications is not feasible, the program may consider providing the recommended home modifications during the first visit. The routine second visit will then involve the occupational therapist determining if the recommended modifications are being completed in the participants' homes. In a study by Szanton et al., (2011) an occupational therapist visited the home of participants up to six times to identify and prioritize performance areas and environmental and behavioral contributors to performance difficulties. After interviewing participants and identifying a list of necessary modifications, a handyman then made the recommended changes. By visiting the home after the home modifications were suggested, the occupational therapist in the study was able to ensure that the participants followed through with the recommendations and were using the adaptive equipment appropriately. By providing a visit after the home modification recommendations are suggested, the program may help to ensure that participants have followed through with the recommendations and have made the home environment safer.

The *Appreciation of Follow-Up Volunteer Calls* theme indicates that participants valued the phone calls, which is a valuable source of social support to the older adults. As a result, it is recommended that the the multifactorial fall prevention program should continue with the volunteer phone calls. Currently, the phone calls were made routinely every month. In the



future, the program may consider asking participants during the first visit how frequently they would prefer having the volunteer phone calls. This will enable the volunteers will be able to cater to the preferences of the participants. The program may also consider having volunteers call multiple times during different times of the day if the participant does not answer the initial phone call. This will allow the program to ensure that participants are able to speak to a volunteer and receive valued social support. Furthermore, a phone message can be left mentioning the next time and date they will try to call the participant. This will allow participants to ensure that they are home to answer the call.

The program may also consider utilizing more volunteers to increase the consistency and frequency of volunteer phone calls. Increasing the number of volunteers available to follow up with participants may be accomplished by recruiting high school students from a local school or older adults from a local senior center or other community facility. Peer support from volunteers in a local senior center will allow the participants to connect to other older adults. The program will be able to provide participants with consistent support throughout the program. These regular phone calls may encourage participants to continue with the program's recommendations. The program may consider allowing participants to report to the occupational therapist if he or she does not form a supportive relationship with the assigned volunteer. The participant will then be assigned a different volunteer. If a participant does not build rapport with the assigned volunteer, he or she may be less inclined to answer the phone call or receive the social benefits of having a volunteer caller. Assigning a different volunteer to the participant may allow another individual the opportunity to form a collaborative relationship with the participant in order to better motivate him or her.

Lastly, the program should consider using a phone number that is not associated with a blocked number. Participant #3 recommended that the phone number be switched from a blocked number to one that is identifiable on caller identification. Having the phone number and name of the agency show up on the caller ID of the participant's phone may motivate them to answer the phone and converse with their designated volunteer.

Social support also provides a positive contribution to participant's quality of life. The program may enhance overall benefit for adherence by integrating the participants' family members and close friends into the multifactorial fall prevention program. During the first occupational therapy visit with the participant, the therapist may consider providing participants the option to involve their family, friends, or neighbors in the program. Enlisting the assistance of the participants' primary support system will help to reinforce any information the participants may have forgotten. Participants' friends and family may serve as another form of encouragement. In a study by Grossman and Stewart (2003), researchers found family to be a motivational factor for older adults to remain healthy and active. During the course of this program evaluation, it was evident that the five participants had family and neighbors who played an active role in maintaining their health and well being. Family and friends participants can play an important role in promoting and motivating participants to maintain engagement with the multifactorial fall prevention program.

Due to the several participants' concerns and unanswered questions about their vision, it would benefit the participants if the program incorporated more vision education related to fall prevention. Based on the information gathered during the interviews, participants may benefit from a more formal visual component in the program. Since occupational therapists are trained in providing basic visual screenings in relation to fall prevention, the program may consider a

more thorough visual screening to identify any visual impairments that may result in a fall. If a participant displays visual impairments, the occupational therapist can refer the participant to an optometrist or ophthalmologist. In addition to basic visual screenings to prevent falls, the program can also utilize the skills and knowledge of the occupational therapist to educate participants on vision safety. For example, the occupational therapist can educate the participant on the risks associated with having multifocal lenses in their glasses. Lord, Dayhew, and Howland (2002) found that older adults who wore multifocal lenses were twice more likely to fall compared to those who wore non-multifocal lens wearers. By educating participants on the importance of avoiding multifocal lenses, the program can help to decrease the incidence of falls in participants. Further education on sunglasses and glare sensitivity, as well as establishing healthy habits regarding vision may provide participants with pertinent information to increase safety awareness and vision strategies for fall prevention. By enhancing the vision component, the program can address the vision concerns of the participants. With adequate screening, education, and referrals, the program can equip participants with resources to reduce the risk of falling.

