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Implementing Multifactorial Education Modules with Older Adults: Individualized and Interactive Fall Prevention Education

Salvador Chavez
Dominican University of California

Jocelle Flores
Dominican University of California

Rachelle Yambao
Dominican University of California

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Implementing Multifactorial Education Modules with Older Adults:
Individualized and Interactive Fall Prevention Education

Salvador Chavez

Jocelle Flores

Rachelle Yambao

A Culminating Project 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 Master's program, has been presented to and accepted by the faculty of the Occupational Therapy department in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy. The content, project, and research methodologies presented in this work represent the work of the candidates alone.

Salvador Chavez, Candidate _____ Date: 12/07/16

Jocelle Flores, Candidate _____ Date: 12/07/16

Rachelle Yambao, Candidate _____ Date: 12/07/16

Ruth Ramsey, EdD, OTR/L, Chair _____ Date: 12/07/16

Susan Morris, PhD, OTR/L, Advisor _____ Date: 12/07/16

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Abstract

Falls are a significant concern for community-dwelling older adults (OAs), with one in four OAs reporting a fall every year. Occupational therapy students collaborated with first responders of the Novato Fire District to identify gaps in fall prevention community outreach programs and found that many interventions lack an interactive or individualized approach. Based on the gap analysis and current literature, seven education modules were developed to address key risk factors including home safety hazards, polypharmacy, fear of falling, and strength and balance exercises. Thirty community-dwelling OAs participated in the education modules that were implemented at two senior community sites in Marin County. Participants were screened via Functional Reach Test (FRT) and completed a survey to determine their personal risk factors for falling, which guided their personalized fall prevention education. Of the participants, 90% rated their experience with the education modules as “very good” or “excellent,” and a majority indicated greatest satisfaction with the balance exercises. The interactive 1:1 education modules are an effective and innovative method for fall prevention education and highlight the importance of client-centered treatment.

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Introduction/Statement of the Problem

One in every four older adults (OAs), age 65 and older, will experience a fall each year according to the Center for Disease Control and Prevention (2015). Falls are the leading cause of fatal and non-fatal injuries in community-dwelling OAs (Cameron, Schneider, & Gilchrist, 2015), resulting in 85% of all injury-related hospitalizations and 95% of hip fractures (Kannus, Sievanen, Palvanen, Jarvinen & Parkkari, 2005). The likelihood of falling greatly increases with age, and as the average life expectancy continues to increase, it is estimated that so will the rate of fall occurrences; making falls a growing concern nationwide (CDC, 2015). A combination of both intrinsic and extrinsic risk factors may increase the likelihood of falling (Cameron et al., 2015). The physical injuries and psychosocial trauma resulting from a fall can limit an individual's independence, and participation in occupations, ultimately resulting in a decline in overall quality of life (AOTA, 2014).

In addition to reviewing current literature regarding the incidence of falls in community-dwelling OAs, the team members of this project-based capstone solution collaborated with the Novato Fire District to identify the needs of the community. Ride-alongs with first responders and interviews with battalion chief, Ted Peterson indicated a need for client-centered fall prevention interventions tailored for community-dwelling OAs residing in Marin County. Further discussion indicated that individualized education may increase the effectiveness of fall prevention programs (T. Peterson, personal communication, 2015). OAs often have limited access to fall prevention education other than generalized printed material (Viverette, 2011). Therefore, team members of the project-based capstone developed a series of education modules that provided community-dwelling OAs with education through a unique 1:1 model. Two senior community centers in Marin County served as the sites for the pilot education modules.

The interactive modules included education on intrinsic and extrinsic fall risk factors and individualized fall prevention strategies to address the risk of falls in community-dwelling OAs. Supplemental educational material provided information on services available in the community including nutrition and grocery delivery, and support groups for alcohol and substance abuse. Community-dwelling OAs who participated in the 1:1 fall prevention program responded well to the education modules. Occupational therapists have an expertise in assessing an individual's likelihood of falling, identifying fall risk factors specific to the individual, and creating client-centered interventions (AOTA, 2014). Occupational therapists provide these fall prevention interventions to reduce the rate of fall occurrences (Hofmann, 2016) with the goal of promoting safety and an overall quality of life for their clients (AOTA, 2014). Individualized and interactive education modules, may serve as an innovative fall prevention method to reach community-dwelling OAs who are at risk of falling, have previously fallen, or are interested in learning more about preventing a fall.

Literature Review

Current literature provides critical information for developing fall prevention modules including the rate of fall occurrences, intrinsic and extrinsic fall risk factors, and fall prevention programs/techniques that may reduce the likelihood of falls among community-dwelling OAs.

Older Adults

Research indicates community-dwelling OAs are less likely to report falls due to fear of institutionalization, being an inconvenience to their family, or simply assuming that falls accompany old age and are normal (Hofmann, 2016). Many OAs fear a loss of independence and limitation of participation in activities, which are often associated with long-term care facilities.

The concept of “aging in place” has become a popular option, for individuals who do not wish to age in a nursing home, with 87% of OAs indicating a desire to stay in their home and community as they age (AARP, 2014). However, aging in place may cause concern for the safety and well-being of OAs. Mitchell et al., (2015) found that OAs who chose to age at home had an overwhelming desire to maintain independence and often declined help from others with daily activities that presented potential hazards, which consequently increased their risk of falling.

Research indicates the need for fall prevention programs to educate OAs on the importance of considering the appropriateness and safety of their participation in their daily activities.

Intrinsic Fall Risk Factors

Intrinsic risk factors, internal and physiological factors related to the individual, include impaired vision and balance, fear of falling, and polypharmacy. The effects of these risk factors may contribute to OAs’ risk of experiencing a fall.

Vision. Vision serves as one of the most important senses to support safety during functional ambulation (Freeman, Munoz, Rubin, & West, 2007). Visual acuity is necessary to engage in and perform ADLs, IADLs, and leisure tasks. Visual deficits and impairments are a part of normal aging and consequently may play a role in increasing the likelihood of falling. If OAs are unable to see the terrain in front of them, they are less likely to avoid obstacles during functional mobility, and may consequently experience a fall.

Freeman et al., (2007) investigated the primary visual deficits most involved with falls among community-dwelling OAs. The study of 743 participants found that visual impairments are the primary contributor to falls in community-dwelling OAs (Freeman et al., 2007).

They also found that the localization of prevalent deficits in the central, lower, and peripheral visual field were related to a higher risk of falls depending on the site of the deficit (Freeman et al., 2007). Results indicated that losses in the peripheral visual field may result in a higher risk of falling, compared to central and lower visual impairments. Additionally, deficits in the visual field correlated with difficulty in maneuvering around and avoiding objects, and a decreased ability to detect steps or thresholds (Freeman et al., 2007). Therefore, individuals with a poor visual field face a risk of bumping into objects during functional mobility and are less able to compensate for a change in surfaces, which may lead to a fall.

Balance. A decrease in balance and postural instability is an additional consequence of aging. Balance is dependent on a dynamic relationship between sensory input, vision, vestibular system, proprioception, efficient muscle strength, and joint mobility (Vaught, 2001). Balance is necessary to perform tasks that require standing and proprioception. Proprioception is interdependent with balance and coordination in order to understand where the body is in space, then execute a motion without having to visually track the motions one is performing (Vaught, 2001). For example, proprioception allows individuals to walk up and down a flight of stairs without having to track each step. The body is able to analyze the task, then appropriately react in order to complete it. A decrease in proprioception may cause poor judgment and lack of awareness of where the body is in space. OAs who experience deficits in balance tend to have a gait pattern that includes: smaller steps, a slower gait, and decreased arm counterbalance. The gait pattern may decrease their base of support, leading to a fall (Vaught, 2001).

Interventions that address balance often consist of therapeutic exercises that help maintain body balance using integration of the neurological/musculoskeletal systems in sync.

To improve mobility and decrease likelihood of falling, aerobic balance exercise methods are often implemented which aim to increase balance ability and muscle strength. Choi and Kim (2015) implemented training programs to facilitate balance. The researchers enrolled participants in an aerobic exercise group or a muscle strengthening exercise group to improve stability and gait. Participants were assessed by the Berg Balance Scale and were required to have a moderate fall risk to meet enrollment criteria. Participants were grouped in either in an aerobic exercise balance training program or an ankle muscle strengthening program 3 times per week, for 50 minutes, for eight weeks (Choi & Kim, 2015).

The balance training group demonstrated significant changes in gait velocity, step length, and stride length, which increased participants' base of support and postural stability for mobility. The ankle muscle strengthening group demonstrated significant changes in gait velocity, cadence, step time, cycle time, step length, and stride length (Choi & Kim, 2015). Between the two groups, the aerobic balance training group showed greater improvement in gait velocity compared to the ankle training group. Participants with improvements in gait velocity demonstrated an efficient gait pattern, with a dynamic relationship between step length and stride length (Choi & Kim, 2015). Aerobic exercises may improve muscle function which is necessary for increasing the number of steps and gait speed (Choi & Kim, 2015).

As OAs age, their muscle strength and reflexes decline, which makes them more likely to fall. This causes difficulty for OAs to regain balance if they begin to fall. OAs may benefit from performing strength/balances exercises to work the muscles and joints specific to mobility. Participants who completed the balance exercise group demonstrated improvements in gait speed and gait velocity (Choi & Kim, 2015).

The research suggests that clinicians use the characteristics of gait, including measurements of speed and gait velocity, to forecast fall risk and rehabilitation outcomes. Improving balance and gait can be attained through exercise programs that target the specific physiological systems related to mobility.

Fear of falling. Fear of falling is a psychological risk factor referring to the extreme worry about experiencing a fall that may result in decreased participation in activities that OAs are capable of performing (Tinetti, Richman, & Powell, 1990). Fear of falling is prevalent in 29%-92% of OAs (Landers, Oscar, Sasaoka, & Vaughn, 2016), including those who have experienced a fall and those who have never fallen (Shin et al., 2010). Fear of falling results in several risks to the health and well-being of OAs including an increase in the likelihood of falling (Shin et al., 2010).

Risk factors that contribute to fear of falling include: cognitive impairments, depression and anxiety, decreased balance and a diminished ability to ambulate, previous incidences of falling, limited social support and social isolation, and living alone (Center for Gerontology, 2013). Cognitive impairments may diminish executive functioning including judgment and concern for safety. An individual's anxiety may diminish engagement in a variety of occupations. Additionally, OAs who live alone may have concerns about falling due to fear that they may not receive immediate assistance if a fall were to occur (Center for Gerontology, 2013). The risk factors correlated with fear of falling may diminish OAs' independence and engagement in occupations and decrease their overall quality of life (Center for Gerontology, 2013). OAs who limit their engagement in daily activities as a result of anxiety related to fear of falling, may increase their susceptibility for experiencing a fall.

Decreased activity level and limited participation in meaningful occupations may lead to an array of concerns including irregular sleep patterns, decreased physical function, social isolation, depression and anxiety which have been found to be directly related to fear of falling (Shin et al., 2010).

Occupational therapists use a variety of intervention strategies to address the psychosocial component of fear of falling among OAs (Center of Gerontology, 2013). Occupational therapists use a client-centered approach to identify the presence of fear of falling, educate clients and caregivers about the fall risks associated with fear of falling, and collaborate with clients to implement strategies that address the specific risks related to their fear of falling (AOTA, 2014). Interventions may include modifying the physical environment to enhance safety, increasing exercise and activity level, and strengthening lower body muscles (Center of Gerontology, 2013).

It is critical to address risk factors that are specific to each individual to reduce their risk of fear of falling, and in turn decrease the likelihood of falling. It is important to discuss additional contributing factors that may lead to fear of falling in order to establish appropriate intervention methods for OAs. The literature provides substantial evidence for the need to educate community-dwelling OAs about the fear of falling, in addition to promote safe participation in meaningful occupations in order to maintain an overall quality of life.

Polypharmacy. Taking four or more medications at a time, referred to as polypharmacy, is common among OAs (Huang et al., 2012). Frequently prescribed medications for OAs include benzodiazepines, sedatives, antidepressants, and antipsychotic drugs, which are all considered fall-risk-increasing drugs or FRIDs (Chen, Zhu, & Zhou, 2014).

