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Preventing and Reducing Falls in Assisted Living Facilities: An Educational Intervention

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Preventing and Reducing Falls in Assisted Living Facilities: An Educational Intervention

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A Capstone Paper 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 project, completed under the direction of the candidates' faculty advisor and approved by the chair of the program, has been presented to and accepted by the faculty of the occupational therapy department in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy.

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Abstract

As the number of older adults continues to rise, falling in older adults has become a national health care issue. Many older adults who fall reside in assisted living facilities. Every time a fall incident occurs, first responders are called, utilizing a significant amount of first responder's time and resources. Therefore, the purpose of this project was to implement a fall prevention program for residents of an assisted living facility (ALF) to reduce fall risk and fall-related calls to the local fire department. The project consisted of a four-week course given once weekly for 60 minutes to residents at an ALF. Course content was evidence-based and included information on the role of occupational therapy in fall prevention, strength and balance exercises, environmental fall risks, and how hydration, nutrition, vitamin D intake, bone health, and medication management impact fall risk. Feedback was overwhelmingly positive, indicating that participants found the information helpful and relevant. Occupational therapists and other health professionals can play an important role in the education of residents and staff of ALFs to increase awareness of fall risks, promote health and well-being among older adults, and help decrease fall-related calls to first responders.

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Introduction/Statement of Problem

The world is on the brink of a demographic milestone. By 2050, the number of adults over the age of 65 years, known as the older adult population, will triple to approximately 1.5 billion, representing 16% of the world's population (WHO, 2011). By 2030, the number of older adults in the United States is projected to almost double from 39 to 72 million (WHO, 2011). As people age, they are at increased risk for falls. Due to this exponential increase in the older adult population, there is a similar increase in risk of fall-related injuries.

According to the Centers for Disease Control and Prevention (CDC), falls are the leading cause of fatal and nonfatal injuries among older adults. In 2012, 2.4 million older adults who fell were treated by emergency services and medical costs of falls reached 30 billion dollars (CDC, 2014a). By 2020, the annual direct and indirect cost of fall injuries is expected to reach 67.7 billion dollars (CDC, 2014a). The effects of falls on individuals range in severity and can increase risk of early death (CDC, 2014b). Many older adults concerned about falling move into assisted living facilities (ALFs), where they have assistance to help ensure a safer way of living. The current rate of older adults moving to ALFs nationally is 2.1 million, but is expected to double to 4 million in the next 20 years (NCHS, 2010). A majority of older adults who live in ALFs are at risk for falls and fall related injuries because of multiple extrinsic and intrinsic factors (NCHS, 2010).

When a fall results in an emergency call, first responders are often dispatched. First responders, including firefighters and emergency medical services (EMS) providers, are faced with numerous fall calls to ALFs on a regular basis. Many emergency services and first responders personnel spend a significant portion of their time and resources responding to falls that could have been prevented (Barton et al., 2013). The number of first responders receiving

calls from assisted living facilities has increased dramatically within the last several years (S. Wargo, personal communication, October 5, 2014). After a person falls, EMS providers may conduct screenings and assessments and also provide referrals for that individual, which may contribute to decreased falls in the future (Kue, Ramstrom, Weisberg, & Restuccia, 2009; Shah et al., 2006; Shah et al., 2010). Yet, due to time and resource limitations- fall risk screenings, assessments, and referrals are often not performed (Shah et al., 2006). Thus, providing interventions that give residents tools, knowledge, and skills to help prevent falls from occurring is a key component to decreasing the number of fall-related calls made to first responders by ALF staff and residents.

Educating residents about fall risk factors and strategies to prevent falls, known as fall prevention programs, can help individuals avoid falls. In addition to direct care of older adults, occupational therapists assist in developing and implementing fall prevention programs in community centers, nursing homes, and assisted living facilities. Because occupational therapists (OTs) are trained as health educators, and specifically trained to analyze environments and tasks to facilitate function and promote safety, they serve as appropriate educators for fall prevention programs. Occupational therapists educate people on how to modify their occupations and environments to accommodate specific needs and help them to recognize fall hazards. Occupational therapists can also evaluate individuals for physical and cognitive limitations that may contribute to falls. Recommendations often include a combination of interventions that target improving physical abilities to safely perform daily tasks, changing activity patterns and behaviors, and modifying the home environment (AOTA, 2012). Occupational therapy services typically include not only training clients, but also families, and interdisciplinary team members on strategies to support fall prevention (AOTA, 2012).

Implementing occupational therapy recommendations to improve safety in ALFs can reduce healthcare costs by reducing the number of calls made to ALFs for fall-related injuries.

Literature Review

Aging in America

Advances in income, nutrition, education, sanitation, and medicine have all contributed to increased life expectancy worldwide (WHO, 2007; Oeppen & Vaeppl, 2002). In the United States, average life expectancy is 72 years for men and 81 years for women (CDC, 2014d). The “baby boom” generation, which includes individuals born between mid-1946 and mid-1964, will soon be retiring (Longman, 2010; United States Census, 2014). Thus, federal, state, and local governments are concerned about increased need for healthcare, transportation, and housing for these older adults (United States Census Bureau, 2010).

Public policies related to older adults are a major focus of global and national organizations such as the World Health Organization, the American Association of Retired Persons (AARP), and the medical professions, including nursing, physical therapy, and occupational therapy (WHO, 2007; Kozar-Westman, Troutman-Jordan, & Nies, 2013). Public policies related to older adults assist in the protection of the rights and health of its population. In recent years, healthcare has shifted to a framework, which highlights the goal of improving quality of life and preventing illness. One such conceptual framework is “active aging.” “Active aging” is defined as a “process of optimizing opportunities for health, participation, and security in order to enhance quality of life as people age” (WHO, 2012, p. 12). The determinants for this process include a variety of factors surrounding the older adult such as gender, culture, behavior, access to health and social services; personal, social, and economic status; and the physical environment (Mendes, 2013; WHO, 2007).

Aging in Place

In the United States, 80% of older adults own their own home and prefer to continue living there as they age; which is referred to as “aging in place” (AOTA, 2014). Their preference for this choice includes the low cost of housing and the importance of experiencing the “feeling” of home (Shu-Li et al., 2008). A home is more than just a physical dwelling; rather the concept of home often carries positive connotations, such as familial connections, emotional connections with neighbors, and involvement in the community (Wiles, Leibing, Guberman, Reeve, & Allen, 2011).

“Aging in place” can be a challenge when an older adult is unable to maintain home management due to deteriorating health (Wiles et al., 2011). Cognitive conditions, such as dementia or Parkinson’s may render older adults unaware of gradual or sudden declines in activities of daily living and may quickly become overwhelming. “Aging in place” may increase the burden for adult children who are caring for both their parents and their own children (City of Novato, 2001). As a result of deteriorating health and family burdens, some older adults decide to move from their homes into senior care housing, such as an assisted living facility (ALF) (Shu-Li et al., 2008).

Assisted Living Facilities

The decision by an older adult to move to an ALF can be a difficult one. Typically, the decision is made by both the older adult and his or her family (Shu-Li et al., 2008). The current number of older adults moving to ALFs nationally is 2.1 million per year, but is expected to double to four million per year in the next 20 years (NCHS, 2010).

According to the National Center for Health Statistics, ALF residents have several common characteristics (2010). Females outnumber males by a ratio of 3 to 1 (National Center

for Health Statistics [NCHS], 2014). ALF residents often take multiple medications, known as polypharmacy, including psychotropic medications, which can negatively affect performance skills and patterns such as walking, and lead to falls (Paul & Liu, 2012). Most ALF residents need assistance with four activities of daily living (ADLs), but require less medical assistance than residents of skilled nursing facilities (NCHS, 2014; Silva-Smith et al., 2013).

In ALFs, some residents receive assistance for ADLs from direct care workers (DCWs) and can spend most of their day in contact with DCWs. Ball et al. (2009) reported that DCWs have high job satisfaction because they enjoy “feeling needed” (p. 41) by the residents. However, DCWs in this study also reported feeling dissatisfaction from working 8-16 hour shifts and earning just over minimum hourly wages. All participants in the Ball et al. study (2009) were immigrants and did not speak English as a first language, and reported that communication problems were common as a result of older adult residents holding “classist” and “racist” attitudes towards them. Furthermore, due to language barriers, DCWs and ALF residents may miscommunicate about medication administration needs (Williams & Warren, 2009). Miscommunication about medications may result in adverse reactions such as dizziness, disorientation, and lack of balance. These adverse reactions may also contribute to falls (Lindsay, 2011).

Falls in Older Adults

Falls are the leading cause of fatal and non-fatal injuries among older adults (CDC, 2014b). A fall is defined as “an event whereby an individual comes to rest on the ground or another lower level with or without loss of consciousness” (National Collaborating Centre for Nursing and Supportive Care, 2004, para. 1). Due to the declining health of older adults, fall incidents are not usually isolated to one event, and repetitive falls are common (Paul & Liu,

2012). One-third of older adults fall annually, and of those, 50% will have recurrent falls (Letts et al., 2009). Fall incidents often require emergency medical care (Paul & Liu, 2012). In 2012, Medicare costs averaged between \$13,797 and \$20,450 per fall (CDC, 2014a). Fall-related injury is thus one of the 20 most expensive medical conditions (CDC, 2014a).

Fall-Risk Factors

There are multiple factors that influence fall risk; some are intrinsic and some are extrinsic. Intrinsic factors relate to individuals, whereas extrinsic factors relate to the environment.

