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Decreasing Fall Risk in Older Adults with Serious Mental Illness

Reynaldo Joseph Ballesteros Jr.
Dominican University of California

Kellie Ann Hislop
Dominican University of California

Chanita Mary Panchasarp
Dominican University of California

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Decreasing Fall Risk in Older Adults with Serious Mental Illness

Rey Ballesteros Jr.

Kellie Hislop

Chanita Panchasarp

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

Masters of Science Occupational Therapy

School of Health and Natural Sciences

Dominican University of California

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

Reynaldo Ballesteros Jr., Candidate	Date 5/1/2013
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Kellie Hislop, Candidate	Date 5/1/2013
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Chanita Panchasarp, Candidate	Date 5/1/2013
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Ruth Ramsey, Ed.D, OTR/L Chair, Thesis Advisor	Date 5/1/2013
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Abstract

This thesis project was created to help promote fall risk awareness in older adults who are living in the community with a serious mental illness. This project consisted of a 3-part multi-factorial intervention plan that focused on increasing fall risk awareness and promoting participation in healthy lifestyles. Environmental modifications were made to the facility to create a safe environment and minimize the risk of falls. An exercise video was created and piloted with the residents of a facility for people with serious mental illness. The video included strength and balance exercises which minimize the risks of falling. An inservice was provided to educate and inform the staff on effective ways to promote healthy aging and fall risk awareness. The residents and staff were given surveys to evaluate the exercise video and inservice. Approximately 90 percent of the responses generated from the surveys were positive. Despite positive reviews, project developers were unable to determine if the exercise video, fall prevention materials provided, and completion of environmental modifications will be adhered to. The population of older adults is on the rise; therefore, healthy aging and wellness are areas of concern for society and occupational therapists.

PROMOTING HEALTHY AGING AND FALL RISK AWARENESS IN OLDER ADULTS
WITH SERIOUS MENTAL ILLNESS

Signature Page	i
Copyright Page	ii
Acknowledgements	iii
Abstract	iv
Introduction	1
Literature Review	2
Statement of Purpose	19
Theoretical Framework: Person, Environment, Occupation (PEO).....	20
Methodology	23
Agency Description	23
Design	24
Target Population	25
Project Development	25
Project Implementation	26
Project Evaluation	28
Ethical and Legal Considerations	31
Discussion, Summary, and Recommendations	32
Conclusion	34
References	36

Appendices

Appendix A: Resident and Staff Questionnaire

Appendix B: Photographs of Facility for Documentation

Appendix C: Fall Log

Appendix D: Environmental Hazards Checklist

Appendix E: Strength and Balance Exercises

Appendix F: Staff Inservice Post-Test

Appendix G: Resident Survey Post-Test

Appendix H: Suggested Modifications

Appendix I: Thesis Project Proposal Form

Appendix J: Site Selection Verification Form

Table of Tables

Table 1: <i>Staff Inservice Post-Test Results</i>	29
Table 2: <i>Resident Exercise Post-Test Results</i>	30

Introduction

It is estimated that by the year 2030, the population of adults in the USA 65 years and above will increase to 72.1 million people (Administration on Aging, 2011). As the older adult population increases, the number of older adults with mental illness will also increase. It has been estimated that one out of five older adults have mental illness, and that rate may double within the next 10 years (NAMI, 2001). Older adults with a mental illness may experience increased impairment in performance skills and decreased occupational participation. Growing older and having a mental illness multiplies the incidence of falls and hospitalizations (Vance et al. 2009). Therefore, older adults who are aging with a severe mental illness are at an increased risk for falling, resulting in decreased participation in meaningful occupations.

Due to the growing number of older adults in the United States, occupational therapists are focusing on fall prevention, along with other strategies to promote healthy aging. However, there is limited research on fall prevention with older adults living with a mental illness. People with a mental illness often take medications to reduce symptoms related to their diagnosis. These medications can cause side effects such as dizziness, vision impairments, and decreased sensory perception that can impair balance and movement (Mehta, Chen, Johnson & Aparasu, 2010). The environment also has an impact on falls. In the United States, many health facilities have environmental hazards (Vance et al. 2009).