Dizziness, impaired cognition, sedation, and disturbances in posture, gait, and balance are negative effects of FRIDs that contribute to an individual's increased risk of experiencing a fall (Chen et al., 2014). Polypharmacy may inadvertently lead to a greater likelihood of a fall due to the increase in and combination of adverse effects from multiple medication consumption. Polypharmacy-related fall risk increases by 14% with the addition of each prescription beyond four (Chen et al., 2014). The side effects of multiple medication use may directly impact an OAs' physiological function and increase their susceptibility to complications associated with a fall risk.

The risks associated with polypharmacy require that OAs properly manage their medications. OAs should be aware of the fall risk associated with each of the prescriptions they take. Individuals who demonstrate difficulty taking the prescriptions as directed may experience additional fall risk. One study investigated medication adherence in a group of community-dwelling OAs and found that low medication adherence was associated with an increase in fall risk compared to high medication adherence. However, the study reported that the reason for the association was unknown (Chen et al., 2014). Sanders and Van Oss (2013) reported that high medication adherence was associated with increased functional status and decreased risk of experiencing a fall. Although the cause of the correlation between medication adherence and risk of falls is unknown, OAs may benefit from multifactorial fall prevention modules that increase their awareness of polypharmacy, medication management, and medication adherence.

The findings of the literature provide indications for multifactorial education modules to address the complex fall-related risk factor of polypharmacy. Material for multifactorial education modules may include a list of FRIDs to increase individual's awareness of risks.

Research suggests that the complex factors of polypharmacy require routine review of the medications prescribed to OAs that may contribute to side effects that increase their risk of falls (Palvanen et al., 2014). These findings indicate the importance of reviewing medications, and their side effects, with individuals to decrease related risk of falls. Multifactorial education modules should promote patient self-advocacy to address this concern by encouraging OAs to facilitate discussion regarding polypharmacy and medication review with their primary care physician (PCP).

Extrinsic Fall Risk Factors

Extrinsic risk factors, factors external to the individual, include the physical environment, social support from family or caregivers, and their use of ambulatory aids. The effects of these risk factors on OAs may contribute to their likelihood of experiencing a fall.

Environment. Most falls occur within homes, public places, health facilities, or other units of community-dwelling OAs. The physical environment that OAs engage with greatly affects the likelihood of a fall. Environmental factors are related to 60% of falls that happen inside the home and 30% of falls that happen outside of the home (Bergland, 2012). The likelihood of a fall increases as the number of risk factors in the environment increases (Bergland, 2012).

There are many factors in the home and outside environment that may increase an OAs risk of experiencing a fall. Environmental fall risk factors include slippery surfaces, dimmed lighting and high thresholds that require an increased step height that may exceed the physical abilities of OAs (Boelens, Hekman, & Verkerke, 2013).

Risk factors in public areas include: uneven ground surfaces and construction areas (Bergland, 2012). OAs are most at risk of experiencing a fall in their home due to numerous contributing safety hazards. Risk factors in the home include tripping over pets, loose cords, clutter, carpets and throw rugs (de Guzman et al., 2013). The bathroom is the most common area for falls in the home due to the safety hazard of slippery floors (Boelens et al., 2013). Other hazards in the bathroom include the absence of shower chairs or handrails, which can aid OAs with safe ambulation. Throughout the home, chairs without armrests, that can provide support during sit-to-stand transfers, are also a risk factor (Boelens et al., 2013).

Maladaptive behavior. The environment not only acts upon the OA, but it also affects behavior and engagement within the OA, which coincidentally may increase the risk of falling. The physical environment may influence the manner in which OAs interact with their environment and how they participate in their daily activities. Research has identified behavioral fall risk factors, meaning behavior that increases the risk of falling. These behaviors include failure to use handrails when they are present, not turning on lights when using the bathroom at night, standing on surfaces such as a step stool, selecting inappropriate footwear and using ill-fitted or outdated eyewear prescriptions (Bergland, 2012).

Multifactorial education modules should focus on increasing individual's awareness of fall risk factors in their environment and include 1:1 discussion on how these factors may influence the way they participate in their daily occupations. Fall prevention programs should include education on home modifications and safety to increase OAs' awareness of the extrinsic risk factors that may be present in their daily activities. Education on how to modify the home to prevent falls may also help ensure safe mobility and engagement with the environment.

OAs may benefit from interactive intervention methods to increase their safety awareness, ability to appropriately modify their environment, and to reduce the likelihood of falls.

Social support. Also extrinsic to the OA is the support that he/she may receive from family or caregivers. Immediate or extended family and significant others who are not members of the family make up the support system of an OA (de Guzman et al., 2013). Support systems from family and spouse may decrease the risk of falling because of the help provided with activities of daily living or ADLs (de Guzman et al., 2013). Help with ADLs may include assistance with self-grooming and dressing tasks, or household management tasks of washing dishes, doing laundry, or mopping floors, which may be difficult for the older adult to complete alone. The research also suggests that OAs who have a spouse may be less likely to experience serious injury, should a fall occur, compared to OAs who are widowed or live alone. The authors suggested this may be because individuals living alone may not receive immediate medical treatment if another individual is not around in the event of a fall incident (de Guzman et al., 2013).

Ambulatory aids. Individuals who require assistance with functional ambulation may benefit from use of ambulatory aids. Ambulatory aids create a wider base of support, and correct the center of gravity for ambulation. The specific diagnosis and functional mobility of a client determines the type of ambulatory aid that is most appropriate for the client. OAs may struggle with correctly using their ambulatory aids, and may drag their aid without using it properly or purposefully which may result in a difficult gait pattern. The misuse of an ambulatory aid can potentially harm, rather than provide support in what it was intended to do, and increase the risk of a fall.

Healthcare professionals should assist in educating family members and clients on the correct use of ambulatory aids. Proper measurement of canes, walkers, and wheelchairs for patients is important to decreasing the number of safety hazards and addressing dysfunctions in ambulation (Vaught, 2001). Education regarding the proper use of adaptive equipment must be accurate and thorough in order to prevent falls.

Falls and First Responders

According to Ted Peterson, Battalion Chief of the Novato Fire District, first responders provide a distinct scope of services when responding to fall-related emergencies which may result in a gap in follow up services. First responders are typically the first to arrive at the scene after an individual has fallen. However, their interactions with patients often do not include follow-up after a fall incident. Peterson (2015) also explained that fall victims are not required to adhere to recommendations from first responders to follow up with medical or other services.

Role of first responders. Beyond providing immediate assistance, the role and responsibilities of first responders include responding to the scene in a timely manner, assessing and treating any immediate injury, assisting the victim in any way possible, and encouraging the victim to seek treatment (Lowton, Laybourne, Whiting, & Martin, 2010). Regulations limit first responders from having the authority to medically advise an individual to go to a hospital unless the individual is unconscious or unable to communicate, in which case the first responders may take the person to the hospital (Lowton et al., 2010). Beyond these extreme cases, first responders are not resourced to provide further assistance to the fall victim at the given time.

First responders are the first line of assistance for OAs who experience a fall. A study identified the emergency scenarios that occur after an individual contacts emergency services.

The study reported that 17% of calls made over a 12-month period were made by OAs, age 65 and older (Lowton et al., 2010). Individuals called for assistance in getting up, and often requested to be returned back to bed. From the 2,500 calls reviewed that year, 425 of the respondents refused hospitalization. Several remarks were recorded in which the fall victim dismissed the severity of potential risk factors identified by professionals at the site where the incident occurred. OAs often underplayed the fall occurrence, and denied that the incident was a serious concern (Lowton et al., 2010). Several individuals did not contact emergency services immediately after a fall incident. The delay in calling for help was often attributed to a sense of embarrassment, fear of being admitted to a hospital and not returning home, fear of creating an inconvenience for the family, or simply assuming that it part of aging and disregarding the need for emergency services (Lowton et al., 2010).

Relevance to capstone. Collateral information from ride-alongs and discussion with first responders guided the design and implementation of the capstone. Observations indicated that first responders provided immediate assistance to individuals; a significant number of whom, were individuals who had previously fallen and sought assistance (T. Peterson, personal communication, 2015). Consultation with first responders of the Novato Fire District indicated a need for client-centered education for community-dwelling OAs regarding fall prevention education. Further discussion highlighted that individuals may be more likely to actively practice and use information that is tailored to their needs rather than generalized information provided in printed educational material that is distributed (T. Peterson, personal communication, 2015).

Based on this feedback, and the literature review, the series of seven education modules developed in the project were designed to provide individualized fall prevention education to community-dwelling OAs in an interactive manner with the goal of being more meaningful and beneficial to the participants involved.

Fall Prevention Programs

Currently, there are several different types of fall prevention programs including: physical activity programs, home modification programs and programs tailored towards adapting the individual.

Physical activity programs. One of the most common types of programs is a physical activity program (Chase, Mann, Wasek, & Arbesman, 2012). These programs include individual or group sessions that incorporate balance and strengthening conditioning or retraining (Chase et al., 2012). The goal of these programs is to effectively address a variety of physical limitations among individuals in order to promote safety. For example, the Healthy Steps for Older Adults Program in Pennsylvania includes physical performance assessments as well as education regarding fall prevention (Albert et al., 2014).

The educational component consists of identifying hazards in the home that can trigger a fall and a variety of simple balance and strengthening exercises that can be performed at the home (Albert et al., 2014). CDC recommends the use of Tai Chi programs to increase balance while simultaneously decreasing symptoms of chronic conditions, particularly Parkinson's disease and Fibromyalgia (Li, 2015). Regardless of the type of activities, evidence shows that participation in a program that includes physical activity contributes to decreased fall risk, fear of falling, and reported falls (Chase et al., 2012).

Home modification programs. Another type of program that is effective in reducing the risks and hazards of falling is a home modification program. These programs include identifying hazards in the home and learning methods to create a safe environment (Chase et al., 2012). Hazards include clutter on the floor, bathtubs without non-skid rubber mats, and dark lighting throughout the environment (Chase et al., 2012). There are several home adaptations that may reduce fall risk. Effective adaptations to the home environment include installing grab bars on walls, replacing flooring, installing proper lighting throughout the environment, and marking the top and bottom stair with contrasting adhesive tape (Li, 2015).

Adapting the individual. While the home environment can be adapted, adaptations to the individual person can also reduce his/her risk of falling. The individual can focus on pacing themselves in order to prevent fatigue and becoming unstable in an unsafe environment (Chase et al., 2012). Individuals can also increase their safety awareness. For example, individuals should consider wearing an emergency alert bracelet at all times, especially in the shower (Li, 2015). Depending on the individual, assistive devices may contribute to preventing a fall. Devices such as reachers, transfer poles, and many others may provide assistance (AOTA, 2014). For example, individuals can use a reacher to pick up something on the floor rather than bending over, which may cause them to lose balance and fall. The individual can take proactive safety measures before they negatively affect them and further increase their likelihood of falling (Li, 2015). Based on the value of individualized adaptations, an educational approach focused on individual needs and hazards may be effective in preventing falls.

Multifactorial programs. While exercise and home modification programs contribute to fall prevention, research shows that multifactorial programs are the most effective.

Multifactorial programs combine a variety of interventions. These interventions focus on health and safety, medication management, vision management, gait and balance training, and exercise. Multifactorial programs can incorporate components from exercise and home modification programs. With multifactorial intervention programs, a variety of professionals, including occupational therapists, physical therapists, nurses, and social workers, can contribute to fall prevention (Chase et al., 2012). These programs are associated with a 36% reduction rate in hospital admissions and increase in fall efficacy among OAs (Chase et al., 2012).

As there are a substantial numbers of methods used to prevent and reduce falls, there is no single rule for intervention. An individual might benefit from considering their current health status, their environment, availability and affordability of resources, and their daily routine, as well as other factors. Making proactive changes and remaining committed to being safe can prevent falls and ultimately decrease the risk of injury or death from falling. Despite the existence of multiple programs designed to reduce falls in community-dwelling OAs, there continues to be a critical component lacking. It is important to work with OAs who are living at home, by providing education and multifactorial materials that are interactive and individualized, in order to address risks in a manner that the individual is likely to respond to.

Statement of Purpose

Falls continue to be a growing area of concern for community-dwelling OAs, with one in four reporting an incident per year (CDC, 2015). A variety of fall prevention programs are currently available for this population, however, the overall statistics regarding falls among OAs continue to rise, making it a nationwide concern among the population. Multifactorial programs are beneficial in reducing the risk of falls among OAs (Chase et al., 2012).

Despite their effectiveness, however, multifactorial programs often lack 1:1 interactions and personalized education that may be most beneficial for community-dwelling OAs. By addressing this current need, multifactorial education modules may serve to enhance retention and effectiveness of fall prevention interventions among community-dwelling OAs.