Intrinsic Factors Contributing to Fall Risk

Multiple intrinsic factors related to physical and mental health can increase risk of falling. Chronic conditions and illness often cause declines in strength and endurance, postural control, and balance (Paul & Lui, 2012). Slowed reaction time, declining vision, and the inability to perceive depth of barriers or steps are also common causes of falls (Paul & Lui, 2012). Mild declines in cognitive function, such as forgetting to turn the light on, or unintentionally leaving barriers in the pathway, can also greatly contribute to fall risk (Paul & Liu, 2012). Many older adults who fall once can develop a fear of falling and begin to turn away from activities they once enjoyed, such as exercise and leisure activities if their fear becomes too great (Wood-Nartker et al., 2014). This then leads to even greater loss of physical fitness and reduced mobility, thus, further increasing fall risk (CDC, 2014b).

Another intrinsic factor linked to falls is a lack of knowledge about fall prevention strategies. Typical barriers to attending fall prevention workshops are reduced mobility, lack of transportation and/or family/caregiver support, and limited knowledge about the existence of such programs (Child et al., 2012). However, another barrier that limits people's knowledge of

fall prevention strategies, including information about assistive mobility devices, such as walkers and canes, is the social stigma associated with being labeled a “fall risk” (Child et al., 2012). Older adults often want to maintain their sense of independence and, as a result, do not seek or receive the necessary education to prevent falls or use assistive devices correctly (Child et al., 2012).

Finally, increased falls have been found in individuals over the age of 65 who experience polypharmacy. Many older adults are taking multiple prescription medications at the same time, and the combination of these drugs, known as polypharmacy, can cause adverse reactions, such as dizziness and confusion (Kelsey, Procter-Grey, Hannan, & Li, 2012). Psychotropic medication use, including antidepressants, hypnotics, benzodiazepines, antipsychotics, and other sedatives is common among older adults with or without dementia in assisted living, acute care medical and psychiatric units, and SNFs (Kelsey et al., 2012; Lindsay, 2011). These medications are known to have potentially serious side effects, and when mixed with other medications, can cause severe dizziness, confusion, and decreased mobilization increasing the likelihood of falling.

Extrinsic Factors Contributing to Fall Risk

The physical environment can contribute to fall risk, especially in the home environment. According to a study conducted in an ALF in 2013, 38% of falls among 15 individuals were at the bedside; 21% in the bathroom; and 17% of fall incidents in common living areas, dining rooms, lobbies, and hallways (Silva-Smith, Kluge, LeCompte, & Snook, 2013). Interestingly, falls in the bathroom were only reported as occurring 3% of the time (Silva-Smith et al., 2013). In 2010, a study of 959 seniors receiving home-care services found that environmental hazards were present in 91% of homes (Leclerc, 2010). Each environmental hazard identified in the

home increased the risk of falling by 19% (Leclerc, 2010). In a study by Cumming et al. (1999), of 174 older adults, factors that contributed to falls included uneven surfaces, unequal stair dimensions, bulky throw rugs, slippery/wet surfaces, absence of bathmats, and slippery footwear. In addition, the absence of grab bars, stair, and bar rails was also an indicator of a high fall risk environment. Participants in the study also suggested that low lighting levels may have contributed to many of these falls. In spite of the necessity for adequate lighting for sight and safety of older adults, light levels in many residences and nursing homes in the United States are far below the recommended levels, according to the American National Standards Institute (Paul & Liu, 2012). When compared to persons satisfied with light levels in their home, persons reporting inadequate light in their residences were also 1.4 times more likely to report depression, which has also been linked to falls (Paul & Liu, 2012).

Fall Consequences

Falling has significant consequences that negatively impact occupational performance (Lindsay, 2011). Experiencing a fall can signify an abrupt and monumental life change. Falls can cause many severe physical injuries including: fractures; sprains; pulled/torn muscles, ligaments, and tendons; dislocated joints; and concussions (Kelsey et al., 2012). Most fractures experienced by older adults are caused by falls and among the most common are spinal and wrist fractures (CDC, 2014c). Twenty to 30% of older adults who fall suffer moderate to severe injuries such as lacerations, hip fractures, and head traumas. Falls are a major cause and consequence of traumatic brain injury (TBI) (CDC, 2014b). In 2000, 46% of fatal falls among older adults were due to TBI (CDC, 2014b). These injuries can lead to and prolong hospital lengths of stay, and increase the risk of early death. Even with fall incidents when no injury occurs, multiple falls invariably trigger changes in lifestyle, including a reduction in physical and

social activities, decreased independence in activities of daily living (ADLs), a reduction in perceived quality of life, and increased social isolation (Paul & Liu, 2012). A fall incident and/or repeated falls can have a tremendous negative impact on a person's sense of identity, and can often result in symptoms of depression (Child et al., 2012).

Falls can trigger declines in occupational performance and participation in social activities (Lindsay, 2011). Experiencing a fall may decrease confidence and reduce engagement in social activities, which can impact interpersonal relationships (McMahon, Talley, & Wyman, 2011). Restriction of activity leads to feelings of frustration and a sense of loss, as older adults cannot engage in valued occupations and begin to rely more on others (Child et al., 2012). Many older adults who have fallen refrain from asking for help from family, friends, or neighbors, due to embarrassment and wanting to preserve their pride and sense of independence (McMahon et al., 2011). Some older adults attempt to participate in social activities without assistive devices, such as canes and walkers, because they do not want to be perceived as helpless: "Although walking aids and 'sensible' footwear may allow a greater range of choice, many aids [are] perceived as unwelcome, despite the assistance they afforded, and [are] negatively viewed as a marker towards loss of independence" (Child et al., 2012, p.11).

Fall Prevention Programs

Falls in older adults can be prevented and fall prevention is a critical national health priority (Child et al., 2012). While there are numerous programs to help prevent falls, there is no one program which is considered the "best." However, the Centers for Disease Control has compiled a resource guide of evidence-based fall prevention programs (CDC, 2014b). The general purpose of all fall prevention programs is to increase awareness and reduce risk of falls through assessing the environment and the individual, as well as educating individuals,

caregivers, and staff on fall risk factors and fall prevention strategies, such as performing a daily balance and strength program. Fall prevention programs often target adults older than 65, who have fallen once and are at risk of falling again, living alone, or who are concerned about falling (MacKenzie, 2013). These are characteristics of many residents in assisted living facilities. Three fall prevention programs in particular were reviewed for this project and were used as a basis for the program design.

The Stepping On Program, a multi-faceted, community-based program, is a recognized program for effectively reducing falls (Clemson et al., 2011). This program uses a series of two-hour weekly sessions to teach fall prevention strategies. The program includes seven educational sessions, a follow-up home visit, and a three-month booster session. Each educational session has a specific topic: (1) risk appraisal; introducing balance and strength exercises; (2) review and practice exercises, how to move safely in the home; (3) hazards in and around the home and how to remove or reduce them; (4) how to move safely in the community, safe footwear and clothing; (5) poor vision and fall risk, the benefits of vitamin D, calcium, and hip protectors; (6) medication management; review of exercises; more strategies for moving safely in the community; and (7) review of topics covered in program (Clemson et al., 2011). After the educational sessions, if the participants would like a team to come out to their home for an assessment, a home visit and recommendations on modifications are made. Following a three-month period, a “booster” session is held, during which the group discusses achievements and how to maintain motivation. The main purpose of the Stepping On program is to promote self-efficacy, empower participants to make better decisions, and make behavioral changes to decrease falls. Participants’ fall rates in one study decreased by 30% after completing the Stepping On Program when compared to those who did not participate (Clemson, 2004).

Another effective program to reduce falls is called Healthy Stepping Older Adults (HSOA). This “hybrid” program utilizes community services for older adults and includes risk screenings for falls and education on prevention (Albert et. al, 2014). The fall risk screening uses standardized assessments, such as Timed-Up-and-Go (TUG). Following the assessment the participants participate in a two hour fall prevention class, where they learn to recognize falling hazards, identify risk situations, and practice exercises designed to improve balance and mobility. In one study, HSOA participants had a significantly lower incidence of falls than a similar comparison group.

The Stay Safe, Stay Active program from Australia, focuses primarily on exercises to improve balance, coordination, muscle strength, reaction time, and aerobic capacity to reduce falls (Barnett, Smith, Lord, Williams, & Baumand, 2003). Classes are conducted in an indoor lawn bowling and sports club that hosts community programs. The program meets for one-hour class periods, once a week, for 37 weeks. Each class includes a 5 to 10 minute warm-up which focuses on stretching of the lower limbs and 10 minutes of cool down that includes gentle stretching, relaxation, and controlled-breathing practice (Barnett et al., 2003). The classes include exercises that focus on balance and coordination, such as modified Tai Chi exercises, practice in stepping and in changing direction, dance steps, catching and throwing a ball, strengthening exercises, involving the participant’s weight such as sit-to-stand, wall press-ups and resistance-band exercises that work both upper and lower limbs and aerobic exercises, including fast-walking practice with changes in pace and direction (Barnett et al., 2003). In one study, participants were 40% less likely to fall and one-third were less likely to suffer a fall-related injury than those who did not receive the intervention based on the study’s results (Barnett et al., 2003).