Voyager Carmel in San Rafael is an independent living facility housing residents with serious mental illness. The Voyager program in Marin County, California provides short-term housing for 12 residents. Each stay is approximately three months. The Carmel program offers long-term housing for 24 residents. Some Carmel residents have been in the program for 16

years. At Voyager Carmel, rooms are spread across three stories of a 100-year-old building in downtown San Rafael. Most of the residents at Voyager Carmel are 23-70 years of age, with an average age of 50-55 years. A majority of the residents are living with mental illness. Primary diagnoses include schizophrenia, bipolar disorder, and schizo-affective disorder.

The purpose of the project was to develop and implement a multi-faceted fall-awareness program to reduce the risks of falls for the residents of Voyager Carmel. One element included an exercise program focused on improving and maintaining strength and balance that may help prevent falls. Another aspect of the program was an environmental assessment to identify potential hazards increasing the risk of falls around the facility. Simple environmental changes, such as lighting and hand-rail installations, were made within the facility. Suggestions for modifications were given to the staff. The final element of the program was a staff inservice program which provided information on medication management and ways to identify risk factors leading to falls in the residents. The program was designed and executed in an effort to decrease falls within the facility.

Review of Literature

There are many issues that need to be considered when developing a program to decrease fall risk in older adults with serious mental illness. This literature review will consider aging, falling in older adults, mental illness, contributing factors to falls, medications linked to falls, and prevention strategies to be taken. The natural aging process and how mental illness affects aging will be discussed first. Next, contributing factors to falls including enviromental hazards and medication misuse will be explored. Finally, steps to prevent falls such as staff education, exercise and environmental modifications will be considered. Focusing on medication

management, exercise, encouraging healthy lifestyles, and making appropriate environmental modifications are important for reducing the risk of falls. Fall awareness was raised for the residents at Voyager Carmel with exercise, environmental modifications, and staff education.

Aging and Fall Risk

Aging is a natural, normal process for everyone. The number of older adults in the United States by 2030 will be twice as large as in 2000, growing from 35 to 72 million (Clayton, 2008). Therefore, addressing the health needs of older adults is important. Health needs include medications, access to healthcare, and living conditions. Older adults living alone are at an elevated risk for injury and placement in a 24 hour long term care facility. Many older adults live alone for a variety of reasons, however, as age increases, living alone can become difficult. Adults over the age of 65 with ample social and emotional support are less likely to develop mental and physical illness, which decreases their risk of mortality (Centers for Disease Control and Prevention [CDC], 2008). Living alone may not directly increase the risk for a fall, however, living alone can increase the severity. If a fall does occur, there is no one to call for help. The person could potentially lay on the floor for extended periods of time unconscious or severely injured. As a result, living alone increases the risk of severity for falls which directly relates to a decrease in quality of life.

Physical components connected with aging may also increase the risk of falling. Older adults may have disturbances in balance, delayed postural reflexes, loss of bone density, and decreases in vision and hearing acuity as physical components of normal aging (Kaminsky, 2010). When balance, vision, and posture are affected by aging, individuals are more susceptible to falling. Due to a loss of bone density, if an older adult falls, the risk of acquiring a fracture or

other injury is elevated. The fall could lead to decreased independence and functional mobility. Therefore, even normal aging can lead to loss of independence and placement in nursing homes and community living facilities (CDC, 2011). While facilities offer 24 hour, long term care, keeping individuals in their own home for as long as possible is ideal and greatly preferred by older adults. Enabling older adults who are aging and living at home to participate in meaningful activities may extend their life expectancy (Kaminsky, 2010). Living at home, maintaining independence, and prolonging quality of life in older adults is important. While falls become more prevalent in the aging population, a fall can jeopardize older adults ability to live on their own and their life expectancy. By raising awareness around falls, older adults who are aging may be able to sustain their every day lives for longer. As a result, fall prevention in older adults is important to consider. This also applies to people aging with a mental illness.