The purpose of the project-based capstone was to design and implement a multifactorial fall prevention program consisting of a series of interactive education modules that was individualized and for community-dwelling OAs through a unique 1:1 model. The goal was to create an education program for community-dwelling OAs, residing in Marin County that addressed intrinsic and extrinsic fall risk factors and fall prevention, in hopes of decreasing the likelihood of falls among the population. Seven education modules were developed and piloted at two senior community centers in Marin County. The education modules provided information regarding a variety of fall risk factors, including: home safety, polypharmacy, fear of falling and, strength and balance.

The education modules were developed for use in a health promotion setting, including health fairs and senior community centers, in order to enhance the opportunity to reach and provide information to community-dwelling OAs. The aim of the unique 1:1 and interactive design was to provide community-dwelling OAs with personalized information regarding their risk of falling, and specific preventative measures for reducing their likelihood of experiencing a fall.

Theoretical Framework: Person-Environment-Occupation Model

Additional information regarding the theoretical framework, and its importance to the project-based capstone will be addressed in subsequent sections.

Components of Theoretical Framework

The PEO model recognizes the existence of three separate entities, and further grounds the importance/purpose of the fall prevention education modules that were developed (Table 1).

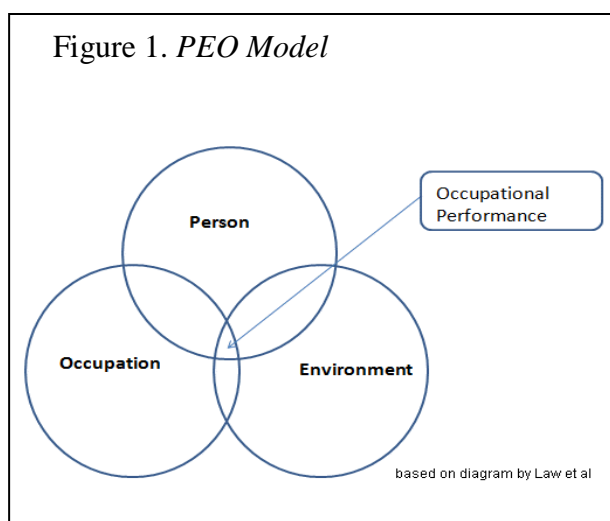
Table 1. *Components of the PEO model and its Relevance to the Capstone*

Model components:	Definition:	Addressed in modules:	Importance:
Person	Individual with a unique skill set that interacts within the environment to complete a meaningful task or occupation	Module 1 & 2: <i>Determining Personal Fall Risk</i> Module 4: <i>Polypharmacy</i> Module 5: <i>Fear of falling</i>	Addressed a variety of intrinsic risk factors that highlight disparities among individuals in order to enhance safety and engagement.
Environment	Physical or virtual space that an individual interacts within that may inhibit or support the individual's engagement in an occupation	Module 3: <i>Home Safety</i>	Addressed a variety of extrinsic risk factors that highlighted environmental hazards that should be removed in order to allow an OA to safely engage in occupation.
Occupation	Task that is vital or meaningful to the individual in a surrounding environment that promotes independence and an overall quality of life	Module 6: <i>Strength and balance</i> Module 7: <i>Completion of education modules</i>	Addressed factors that are pivotal for allowing an OA to engage in meaningful occupations, to ultimately support an enhanced quality of life through activities of daily life (ADL's).

The PEO model further recognizes the fluid interaction between the three entities and the occupational performance that results from it. Occupational performance is the interactive and dynamic relationship between the three entities that supports an individual in completing a meaningful task or occupation, in a unique environment supported through optimal performance. It is through this relationship that an individual can perform at an optimal level and engage in a variety of meaningful occupations (Law et al., 1996). By understanding the theoretical basis of the PEO Model, team members were able to acknowledge and use it in the development and implementation of the capstone.

Theoretical Framework and Fall Prevention

Multifactorial education modules were developed to address a variety of fall risk factors specific to the person, environment, and occupation, tailored to the needs of each participant. The education modules allowed participants to enhance their occupational performance, or P-E-O fit, through individualized and personalized information. The PEO model serves as an appropriate and beneficial foundation for the development and implementation of the education modules.



Occupational therapy recognizes and acknowledges the importance of these three entities in promoting a balance of occupations (Figure 1). The project-based capstone design aimed to address the dynamic relationship between the three entities outlined in the PEO model through 1:1 interactions.

The education modules highlighted specific factors related to the person, their environment, and their engagement with occupations; including fall risk screening, education related to home safety, polypharmacy, the fear of falling, and strength and balance.

Methodology

Agency Description

Several intrinsic and extrinsic risk factors, previously mentioned, may increase the risk of falling among community-dwelling OAs. These risk factors guided the design and implementation of a series of seven education modules, at two senior community centers in Marin County. The Margaret Todd Senior Center serves the residents of Novato, California and offers both, enrichment and fitness courses, a variety of social and support groups, and additional outreach programs. The mission of the center is to unite people, nurture the development of social support, and enhance life-learning for individuals of the community (City of Novato, 2016).

Whistlestop Senior Services is located in Downtown San Rafael, California and provides a variety of services to community-dwelling OAs of Marin County. Whistlestop enhances independence, and provides programs to encourage overall well-being and quality of life. Services include nutrition education and meals, a variety of education classes, further referral services, and transportation services through the celebration of multifactorial environment (Marin Senior Coordinating Council, 2016). These two centers served as the pilot sites of implementation for the education modules, after it was determined that participants in these programs, would benefit from fall prevention education in a unique 1:1 model, in order to reduce their likelihood of falling (Appendix A).

Project Design and Needs Assessment

A project needs assessment was conducted through a 4-step process: a) During the initial planning stage, team members participated in ride-alongs, and conducted interview with first responders and the Chief of the Novato Fire District, in order to gather information related to the process of assisting victims of falls among community-dwelling OAs in Marin County. b) Next, team members explored current literature regarding falls and fall prevention. The literature review indicated risk factors that contribute to the likelihood of falls among community-dwelling OAs.

Literature regarding pre-existing fall prevention programs provided information on effective and ineffective intervention methods. Collaboration with first responders and information found in the literature review indicated a need for individualized and interactive fall prevention education tailored towards community-dwelling OAs residing in Marin County. c) A series of seven interactive education modules were designed to address intrinsic and extrinsic risk factors that had been identified as associated with an increased fall risk among the population. d) Lastly, the education modules were piloted at two community senior centers in Marin County where they were tailored towards every individual that participated.

The individualized and interactive education modules that were created are as follows: *Assessment of personalized factors*: Module 1: Fall Risk Questionnaire; Module 2: Functional Reach Test (FRT); *Interactive Education Modules*: Module 3: Home modifications; Module 4: Polypharmacy; Module 5: Fear of falling (FOF); Module 6: Strength and balance exercises; Module 7: post-survey, additional fall prevention material and community resources.

Target Population

The capstone served community-dwelling OAs, age 65 and older, residing in Marin County at the Margaret Todd Senior Center and Whistlestop Senior Services. Program planning took into consideration the possibility of declined physical and cognitive conditions among participants, assistance provided by family and caregivers, and access to use of assistive devices. The education modules were designed for community-dwelling OAs who are at risk of falling, have previously fallen, or are interested in learning more about preventing a fall.

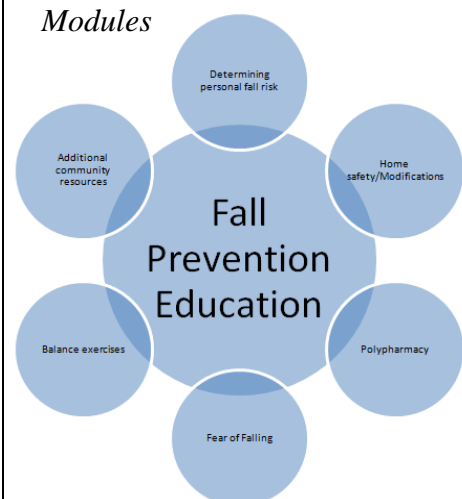
Project Development

The purpose of the capstone was to reduce the likelihood of falling among community-dwelling OAs, age 65 and older, residing in Marin County, through the development and implementation of a series of seven education modules regarding fall prevention. The team members of the capstone developed education modules that addressed the intrinsic and extrinsic risk factors that were identified to be critical in preventing falls for the population of interest. In order to develop the education modules, a multitude of information was reviewed including: a) previous project-based capstones regarding fall prevention, b) current literature regarding fall prevention programs and education, c) information retrieved from an initial interview with CMO Battalion Chief-Director of EMS, Ted Peterson, of the Novato Fire District and d) observations and additional input provided from first responders of the Novato Fire District during interviews and ride-alongs.

The information and handouts provided at each education module were retrieved from public domain websites on the internet (Appendix D & H), used with permission (Appendix B, F, I, & K), and/or created by the team members of the capstone (Appendix E & M). Examples of the handouts used in the first and second pilot implementations can be found in the appendices at the end of the paper (Appendix C, D, G, H, J & L).

Upon developing the education modules, team members organized the modules in a sequence that allowed for a) screening and assessment in order for team members and participants to better understand each participant's likelihood of falling, b) a 1:1 discussion of the

Figure 2. *Intrinsic and Extrinsic Risk Factors Addressed in Modules*



participant's intrinsic and extrinsic factors and strategies to reduce their risk, and c) additional take-home resources and an evaluation of the participant's overall experience in a post-survey developed by team members. The following figure (Figure 2) includes the risk factors that were identified, and incorporated into the individualized and interactive education modules. Information regarding the order of the education modules during the implementation of the pilot program and the second implementation can be

found in a subsequent section (Figure 3 & 4).

Ethical and Legal Considerations

The American Occupational Therapy Association (AOTA, 2015) Code of Ethics guided the development and implementation of the capstone. Team members adhered to the principles of beneficence, nonmaleficence, autonomy, and justice.

Beneficence. Beneficence requires team members to take action by promoting safety for the well-being of participants (AOTA, 2015). Team members provided participants with step-by-step instructions and stand-by-assistance during the Functional Reach Assessment (FRT) and strength & balance exercises to ensure the safety of all participants. An interactive home modification module increased participants' awareness of safety risk factors that occur in the home environment. Team members adhered to beneficence during 1:1 interactions to facilitate participation in daily activities and to help participants maintain overall quality of life.

Nonmaleficence. AOTA (2015) states that team members shall refrain from causing any intentional or unintentional harm or injury to participants. In congruence with beneficence, team members adhered to nonmaleficence by ensuring safe participation in all modules. To prevent unintentional harm or injury, team members practiced administering the Functional Reach Assessment (FRT) and strength & balance exercises before project implementation. Additionally, modules that required physical activity took place in a corner of the room in close proximity with a wall or handrails, and a chair nearby, to further increase the safety of participants. Team members also considered precautions related to pre-existing medical conditions of participants and acknowledged participants who used ambulatory aids.

Autonomy. Autonomy states that participants have the right to make their own choices and team members must respect the privacy, views, values/beliefs of participants (AOTA, 2015). All OAs who participated in the education modules did so at their own free will. Individuals maintained the right to participate as much or as little as they were comfortable with, and the right to stop participation at any time. Participants freely chose to complete a post-survey at the end of the program.

Post-surveys did not require participants to provide their names or personal information aside from age and gender. Information collected from the post-surveys were used solely to collect feedback for improvement of the fall prevention program.

Justice. AOTA (2015) requires team members to adhere to the code of justice by respecting the OT standards of practice and demonstrating fair, equitable, and appropriate treatment of participants. Team members abided by the occupational therapy standards of practice as outlined in the Occupational Therapy Practice Framework (AOTA, 2014). All individuals regardless of race, gender, ethnicity, or socioeconomic status maintained the equal right to participate in the education modules.

Project Implementation

Information regarding the implementation of the education modules at the first and second pilot implementation are found in subsequent sections.

Implementation of pilot program. The first implementation of the pilot program occurred during a senior health fair at the Margaret Todd Center in Novato, California on February 17, 2016. The health fair was from 9:00 A.M to 12:00 P.M. Team members of the capstone presented the education material through a booth to attendees of the health fair.

Education modules. Seven education modules, served as the basis for team members to present fall prevention information and strategies to participants in a unique 1:1 model tailored towards their individualized risk of falling and identified risk factors.