Role of Occupational Therapy in Fall Prevention

Falls are often associated with limitations in activity, loss of independence, and institutionalization (Leland et al., 2012). Therefore, the main role of occupational therapy in fall prevention is helping individuals continue to engage in valued occupations through the use of environmental modifications and education of the patient and caregivers. If a fall restricts a person's activities or occupations, then an occupational therapist has the skills to modify or adjust items in the environment or task (AOTA, 2013). Occupational therapists are able to look at a person, his or her environment, and the task and ensure that all their parts are working in harmony in order for the task to be completed. If a task is too difficult for the person, an occupational therapist can adapt the task or environment. Occupational therapists are thus the ideal professionals for fall prevention implementations (AOTA, 2013).

Occupational therapists are qualified to implement fall prevention programs, which can include environmental modification interventions, and exercise interventions. Environmental modification involves home modification recommendations, such as installing grab bars in the bathroom or removing throw rugs, to reduce fall hazards and improve performance of ADLs. Exercise interventions include functional exercises and complementary exercises to increase strength and improve balance. Occupational therapists also understand intrinsic and extrinsic fall risk factors. By addressing environmental modifications, occupational therapists are decreasing extrinsic fall risk factors and increasing self-efficacy (Leland et al., 2012). When implementing exercises routine in relation to fall prevention, occupational therapists are addressing intrinsic fall risk factors.

Occupational therapists often work in multi-disciplinary teams to implement multi-factorial and multi-component programs to address all areas that factor into falls (Wood et al.,

2013). In a multi-disciplinary team, occupational therapists are responsible for assisting the patient with areas that affect occupational performance, such as conditions disrupting meaningful activities. Not all causes of falls are within the scope of occupational therapy practice, which is why multi-disciplinary teams are established. Yet, without occupational therapy, fall prevention programs lack unique perspective (Leland et al., 2012). The different lens and components that occupational therapists develop and implement can optimize occupational performance in older adults and contribute to successful aging in place in older adults (Wood et al., 2013).

Role of First Responders in Fall Prevention

First responders, such as fire fighters or emergency medical personnel, often make initial contact with a person who has fallen, thus giving them a unique perspective regarding the cause of the fall (Robnett & Chop, 2010). The initial role of the first responder is to assess the health and safety of the individual who has fallen and respond appropriately. A few studies have demonstrated the feasibility of first responders and EMS staff conducting fall risk screenings for older adults during an emergency response incident (Shah et al., 2006; Shah et al., 2010). One EMS-based program successfully screened 1,231 of 1,444 older adult participants (85%) and identified needs in three specific domains: falls (45%), medication management (69%), and depression (20%) (Shah et al., 2010). Of the participants that received a screening, 91% were determined to have needs in at least one of the three domains (Shah et al., 2010). In another study by Shah et al. (2006), first responders were able to screen 258 older adult participants for falls, environmental hazards, influenza, and pneumococcal infections. By identifying specific fall risks in older adults immediately after a fall, first responders can contribute directly to the health and well-being of community dwelling older adults by preventing injuries, the loss of independence, and even early death.

In a study done to identify and assist older adults in a rural community, the role of first responders was to screen older adults for falls, depression, and medication management (Shah et al., 2010). The first responders then referred eligible older adults to case managers for any unmet needs. The majority of assessments were done in-home after the first responders received a call. It is at this time that first responders can help reduce future falls through screening for potential fall risks (Shah et al., 2010). A study completed by Bloch et al. (2008), showed that 49% of people who fell during the study period, were hospitalized after calling first responders. Of the 49% who were hospitalized, 51% of them were immediately discharged. Of those discharged, only 9% were given a fall prevention program. Many older adults are not given fall prevention programs when returning home, therefore increasing their risk of repeating a fall. While the person may not have been seriously injured that time, research shows that people who fall once are at higher risk for future falls. In order to prevent potentially limiting accidents, first responders should utilize prevention methods.

Statement of Purpose

Based on previous research studies, fall prevention programs have been found to decrease falls and fall risk in older adults. However, there is little evidence of fall prevention programs in progress in ALFs. Therefore, the purpose of this project was to develop and implement a customized fall prevention program for residents of a local ALF. The target population was older adults living in an ALF. In conjunction with a local Battalion Chief, we selected an assisted living facility with a high number of fall-related calls to the local fire department.

Theoretical Framework: Andragogy

Andragogy was developed in America in 1970 by Malcolm Knowles, a leading scholar of adult education (Knowles, 2007). Knowles defined andragogy as “the art and science of helping adults learn,” (p. 3) differentiating it from the learning styles of children, which are more concerned with biological development and academic performance (Knowles, Holton, & Swanson, 2012). Andragogy is a theory and model for adult learning and uses approaches to learning that are “problem-based and collaborative ... and emphasize equality between the teacher and learner” (Knowles, 2007, p. 4). This theory focuses on providing learning strategies that are suited for the adult process of learning. Andragogy was applied to our fall prevention project in the following ways.

Andragogy holds six assumptions about how adults learn. The first assumption states that an individual psychologically becomes an adult at the point in which he/she moves from dependency to self-directedness (Knowles, Holton, & Swanson, 2012). When this occurs, the individual develops a deep psychological need to be perceived by others as self-directed. Encouraging participants in our fall prevention program to ask questions allowed them to direct the path of their own learning. The second assumption states that with aging, a person accumulates learning experiences that provide a strong foundation in which to relate novel learning (Knowles, 1973). In order to best suit adult learning needs in this project, emphasis was placed on providing interactive opportunities that invited learners to analyze their experiences (Duay & Bryan, 2008). According to Knowles (1973), an adult’s experience defines who he is, as opposed to a child, whose experience is passive. Therefore, when an adult’s experience is undervalued and neglected, the adult perceives this as a rejection of himself as a person (Knowles, 1973). During the process of teaching the fall prevention program, presenters

encouraged the participants to evaluate their new learning experience after each educational session, and showed them that their responses had value by listening to them attentively.

Andragogy's third assumption is related to the adult's readiness to learn. As an individual matures, readiness to learn is related to the performance of evolving social roles (Knowles, Holton, & Swanson, 2012). Older adults may not wish to discuss negative issues of their declining health. However, discussing their health status may promote the prevention of falls. The educators promoted readiness to learn by discussing the participants' changing social roles and respecting their insights. The fourth assumption is adults are relevancy-centered in their orientation to learning (Knowles, 1973). As people mature, they move from obtaining knowledge for the sake of future use to gaining knowledge for immediate application (Chan, 2010). In other words, adults desire learning that is relevant to solving an immediate problem. This is appropriate to the older adults who participated in the fall prevention program, as learning fall prevention strategies decreased fall risk.

The fifth assumption describes adult learners as intrinsically motivated, rather than extrinsically motivated (Chan, 2010). Due to adults' self-directed behavior, they gather information that is meaningful to them. As theorized by Knowles, strong internal motivators for adults include self-esteem, better quality of life, and self-actualization (Knowles, Holton, & Swanson, 2012). Adults tend to seek information that will improve their quality of life. In the example of older adults, gathering information on decreasing fall risk can help them live with a longer, higher quality of life. The sixth and final assumption is that adults need to know why the information they are learning is valuable (Chan, 2010). If adults do not consider the information valuable or practical, they are not motivated to designate the time and effort needed to learn (Duay & Bryan, 2008). The program emphasized how critical the information was for

prevention of falls. Statistics were provided about the effectiveness of fall prevention programs to further support its relevance and importance.

Andragogy principles are useful to consider for implementers of fall prevention programs because “part of being an effective educator involves understanding how adults learn best” (“Adult Learning Theory and Principle,” 2007, para. 1). The fall prevention program utilized for this project provided education on common fall risk factors, including fall hazards, hydration, nutrition, and medication management. Based on Andragogy’s six main assumptions, education programs can be enhanced by utilizing participants’ previous experience, teaching information for present use, and promoting the value of the information (Duay & Bryan, 2008). Stressing the pertinence of the information presented in the fall prevention program may have helped to increase attendance and attention during the sessions.

As residents recognized that falling is a problem and were made aware of the consequences that accompany falls, they were more motivated to pay attention during to the session. According to Knowles’ theory of Andragogy, tying the information into past experiences for those who have already fallen effectively educated the learners on fall prevention strategies. Teaching information for present use encouraged the learners to independently take action in preventing future falls. Finally, the educators provided opportunities for collaboration between the learner and the educator through discussion, which provided the participants with a sense of equality. The learners offered their experiences and in return, the educators offered their information about fall prevention strategies. The application of assumptions of Andragogy is summarized in Table 1.

Andragogy Assumption	Application to Project
<i>Self Concept:</i> Adult learners are self-directed, autonomous, and independent.	Encouraged residents to attend. If residents independently attended the educational session, they were more motivated to learn.
<i>Role of Experience:</i> Repository of an adult's experience is a rich resource for learning. Adults tend to learn by drawing from their previous experiences.	Utilized past experiences and provided interactive analysis of their past experiences to enhance learning.
<i>Readiness to Learn:</i> Adults tend to be ready to learn what they believe they need to know.	Discussed past falls, evolving social roles, and why the information was increasingly pertinent to help prevent falls.
<i>Orientation to Learning:</i> Adults learn for immediate applications rather than only for future uses.	Taught information for present and future use to help prevent falls.
<i>Internal Motivation:</i> Adults are more internally motivated than externally motivated.	Motivated learners through utilizing methods that increased self-esteem, better quality of life, and self-actualization.
<i>Need to Know:</i> Adults need to know the value of learning and why they need to learn.	Stressed the crucial importance of fall prevention, in order for residents to continue a high quality of life and self-efficacy.