### **Limitations**

There are several potential limitations and biases that may have affected the results of this qualitative study. However, the program evaluators made considerable efforts to prevent as many of them as possible given the time allotted for the evaluation.

This qualitative study included five female participants between the ages 85 and 100. Although senior women are at a higher risk for falls than men, this program evaluation did not include any male participants. Therefore, a male perspective on fall preventing factors is not available. In regards to the ages of the participants, all except one 85 year old participant fell in

the original inclusion criteria of 65-85 years of age. Although our intention was to recruit older adults between the ages 65-85, the agency received less responses than expected from that particular age group. In addition to the age of participants being a potential limitation, the sample size being extrapolated from a small population also presents a potential question regarding how accurately the sample size represents the larger population.

The five females who participated in our program evaluation were all relatively healthy. All five of the participants were taking no more than a few medications. For this reason, there was no significant change in medications for the medication review component of the program. Had there been participants who were taking greater number of medications, the results may have varied. They may have found the medication review component of the program more beneficial.

Another potential limitation and threat to internal validity may be natural maturation of the community-dwelling older adults. Since participating in the multifactorial fall prevention program, the older adults have experienced mental and physical changes as a result of normal aging. Since most of the older adults completed the multifactorial fall prevention program two to four years ago, it would not be surprising if they forgot a few details about the program (i.e. a home visit by an occupational therapist or specific recommendations for home modifications). In attempts to minimize this threat to internal validity, the agency and program evaluators specified in the inclusion criteria that the older adults must have completed the multifactorial fall prevention program between the years of 2010-2012. Including program participants from the past four years will hopefully limit the amount of information lost due to maturation.

Additionally, the results of this study may have been affected by the Hawthorne effect. Portney and Watkins (2009) explained the Hawthorne effect as when participants try their best to

fulfill the program evaluators' expectations in a way that alters their responses such that they are no longer representative of their natural behaviors. This may apply to our study because the agency specifically recruited participants who found the multifactorial fall prevention program to be beneficial to their decrease in falls. Additionally, the program evaluators, occupational therapist from the agency, and consent form (Appendix B), made it evident to the older adults that we desired participants who benefited from the program. Perhaps the older adults we interviewed were emphasizing certain aspects of the program they thought beneficial and neglecting to include components of the program that could improve. It is difficult to determine or measure if the Hawthorne effect influenced the answers the older adults presented to us during the interviews, but it should not be dismissed as a potential bias to the data collected. Regardless of the potential limitations, we consider the data collected very valuable and positive, and trust that the participants provided us with reliable and truthful information to the best of their abilities.

### **Conclusion**

While much of the "baby boomer" generation reaches age 65 or older, the incidence of falls is expected to increase (Healthy People 2020, 2014). The vast array of consequences resulting from a fall may affect older adults in financial, physical, and emotional aspects. In order to better educate older adults and help to prevent falls, multifactorial fall prevention programs have been implemented. These programs aim to educate older adults and equip them with strategies to reduce the risk of falling. Previous literature has determined the effectiveness of multifactorial fall prevention programs. However, the literature does not explore which particular aspects of multifactorial fall prevention programs older adults find to be most beneficial in preventing falls.

The purpose of this program evaluation was to explore participants' perceptions regarding benefits of a fall prevention program. Data collection for this qualitative program evaluation was completed through semi-structured interviews conducted by program evaluators and an occupational therapist from the agency. The semi-structured interviews were transcribed verbatim and compared with field notes taken by the program evaluators. Three primary themes arose: integration of exercises into daily life, appreciation of follow-up volunteer calls and implementation of home modification recommendations. Based on the information gathered from the interviews, program evaluators had a deeper understanding of which aspects participants considered beneficial. With this valuable information program evaluators were able to make recommendations to enhance the program and better cater to the needs of the participants. This program evaluation emphasized the importance of listening to the participants' perspective in order to promote a more client-centered occupational therapy practice.

Due to the exploratory nature and limitations of this program evaluation, the findings cannot be generalized to all older adults who participate in multifactorial fall prevention program. In order to gain a more thorough understanding of participants' perceived benefits, future studies should consider interviewing a larger population. This population should include males and females of a wide variety of ages. Future studies should also consider interviewing participants soon after the final home visit. This will allow participants to share their perceptions and not forget any aspects of the program. With the knowledge gained by the this program evaluation and future program evaluations, multifactorial fall prevention programs can be more client-centered. By increasing adherence and decreasing the likelihood of falling with the suggested recommendations, older adults can enjoy participating in their meaningful occupations.