Participants began at **Module 1** by filling out the “Check Your Risk for Falling” questionnaire, a pre-survey used to identify personal fall risk factors (Appendix C). Permission to use the “Check Your Risk for Falling” table can be found in Appendix B.

Participants then moved onto **Module 2** where they were administered the Functional Reach Test (FRT); a balance assessment, used to screen and identify each participant's individual risk of falling (Appendix D). Trained team members conducted the assessments to ensure safety of participants and accuracy of results.

Individuals then continued to **Module 3** where they participated in an interactive home modification module. The station consisted of three-dimensional, backdrop images of three rooms in a home, including: a bathroom, kitchen and bedroom. Each image had a variety of common items placed on the backdrop with Velcro, including: clutter, pets, and loose rugs (Appendix E). Team members prompted the participants to identify the risk factors included in each of the rooms, and provided education on safety strategies to eliminate items that may contribute to falls. Additional information regarding adaptive equipment, including: grab bars, shower chairs and bathroom commodes was also provided, depending on the needs of the individual. Attendees then moved onto **Module 4**, where they participated in a 1:1 discussion about fear of falling and its effects on quality of life. Participants were presented with a visual "Fall Prevention Continuum" (Appendix G). Permission to use the "Fear of Falling Continuum" can be found in Appendix F.

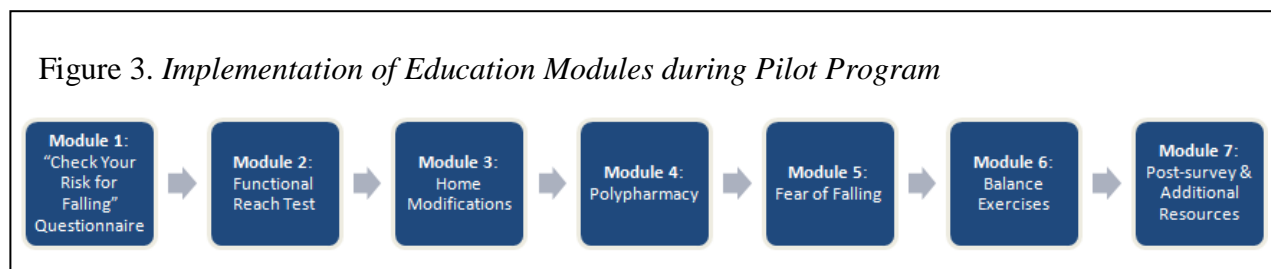
Team members led individual discussions regarding risks associated with having a high fear of falling, risks associated with being fearless and demonstrating possibly unsafe behavior, and strategies to maintain a healthy concern for falling. Team members discussed activity avoidance, which is related to fear of falling and the downward spiral of function that an OA may experience as a result. Discussion also included risks related to participating in occupations that may exceed an individual's physical abilities.

Attendees were encouraged to share their personal experience with falls, and their fear of falling, to identify the area on the continuum that best described their occupational performance. Participants collaborated with team members to identify specific methods for modifying and adapting their routines to maintain safe engagement in their daily occupations and decrease the likelihood of a fall. Individuals then engaged in a dialogue regarding risk-taking behaviors, including the risks associated with polypharmacy in **Module 5**. The module included a handout that provided a list of medications that may contribute to the likelihood of a fall (Appendix H). It is important to note that team members did not provide participants with medical advice concerning medication intake but facilitated self-advocacy among participants and encouraged them to initiate discussion with their primary care physician (PCP) regarding possible side effects related to polypharmacy.

Hands-on demonstration of strength and balance exercises conducted in **Module 6** allowed for physical engagement of participants. Step-by-step instructions allowed participants to engage in the exercises while maintaining safety and being supported by team members. Participants were provided with a “Falls Prevention-Home Exercises” handout to take home for future use (Appendix J). Permission to use “Falls Prevention-Home Exercises” handout can be found in Appendix I.

Lastly, each participant evaluated the education modules in **Module 7** with a post-survey, used to provide feedback for future improvements (Appendix M). Upon completion of the survey, individuals received additional printed education material related to the information provided through the modules (Appendix L). Permission to use additional printed educational material can be found in Appendix K.

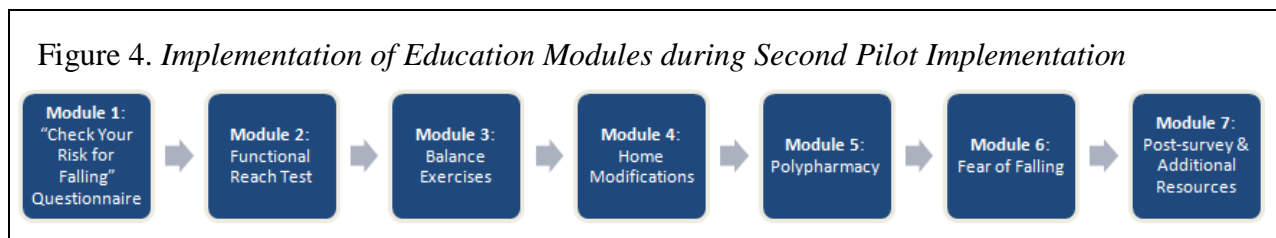
Team members provided each participant with a folder containing handouts to take home for future reference beyond the scope of the health fair. The order of the education modules during the first pilot implementation, at the Margaret Todd Senior Center, is shown below (Figure 3).



Implementation of second program. The second pilot program implementation occurred at Whistlestop Senior Services in Downtown San Rafael, California, in a multi-purpose room on May 3rd, 2016 from 3:00 P.M. to 5:00 P.M. Participants were allowed to sign up for a specific 10-minute time slot, prior to the event, or walk in during the allotted time.

Prior to the second implementation of the modules, the capstone team revisited the organization and layout of the education modules to make improvements. During the pilot implementation, team members discovered that Module 5: Fear of Falling, was of high demand and interest among participants. However, due to the layout of the modules, participants often felt pressured to end the session early or became frustrated by the wait and skipped the module.

After evaluating the first pilot program, team members believed that moving the fear of falling module to the end of the program, would better suit the needs of the participants; as it would allow additional time to address this component in more detail than what was previously planned. The order of the education modules during the second implementation, at Whistlestop Senior Services, is shown below (Figure 4).



Despite the efforts of the team members to make improvements to the second implementation of the education modules, the flow did not go as anticipated. Individuals arrived in groups rather than at their allotted time, making it difficult to follow the exact order that the education modules were intended to follow. Nonetheless, team members worked together to ensure that all participants received individualized education based on their personal risk factors and likelihood of falling in order to provide meaningful and client-centered services. Despite the challenges presented, team members would recommend using the same order outlined in Figure 4 for future implementation to allow participants additional time with the fear of falling module.

Project Evaluation

Each individual that participated in the modules completed an eight-question post-survey, to provide feedback of the fall prevention program. Results from the post-survey have been combined from both sites and are summarized at the end of this section (Figure 5 & 6).

Post-survey evaluation. Team members created a post-survey that was titled “Survey: Fall Prevention,” and printed in large, simple font that would allow for easy reading (Appendix M). A note was included at the top of the survey and read as follows, “Thank you for attending our information booth today, please consider taking 5 minutes to fill out this survey. Your answers will be kept confidential and will serve to better develop the information that we have provided.”

Below the statement, the survey asked the individual to indicate their gender, age, and to rate the education modules on a Likert scale of 1 to 5. The survey then asked individuals to indicate the likelihood that they would refer the education modules to a friend or family member by selecting “yes”, “no”, or “not sure”. They were then asked to rank their overall experience on a Likert scale from 1 to 5. Three additional open-ended questions were included with writing space provided: “What did you like most about your experience today?”, “Was there anything that you would like to have seen but did not?”, and “Please provide any additional comments, suggestions or additional information below.”

Evaluation of first pilot program. Twenty-one participants from the Margaret Todd Senior Center completed the post-survey. Among the participants, there were seventeen females, three males, and one attendee who chose not indicate gender or age. The age range of attendees was 67 to 97 years of age, with an average age of 73 years old. When asked to rate the helpfulness of the education modules, on a 1 to 5 point scale, where 1 indicated “Not helpful,” and 5 indicated “Very helpful,” on average attendees rated the material a 4.47. When attendees were asked if they would recommend the education modules to a friend or family member, 19 attendees indicated “yes”, one attendee indicated “not sure”, and one attendee chose not to respond.

On average, attendees rated their overall experience a 4.47 based on a 5-point scale, where 5 indicated “Very helpful.” Attendees were also asked to state what they liked most about their experience with the education modules. Most participants indicated satisfaction with all education modules, with the greatest satisfaction with the following modules: Strength & balance exercises, and Fear of falling (FoF).

When participants were asked “Was there anything that you would like to have seen but did not?” two participants suggested showing actual exercises, despite the fact that exercises had been demonstrated by team members; leading the team to consider adding additional exercises to the modules. Additionally, the survey responses indicated that participants would have liked to see visual demonstrations of correct postures. In the section of the survey where attendees were asked to provide additional comments, several participants commented on the professionalism and friendliness of team members, and overall gratitude for the fall prevention educational material. Positive feedback from participants who attended the pilot implementation indicated an overall effectiveness of the material provided by team members. Members of the fall prevention team took into consideration the results of the survey when preparing for the second implementation of the education modules.

Evaluation of second implementation. Fourteen participants from Whistlestop Senior Services completed the post-survey during the second pilot implementation of the capstone. A total of six females, six males, and two participants who chose not to indicate gender or age, completed the post-survey. The age range of participants was 65 to 91 years old with an average age of 81. Participants provided feedback using the same evaluation as that used at the first pilot implementation.

When asked to rate the helpfulness of the educational material, on average, attendees rated the material a 4.0 out of 5.0, where 5 indicated “Very helpful.” When attendees were asked if they would recommend the education modules to a friend or family member, seven attendees answered “yes”, two attendees answered “not sure”, and one attendee answered “no”. On average, the attendees rated their overall experience a 4.2 based on the 1-5 Likert scale.

When asked to state what they liked most about their experience, participants indicated greatest satisfaction with the strength & balance module, in addition to the friendliness of team members. When participants were asked, “Was there anything that you would like to have seen but did not?” two participants suggested to provide additional demonstration of exercises. When asked to provide additional comments, most participants stated that they liked that the team members were “courteous, friendly, and well informed” and that the material provided in the education modules was “very important.” One participant also mentioned that he/she would have liked to experience a presentation with a general overview, a list of home modifications, and a driving assessment. The ideas mentioned were acknowledged by team members, and may be considered for future integration, past the scope of this project-based capstone.

Results from post-survey evaluations. Data was combined from both sites, and has been summarized in the following figures (Figure 5 & 6).

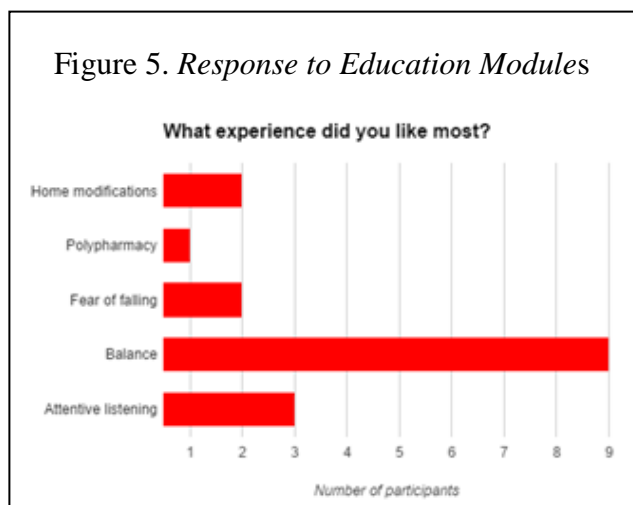


Figure 5 represents the participant's' response to “What experience did you like most?” where 45% of participants indicated greatest satisfaction with the strength & balance module. Participants also reported an appreciation of the attentive listening provided by team members. Team members have acknowledged and

validated the importance of the strength & balance module through its a) consistent mention via post-survey evaluations at both sites, b) its selection as the education module that was most valued by the participants, and c) its mention in additional comments on four different occasions.