Table 1: *Andragogy theory project application chart*

Definitions

Activities of daily living (ADLs): Activities that are oriented toward taking care of one's own body (adapted from Rogers & Holm, 1994, pp. 181–202) such as toileting, dressing, eating, feeding, functional mobility, personal device care, personal hygiene and grooming, sexual activity (OTPF, 2013). These activities are “fundamental to living in a social world; they enable basic survival and well-being” (Christiansen & Hammecker, 2001, p. 156).

Assisted living facility (ALF): A residential building or buildings that also provide housing, personal or health care, as permitted by the Department of Social Services, designed to respond to the daily, individual needs of the residents. Assisted Living Facilities may include kitchenettes within individual rooms, are required to be licensed by the California Department of Social Services, and do not include skilled nursing services (City of Novato, 2001).

Assistive device: A tool or piece of equipment that provides assistance in activities of daily living to a person with a disability (Kelsey, Procter-Grey, Hannan, & Li, 2012).

Direct care workers (DCW): DCWs are resident assistants in assisted living facilities (Ejaz, Noelker, & Menne, 2008).

Falls: An event whereby an individual comes to rest on the ground or another lower level with or without loss of consciousness (National Collaborating Centre for Nursing and Supportive Care, 2004).

Older adults: Older adults are defined as men and women over 65 years of age (WHO, 2007).

Polypharmacy: Simultaneous use of multiple prescription medications at the same time, and the combination of these drugs (Kelsey, Procter-Grey, Hannan, & Li, 2012).

Methodology

Agency Description and Needs Assessment

The site selected was an assisted living facility located in Novato, CA, and was identified by Battalion Chief Ted Peterson as a facility with a high number of falls compared to other ALFs in the area. Atria Tamalpais Creek is a multi-level facility offering independent, assisted, and memory care living. Tamalpais Creek's staff include resident service assistants, resident medication assistants, wait staff, cooks, housekeeping, maintenance, a nurse who is the director of care, and one director of memory care. It is a two-story building with 112 residents, and 116 rooms. Tamalpais Creek contains three common dining rooms and each resident has his/her own bathroom and kitchen containing a microwave, sink, and refrigerator. A needs assessment was done via interview with the activities directors and the residents. The results of the needs assessment indicated more information was wanted regarding environmental awareness, exercises, moving safety, proper clothing/shoes, walking aids, diet, medication and hydration.

Project

The fall awareness and prevention educational intervention consisted of a series of workshops, held once a week, for one hour, over a span of four weeks in March and April 2015. The goal of the sessions was to educate residents about fall risks and fall prevention strategies. The program targeted adult residents of Atria Tamalpais Creek. To develop the intervention, evidence-based fall prevention programs, such as Stepping On Program, Healthy Stepping Older Adults, and Stay Safe, Stay Active, were analyzed for commonalities in the educational content. The fall prevention program developed for this project included content on identifying fall hazards, intrinsic and extrinsic fall risk factors, exercises to improve balance and strength, and education on nutrition and medicine management (Appendix D).

Primary Target Population

The primary target population for this project was older adults living in an assisted living facility. Administrators and residents' families were encouraged to attend. Staff of the assisted living facility were also encouraged to attend, however due to scheduling conflicts and job responsibilities to the other residents of the facility, they were unable to attend the presentations.

Project Development

The first step in developing this project was to meet with Ted Peterson, Novato Fire District Battalion Chief and Chief Medical Officer, on September, 25, 2014. In this meeting we discussed falls from the first responders' point of view and factors that were commonly seen among falls. According to Peterson, issues with nutrition, medication and confusion are some of the common causes of falls in older adults seen by his firefighters.

The next step was to schedule "ride-alongs" with the Novato Fire Department (NFD) to learn more about the process that occurs when firefighters respond to a call for a fall, their perspectives on what is causing the falls, and their perspectives on why many staff in assisted living facilities do not pick up the people who have fallen. Firefighters with the NFD reported the main causes of falls they answer calls for were related to polypharmacy, physical deconditioning, Alzheimer's, shortness of breath, and the environmental hazards such as dim lighting, throw rugs, and walkers (K. Marshall, personal communication, November, 2, 2014). Other factors mentioned included medication management and recovering safely after a fall (T. Peterson, personal communication, November, 2, 2014).

The next step in developing the project was scheduling a meeting in February 2015 with the staff at the ALF. The program developers prepared a list of questions to ask the facility about resident and staff needs. Some of the questions included: What are the main causes of

falls? What fall prevention methods are currently being used? What training does staff have and what is the protocol when a fall occurs? The program implementers took written notes at the meeting.

The program developers also requested a tour of the residents' living spaces, which included touring the common areas such as the recreational room, exercise room, dining hall, hallways, restrooms, and individual's living rooms, kitchen areas, and restrooms. This environmental assessment provided the program developers with more information regarding environmental hazards that could potentially cause falls.

A review of the literature on falls was completed before the implementation of the program. Upon reviewing the literature, the Stepping-On and Remembering When fall prevention programs were found to share common educational characteristics, which proved to be useful when planning the educational sessions. After meeting with the NFD key informant, interviewing the staff, touring the facility, completing the ride-along with the NFD, and reviewing the literature, the program developers created a program tailored to the needs of the ALF. Through informal interviews a needs assessment was conducted with the residents and then added to the program. Results of the needs assessment included a desire for information regarding proper clothing/shoes, environmental setup, moving safely, walking aids medication, and diet to help prevent falls. A needs assessment was also completed by the activities directors via interview and then later added to the program. Both needs assessment identified the same topics of concern.

Project Implementation

The ALF agreed to hold the sessions at their facility. The sessions were developed in February 2015 and implemented in March 2015 and the first week in April, 2015. The number

of participants varied by week due to the voluntary status of the program however, on average 15 participants attended each presentation. Of the average 15 participants in attendance, at least 2 of those participants were men and the remaining 13 were women. Each session was one hour in length and held in the late morning after the daily exercises class and right before lunch. The first two sessions were held in the media room, however with the increase of attendance, the other sessions were held in the living room. The topics included reducing fall hazards, utilizing exercises to improve balance and strength, and education on nutrition and medication management. Within the session, information was presented via PowerPoints, handouts, demonstrations, discussions, and engaging activities. Each session included a hydration break lasting about 5 to 7 minutes and involved the implementers passing out small bottles of water to the participants and discussing the importance of hydration for fall prevention. The hydration breaks were implemented about half way through the presentation or once the participants expressed a desire to take a break, because we wanted them to focus on the material being presented. During the first session, folders were handed out to the participants which carried information regarding falls and exercises (See Appendix D- pp. 52-57). Throughout the four week program various handouts were given to the participants on the topic of the week (Clemson, 2011).

As the weeks progressed, a special type of rapport was created between the implementers and the residents. The residents started asking questions that were more specific to them, indicating they trusted the knowledge implementers. Also, with the slight increase of attendees, participants were informing other residents about the sessions and encouraging them to come. The sessions were planned to be one hour long, however, all sessions ran over due to the amount of questions and discussions that each topic generated. The implementers made the sessions as

captivating as possible by asking open-ended questions, hearing the participants' insights, creating interactive discussions and presenting information that was relevant and important to the participants. This was done to promote the greatest possible retention of the information being presented.

Project Evaluation

Project evaluation surveys were distributed to the participants upon completion of the program to determine its effectiveness in educating the participants in fall prevention methods and strategies (See Appendix I). Specific questions on the survey were:

1. How useful was this fall prevention program for you?
2. How likely are you to use the information?
3. What are three things that you learned throughout the sessions?
4. What are three things you might do differently now?
5. Any suggestions for improvements?

The first two questions were based on a scale from 5 (strongly agree) to 1 (strongly disagree) and the remaining questions were open-ended questions.

The implementers provided an evaluation format that contained open-ended questions so participants could respond in detail. The implementers used a 5-point Likert scale to indicate the participants' degree of agreement with statements regarding the fall prevention program. Once the surveys were collected and reviewed, the results were averaged. The average of all responses was 4 out of 5, demonstrating very positive feedback. According to the surveys, participants learned information such as being more aware of the environment, getting up after a fall, not panicking after a fall, thinking before moving or getting up, drinking more water, wearing non-slip shoes, and continuing the balance and strength exercises. No suggestion for improvements

regarding the program were offered. Instead, the participants expressed their praise and appreciation. The participants thought the presentations were easy to follow and the information presented clearly. Based on verbal and written feedback, many of the participants enjoyed and learned a great deal from the program, and would like it to be implemented again in the future.

Ethical and Legal Considerations

Throughout this project, care was taken to ensure the American Occupational Therapy Association (AOTA) Code of Ethics was upheld (American Occupational Therapy Association, 2010). We upheld the code of beneficence and nonmaleficence during our fall education program by instituting many precautions and safety measures to ensure that participants were not at risk for falling during the class time. We made sure we addressed each resident's right to autonomy as well, ensuring the residents that they had the right to participate in the educational courses and were encouraged but never coerced into participating. We practiced veracity by not speaking outside our scope of practice. We introduced ourselves as occupational therapy students, and not licensed occupational therapists. We properly credited and cited sources and material used.

Discussion, Summary, and Recommendations

As falls are a major threat to the well-being and independence of older adults, the implementation of fall prevention education is urgent. The world's older adult population continues to increase, and an increasing number of people will need interventions to help prevent falls (Leland et al., 2012). Due to the debilitating results of falls that could potentially limit engagement in meaningful occupations and independence, occupational therapists are ideal professionals for fall prevention program implementation with older adults. The program delivered for this project provided the participants with information they can use to help reduce

their risk of falling. The participants were taught that falls are preventable. They gained knowledge and awareness about potential fall risk factors and learned how to overcome their fear of falling. This program was well received by the participants and staff of Atria Tamalpais Creek, who expressed a desire for Dominican University occupational therapy students to return in the future to continue this program (See Appendix D-J).