Falling in Older Adults

According to Agostini, Baker, and Bogardus, a fall is characterized by “unintentionally coming to rest on the ground, floor, or other lower level” (2001). Falling can result in injury and death, affecting all age groups. However, falling becomes prevalent in older adult populations due to decreased body functioning. One study investigating predictors for fall risks identified physical and cognitive contributing factors of falls (Vance et. al., 2009). Factors attributed to specifically increasing the risk of falling include: decreases in vision, muscle tone, and flexibility. The inability to view upcoming obstacles, maintain proper gait and balance, and employ skills to protect the body against falling increased the risk of falls (Vance et. al., 2009). Age-related falls occur gradually over time. In a study evaluating the components causing older adults to become fallers, lower extremity weakness and impaired balance were identified as risk

factors (Muir, Berg, Chesworth, Klar, & Speechly, 2010). As aging occurs, these elements are impacted, resulting in an increase of falls. Another study of connecting factors between life expectancy and falls in older adults found environmental hazards, improper use of mobility aids, unsafe clothing, medications, caregiver related factors, and disease related symptoms as elements of falling.

When someone falls, depending on the severity, many negative consequences follow. Financial burdens on the individual, family, society, and nation are increased due to falls. The cost of falling in older adults has increased from 19 billion dollars in 2000 to 28.2 billion in 2010 (CDC, 2011). Falls requiring hospital visits, surgery, and therapy can lead to costly medical bills. While cost can be considered an external factor, it is important to recognize that the individual also experiences repercussions. One study examining the consequences of falls in older adults found that impaired mobility and independence could lead to institution or 24 hour care facility placement. It was noted that falling could also lead to premature death, depending on the severity of the fall. Following the falls, participants noted a decrease in quality of life, well being and lifestyle (Roe et al., 2009). While a fall may seem simple, many factors affect the outcome for the patient, and society.

According to Lin, Wolf, Hwang, Gong, & Chen, falls in people 65 and older are the leading cause of fractures. Falls are also the second leading cause of spinal cord and brain injuries (2007). Older adults may have decreased bone density, which can lead to fractures as a result of falls. While the fracture itself is hard to heal, older adults become susceptible to other complications. Twenty to thirty percent of people who fall experience head trauma, lacerations and hip fractures. As a result, living without assistance becomes very difficult and the risk of

early death increases (CDC, 2011). Fractures can occur anywhere throughout the body and are commonly found in the wrists and forearms. However, the most common fracture associated with falls in older adults are hip fractures (Clayton, 2008). Some repercussions of a hip fracture include need for pain medications, use of ambulatory aids, and surgery. Falls resulting in hip surgery elevate mortality rates in older adults (Clayton, 2008). Falls causing fractures in older adults often lead to premature mortality and decreased quality of life. Hip fractures cause individuals to have impairments in mobility and daily activities.

Complications from serious falls can also include traumatic brain injuries (TBI) which may lead to a higher risk of premature mortality. Falls are the leading cause of TBI in older adults (Thompson, et al., 2006). Research on the effects of fall-related TBIs determined that negative outcomes are more severe in older adults (Thompson, McCormick, & Kagan, 2006). These types of injuries vary due to the location, severity, and ability to recover. Factors specific to older age are often neglected in the recovery and treatment of persons with a TBI. TBIs can limit occupations, quality of life, and cause premature death, making fall prevention an important area of focus. Comorbidities including depression, dementia, Parkinson's disease, and mild cognitive impairment from multiple etiologies have been linked to increased fall-induced TBIs and slower recoveries (Thompson, et al., 2006). Individuals diagnosed with cognitive and/or physical impairments are more likely to fall. As a result, they are more likely to sustain a severe TBI. Persistent or severe falls leave older adults, with or without a mental illness, at an elevated risk for premature mortality.