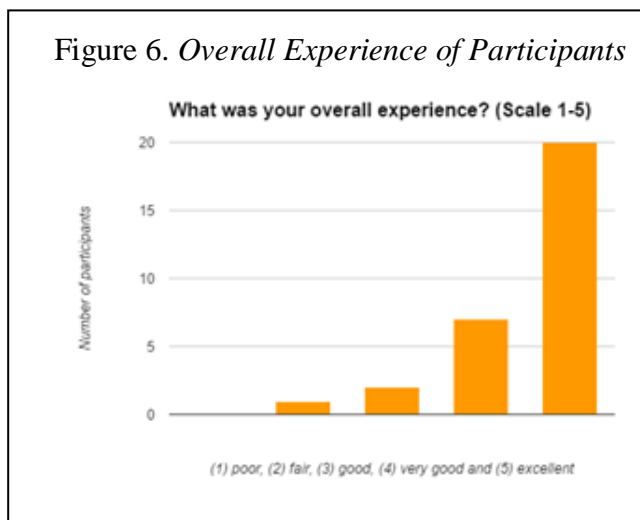


Figure 6 presents the participants' response to "What was your overall experience?" on a Likert scale of 1 to 5. Results indicated that 90% of participants, rated the education modules as "very good," or "excellent," indicated by a 4 or 5 on a Likert scale. These results validate the success of team members

and the education modules, in providing fall prevention education to the target audience.

Discussion, Summary, and Recommendations

Discussion

The development and implementation of the education modules proved to be an extensive process grounded in the literature review and additional research conducted by team members of the project-based capstone. Furthermore, the education modules proved to be effective in providing education to a group of individuals in a unique, 1:1 model that was interactive and individualized. The pilot experience, and survey feedback indicate that the developed modules may serve as an innovative method for providing education in a community setting. The project-based capstone allowed team members to address a nationwide concern and provide personalized prevention strategies to each participant, by identifying their personal risk factors and likelihood of falling. Furthermore, the development of the education modules rooted in the principles of client-centered treatment and engagement in meaningful occupations proved to be effective and beneficial to the target population.

Therapeutic use of self and 1:1 interactions with participants allowed team members to build rapport with every individual. This was particularly true of the fear of falling module during which participants shared personal information regarding concerns about falling. Established rapport and collaboration allowed OAs to address personal risk factors. Team members were able to provide personalized strategies for making modifications and adaptations to daily routines, in order to increase safe participation in occupations and decrease their individual likelihood of falling.

Refinements to the information provided in the education modules, in addition to the order in which individuals participated, were modified from the first pilot implementation to the second pilot implementation based on the experience of the team members, and feedback provided in the post-surveys completed by the participants. Development and implementation of education modules allowed participants and team members to better understand the value of education in preventing falls.

Despite the praise of the education modules in both piloted implementations, it is important to acknowledge and recognize the limitations that were identified by team members of the capstone. On multiple occasions, participants indicated that they would have liked a list and demonstration of exercises, despite them being presented in module 6. Due to this phenomenon, team members understand that participants may have benefited from additional strength and balance exercises to be incorporated into the daily routine and everyday life of OAs, past the scope of the fall prevention program. Furthermore, team members understand and acknowledge that the efforts that were done to provide fall prevention education to community-dwelling OAs was successful, however, has only been supported through two piloted interventions.

Additional topics to consider, the organization of the education modules when implementing, and further suggestions for enhancing the success and long-term effects of the education modules are mentioned in subsequent sections of this paper.

Summary

The aim of the capstone was to develop and implement a set of seven interactive multifactorial modules regarding fall prevention, in order to educate community-dwelling OAs residing in Marin County. The team's objective was to develop a brief and effective method for educating OAs in a community setting using a unique, 1:1 model. The education modules addressed a variety of factors specific to an individual's fall risk, including their home environment, fear of falling, use of medications, and exercise routine.

A post-survey conducted with participants, allowed individuals to provide feedback regarding their overall experience with the education modules and the interactive fall prevention program. Positive feedback from the post-survey, in addition to participant testimonials, indicate a benefit and overall effectiveness of the education modules in increasing participants' awareness and understanding of risk factors associated with their individual risk of falling. Furthermore, the education modules were rated as effective in educating community-dwelling OAs regarding preventative measures and strategies to reduce their likelihood of falling.

Nearly half, 45% of participants indicated greatest satisfaction with the strength and balance exercises module, and additionally enjoyed the attentive listening provided by team members. Results indicated that a majority of participants, 90%, rated the education modules as "very good," or "excellent." The education modules were well received among participants, and may further support the use of a unique 1:1 model in providing outreach education to OAs.

Limitations

Limitations of the capstone include limited implementation opportunities, and the number of appropriate sites for implementation. Team members expressed difficulty in finding and confirming sites in Marin County for the implementation of the education modules. Additionally, team members expressed a limitation in the education that was provided to the participants due to time constraints. Limited time also diminished the ability of team members to gather sufficient background information from participants that would have allowed for a further individualized approach to the education modules. Lastly, the ability to determine the long term benefits and effectiveness of the fall prevention program is past the scope of the capstone, but would be valuable if a similar approach were to be continued in years to come.

Recommendations

Further planning and revisitation should be considered for subsequent implementation of the education modules. Recommendations include making a wait-list system and using a sign-in sheet to address previous difficulties with time restraints. Team members were able to engage participants in 1:1 discussions; however, some individuals may have declined to participate due to the amount of time they had to wait between each module. For future implementations, team members may benefit from using a sign-in sheet to call participants one at a time, based on availability and wait time.

The fall prevention program provided participants with information on the benefits of using adaptive equipment and home modifications but did not include specific education on the cost of these methods. Future programs may include discussion regarding the accessibility and feasibility of specific interventions.

The fall prevention program was conducted on two separate occasions, and generally received positive feedback. The project-based capstone would benefit from a follow-up segment, which would allow team members to assess the effectiveness of the education modules over a prolonged period of time. Ideally, the participants would be reassessed after a certain period of time, such as 6 weeks, in order to evaluate the retention of information, and healthy changes made among participants, based on the education provided at the fall prevention program.

Conclusions and Other Considerations

Input from the Novato Fire District, combined with the current literature regarding fall prevention indicates a need for occupational therapy services to address fall risk and other concerns among community-dwelling OAs. There are a variety of fall prevention programs available, however, there continues to be a lack of individualized and interactive interventions for OAs who are aging at home. Current literature indicates a need for providing community-dwelling OAs with education regarding intrinsic and extrinsic risk factors and preventative strategies. The needs of the population of interest, identified by the team members of the capstone, additionally included therapeutic use of self, and the demonstration of strength and balance exercises to enhance independence and safety during daily activities among community-dwelling OAs.

A lack of health promotion opportunities available to this population guided the development and implementation of the modules of the fall prevention program. The purpose of the capstone was to reduce the likelihood of falls among community-dwelling OAs through individualized and interactive education regarding intrinsic and extrinsic fall risk factors.

The fall prevention program described in this paper sought to increase overall safety awareness among participants, in an attempt to reduce their likelihood of falling. The program mimicked the occupational therapy process via assessment and intervention. The intervention process encompassed a variety of handouts and 1:1 interactions about fall prevention strategies personalized to the specific needs of each participant.

Team members demonstrated advocacy for the well-being of community-dwelling OAs residing in Marin County, through the promotion of individualized fall prevention strategies. Both implementations of the multifactorial fall prevention program, allowed team members to interact with an array of community-dwelling OAs residing in Marin County. Positive post-survey results and participant testimonials supported the multifactorial education modules as being effective in providing participants with individualized education regarding fall risk factors and fall preventative strategies.

The modules may further guide an innovative method for providing education to a group of people in a form that is more meaningful and substantial than what can be provided on brochures. Despite its effectiveness among community-dwelling OAs, however, improvements and further refinements may be made if the opportunity for more experience with these modules presents itself; although these efforts would be outside the scope of the capstone project.

Falls continue to be a growing, and nationwide concern for community-dwelling OAs, age 65 and older, and the professionals who work with them. Individualized fall prevention education may, and should be used in order to promote safety, while enhancing independence and engagement in meaningful occupations, in order to magnify their overall quality of life.

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

Student names: Salvador Chavez, Jocelle Flores, & Rachelle Yambao

Title of the Capstone Project: Implementing Multifactorial Education Modules with Older Adults: Individualized and Interactive Fall Prevention Education

Background and rationale:

Falls are among the leading cause of fatal and non-fatal injuries among older adults, or OAs (Cameron, Schneider, & Gilchrist, 2015). Approximately 1 in 4 OAs age 65+ falls every year (CDC, 2016). These statistics increase as the age of the adult population increases, due to recent medical advances (Cameron et al., 2015). The team members of this capstone collaborated with the Novato Fire District to address the growing concern of falls among community-dwelling OAs residing in Marin County. According to Ted Peterson, CMO Battalion Chief-Director of EMS of the Novato Fire District, there are roughly 10-12 calls made per day regarding falls among community-dwelling OAs (T. Peterson, personal communication, September 30, 2015). First Responders primarily respond to falls in assisted living facilities, but often receive frequent and recurring fall-related emergencies that occur in the homes of OAs (T. Peterson, personal communication, September 30, 2015). First Responders provide immediate assistance and may suggest additional medical services, however, OAs are at will to decline services that may address their risk of falling. Collaboration with the Novato Fire District indicated a need for the development and implementation of educational fall prevention material for community-dwelling OAs. There are many factors, both intrinsic and extrinsic, that contribute to falls among this population. The purpose of the developed educational material is to increase OAs' safety awareness by addressing intrinsic and extrinsic fall risk factors and provide prevention techniques to reduce their likelihood of falling. Team members will facilitate therapeutic use of self, establish rapport, and collaborate with OAs to develop appropriate methods of adaptations and modifications to maintain safe participation in their daily activities. Additionally, team members collaborated with two community senior centers in Marin County, The Margaret Todd Center and Whistlestop, to establish project implementation sites that may be accessible to community-dwelling OAs.

Description of the collaborating agency/site(s):

Agency #1: Novato Fire District, Station 61

Contact person (including Title) at the agency/site: Ted Peterson, CMO Battalion Chief-Director of EMS

Type of Facility: First responders' housing station

Address: 7025 Redwood Blvd, Novato, CA 94945

Phone: (415) 878-2690

Appendix A: Site Selection Form

Agency #2: The Margaret Todd Center

Contact person (including Title) at the agency/site: Carol Ann Moore, Director

Type of Facility: Community Senior Center

Address: 1560 Hill Road, Novato, CA 94947

Phone: (415) 899-8290

Agency #3: Whistlestop

Contact person (including Title) at the agency/site: Diana Gruhl, Active Aging Services Program Manager

Type of Facility: Non-Profit Community Senior Center

Address: 930 Tamalpais Ave, San Rafael, CA 94901

Phone: (415) 456-9062

Has initial contact been made? Yes

An initial interview was conducted with Ted Peterson on Wednesday, September 30th. This meeting was conducted in Meadowlands Hall in which all members of the group were present, as well as our capstone advisor, Susan Morris. In this initial contact, Ted Peterson provided background in his position and the organization of the Novato Fire District. Additionally, he provided information regarding the types of calls that are received by the district, the current protocol for first responders when receiving a call about a fall, the training that first responders receive, and suggestions for the focus of the group based capstone solution. Both the members of the capstone group and the advisor asked Ted additional questions throughout the interview and noted them down. This initial contact facilitated collaboration between team members of the capstone project and first responders of the Novato Fire District. Capstone team members further contacted the agency to assign dates for ride along appointments and participated in individual ride alongs with first responders. Details regarding falls in the community were gathered during ride along opportunities and further aided in the development of the project. First responders expressed concerns about the number of received fall related emergency calls. Suggestions from first responders included; educating community dwelling older adults about home exercises that can help in preventing falls and what to do if a fall does occur. Members of the group will take the information that was provided by the first responders into consideration when developing the fall prevention education modules.

In addition to collaborating with first responders, team members made contact with community centers to implement the developed Education material. The first community agency was the Margaret Todd Center. Contact was made with Carol Ann Moore, the Director of the senior center to discuss details about project implementation. Moore provided details regarding the opportunity to participate in a senior community health fair to promote healthy aging among community-dwelling OAs. The team arranged an on-site meeting to discuss further details with the program director and to refine plans for the project implementation.

The second senior center collaboration occurred with Whistlestop in San Rafael. Team members reached out to community agencies to establish a second project implementation site.

Appendix A: Site Selection Form

Contact with Diana Gruhl the Active Aging Services Program Manager at Whistlestop, allowed the group to set-up a second implementation. Team members conducted an on-site meeting with the program director to discuss the needs of the target audience of OAs who frequently receive services from the senior center and to identify expectations of the agency.