Based on this review, we recommend that ongoing fall prevention programs be implemented in all ALFs, ideally instructed by occupational therapists or occupational therapy students. As part of the program, balance and strength exercise classes could be offered for the residents two times per week. Many of the fall prevention programs we reviewed had strength and balance exercises incorporated into the session(s). Balance and strength exercises are essential to a fall prevention program because when muscles in the body are weak, there is an increased risk of falling (Barnett et. al, 2003). Practicing balance exercises is essential for maintaining balance in certain situations such as going up or down stairs, getting dressed, and getting in and out of the shower. Therefore, ensuring the residents are practicing balance and strength exercises can help reduce the risk of falling.

Although efforts were made to create the greatest retention of the information taught, many participants had a hard time remembering homework given for the next session, such as completing the balance and strength exercises. Also, despite reminders and explanations some participants did not attend all sessions because they believed presentations were on the same subject as the previous week. A recommendation is to have more sessions of shorter duration to enhance retention and establish rapport, such as eight weekly forty-five minute sessions, held twice per week.

Finally, a recommendation to gain more participants is to increase advertising within the ALF. At Atria Tamalpais Creek, advertising was completed by the activity directors through the daily activity schedule. Perhaps personally inviting and explaining the program could increase attendance and reduce any misunderstanding regarding the content of our sessions. For example, some of the residents believed that the same information was going to be presented for four weeks in a row, so highlighting the topics covered each week clearly, through weekly advertisements, would possibly create a more consistent attendance. Creating flyers for the residents as a visual reminder could increase attendance and understanding of what will be covered. Also, calling the sessions “classes” would appeal to the participants more. It would have also been beneficial if family and staff members attended the sessions. This would help promote awareness about fall risk factors, allow them to feel more empowered in relation to this topic, and contribute to the prevention of falls.

Conclusions and Other Considerations

One-third of older adults fall each year, and of those, 40% will have repeat falls (Letts et al., 2009). As the number of older adults is expected to double by the year 2050, from 8% to 16% of the world population, fall risk will multiply (WHO, 2011). As people age, many move to senior housing communities such as ALFs where 40% of the older adult residents have a fall during their residency (NCHS, 2010). A majority of older adults who live in ALFs are at risk for falls and fall-related injuries because of intrinsic and extrinsic factors adults face as they get older (NCHS, 2014; Silva-Smith et al., 2013). With the increase of older adults falling, the rate of first responders receiving calls for assisted living facilities has also risen. Thus, fall prevention programs for residents of ALFs may promote health and wellbeing for the residents and also decrease fall calls to FRs.

The purpose of our project was to implement a fall prevention program that educated residents at an ALF about fall risk factors and strategies that can be used to prevent falls. Because the field of occupational therapy places value on educating people about how to adapt/modify their occupations and environment to accommodate specific needs, OTs can help people learn how to prevent falls (OTPF, 2014). Occupational therapists are also trained to educate DCWs and caregivers about fall prevention programs.

The likelihood of falling increases rapidly with advancing age, and understanding fall risk factors and fall prevention strategies is critical in reducing and preventing risk of falling. Fall prevention programs educate older adults not only about fall risks, but how to apply fall risk management skills that can be generalized to a variety of settings (Peterson, 2012). Fall prevention educational programs may improve awareness of fall prevention, decrease the incidence of falls in the ALF, and help the local fire departments direct resources to other emergency-related services. OTs can partner with firefighters to educate ALF residents and staff about fall prevention. These partnerships could result in increased awareness about fall risk, prevention methods, promote strategies to improve health and wellbeing in older adults, and decrease recorded fall calls to firefighters. This is an important area of health and wellness where occupational therapy can make a significant contribution.

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Appendix A: Contact with Site

November 18, 2014

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(916) 214-7812

Ashley Kimball
Activities Director
Atria Tamalpais Creek
853 Tamalpais Avenue
Novato, CA 94947

Dear Ms. Kimball:

My name is Jennifer Borcich and I am a graduate student in the master's program at Dominican University of California. As you may know, occupational therapy is a health and service profession that assists individuals in maintaining their participation in meaningful activities. For our capstone project, we are creating a series of fall prevention presentations for residents of assisted living facilities. I am working with three other graduate students, Tracy Dietz, Taylor Wong, and Raquel Ramos on this project. We are also working with Ted Peterson, the Novato Fire District Battalion Chief and Chief Medical Officer, who suggested we contact you as a possible site to implement our program. Dr. Ruth Ramsey, OTR/L, professor and chair of our department, is our faculty advisor. Dr. Ramsey and Chief Peterson met and worked together on the Marin County Fall Prevention Task Force and identified a need to help reduce falls in the community. For this project, our goal is to develop a fall prevention education program tailored to the needs of your residents and care giving staff. We believe that learning more about ways to prevent falls could greatly benefit your residents.

If you agree to let us present these educational sessions, we would implement them next spring, between February and March, 2015. Currently we are in the planning stages, and would like to meet with you at your earliest convenience to discuss your specific needs further. Some ideas for the education curriculum are: Falls and fall prevention for older adults, balance and strength exercises to decrease fall risk; how to move safely in the facility and in the community; safe and appropriate use of assistive devices such as wheelchairs, walkers, and canes; hazards in and surrounding the facility; low vision and fall risks; the importance of good nutrition and hydration in decreasing falls, and medication management. We are also considering including a separate workshop for direct caregiver staff if appropriate.

We look forward to meeting with you soon to learn more about your facility, your residents' needs, and how we can work together to develop a program that is targeted and thorough.

Sincerely,
Jennifer Borcich, OTS
Dominican University of California

Appendix B: Contact from Site

January 26, 2015

Hi Jennifer, I work with Ashley in the Activities Department @ Atria and spoke to Sandy today. We'd love to have you come in- if you can please let me know some days and times that would work for you, we can get it on the calendar.

Thanks so much,
Stephanie

Stephanie Walley
Activities Assistant
Atria Tamalpais Creek

Appendix C: Site Selection Form
Dominican University of California
Department of Occupational Therapy
OT 5110: ICE Proposal: Site Selection Verification Form

Student Names: Jennifer Borcich, Raquel Ramos, Taylor Wong

Title of capstone project or research: Preventing and Reducing Fall in Assisted Living Facilities: An Educational Intervention

Background and Rationale (no more than 300 words). Describe nature of the problem and purpose of current study.

The world is on the brink of a demographic milestone in which older adults, or people over 65, outnumber children (WHO, 2011). Along with the increase of older adults, is an increase in the risk of falls. According to the Centers of Disease Control and Prevention (CDC), falls are the leading cause of fatal and nonfatal injuries among older adults. However, falls are preventable. After a fall occurs, first responders are called to the scene to provide medical assistance. When resulting injuries are mild, first responders are called for safety protocol. With the number of fall calls increasing in assisted living facilities, the first responders are responding to accidents that can be prevented. While most older adults would prefer to live their lives at home, some must be relocated to assisted living facilities. The decision of the family and the individual to live in an assisted living facility can be caused by an accident, for safety reasons, or the family is unable to provide the amount of care the individual needs. In conjunction with the Novato Fire Department, a fall prevention program will be provided to a recommended assisted living facility, Atria Tamalpais Creek, in order to reduce the number of accidents. Fall prevention programs show significant improvement of fall rates among older adults. Some programs focus on strengthening and balance exercises, while other look at modifying the environment. The program provided for the chosen assisted living facility will be customized for the residents and the topics that would best help reduce falls.

Name of Proposed Site: Atria Tamalpais Creek

Person with whom you will be working: Ashley Kimball and Stephanie Walley

Type of facility: Assisted Living and Independent Living

Address: 853 Tamalpais Avenue, Novato, CA 94947

Phone #: (415) 578-7526

Contact Person (include title) related to approval at the site: Activities Coordinators

Has initial contact been made? Yes

OT students will provide a fall prevention course for the residents at Atria Tamalpais Creek once a week for 1 hour, between the dates of March 12, 2015 and April 2, 2015. The course will provide information on identifying fall hazards, intrinsic and extrinsic risk factors, utilizing exercises to improve balance and strength, and education on nutrition and medication management.

Describe the proposed intervention(s), e.g. manual or planned presentation:

The students will provide a planned presentation of fall prevention material, along with engaging activities to exemplify the information being taught.

Describe any potential problems and your plan for addressing problems (pro-active planning for alternatives)

During the presentations, an individual can fall. This may be due to not feeling well or performing actions that the individual is not ready for. If a similar situation occurs, the instructors will have the individual sit on a chair if possible and call 911.

Signatures (students):

_____ **Date** _____

_____ **Date** _____

_____ **Date** _____

Faculty advisor signature:

_____ **Date** _____

Appendix D: Session One PowerPoint

Dominican University of California's
Occupational Therapy Program

Fall No More!