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**Appendix A**  
**LETTER TO THE AGENCY**  
**DOMINICAN UNIVERSITY OF CALIFORNIA**

Ms. Ellen Corman  
Stanford University Medical Center Trauma Service  
300 Pasteur Drive M/C 5898  
Stanford, CA 94305

Dear Ms. Ellen Corman,

This letter confirms that you have been provided with a brief description of our capstone research study, and that you give your consent for us to interview a selected sample of your clients who have successfully participated in the multifactorial fall prevention program provided by the Stanford University Medical Center Trauma Service. Our capstone research is a qualitative study exploring aspects of a multifactorial fall prevention program that reduce falls in community dwelling older adults. This research study is an important part of our graduate requirements for the Master of Science in Occupational Therapy degree at Dominican University of California.

As we discussed during our visit to your campus in early September, we will make every effort to ensure that our data collection will not interfere with your program, and that your clients will be treated with the utmost respect and sensitivity. If you have questions about the research, you may contact Nadine Marcelo at (510) 402-8383. If you have further concerns, you may contact our capstone faculty supervisor, Dr. Kitsum Li, at (415) 458-3753, or the Institutional Review Board for the Protection of Human Subjects at Dominican University of California at (415) 482-3547.

After our research study has been completed in June 2014, we will be glad to send you a summary of our research results.

If our request to interview your clients meets with your approval, please sign and date this letter and return it to Kitsum Li at 50 Acacia Ave, San Rafael, CA 94901, at your earliest convenience. Furthermore, please feel free to contact us if you have any questions about this research study.

Thank you very much for your time and support.

Sincerely,

Nadine Marcelo  
On behalf of student researchers Nadine Marcelo, Rajvinder Bains, Jaclyn Fok, and Tamara Vileshina.

**I agree with the above request**

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**Signature**

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**Date**

**Appendix B**  
**CONSENT FORM TO ACT AS A RESEARCH PARTICIPANT**  
**DOMINICAN UNIVERSITY OF CALIFORNIA**

1. I understand that I am being asked to participate in a research program evaluation designed to explore participants' perceptions to determine what factors of a multifactorial fall prevention program, such as Farewell to Falls, facilitate or inhibit fall prevention. This research is part of the capstone research program evaluation at Dominican University of California for occupational therapy students Rajvinder Bains, Jaclyn Fok, Nadine Marcelo, and Tamara Vileshina. This capstone research program evaluation is being supervised by Dr. Kitsum Li OTR/L, a professor in the Occupational Therapy Department at Dominican University of California.
2. I understand that participation in this research will involve taking part in a one and a half hour semi-structured interview in my own home or a mutually agreed upon location, which will include questions about my general experience, my follow through with the provided recommendations, and strategies, facilitators, and barriers that I experienced during Stanford's Farewell to Falls program.
3. I understand that I will be discussing topics of a personal nature, and that I may refuse to answer any question that causes me distress or seems an invasion of my privacy. I also understand that my participation may involve some physical fatigue, mental fatigue, or psychological discomfort given the nature of the topic being addressed in the interview. If I experience any problems or serious distress due to my participation, I can take a break or withdraw from the program evaluation without any adverse consequences.
4. I have been made aware that the interviews will be audiotaped. All personal references and identifying information will be eliminated when these recordings are transcribed, and all subjects will be identified by a pseudonym only. The master list for these pseudonyms will be kept by Dr. Kitsum Li in a locked file separate from the transcripts. Coded transcripts will be seen only by the student researchers and Dr. Kitsum Li. Additional graduate students will be used as research assistants to transcribe the audiotapes. These students will have completed the Research in the Health Professions course and guided by the code of ethics in research maintaining my confidentiality. The digital recording will be erased once the transcription is completed. One year after the completion of the research, all written materials will also be destroyed.
5. I am aware that all program evaluation participants will be furnished with a written summary, upon request, of the relevant findings and conclusions of this program evaluation. Such results will not be available until June 2014.

6. I understand that if I have any further questions about the program evaluation, I may contact student researchers Rajvinder Bains, Jaclyn Fok, Nadine Marcelo, and Tamara Vileshina at [ffqual@gmail.com](mailto:ffqual@gmail.com) or their research supervisor, Dr. Kitsum Li at [kitsum.li@dominican.edu](mailto:kitsum.li@dominican.edu) or (415) 458-3753. If I have further questions or comments about participation in this program evaluation, I may contact the Dominican University of California Institutional Review Board for the Protection of Human Subjects (IRBPHS), which is concerned with the protection of volunteers in research projects. I may reach the IRBPHS Office by calling (415) 482-3547 and leaving a voicemail message, by fax at (415) 257-0165 or by writing to the IRBPHS, Office of the Associate Vice President for Academic Affairs, Dominican University of California, 50 Acacia Avenue, San Rafael, CA 94901.