Has Needs Assessment been done? Yes

The Needs Assessment has been completed through initial interview with Battalion Chief, Ted Peterson. Based on our group collaboration, further action has been taken through ride-along shifts in which interviews were conducted with the first-responders. Upon discussion with the first responders, clear needs were outlined that prove to be relevant to our project and will further enhance our collaboration with the Novato Fire Department. Based on interviews with the first responders, it was concluded that there is a need for providing therapeutic use of self in order to be effective with the community dwelling population. The first responders explained that that from their experience and from past collaboration with Dominican University OT students, they have found that there is a need for providing education and training through a genuine manner. The first responders went on to explain that through the use of therapeutic techniques, the community dwelling elderly will be more likely to implement information from the workshop into their everyday routines.

The need for maintain physical strength was also identified. First responders shared their ideas about what they believe leads to falls and that low strength and endurance are common key underlying factors that pose as additional fall risks. The first responders recommended teaching the community dwelling elderly simple stretching and strengthening exercises that they can do in their own home. Such activities should be visually demonstrated in order to teach proper positioning and body mechanics and to ensure safety. Additional material such as a handout of exercises from the workshop should be provided to all attendees of the workshop so that they can have a written and visual aid to refer back to when completing the exercises at home. In addition to interviews with the first responders, conversations with other health care professionals were also made. During a ride-along shift and a visit to the Sutter Health Novato Community Hospital, a brief time was given to be able to ask the nursing staff about their views on fall prevention. The staff reinforced the need for fall prevention in the community dwelling elderly by stating that patients are seen every day due to falls. Through communication with various professional team members, it is evident that there is a need to address fall risk in the community dwelling elderly to provide direct interventions with this population to increase the likelihood of retention of information provided through the workshops. Additionally, literature review on fall risk provides evidence for the need of a fall prevention workshop.

What agreements have been made regarding project implementation? (for example, prepare a manual, deliver a workshop or develop an intervention)

The capstone advisor provided support and guidance with the development of the capstone project. The capstone group sought to create and implement educational fall prevention

Appendix A: Site Selection Form

material designed for community-dwelling OAs residing in Marin County who are at risk of falling, have previously fallen, or would like to receive additional information regarding fall prevention. Locations for project implementation have been determined by the group and capstone advisor. Together with discussion from our capstone advisor it has been agreed upon that the fall prevention interventions will take place at local senior community centers. The educational material provided will include: the intrinsic and extrinsic risk factors that contribute to falls and prevention techniques to reduce the likelihood of falls. Additional information to be presented will include: strength and balance exercises, home safety, assessments conducted to assess an individual's risk of falling, and information about community resources available to older adults regarding fall prevention.

Further discussion will be completed in order to finalize the following areas: the location(s) and dates of the workshops, the number of workshops that will take place and the handouts that will be provided to the community regarding falls and preventative measures. Further discussion will include methods for project evaluation such as a questionnaire or survey.

Description of Capstone Project Implementation and Evaluation Plan:

The Capstone project will be implemented through education fall prevention modules that will include 1:1 discussions, visual and hands-on demonstrations, and printed educational material. Key points of educational material pertaining to fall prevention strategies to decrease risk factors, will be based on evidence found from the literature review. Visual demonstrations will be used to help facilitate retention of fall prevention strategies, such as home exercises to help maintain and improve strength and endurance. Balance assessments will provide OAs with information regarding their individual risk of a fall. Based on results from balance assessments, OTS' will provide personalized education to address the specific factors of each person. Information on home modifications and risk factors inside the home. Additional resources may include information on community resources such as further workshops about fall prevention or information on where to obtain affordable adaptive equipment. Active participation from the community will be encouraged so that each individual may express their own concerns about falling. Each member of the capstone will implement therapeutic techniques to help make community members feel comfortable discussing fall prevention.

Project implementation will also take place through collaboration with the first responders. First responders may play the role of additional educators about fall risks and fall prevention, as well as help to provide overall support to the population that will be attending the workshops. Collaboration with the first responders may also help to increase an overall sense of community to help address any fears that the seniors may have in regards to falling.

Project evaluation will consist of a post-survey to be completed by OAs who participate in the developed education modules. The post-survey will allow participants to provide feedback regarding their experience with the education modules, interactions with team members, and the effectiveness of the material provided. This will also provide opportunity for suggestions and recommendations to help improve the fall prevention modules.

Appendix A: Site Selection Form

Proposed date(s) for project delivery, be specific:

Ride-Alongs with Station 61 of Novato Fire District: October 2015

Health Fair at Margaret Todd Center: 2/17/2016, 9:00AM-12:00PM

Fall Prevention Presentation at Whistlestop: 5/3/2016, 3:30PM-5:00PM

Potential problems, plans for addressing problems (pro-active planning for alternatives):

Our project involves creating educational fall prevention material for community-dwelling OAs. However, this may cause a potential problem of a lack in participants. Members of the community will be encouraged to attend local community center to participate in the fall prevention modules. The capstone team will establish contact with relevant community agencies who aim to serve the older adult population residing in Marin County in order to access the most appropriate group of OA participants who may benefit from fall prevention methods. There are also safety concerns that are present in dealing with such a vulnerable population. Information that is provided in the modules may potentially cause harm to OAs. Extra precautions will be taken during physical activities including balance assessment and exercises. OAs may hurt themselves while attempting to do home exercises if they are not conducted properly. Team members will be cautious when suggesting and providing information and will only provide information that is evidence-based and will provide disclaimers when necessary. . Due to the limited amount of time, there is a possibility of not having a strong and measurable impact on the community regarding fall prevention. Members of the community and the team need to be aware that fall prevention can be improved over a longer period of time with multiple resources involved.

SENIOR RESOURCES
Adult Center Staff

HEALTH SERVICES DAY

at Margaret Todd Senior Center, 1560 Hill Road, Novato

Wednesday, February 17, 2016
9:00am—12:00 noon

ALL HEALTH SERVICES ARE FREE!

CO-PRESENTED BY: Novato Independent Elders Program, Audiology Associates, Community Acupuncture of Marin, Dominican University, EyeSight Optometry, Hospice by the Bay, La Vita Chiropractic, Marin Community Clinic, Novato Community Hospital, Novato Dermatology, Novato Sanitary District, SCAN, Suter Care at Home, Veolia Water

HEALTH SERVICES OFFERED

- Acupuncture for Seniors
- Blood Pressure Checks
- Cholesterol Testing
- Cranial Sacral Work
- Dental Evaluations
- Eye Screening
- Fall Risk Assessment
- Glucose Testing
- Hearing Screenings
- Medication Drop-off
- Skin Cancer Screening
- Stroke Simulation
- Thermometer Exchange
- Trigger Point Massage

Also at Margaret Todd on February 17th:
The Senior Produce Market 10-11:00am
Lunch at Margaret Todd Dining Room at 12:00 noon—Reservations Required
The Brown Bag Market 1-2:00pm

Logos for sponsors: Independence at Home, EPISCOPAL SENIOR COMMUNITIES, Sutter Health, Hospice by the Bay, AUDIOLOGY ASSOCIATES, Suter Care at Home, Community Acupuncture of Marin, Hospice by the Bay, VEOLIA WATER, NSP.

On-site location of Pilot Program Implementation of Education Modules: Health Fair at Margaret Todd Senior Center in Novato, CA.

The Marin Interfaith Council
CELEBRATE FAITH. ADVOCATE JUSTICE. BUILD COMMUNITY.

HOME ABOUT EVENTS FAITH COMMUNITIES STAFF • BOARD CONTACT US BLOG MEMBERSHIP

FALL PREVENTION PRESENTATION

When and Where:

Date and Time: Tuesday, May 3 - 3:30pm - 5:00pm

Event Location: Whistlestop, 930 Tamalpais Ave, San Rafael, CA 94901

Instructors: Senior Occupational Therapy students from Dominican University, Salvador Chavez, Jocelle Flores, Emily Vassallo, and Rachel Yambao.

The Department of Occupational Therapy at Dominican University of California, in collaboration with Whistlestop, invites you to participate in a fall prevention workshop. Interactive education material will be provided regarding simple home modifications, polypharmacy, fear of falling, and balance exercises to do at home.

EVENT PHOTO GALLERY:

Marin Interfaith Council Since 1982

On-site location of Second Implementation of Education Modules: Fall Prevention Presentation at Whistle Stop Senior Center in San Rafael, CA.

Appendix B: Permission to use “Check Your Risk for Falling” table

Permission to use "Check Your Risk for Falling" table



Salvador Chavez

Jan 29

to info 

To Whom it may Concern:

Hello, my name is Salvador Chavez and I am currently a senior occupational therapy major at Dominican University of California located in San Rafael. I am currently working on my senior capstone thesis project focused on fall prevention in collaboration with the Novato fire district for community dwelling elderly of Marin County. My teammates and I recently came across your website, <http://www.heartofida.org/>, and the "Check Your Risk for Falling" table found [here](#). I am emailing you today to inquire about using this material at a health and wellness fair that we will be presenting at next month, as part of our senior capstone thesis project.

Thank you for taking the time to read this email; please contact me here with any questions or concerns.

Best,

Salvador J. Chavez
Occupational Therapy Major
Dominican University of CA I Class of 2016

Fall risk table



Dbheartofida@gmail.com

Feb 6

to me 

Sure!

Sent from my Verizon 4G LTE Smartphone

Appendix C: “Check Your Risk for Falling” table

Check Your Risk for Falling

Please circle “Yes” or “No” for each statement below. Why it matters

Yes (2)	No (1)	I have fallen in the past year.	People who have fallen once are likely to fall again.
Yes (2)	No (0)	I use or have been advised to use a cane or walker to get around safely.	People who have been advised to use a cane or walker may already be more likely to fall.
Yes (1)	No (0)	Sometimes I feel unsteady when I am walking.	Unsteadiness or needing support while walking are signs of poor balance.
Yes (1)	No (0)	I steady myself by holding onto furniture when walking at home.	This is also a sign of poor balance.
Yes (1)	No (0)	I am worried about falling.	People who are worried about falling are more likely to fall.
Yes (1)	No (0)	I need to push with my hands to stand up from a chair.	This is a sign of weak leg muscles, a major reason for falling.
Yes (1)	No (0)	I have some trouble stepping up onto a curb.	This is also a sign of weak leg muscles.
Yes (1)	No (0)	I often have to rush to the toilet.	Rushing to the bathroom, especially at night, increases your chance of falling.
Yes (1)	No (0)	I have lost some feeling in my feet.	Numbness in your feet can cause stumbles and lead to falls.
Yes (1)	No (0)	I take medicine that sometimes makes me feel light-headed or more tired than usual.	Side effects from medicines can sometimes increase your chance of falling.
Yes (1)	No (0)	I take medicine to help me sleep or improve my mood.	These medicines can sometimes increase your chance of falling.
Yes (1)	No (0)	I often feel sad or depressed.	Symptoms of depression, such as not feeling well or feeling slowed down, and linked to falls.
Total _____		Add up the number of points for each “yes” answer. If you scored 4 points or more, you may be at risk for falling. Discuss this brochure with your doctor. If you have questions about Heart of Ida’s fall prevention programs and/or classes, please call us at 562-496-4734 or email info@heartofida.org .	

* This checklist was developed by the Greater Los Angeles VA Geriatric Research Education Clinical Center and affiliates and is a validated fall risk assessment tool (Rubenstein et al. J Safety Res; 2011:42(6)493-499). The Heart of Ida reproduced this risk assessment directly from the CDC website. More information can be found at www.cdc.gov/injury or www.stopfalls.org.

Used with permission from Heart of Ida (www.heartofida.org). Refer to Appendix B.

Appendix D: Functional Reach Test (FRT)

Functional Reach Test and Modified Functional Reach Instructions

General Information: The Functional Reach test can be administered while the patient is standing (Functional Reach) or sitting (Modified Functional Reach).

Functional Reach (standing instructions):

- The patient is instructed to next to, but not touching, a wall and position the arm that is closer to the wall at 90 degrees of shoulder flexion with a closed fist.
- The assessor records the starting position at the 3rd metacarpal head on the yardstick.
- Instruct the patient to "Reach as far as you can forward without taking a step."
- The location of the 3rd metacarpal is recorded.
- Scores are determined by assessing the difference between the start and end position is the reach distance, usually measured in inches.
- Three trials are done and the average of the last two is noted.