Jennifer Borcich, Raquel Ramos, &
Taylor Wong

Introductions

- Dominican University of California
- Occupational therapy (OT) major

Purpose

- Working in conjunction with the Novato Fire Department
- Falls are the leading cause of fatal and non-fatal injuries in older adults (CDC)

Occupational Therapy

- Help people with temporary or permanent limitations be as independent as possible
- Help people to do daily life activities
- Also interested in wellness and injury prevention (i.e. falls)

**What do you hope to gain
from these sessions?**



Appendix D: Session One PowerPoint

Session 1	Introduction, Choosing What to Do, Balance and Strength Exercises - Getting to know each other, sharing fall experiences, practice balance and strength exercises
Session 2	Identify Fall Hazards and Moving Safely: Identify hazards in and about the home and the community, problem solving solutions, and talk about strategies to move safely
Session 3	Medication, Wellness and Sleeping Better: Identify the importance of Vitamin D, sunlight and calcium to protect from fall injury and strategies to sleep better are discussed.
Session 4	Wellness continued and Communicating with Health Professionals: Continue discussion regarding wellness and discuss questions to ask your doctor or nurse.



Shopping list

Topics for today:

- Balance exercises
- Strength exercises

Older adults can benefit from balance and strength exercises because it increases muscle tone and assists in mobility

Balance exercises

- Do daily
- Alignment
 - Shoulder in line with hips
 - Sit up straight
 - Feet planted
 - Head facing forward
- Do at optimal time of day, when you have energy

Heel-toe (tandem) standing



Heel-toe standing Modifications

- Stand up tall besides the counter with only your finger tips touching.
- Shift weight forward and backward, from foot to foot, while still keeping both feet on the ground.



Appendix D: Session One PowerPoint

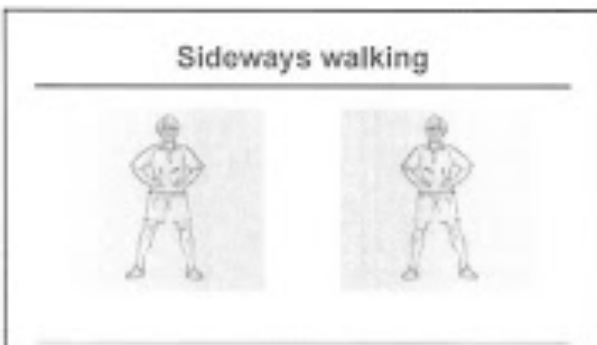


Heel-toe walking Modification

- Include at tandem walk backward with one hand on the counter.

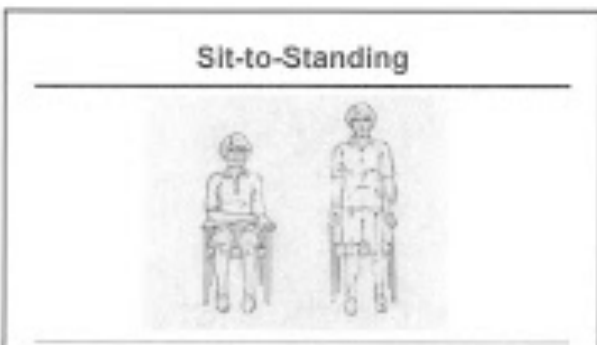
Diff to easy?

- Try using just fingertips for support with tandem walking forward, then advancing to no support.
- However, hold on firmly when walking backwards.



Sideways walking Modifications

- Take 10 longer steps to each side.
- Increase the number of times you take 10 steps to each side.
- Gradually increase taking 10 steps to each side 4 times.



Sit-to-standing Modifications

- Gradually increase to 10 reps.
- Stand up slowly using only one hand on one arm rest.

Appendix D: Session One PowerPoint

Sit-to-stand Modifications continued

Still to easy?

- Stand up slowly with arms cross in sitting position, keep them crossed when you stand up.



Hydration break

Strength Exercises

- Do 3x a week
- Alignment
 - Shoulder in line with hips
 - Sit up straight
 - Feet planted
 - Head facing forward
- Complete at optimal time
 - Limit distractions

Front-knee strengthening



Front-knee Modifications

- Gradually increase to 10 reps each leg.
- Once at 10 reps, add 2 pounds of ankle weights to each leg.
- Work up to 10 reps using the weight you have added.
- Once current weight is too easy, add on 1 pound of weight.
- To progress repeat this cycle as you get comfortable.



Side-hip strengthening



Appendix D: Session One PowerPoint

Side-hip Modifications

- Gradually increase to 10 reps each leg.
- Once at 10 reps, add 2 pounds of ankle weights to each leg.
- Walk up to 10 reps using the weight you have added.
- Once current weight is too easy, add 1 pound.
- To progress, repeat this cycle.



Heel raises

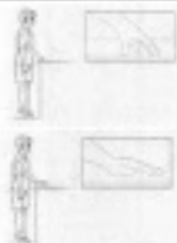


Heel raises Modifications

- Gradually increase to 20 reps.
- Use just your fingertips on the counter for support.

Still too easy?

- Try placing your hand over the counter, but not touching it.



Toe raises

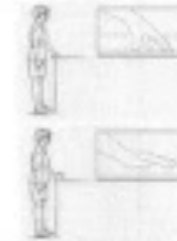


Toe raises Modifications

- Gradually increase to 20 reps.
- Use just your fingertips on the counter for support.

Still too easy?

- Try placing your hand over the counter, but not touching it.



Risk Appraisal


Fall stories

Appendix D: Session One Handouts

Quick Overview of the Program

Session 1	Introduction, Choosing What to Cover, Balance and Strength Exercises Getting to know each other, sharing fall experiences, choosing what to cover and review and practice exercises, discuss when and how to upgrade your exercises.
Session 2	Identify Fall Hazards and Moving Safely Identify hazards in and about the Atria and rooms, problem solving solutions and talk about strategies to get around the Atria.
Session 3	Medication, Wellness and Sleeping Better Identify the importance of Vitamin D, sunlight and calcium to protect from fall injury and strategies to sleep better are discussed.
Session 4	Wellness continued and Communicating with Health Professionals Discuss fall scenarios and problem solve through them and question to ask your doctor or nurse.

Appendix D: Session One Handouts



What are the risk factors contributing to falls?

- ◆ Poor Nutrition & Hydration
- ◆ Polypharmacy
- ◆ Alcohol/Substance Abuse
- ◆ Hazardous living situations

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DOMINICAN UNIVERSITY OF CALIFORNIA
DEPARTMENT OF OCCUPATIONAL THERAPY

TIPS TO PREVENT FALLS



One in three adults over 65 falls each year.

Are you at risk?

POOR NUTRITION & HYDRATION

Only 15% of older adults consume enough protein. Lack of protein leads to loss of muscle, which increases risk of falling. Drink 6-8 glasses of liquid daily for proper hydration.

POLYPHARMACY

Polypharmacy is defined as "the long term simultaneous use of two or more drugs." Signs of polypharmacy include: tiredness, sleepiness, decreased alertness, and weakness. All these symptoms can lead to falls.

ALCOHOL/SUBSTANCE ABUSE

One in five older adults may be affected by alcohol and drug abuse. Older adults are 4X more likely to fall if abusing alcohol or drugs.

UNSAFE LIVING CONDITIONS

Falls caused by environmental factors account for 30%-50% of all falls. Minimizing throw rugs and carpets can reduce risk of falling.

WHO CAN YOU CALL FOR HELP?

MARIN COUNTY INFORMATION AND REFERRAL

MARIN COUNTY ADULT AND AGING 415-457-4636

NUTRITIONAL SERVICES

NOVATO INDEPENDENT ELDERS (NIEP)	DESCRIPTION:	PHONE:
	+GROCERY DELIVERY	(415)899-8296
	+SEASONAL PRODUCE AT WHOLESALE PRICE	WEBSITE:
	+GROCERIES DISTRIBUTED "FARMERS MARKET STYLE"	WWW.NOVATOSENIORS.ORG


ALCOHOL/SUBSTANCE ABUSE

MODERATION MANAGEMENT SUPPORT GROUP	DESCRIPTION:	PHONE:
	+FOR ADULTS WHO ARE LOOKING INTO THEIR ALCOHOL USE	(415)689-1017


IN HOME SERVICES

IN-HOME SUPPORT SERVICES (IHSS) PROGRAM	DESCRIPTION:	PHONE:
	+RECEIVE IN-HOME SUPPORT WITH PERSONAL CARE, PARAMEDICAL SERVICES, HOUSE CLEANING, COOKING, SHOPPING AND ACCOMPANIMENT TO AND FROM MEDICAL APPOINTMENTS	(415)473-7118
		ADDRESS:
		10 N. SAN PEDRO RD., SAN RAFAEL, CA
		WEBSITE:
		WWW.PAMARIN.ORG


Appendix D: Session One Handouts





Fall Prevention for Older Adults




Fall Risk:

- 

 - 1/3 of adults age 65 and older fall each year.
 - After falling, a person may become afraid to fall again, resulting in limiting activities, leading to less movement and a greater chance of falling again.
- 

 - \$30 Billion spent each year treating older adults after a fall.
- 

 - 20,000 older adults die each year from a fall.
 - 90% of hip fractures are caused by falls.
 - 20% of people who fall and fracture a hip will die as a result.
- 

 - Increased awareness of safety can prevent falls!

More Information on Falls:

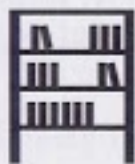
- **Center for Disease and Control:**
<http://www.cdc.gov/homeandrecreationalafety/Falls/adultfalls.html>
- **Mayo Clinic:**
<http://www.mayoclinic.org/healthy-living/healthy-aging/in-depth/fall-prevention/art-20047358>
- **National Council on Aging:**
<http://www.ncoa.org/improve-health/falls-prevention/>

Appendix D: Session One Handouts

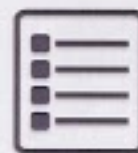
How to Prevent Falls:

At Home:

Add more lighting and organize clutter to prevent tripping over obstacles. Secure rugs to the floor. Wipe up spills immediately.