Mental Illness

Mental illness is a medical condition that impairs a person's thoughts, feelings, and moods. Mental illness may leave the person unable to complete daily functions or keep up with the demands of everyday life (National Alliance on Mental Illness [NAMI], 2011). Mental illnesses are classified and defined in the Diagnostic and Statistic Manual of Mental Disorders Fourth Edition (American Psychiatric Association, 2000). Schizophrenia, bipolar disorder, mental retardation and depression are examples of common mental health diagnoses found in older adults (CDC, 2008). Disorders may be genetic, environmental, or of unknown causes. Symptoms of mental illness vary, including hallucinations, cognitive impairments, and severe mood swings. Despite the differences in symptoms, all mental illnesses affect every day life and occupations of the individual. Treatment is available for people with mental illnesses. Psychotherapy, medication, interpersonal therapy, peer support groups, and community services are combined to facilitate recovery for people with mental illness (NAMI, 2011). With advances in treatment, mental illnesses have become more manageable. As a result, more people with serious mental illness are living in the community, and also living longer with their diagnosis (National Coalition for the Homeless [NCH], 2006).

Aging with a Mental Illness

Aging with a mental illness can cause many challenges. It is estimated that 20% of people aged 55 years or older experience some type of mental health concern. (American Association of Geriatric Psychiatry, 2011). Mental illness affects cognition, therefore when combined with cognitive impairments associated with aging, complex tasks for daily living can become difficult. In a survey of adults 50 years and older living with a mental illness, people

reported mental distress as the cause of disturbances in daily living activities. Specific tasks were further identified; “Frequent mental distress (FMD) may interfere with major life activities, such as eating well, maintaining a household, working, or sustaining personal relationships” (CDC, 2008, p. 4). Older adults aging with a mental illness may also have comorbidities such as traumatic brain injuries or substance dependencies which may complicate their ability to function effectively. Mental health is important to well-being, and should be addressed with the same urgency as physical health (CDC, 2008). People aging with a mental illness require extensive personal individualized care and attention regarding health precautions and symptom management. For example, older adults with a mental illness may forget to take necessary medications for mental and physical symptoms. When symptoms are not addressed, those aging with a mental illness are at an elevated risk for injury.

People living with serious mental illness are at an increased risk for falling. Serious mental illness is defined by impairments in multiple areas which include cognition, mood, and self care (NAMI, 2011). Disregarding necessary medication regimens along with decreased cognitive and physical functioning leaves people with serious mental illness at risk for falling. Older adults with serious mental illness who live independently within the community struggle with symptom control, decreased cognition and physical health (Wong, Lee, & Solomon, 2010). People living in the community with serious or persistent mental illness account for 20 to 25 percent of the adult homeless population (NCH, 2006).

Homeless people living with serious mental illness are less likely to take necessary medications because they do not have funds to obtain them (Wong et al., 2010). Homeless, aging adults with a serious mental illness have decreased cognition and physical health (NCH,

2006). As a result, they are at an increased risk for falling. Housing programs offered to individuals with serious mental illness often have rules regarding treatment. However, one study determined that people who were introduced to housing and treatment plans were likely to disregard treatment (Wong et al., 2010). The lack of treatment and medication adherence leaves people living in the community with a serious mental illness at an elevated risk for falling.

Factors that Contribute to Falling

Several factors have been identified as direct causes of falling in older adults. The factors fall into certain broad categories that include medications, environmental contexts, and an inactive lifestyle. Medications cause many side effects and influence and impair movement and perception. Environmental contexts such as health facilities and homes present obstacles that contribute to the prevalence of falls. People with a sedentary lifestyle tend to have weaker lower extremities. This weakness leaves individuals at a higher risk for falls. Medications, environmental obstacles within living spaces and decreased physical activity, are factors contributing to increased fall risk. Those specific factors are prevalent in the older adult population as well as those aging with a mental illness.

Difficulty balancing, blurred vision, and dizziness are common byproducts of many medications (Mehta et al., 2010). Medications such as psychotropics and antidepressants are prescribed to clients with mental illness to treat associated symptoms but even with proper management, those medications have significant side effects. Mehta, Chen, Johnson, and Aparasu (2010) found that the longer patients were using psychotropics, the more their risk for falls and fractures increased. This is because the antipsychotics caused extrapyramidal symptoms (EPS) and tardive dyskinesia (TD), which impairs movement. Some psychotropics used to treat

people with mental illnesses such as bipolar disorder and schizophrenia include selective-serotonin reuptake inhibitors, benzodiazepines, antihypertensives, tricyclic antidepressants, and antipsychotics, all of which have been linked to falling (Krauss et al., 2010). When actively taking their medication, elderly clients with mental illnesses may experience extra pyramidal symptoms such as akathisia and tardive dyskinesia (Naidoo, Goff, & Klibanski, 2003). These symptoms can affect gait and the ability to perceive obstacles. Older adults who take psychotropics to treat their mental illness have higher risks for falls because of the side effects of these drugs.