Modified Functional Reach Test (Adapted for individuals who are unable to stand):

- Performed with a leveled yardstick that has been mounted on the wall at the height of the patient's acromion level in the non-affected arm while sitting in a chair
- Hips, knees and ankles positioned are at 90 degree of flexion, with feet positioned flat on the floor.
- The initial reach is measured with the patient sitting against the back of the chair with the upper-extremity flexed to 90 degrees, measure was taken from the distal end of the third metacarpal along the yardstick.
- Consists of three conditions over three trials
 - Sitting with the unaffected side near the wall and leaning forward
 - Sitting with the back to the wall and leaning right
 - Sitting with the back to the wall leaning left.

Appendix D: Functional Reach Test (FRT)

- Instructions should include leaning as far as possible in each direction without rotation and without touching the wall
- Record the distance in centimeters covered in each direction
- If the patient is unable to raise the affected arm, the distance covered by the acromion during leaning is recorded
- First trial in each direction is a practice trial and should not be included in the final result
- A 15 second rest break should be allowed between trials

Set-up:

- A yardstick and duck tap will be needed for the assessment.
- The yardstick should be affixed to the wall at the level of the patient's acromion.

References:

- Duncan, P. W., D. K. Weiner, et al. (1990). "Functional reach: a new clinical measure of balance." J Gerontol **45**(6): M192-197.
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- Weiner, D. K., D. R. Bongiorni, et al. (1993). "Does functional reach improve with rehabilitation?" Arch Phys Med Rehabil **74**(8): 796-800.
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Appendix D: Functional Reach Test (FRT)

Functional Reach Test and Modified Functional Reach Score Sheet

Name: _____

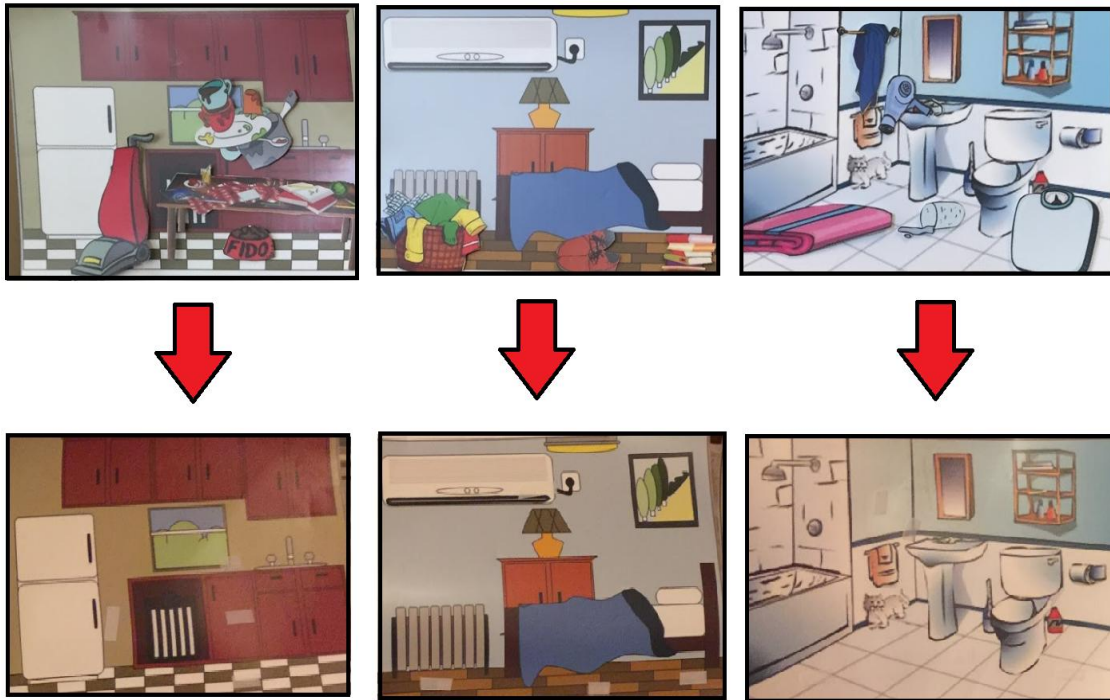
Instructions:

Instruct the patient to "Reach as far as you can forward without taking a step"

Score Sheet:

Date	Trial One (Practice)	Trial Two	Trial Three	Total (average of trial 2 and 3 only)


Appendix E: Home Modifications 3D Boards



Created and developed by Emily Vassallo, BSHS; Salvador Chavez, OTS; Jocelle Flores, OTS; Rachelle Yambao, OTS. Photos retrieved from public domain.

Appendix F: Permission to use “Fear of Falling Continuum”

Permission to use material for capstone

 **Jocelle Flores** Nov 17
Hello Kitsum, I am emailing you in regards to content that you provided in OA...

 **Li, Kitsum** Nov 17

Hi Jocelle,
Thank you for writing to me. Yes, you have my permission to use the FOF continuum.

*Kitsum Li, OTD, OTR/L, CSRS
Assistant Professor
Department of Occupational Therapy
Dominican University of California*

Appendix G: Fear of Falling Continuum

The Continuum

Risk Taking Behavior-
Fearless Attitude
↓

Fear of Falling-
Activity Avoidance
↓

↑
**Healthy Concern-
Caution during activity**

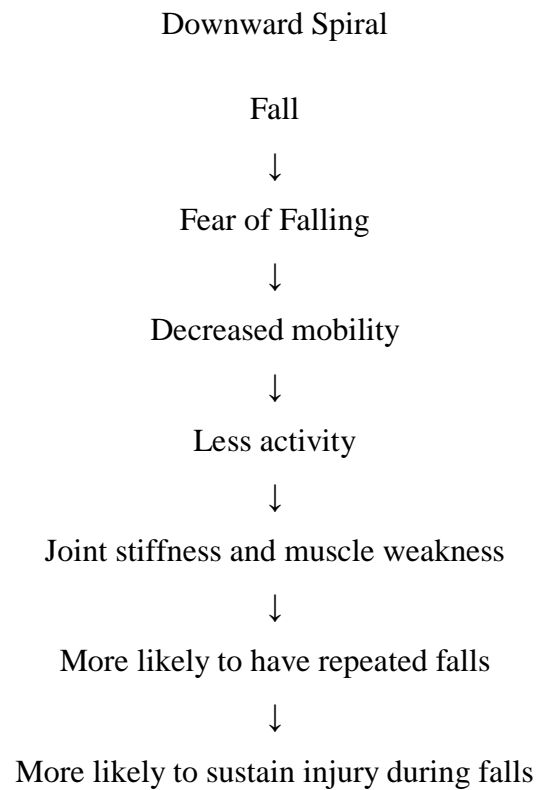
Identify which category best describes your level of participation in your daily activities. Let's collaborate to identify 5 specific strategies that you can use to get to/maintain a healthy concern of falling:

- 1.
- 2.
- 3.
- 4.
- 5.

*Used with permission from Dr. Kitsum Li of Dominican University of California.
Refer to Appendix F.*

Appendix G: Fear of Falling Continuum

Fear of Falling: The concern about falling that can cause an individual to avoid activities that he/she remains capable of performing and can lead to a continuous downward spiral as shown below:



*Used with permission from Dr. Kitsum Li of Dominican University of California.
Refer to Appendix F.*

Appendix G: Fear of Falling Continuum

Problem: Risk Taking Behavior- Fearless Attitude

Solution: Identify a way to safely complete desired activities

- Accept help with activities that may be challenging or that pose a safety concern
- Modify the activity by breaking it down into steps that can be completed in a safer manner
- Create a schedule of when to do certain activities
- Ensure home environment is safe

Problem: Fear of Falling- Activity Avoidance

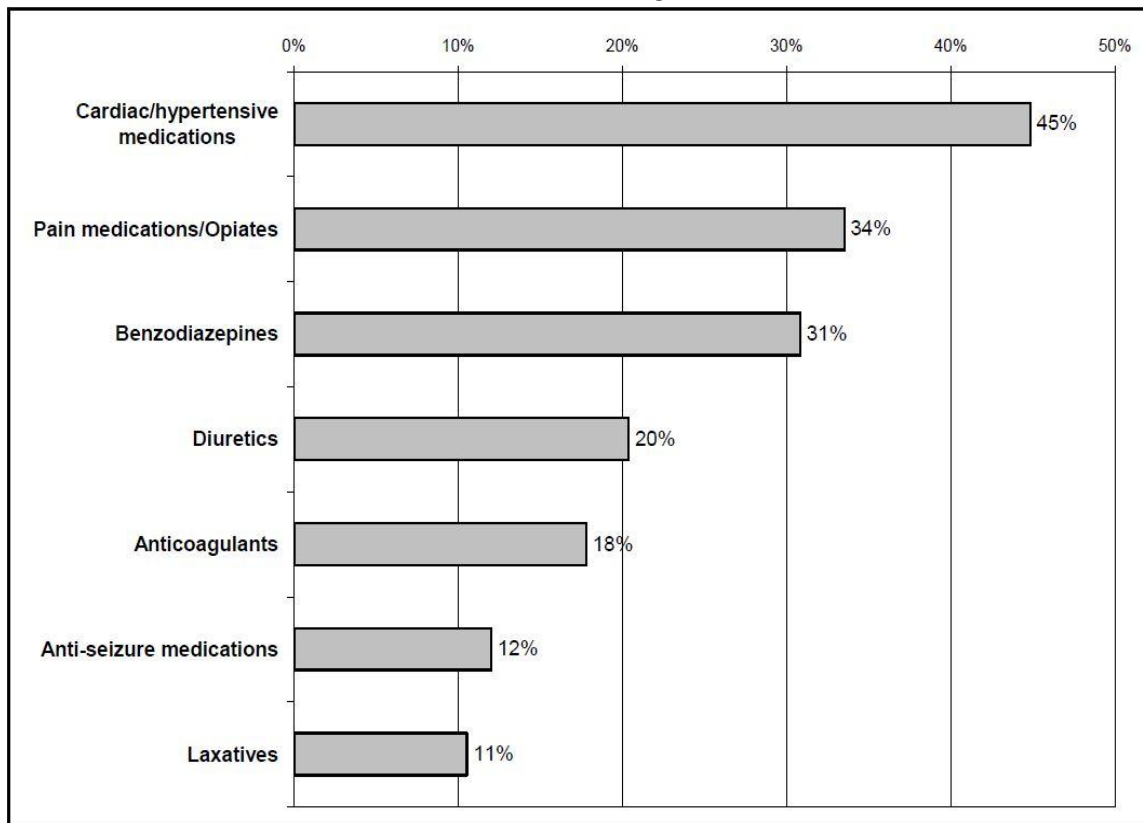
Solution: Develop a plan for regaining participation in desired activities

- Identify the cause of the concern
- Did you have a prior fall? If so, what led to the fall?
- Do you know a friend/family member who experienced a fall?
- What are some activities that you avoid doing because of a fear of falling?
- How can you use fall preventative techniques to assure safety and increase participation in your activities?

*Used with permission from Dr. Kitsum Li of Dominican University of California.
Refer to Appendix F.*

Appendix H: Polypharmacy

Medications Contributing to Fall Risk



*Retrieved from public domain website at
[http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2004/dec1\(4\)/PublishingImages/06fig1.JPG](http://patientsafetyauthority.org/ADVISORIES/AdvisoryLibrary/2004/dec1(4)/PublishingImages/06fig1.JPG)*

Appendix I: Permission to use “Falls Prevention-Home Exercises”

TRIM Ref: D16/18065



Ms Rachelle Yambao
Dominican University of California
50 Acacia Ave
SAN RAFAEL, 94901, CALIFORNIA, USA

rachelleyambao@gmail.com

Dear Ms Yambao,

Re: Your request for copyright permission

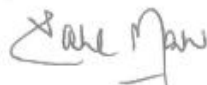
Thank you for your request seeking permission to reproduce the Clinical Excellence Commission's Falls Prevention – Home Exercises patient information brochure.

I have been advised that your request is within the CEC's copyright position, and I grant permission for you to reproduce this brochure for the purposes outlined in your request.

Please ensure you include an appropriate acknowledgement of the Clinical Excellence Commission as the source. I wish you the very best of success with your publication, and would appreciate a final copy of the thesis being forwarded to our *Falls Prevention* program team via email CEC-FALLS@health.nsw.gov.au

If you have any additional questions regarding the conditions of use of CEC material, please feel free to contact the CEC's Corporate Governance & Reporting Officer, Murray Stone, on 02 9269 5520 or via email murray.stone@health.nsw.gov.au.