**I HAVE READ AND UNDERSTAND ALL OF THE ABOVE EXPLANATIONS REGARDING THIS PROGRAM EVALUATION. I VOLUNTARILY GIVE MY CONSENT TO PARTICIPATE. A COPY OF THIS FORM HAS BEEN GIVEN TO ME FOR MY FUTURE REFERENCE.**

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Signature

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Date

**Appendix C**  
**IRBPHS RESEARCH PARTICIPANT'S BILL OF RIGHTS**  
**DOMINICAN UNIVERSITY OF CALIFORNIA**

Every person who is asked to be in a research program evaluation has the following rights:

1. To be told what the program evaluation is trying to find out;
2. To be told what will happen in the program evaluation and whether any of the procedures or devices are different from what would be used in standard practice;
3. To be told about important risks or discomforts of the things that will happen to her/him;
4. To be told if s/he can expect any benefit from participating and, if so, what the benefits might be;
5. To be told what other choices s/he has and how they may be better or worse than being in the program evaluation;
6. To be allowed to ask any questions concerning the program evaluation both before agreeing to be involved and during the course of the program evaluation;
7. To refuse to participate at all before or after the program evaluation is stated without any adverse effects. If such a decision is made, it will not affect h/her rights to receive the care or privileges expected if s/he were not in the program evaluation.
8. To receive a copy of the signed and dated consent form;
9. To be free of pressure when considering whether s/he wishes to be in the program evaluation.

If you have questions about the research you may contact the student researchers at [ffqual@gmail.com](mailto:ffqual@gmail.com). If you have further questions you may contact our research supervisor, Dr. Kitsum Li, at (415) 458-3753 or the Dominican University of California Institutional Review Board for the Protection of Human Subjects (IRBPHS), which is concerned with protection of volunteers in research projects. You may reach the IRBPHS Office by calling (415) 482-3547 and leaving a voicemail message, or by faxing at (415) 257-0165, or by writing to IRBPHS, Office of Associate Vice President for Academic Affairs, Dominican University of California, 50 Acacia Avenue, San Rafael, CA 94901.

## **Appendix D**

### **SEMI-STRUCTURED INTERVIEW QUESTIONS**

#### **General Questions**

1. How old are you? When did you participate in the Farewell to Falls program? What was the reason for your participation?
2. Please describe your experience with the Farewell to Falls program.
3. What were your goals when participating in the Farewell to Falls program?
4. How have your concerns about falling changed since participating in the Farewell to Falls program? And why?

#### **Following Through With Recommendations**

1. What kind of changes did you make based on the recommendations from the occupational therapist?
2. Which component of the Farewell to Falls program did you find most useful?
3. What did you find useful or supportive outside of the Farewell to Falls program?

#### **Medication Review**

1. Based on the medication review during the Farewell to Falls program, have there been any changes in the medications you are taking? Please explain.
2. How was the medication review component beneficial to you? If not found to be beneficial, how do you think this component of the program could be changed?

#### **Home Exercise Program**

1. Did you find the Farewell to Falls home exercise program helpful? How so or why not?
2. How did the Farewell to Falls home exercise program help you with preventing falls?
3. Do you continue to complete the home exercise program? If so, how often? If not, why not?

**Home Safety Assessment and Modifications**

1. Did you meet with a home safety specialist regarding home modifications? If so, what kind of changes did you make?
2. Did you find the suggestions regarding home modifications beneficial or not beneficial?
3. If modifications were made, do you feel that they were beneficial in preventing falls?

**Strategies, Facilitators, and Barriers**

1. Aside from the Farewell to Falls program, what other strategies have you used to reduce your risk of falling?
2. Did you find the recommendations given by the Farewell to Falls program regarding fall risk reduction methods helpful (i.e. getting up from a fall)?
3. What do you feel has contributed to your decrease in falls after participating in the Farewell to Falls program?
4. What, if any, barriers do you feel existed within the Farewell to Falls program? And why or why not?
5. What fall strategies did you use the most and why?
6. How involved were your family/friends during your participation in this fall prevention program?
7. How involved were your family/friends after your participation in this fall prevention program?
8. What new knowledge do you have now on how to prevent falls in your home?



**Appendix E**  
**IRB APPROVAL LETTER**



January 28, 2014

Rajvinder Bains  
50 Acacia Ave.  
San Rafael, CA 94901

Dear Rajvinder:

I have reviewed your proposal entitled *Participants' Perceptions of Factors in Preventing Falls* submitted to the Dominican University Institutional Review Board for the Protection of Human Participants (IRBPHP Application, #10231). 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