The environmental context also has an important impact on fall risk in elderly people. In a systematic review and meta-analysis by Letts et al., the researchers found that home hazards are the most common factors that contribute to falling (2010). Environmental hazards such as poor lighting, stairs, throw rugs, and tiled floors are identified as presenting risks for falling (Letts et al., 2010). Poor lighting limits visibility of obstacles and leads to the inability to identify dangerous obstacles within the individual's proximity. When a person poorly perceives any obstacles in the environment due to insufficient lighting, it increases the likelihood of falling.

Throw rugs are commonly placed on the floor within a household. They come in different textures and sizes, but many lack a nonslip rubbery surface on the back. In addition, these rugs elevate the floor by a small amount and if an individual is not careful, he or she can fall, causing detrimental injuries (Letts et al., 2010). As people age, they have decreased gross motor skills in ambulation. Inadequate ambulation over throw rugs can increase the risk of falling; therefore, throw rugs pose a significant obstacle for older adults and remain a factor contributing to falls (Letts et al., 2010).

Stairs in the environment present another risk factor for falls among older adults. Many people ambulate up and down stairs during their daily living activities. Unstable, long, and steep staircases without handrails are some elements that make stairs dangerous. When older adults walk up and down stairs, they can increase their potential for falling. Poor lighting and slick surfaces in the stair area can also contribute to falls.

The environmental context of a home may include tiled floors. These are commonly located on bathroom and kitchen floors. As people perform self-care activities in the bathroom, there are cases where water can spill on the tiled flooring causing a slick surface. This can also occur in kitchens as well. As the floor becomes wet and slippery, older adults have a higher risk of falling. Decreased awareness of the slippery surface coupled with decreased motor control due to aging, increases the likelihood of a fall and injury (Letts et al., 2010).

Another identifiable risk factor for falls in older adults is fall history. Muir et al. found that those who had previously fallen in their life had a decline in lower body weakness and balance compared with those who did not sustain a recent fall (2010). As a result, those who fell temporarily became sedentary in activity level. This subsequent inactive lifestyle led to further deterioration of the body, resulting in an even higher risk for future falls.

Fall Prevention Interventions

The main categories of fall prevention programs in literature are management of medications, especially psychotropics, exercise programs, environmental assessments and modifications, staff education, and multi-factorial approaches, including a combination of two or more of the above. A sample of multiple databases such as Medline, CINAHL, ERIC,

PsycINFO, and EBSCOHost presented limited research regarding fall prevention interventions specifically designed for people with serious mental illness.

Medication Management for Fall Prevention

As older adults age, many develop physical and mental conditions due to aging that warrant the prescription of psychotropic medications. Use of psychotropics is an established risk factor for falling, so management of these medications, including reduction and withdrawal, is an area of focus in fall prevention. Ziere et al. (2006) found that poly-pharmacy, or the use of multiple drugs, including psychotropics, significantly increased the risk of falling, supporting the need for medication management. Other studies in support of medication management to reduce fall risk reported that the withdrawal of psychotropics negatively affected the nervous system. Withdrawing from psychotropics such as benzodiazepines, antidepressants (Campbell, Robertson, Gardner, Norton, & Buchner, 1999), and antipsychotics (Frick, Kung, Parrish, & Narrett, 2010), reduced the risk of falling.