Review Medications with Doctor:



Bring list of ALL medications and supplements to the doctor. Mixing medications can cause dizziness and dehydration, leading to falls.

Make Healthy Choices:

- Drink water to prevent dehydration. (6 to 8 glasses of water per day is recommended.)
- Stay active: Decreased activity can lead to muscle loss and decreased endurance.
- Take Calcium to increase bone strength.
- Take Vitamin D for muscle strength.
- Eat 20-30 grams of protein to increase muscle growth.
- Visit your doctor before exercising and taking supplements.



Reading level: 7th grade. Readability Score: 6.5 (standard/average) SMOG Index
Created by Valerie DeRoos, OTS and Christine Kim, OTS; Dominican University of California

Appendix E: Session Two PowerPoint

Dominican Occupational Therapy
"Fall No More"
Session 2

Jennifer Borrich, Raquel Barros, Taylor Wong

March 19, 2015

Let's Check In!

How did the exercises go?

Practice makes perfect!

What are the benefits and barriers to regular exercise?

Let's practice!

Benefits of and barriers to Regular Exercise

Benefit	Barrier
Freedom	Take time
Strengthen your legs	Fitting in something extra
Makes you feel good	No place to exercise
Not tiring	Don't have energy
Doing something for yourself!	Don't remember
Lubricates joints	Too busy
Improves and maintains mobility	My friends do other things
Improves whole body	Bad luck
Better balance, better control	Need discipline
Independence, not relying on others	Need to want to keep exercising
	Muscles feel a bit tight
	Not a habit

Incorporating the exercises

Tips:

- Leave the clothes, shoes, or weights in a particular place where they will notice them so as to prompt exercise in the morning
- Using a particular TV program to prompt the exercises
- Sticking a note on the refrigerator or TV

Topics for today: Environment

- Identifying fall hazards in environment
- Moving safely in environment

Appendix E: Session Two PowerPoint

Objectives

1. To recognize the benefits and the barriers to regular exercise.
2. To raise awareness of the type and range of fall hazards in and about the home.
3. To be able to recognize hazards in one's environment.
4. To be able to suggest adaptations and problem-solve ways to reduce home fall hazards.

Tell us about Atria's environment

Pros vs Cons?

Bathroom hazards



Bedroom hazards



Inside hazards



Outside hazards



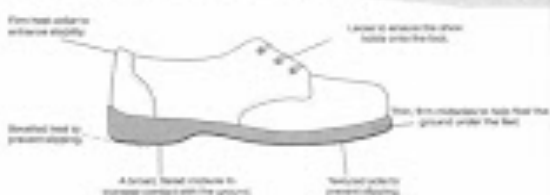
Appendix E: Session Two PowerPoint

Hydration break

Moving Safely Overview

- Safe footwear
- When walking
- When climbing stairs
- When getting up from a chair
- When sitting down
- Walker/cane fit and use

Safe Clothing and Footwear



When walking

- Remember to scan ahead
- Be aware of wet surface and uneven ground
- Walk heel-toe, no shuffling!



When climbing stairs

- "Up with the good, down with the bad"
- Always use hand rails when available
- Be aware of any trip hazards (i.e. loose rugs)
- Do not multi-task



When getting up from your chair

1. Move your bottom to the edge of the chair
2. Place your hands on the armrests of the chair
3. Lean forward so that you have "nose over toes"
4. Push up through your arms and legs to standing
5. Take your time



Appendix E: Session Two PowerPoint

When sitting down

1. Position the back of your legs at the edge of the chair
2. Look back and reach one hand for the armrest, if possible
3. Slowly ease yourself down onto the chair, DO NOT PLOP!

Walker/Cane Fit

Walker:

- Handles should be at wrist
- Width, must provide adequate clearance for steps

Cane:

- Height should be at wrists
- Used with affected side

Walking sticks

- 4 points of contact
- Reduces fatigue
- Improves aerobic capacity
- Improves upper body strength

Overview of the session:

- Fall hazards
 - Bathroom
 - Bedroom
 - Inside
 - Outside
- Moving safely
 - Safe footwear
 - When walking
 - When climbing stairs
 - When getting up from a chair
 - When sitting down
 - Walker/cane fit

Appendix F: Session Three PowerPoint

 Dominican Occupational Therapy

"Fall No More"
 Session 3

 Jennifer Borcich, Raquel Ramon, Taylor Wong

 Topics for Session 3

• Balance and Strength Exercises

- Check-in
- Practice

• Wellness

- Bone health and Vitamin D
- Diet and Nutrition
- Hydration

 Objectives

- 1) To understand safe options for clothing
- 2) To practice the exercises and help establish them as part of your daily routine
- 3) To inform you that advancing exercises is key to getting stronger and achieving better balance
- 4) To understand the importance of vitamin D and calcium as protection against fall injuries
- 5) To understand the importance of sunlight to health
- 6) To understand the benefits of adequate hydration and nutrition

 Check-In

What did you think about how safe your apartment / room is?

Did you notice any fall hazards?

How did everyone do with the exercises?

 Safe clothing is when...

- ★ loose robes, loose belts, and ties are fastened securely
- ★ no wide or open pockets stick out or catch on doorknobs or furniture
- ★ sleeves are not too long, too open, or too wide
- ★ hems are not too long and are taken up above the ankle

 Balance Exercises

1. Sit to Stand (x5)
2. Sideways Walking (8 steps)
3. Heel-toe Tandem Standing (10-12 secs.)
4. Heel-toe Tandem Walking (6 steps)
Walking (6 steps)

Appendix F: Session Three PowerPoint

Advancing Balance Exercises

- | | |
|--|--|
| <p>1) Sit to Stand</p> <ul style="list-style-type: none"> ○ Pain? ○ Advance → (x5) <p>2) Sideways Walking</p> <ul style="list-style-type: none"> ○ Advance → (3 steps) ○ Less hand support ○ Build slowly | <p>3) Tandem Standing</p> <ul style="list-style-type: none"> ○ Advance: decrease hand support ○ start Ⓢ (10-12 secs.) <p>4) Tandem Walking</p> <ul style="list-style-type: none"> ○ Advance → (5 steps) |
|--|--|

Strength Exercises

1. Front knee strengthening exercises (x5)
2. Side Hip strengthening (x5)
3. Heel Raises (x10)
4. Toe Raises (x10)

Advancing Strength Exercises

- | | |
|---|---|
| <p>1) Front Knee</p> <ul style="list-style-type: none"> ○ Pain? ○ Increase to 30 reps ○ Add 2 pound → (x10) <p>2) Side Hip</p> <ul style="list-style-type: none"> ○ Increase to 30 reps ○ Add 2 pounds → (x10) | <p>3) Heel Raises</p> <ul style="list-style-type: none"> ○ Increase to 20 reps ○ Decrease support <p>4) Toe Raises</p> <ul style="list-style-type: none"> ○ Increase to 20 reps ○ Decrease support <p>Build slowly!!</p> |
|---|---|

Bone Health: Calcium and Vitamin D

- Adequate calcium and vitamin D intake strengthens bones and prevents hip fractures.
- Recommended Dietary Allowance
 - For women
 - Over 50 years old in 1200 milligrams
 - For men
 - Up to 70 it is 1000 mg
 - Over 70 its is 1200 mg

Vitamin D

- Absorbs the calcium in your body and strengthens bones.
- It decreases the risk of hip fractures.
- Linked to muscle strength.
- It improves balance.
- It is the one supplement that we know helps to prevent falls!

Where to get Vitamin D

- **Sunlight**
 - The skin makes vitamin D through the action of ultraviolet B (UVB) rays.
 - Skin can not make vitamin D if:
 - You are sitting by a window.
 - Or have sunscreen on
- **Food**
 - Egg yolks, liver, cod liver oil, salmon, tuna, herring, sardines, oysters, and foods fortified with vitamin D such as milk.
 - Just from milk, you will have to drink 8 cups a day!
 - It is hard to get vitamin D just from diet alone.

Appendix F: Session Three PowerPoint

Where to get Vitamin D continued

• Supplements

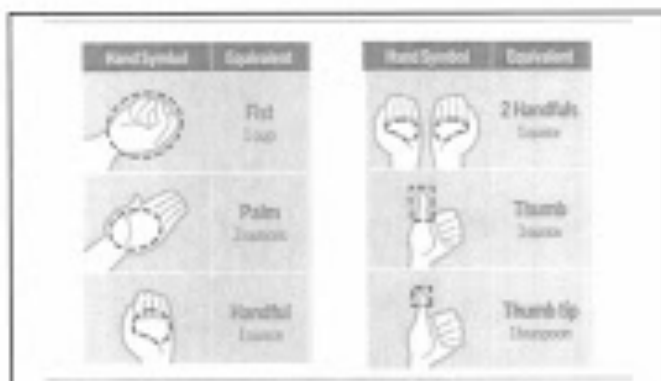
- Multivitamins usually have some vitamin D
 - Ask your doctor about taking multivitamins!
- Some calcium supplements also contain vitamin D
 - Again ask your doctor before taking these supplements!

Diet and Nutrition

- Keep our bodies working at optimal levels!

How much you should be eating:

- 2 1/2 cups of vegetables
- 2 cups of fruit
- At least 3 oz. of whole grains
 - One slice of bread= one oz
- 3 cups of dairy (low fat)
- 5 1/2 oz of proteins



Tips

- Adopting a varied and balanced diet provides adequate amounts of nutrients
- Eat the rainbow
- Small meals for frequently



20% of our fluids come from food!