Yours sincerely,

A handwritten signature in black ink that reads "Carrie Marr".

Ms Carrie Marr
Chief Executive

Appendix J: “Falls Prevention-Home Exercises” Handout



Falls Prevention – Home exercises

The following balance and strength exercises are easy to do at home. Make sure you have a chair, bench top or wall nearby for support when you try them. Once you become more confident, you can hold for longer, or increase the number of repetitions. Use smooth movements when performing these exercises and take your time.

1. Heel-to-toe standing/walking:

Helps keep balance when you have to walk through a narrow space

- With fingertips on something solid to help balance, stand heel-to-toe, bend your knees slightly and keep still for ten seconds
- Vary the exercise by walking slowly, placing your heel to touch the toe of the other foot.



2. Knee raises:

Helps with climbing stairs and getting in and out of cars and buses

- With fingertips on something solid to help balance, lift a knee to hip level and hold it for five seconds
- Repeat with the other leg
- Then repeat 8 times.



3. Side leg raise/sideways walking:

Improves stability when you have to take weight on one leg and helps you step sideways to avoid tripping

- With fingertips on something solid to help balance, stand on one leg and raise the other sideways, holding it for five seconds
- Repeat eight times
- Repeat with the other leg
- Extend to walking sideways, with slow steps alongside a bench or table.



Used with permission from Clinical Excellence Committee (<http://www.cec.health.nsw.gov.au/>). Refer to Appendix I.

Appendix J: “Falls Prevention-Home Exercises” Handout



Falls Prevention – Home exercises

4. Heel raise:

Helps with walking and climbing stairs

- With fingertips on something solid to help balance, lift both heels off the floor and stand on your toes for three seconds, then slowly lower your heels to the floor
- Repeat five times.



5. Stepping up a step:

Improves stability on steps, paths and uneven surfaces

- Holding onto a rail, go up and down a single step
- Repeat five times.



6. Sit to stand:

Helps with getting up and down from a chair or toilet and in and out of the car

- Stand up slowly from a chair, keeping your knees slightly apart. To make it harder, cross your arms in front of your chest or hold them out in front of you at shoulder height
- Then lower yourself back down into the chair
- Repeat 5 times



- If this is too strong for your knees, start by using a chair with armrests.

Acknowledgement to:

Staying Active and on Your Feet booklet
2010 www.activeandhealthy.nsw.gov.au

For further information scan this with your smart phone

Email: falls@cec.health.nsw.gov.au
Web: www.cec.health.nsw.gov.au



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*Used with permission from Clinical Excellence Committee
(<http://www.cec.health.nsw.gov.au/>). Refer to Appendix I.*

Appendix K: Permission to use “Tips to Prevent Falls” Brochure

Permission to include "Tips to Prevent Falls" brochure in Capstone appendix



Salvador Chavez

Nov 16

Good evening Dr. Ramsey,

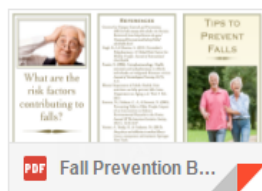
I hope this email finds you well. As you may know, I am a part of the fall prevention capstone group, advised by Susan Morris, and we are currently in the final phase of our capstone. During the implementation of our fall prevention program last semester, we distributed "Tips to Prevent Falls," a brochure designed by one of your previous capstone groups. That being said, we decided to include it in the appendix of our working capstone paper. After receiving feedback, Dr. Morris, suggested that we obtain permission from you, before including the brochure in our final capstone paper.

The purpose of this email is to request your permission in including the brochure in the appendix of our final capstone paper. I have attached an electronic version of the brochure as reference.

Please contact me at this email with any questions or concerns.

Best,

Salvador J. Chavez
Occupational Therapy Graduate Student (OTS)
Dominican University of CA I Class of 2017



Ramsey, Ruth

Nov 16

Yes, of course you have my permission, as long as you fully credit the source.

Appendix L: “Tips to Prevent Falls” Brochure

 <p>What are the risk factors contributing to falls?</p> <hr/> <ul style="list-style-type: none"> ♦Poor Nutrition & Hydration ♦Polypharmacy ♦Alcohol/Substance Abuse ♦Hazardous living situations 	<p style="text-align: center;">REFERENCES</p> <p>Centers for Disease Control and Prevention. (2015). <i>Falls among older adults: An Overview</i>. Retrieved from http://www.cdc.gov/HomeandRecreationalSafety/Falls/adultfalls.html</p> <p>Dagli, R.J., & Sharma, A. (2014, November). Polypharmacy: A Global Risk Factor for Elderly People. <i>Journal of International Oral Health</i>.</p> <p>Frazier, S. (2005). Geropharmacology. Health outcomes and polypharmacy in elderly individuals: an integrated literature review. <i>Journal of Gerontological Nursing</i>, 31(9), 4-11.</p> <p>Illinois Department of Public Health. How nutrition can help prevent falls. Iowa Department on Aging, n.d. Wed. 4 Feb. 2015</p> <p>Stevens, M., Holman, C. J., & Bennett, N. (2001). Preventing Falls in Older People: Impact of an Intervention to Reduce Environmental Hazards in the Home. <i>Journal Of The American Geriatrics Society</i>, 49(11), 1442-1447.</p> <p>Verster, J., Brady, K., & Galanter, M. (2015). <i>Drug abuse and addiction in medical illness: Causes, consequences and treatment</i>. Springer New York.</p> <p>Center for Substance Abuse Treatment. (1998). Substance abuse among older adults. Rockville, MD.</p> <p>Hin, A., Pulido, J., & Vazquez, J. (2015). <i>Novato Fall Fighters- Pilot Program Proposal</i> (Unpublished master's thesis). Dominican University of California.</p> <hr/> <p style="text-align: center;">DEVELOPED BY: KRISTIN BEEMAN OTS, ERICA BERGER OTS, ISABEL CABEZAS OTS, NIKKI MATHEWS OTS FACULTY ADVISOR: DR. RUTH RAMSEY RUTH.RAMSEY@DOMINICAN.EDU</p> <hr/> <p style="text-align: center;">DOMINICAN UNIVERSITY OF CALIFORNIA DEPARTMENT OF OCCUPATIONAL THERAPY</p>	<p style="text-align: center;">TIPS TO PREVENT FALLS</p> <hr/>  <p style="text-align: center;">One in three adults over 65 falls each year.</p> <hr/> <p style="text-align: center;">Are you at risk?</p>
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Developed by Krystin Beeman, OTS; Erica Berger, OTS; Isabel Cabezas, OTS; and Nikki Mathews, OTS. Used with permission from Dr. Ruth Ramsey of Dominican University of California. Refer to Appendix K.

Appendix L: “Tips to Prevent Falls” Brochure

<p>POOR NUTRITION & HYDRATION</p> <p>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.</p> <hr/> <p>POLYPHARMACY</p> <p>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.</p> <hr/> <p>ALCOHOL/SUBSTANCE ABUSE</p> <p>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.</p> <hr/> <p>UNSAFE LIVING CONDITIONS</p> <p>Falls caused by environmental factors account for 30%-50% of all falls. Minimizing throw rugs and carpets can reduce risk of falling.</p>	<h3 style="text-align: center;">WHO CAN YOU CALL FOR HELP?</h3> <div style="background-color: #d9ead3; padding: 5px; text-align: center; margin-bottom: 10px;"> MARIN COUNTY INFORMATION AND REFERRAL </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">MARIN COUNTY ADULT AND AGING</td> <td style="padding: 5px; text-align: right;">415-457-4636</td> </tr> </table> <div style="background-color: #d9ead3; padding: 5px; text-align: center; margin-bottom: 10px;"> NUTRITIONAL SERVICES </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px; vertical-align: top;"> NOVATO INDEPENDENT ELDERLS (NIEP) </td> <td style="padding: 5px; vertical-align: top;"> <u>DESCRIPTION:</u> +GROCERY DELIVERY +SEASONAL PRODUCE AT WHOLESALE PRICE +GROCERIES DISTRIBUTED “FARMERS MARKET STYLE” </td> <td style="padding: 5px; vertical-align: top;"> <u>PHONE:</u> (415)899-8296 <u>WEBSITE:</u> WWW.NOVATOSENIORS.ORG </td> </tr> </table> <div style="background-color: #d9ead3; padding: 5px; text-align: center; margin-bottom: 10px;"> ALCOHOL/SUBSTANCE ABUSE </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px; vertical-align: top;"> MODERATION MANAGEMENT SUPPORT GROUP </td> <td style="padding: 5px; vertical-align: top;"> <u>DESCRIPTION:</u> +FOR ADULTS WHO ARE LOOKING INTO THEIR ALCOHOL USE </td> <td style="padding: 5px; vertical-align: top;"> <u>PHONE:</u> (415)689-1017 </td> </tr> </table> <div style="background-color: #d9ead3; padding: 5px; text-align: center; margin-bottom: 10px;"> IN HOME SERVICES </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px; vertical-align: top;"> IN-HOME SUPPORT SERVICES (IHSS) PROGRAM </td> <td style="padding: 5px; vertical-align: top;"> <u>DESCRIPTION:</u> +RECEIVE IN-HOME SUPPORT WITH PERSONAL CARE, PARAMEDICAL SERVICES, HOUSE CLEANING, COOKING, SHOPPING AND ACCOMPANIMENT TO AND FROM MEDICAL APPOINTMENTS </td> <td style="padding: 5px; vertical-align: top;"> <u>PHONE:</u> (415)473-7118 <u>ADDRESS:</u> 10 N. SAN PEDRO RD., SAN RAFAEL, CA <u>WEBSITE:</u> WWW.PAMARIN.ORG </td> </tr> </table>	MARIN COUNTY ADULT AND AGING	415-457-4636	NOVATO INDEPENDENT ELDERLS (NIEP)	<u>DESCRIPTION:</u> +GROCERY DELIVERY +SEASONAL PRODUCE AT WHOLESALE PRICE +GROCERIES DISTRIBUTED “FARMERS MARKET STYLE”	<u>PHONE:</u> (415)899-8296 <u>WEBSITE:</u> WWW.NOVATOSENIORS.ORG	MODERATION MANAGEMENT SUPPORT GROUP	<u>DESCRIPTION:</u> +FOR ADULTS WHO ARE LOOKING INTO THEIR ALCOHOL USE	<u>PHONE:</u> (415)689-1017	IN-HOME SUPPORT SERVICES (IHSS) PROGRAM	<u>DESCRIPTION:</u> +RECEIVE IN-HOME SUPPORT WITH PERSONAL CARE, PARAMEDICAL SERVICES, HOUSE CLEANING, COOKING, SHOPPING AND ACCOMPANIMENT TO AND FROM MEDICAL APPOINTMENTS	<u>PHONE:</u> (415)473-7118 <u>ADDRESS:</u> 10 N. SAN PEDRO RD., SAN RAFAEL, CA <u>WEBSITE:</u> WWW.PAMARIN.ORG
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Developed by Krystin Beeman, OTS; Erica Berger, OTS; Isabel Cabezas, OTS; and Nikki Mathews, OTS. Used with permission from Dr. Ruth Ramsey of Dominican University of California. Refer to Appendix K.

Appendix M: Post-Survey



Survey: Fall Prevention

Thank you for attending our information booth today, please consider taking 5 minutes to fill out this survey. Your answers will be kept confidential and will serve to better develop the information that we have provided.

Gender:

- Male
 Female

Age:

On a scale of 1 to 5, please rate the information provided to you today:

1 2 3 4 5
 Not helpful Very helpful

Would you recommend the information provided today, to your friends or family members?

- Yes
 No
 Not sure

On a scale of 1 to 5, please rate your overall experience with us today?

1 2 3 4 5
 Not helpful Very helpful

Created and developed by Emily Vassallo, BSHS; Salvador Chavez, OTS; Jocelle Flores, OTS; Rachele Yambao, OTS.

Appendix M: Post-Survey

What did you like most about your experience today?
(Balance exercises, Polypharmacy, Home modification, Fear of falling)

Was there anything that you would like have seen but did not?

Please provide any additional comments, suggestions or additional information below:

Created and developed by Emily Vassallo, BSHS; Salvador Chavez, OTS; Jocelle Flores, OTS; Rachelle Yambao, OTS.