To test the effects of psychotropic management on falls, Campbell et al. conducted a randomized control trial of 93 adults aged 65 and older from general practices in New Zealand (1999). To be included in this sample, the participants had to have been taking psychotropics, mostly benzodiazepines, hypnotics, antidepressants, or major tranquilizers, and be recommended by their general practitioner to withdraw from their psychotropics. The study did not reveal the participants' diagnoses. Gradual withdrawal happened over the course of 14 weeks, and after 14 weeks the withdrawal groups were taking capsules filled with inert substances only. Drug allocation was double-blinded and falls were recorded for 44 weeks. Results of the study showed that 70% of the falls were incurred by the participants taking their original doses versus

30% in the withdrawal group. Withdrawing from psychotropics resulted in a 66% reduction in fall risk amongst the participants (Campbell et al., 1999).

In another study evaluating the effectiveness of fall-prevention programs, Frick et al. found medication management of psychotropics by far the least expensive and most effective option, although the authors pointed out that withdrawal may be difficult to sustain, especially for those with serious mental illness (2010).

Exercise Programs for Fall Prevention

Exercise programs, including strength training, balance and co-ordination, aerobic activity, and Tai Chi, are often used in fall-prevention programs for community-dwelling older adults. In order to identify an appropriate and effective exercise intervention that addresses physical/intrinsic fall risk factors, Costello and Edelstein analyzed 10 studies chosen from electronic databases and grouped them into the following three categories: exercise that improves strength, balance, and endurance and/or aerobic capacity (2008). Tai Chi was considered a balance training strategy, although in other studies it has been placed into the strengthening as well as balance category. Examples of interventions in strength training were targeted muscle group exercises and use of resistance (cuff weights, dumbbells, resistive bands, machinery), while balance training consisted of one-legged standing, weight-shifting, toe and heel walking, positional changes during activities of daily living, stair climbing, and sitting to standing. Aerobics used in the studies were simple strategies such as community walks, recommended for 30 minutes three times a week. Nine out of 10 studies reviewed demonstrated a positive effect of exercise on fall-related outcomes. The key point was that group exercise as a single intervention approach can decrease fall risk for older adults living in a community, with the most effective

ones including at least two out of three components of exercise (Costello & Edelstein, 2008).

Costello and Edelstein also found the minimum duration was 12 weeks for an exercise fall-prevention program to be effective, while incorporating at least two out of the three components (2008).

In further support of this claim, Campbell et al. demonstrated that the exercise portion of their multi-factorial program consisting of the three components (strength, balance, endurance and/or aerobic) successfully reduced the number of falls of 93 older adults by 39% in the exercise group versus 61% in the control group (1999). The eight-week exercise program included muscle strength and balance retraining for 30 minutes three times a week and walking two times a week.

Australian researchers conducted a community-based group exercise intervention with a sample of 163 people over 65 years old identified with fall risks (Barnett, Smith, Lord, Williams, & Baumann, 2003). The sample was divided into a control group and exercise group, and the design of the intervention included all three components of exercises, with an additional home exercise brochure and information regarding strategies for avoiding falls. After 12 months of implementation, Barnett et al. reported that the fall rate in the exercise group was 40% lower than the control group (2003). Also, 34% fewer injurious falls were reported in the exercise group compared to the control group, indicating that the exercise intervention not only decreased fall rates, but also decreased injuries from falls (Barnett et al., 2003).

Tai Chi is a popular fall-prevention intervention for older adults. Suzuki, Kim, Yoshida, and Ishizaki studied 52 elderly women in Tokyo, Japan (2004). Their group exercise intervention consisted of 10 one-hour classes held at a community center once every two weeks

for six months. The intervention incorporated several types of exercises, including a 24-form simplified Tai Chi program with home exercises. In the eight month follow-up, the proportion of falls in the intervention group decreased by 13.6% compared to 40.9 % in the control group that did not participate in any exercise (Suzuki et al., 2004). After a 20 month follow-up, the number increased to 54.5% in the control group, while the exercise group remained at 13.6%, suggesting that the benefits of exercise have a lasting effect on the prevention of falls (Suzuki et al., 2004).