- | | |
|--------------------|----------------------|
| • cucumber (97.8%) | • watermelon (92%) |
| • iceberg (98%) | • strawberries (92%) |
| • celery (95%) | • grapefruit (91%) |
| • radishes (95%) | • broccoli (91%) |
| • tomatoes (94.5%) | • cantaloupe (90%) |
| • peppers (93.9%) | • oranges (87%) |



Benefits of H2O

- Promotes:
- ◆ smooth skin
 - ◆ protection of organs
 - ◆ absorption of nutrients
 - ◆ energy & mobility
 - ◆ clear thinking
 - ◆ less infection

Benefits Of Keeping Well Hydrated



Appendix F: Session Three PowerPoin

Dehydration

- Lower water content (60% → 50%)
 - Sensation of thirst decreases with age, increasing risk of being dehydrated.
 - **So, it is important to drink water before you are thirsty.**
- Kidney function is somewhat less efficient than it used to be
 - This decreases ability to concentrate urine

Incontinence

- Decreasing fluid intake **does not** decrease incontinence, nor does it decrease trips to the bathroom.
- In fact, as the urine becomes more concentrated, it irritates the bladder (possibly causing bladder infections) and **may increase the urge to void**, resulting in frequent small voidings.

Hydration

How much water should I drink?

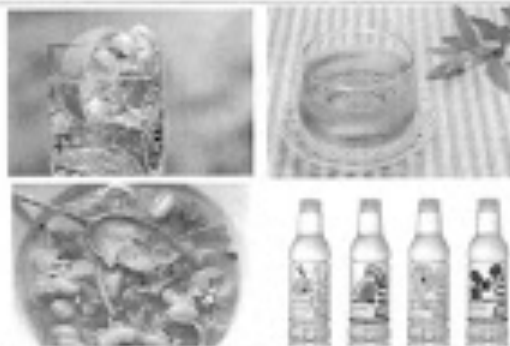


Getting over



Once you drink enough water to become well-hydrated, water tastes great!

What are some ways that you can increase our hydration?



Appendix F: Session Three PowerPoint

How to increase fluid consumption

- keep track of how many fluids you drink
- eat low sodium soups
- flavored water, different temperatures
- bottled water → convenience
- buy a big water bottle (32 oz) & fill twice each day
- drink 1 glass of water at each meal and 1-2 glasses of water in between meals

Homework

- Continue to progress with your exercises
- Think about strategies you can use to drink more water and alter your diet, if you are in need!

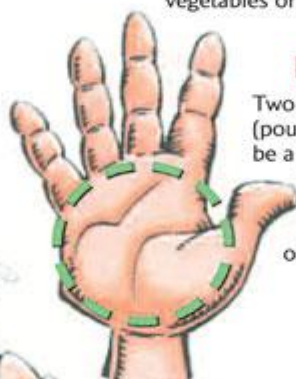
Appendix F: Session Three Handout

THE SECRET TO SERVING SIZE IS IN YOUR HAND



A fist or cupped hand = 1 cup

1 serving = 1/2 cup cereal, cooked pasta or rice
or 1 cup of raw, leafy green vegetables
or 1/2 cup of cooked or raw, chopped vegetables or fruit



Palm = 3 oz. of meat

Two servings, or 6 oz., of lean meat (poultry, fish, shellfish, beef) should be a part of a daily diet. Measure the right amount with your palm. One palm size portion equals 3 oz., or one serving.

A thumb = 1 oz. of cheese

Consuming low-fat cheese is a good way to help you meet the required servings from the milk, yogurt and cheese group. 1 1/2 - 2 oz. of low-fat cheese counts as 1 of the 2-3 daily recommended servings.



Thumb tip = 1 teaspoon

Keep high-fat foods, such as peanut butter and mayonnaise, at a minimum by measuring the serving with your thumb. One teaspoon is equal to the end of your thumb, from the knuckle up.



Three teaspoons equals 1 tablespoon.



Handful = 1-2 oz. of snack food

Snacking can add up. Remember, 1 handful equals 1 oz. of nuts and small candies. For chips and pretzels, 2 handfuls equals 1 oz.



1 tennis ball = 1 serving of fruit

Healthy diets include 2-4 servings of fruit a day.

Because hand sizes vary, compare your fist size to an actual measuring cup.

Appendix G: Session Four PowerPoint

Dominican University of California
Occupational Therapy

**Session 4:
Sleeping Better &
Medication Management**

Jennifer Borcich, Raquel Ramos, & Taylor Wong

Topics for the day

1. Balance and Strength Exercise Warm-Up
2. Wellness continued: Sleeping Better
3. Medication Management
4. Share Fall Stories
5. Getting Up After a Fall
6. Feedback!

Objectives

1. To practice exercises and help establish them as part of a daily routine.
2. To understand the reasons why sleep may be interrupted.
3. To understand the consequences of taking multiple medications and the potential side effects.
4. To understand that there are ways to get up after a fall, recognize the importance of not panicking, and identify a plan of action that might work if a person does fall.
5. To hear from participants about their experiences in the program.

Balance Exercises

1. Sit to Stand (6-7x)
2. Sideways Walking (8-10 steps)
3. Heel-toe Tandem Standing (10-12 secs.)
4. Heel-toe Tandem Walking (8 steps)

Advancing Balance Exercises

- | | |
|-------------------------------------|---------------------------------------|
| 1) Sit to Stand
o 6-7 times | 3) Tandem Standing
o 10-12 seconds |
| 2) Sideways Walking
o 8-10 steps | 4) Tandem Walking
o 8 steps |

Strength Exercises

1. Front knee strengthening exercises (x5)
2. Side Hip strengthening (x5)
3. Heel Raises (x10)
4. Toe Raises (x10)

Appendix G: Session Four PowerPoint

Advancing strength exercises

- | | |
|--|---|
| <p>1) Front Knee</p> <ul style="list-style-type: none"> ○ Pain? ○ Increase to 10 reps ○ Add 2 pound → (x10) <p>2) Side Hip</p> <ul style="list-style-type: none"> ○ Increase to 10 reps ○ Add 2 pounds→ (x10) | <p>3) Heel Raises</p> <ul style="list-style-type: none"> ○ Increase to 20 reps ○ Decrease support <p>4) Toe Raises</p> <ul style="list-style-type: none"> ○ Increase to 20 reps ○ Decrease support <p>Build slowly!!</p> |
|--|---|

Sleeping Better Outline

- 1) Sleeping pills
- 2) Side effects of taking sleeping pills for a long time
- 3) Do older people need less sleep?
- 4) Reasons for not sleeping
- 5) How to sleep better

Sleeping Pills

- Not good to take over a long period for most people.
- Sleeping pills are acceptable on occasion or when needed.
- It's best not to start taking these on a regular basis.
- If you are taking sedatives on a regular basis, try reducing the dose.

Sleeping Pill Side Effects

- No real demonstrated effect on insomnia
- Side effects of taking sleeping pills for a long time can be:
 - Daytime hangover effects
 - Daytime sleepiness
 - Falls and confusion
 - More sleep problems
 - Becoming addicted to the pain pills

Why less sleep?

- Do older people need less sleep?
- Experience less of the deeper REM sleep and more of the lighter (non-REM) sleep. **This is natural.**
- Insomnia is **not** a result of aging.

What are some reasons for not sleeping well?

Reasons for not sleeping

- Overweight, sleep disordered breathing
- Alcohol, decreased alertness
- Inactivity, reduced social activity
- Stress
- Depression
- Reduced natural light exposure, lack of environmental time cues
- Pain
- No routine
- Lack comfortable position
- Polypharmacy
- Sleeping tablets, side effects
- Caffeine
- Fluid excretion
- Respiratory or cardiac conditions
- Sleep apnea

What kinds of things can you do to help you sleep better?

Medication Management

- Antidepressants, anti-anxiety, and sleeping medications
 - Strong evidence links to increased fall risk
 - Tough to break the habit
 - Alternatives
- Multiple Medications
 - Polypharmacy



Will you share a fall story?

Getting up after a fall

1. Don't panic, take your time.
2. Bend both of your knees.
3. Roll onto one side.
4. Push up onto one elbow.
5. Move into a kneeling position on hands and knees.
6. Stop and get your balance.
7. Crawl to a phone on a low table or to a chair.
8. Using both hands pull yourself up.

Please tell us how we did :)





Media Consent Form

I, _____, agree to be photographed or videotaped by Dominican University of California.

I fully understand and agree that any statements I make or any photographs taken of me may be displayed in public places, duplicated, distributed and/or published by Dominican University of California in a manner including, but not limited, to the following:

- Photographic display
- Audio recording
- Video tape
- Newspapers
- Via internet
- Website

I release Dominican University of California and their officers, agents, employees, volunteers and/or students from any and all claims that might arise from use of such statements and/or photographs.

Date _____

Signature _____
 (Signature of parent/legal guardian is required for minors to participate.)

Fall Prevention Education Satisfaction Survey

How useful was this fall prevention program for you?

Strongly agree 5 4 3 2 1 Strongly disagree

How likely are you to use the information?

Strongly agree 5 4 3 2 1 Strongly disagree

What are 3 things you learned throughout the sessions?

What are 3 things you might do differently now?

Any suggestions for improvements?

Thank you!

Appendix J: Certificate of Completion



Certificate of Completion

presented to

for completing _____

“Fall No More”

*Dominican University of California
Department of Occupational Therapy*

Awarded on:

April 2, 2015

Signed By

Date