Environmental Assessments and Modifications for Fall Prevention

Home visits to assess environmental hazards and implement modifications as a single intervention have proven to be a successful strategy to reduce the risk of falling in community-dwelling older adults. Environmental hazards and modifications include moving furniture, removing loose carpets, moving electrical cords, using nonskid bath mats, and adding night-lights, while more extensive changes and additions include installing grab bars, repairing damaged floors, and adding step rails and ramps (Costello & Edelstein, 2008). A multi-factorial systematic review of multiple studies by Costello and Edelstein indicated that home hazard assessments and subsequent modifications recommended by those with professional training yielded strong results in fall reduction and additional benefits, particularly assessments done by occupational therapists (Costello & Edelstein, 2008). Occupational therapists were shown to have “addressed the subject’s general functional limitation by providing specific strategies that resulted in an overall improvement in safety...” (Costello & Edelstein, 2008, p.1145).

In a study examining the effectiveness of home assessments and modification interventions, Nikolaus and Bach formed a home intervention team (HIT), which included an occupational therapist, to visit the homes of community-dwelling older adults with fall risk in

Germany (2003). During the home visit, the HIT provided advice on possible modification of the environment, facilitated in making these changes, and educated participants in the use of technical aids. When researchers followed up a year later, they determined that the participants (N=131) who complied with the modifications (elevated toilet seats, installation of grab bars, and use of shower seats) reported 163 falls compared with 204 falls in the control group (N=133) who did not have a home visit; this was a 31% decrease in falling versus the control group (Nikolaus & Bach, 2003).

A similar study in Australia implementing community-based home visits by an experienced occupational therapist found a reduced proportion of falling by 36% for those with a history of falling (Cumming et al., 1999). For those with no record of falls, however, there was no significant difference resulting from the home visit. Both studies emphasized the significance of using occupational therapists who are experienced in assessing homes for hazards and making appropriate modifications. During the home visits occupational therapists took into account personal characteristics of residents, such as limited mobility, and gave advice on how to live with a hazard that could not be modified (Cumming et al., 1999).

With environmental assessments and modifications, it is important to consider the influence and importance of occupational therapists, the compliance of residents in modifying their homes, the behavioral changes of residents as they become more aware of fall risks, and their limited functional mobility (Clemson, Mackenzie, Ballinger, Close, & Cumming, 2008; Cumming et al., 1999; Nikolaus & Bach, 2003). These external factors and considerations may contribute to the positive outcomes from environmental interventions and reduction in fall rates.

Educating Staff on Fall Prevention

There are several ways to educate people who supervise and care for older adults prone to falling. In some studies, staff were required to attend educational classes, as in the fall reduction program implemented by the University of Wisconsin Medical Foundation (Peterson & Berns, 2006). These classes were held over a four-month period and covered topics such as medical conditions and procedures for caring for individuals with fall risks. In this study conducted by Peterson and Berns, the total number of falls decreased after staff training from 47 to 32 falls, although it was not stated whether the researchers directly conducted staff training or if the training was provided by members of the university (2006).

The “Ruby Red Slipper Program” is another fall-prevention program in New York Hospital Queens, a community academic medical center serving a majority of older adults with fall risks. The intervention was educating staff about reducing falls. The curriculum educated staff in fall prevention, injury prevention, fall risk assessment, and fall-prevention strategies, along with team building and development, conflict resolution, and communication (Wexler et al., 2011). Results in fall reduction were noticed immediately in the orthopedic/neurology unit. Falls decreased from 11.48 per 1000 patient days in July 2007 to 9.41 per 1000 patient days in August 2007. By March 2008 the fall rate was reduced to 3.17 per 1000 patient days in the unit, achieving statistical significance (Wexler et al., 2011). This study demonstrates the value of educating staff members to more effectively prevent falls in older adults.

Multi-Factorial Interventions for Fall Prevention

Multi-factorial fall prevention programs include two or more types of interventions, such as a combination of the previous methods described for fall prevention. In some studies, a multi-

factorial approach rather than a single intervention approach generated the highest reduction in falls. Day et al. reported the strongest effect in fall reductions was the combined interventions of strength and balance exercise, home hazards assessment, and a vision test (2002). The study included 1107 older adult participants in Australia and found that the three interventions used together produced the greatest reduction in annual fall rate of 14% compared to solely home hazard assessment, which contributed to a 3.1% decrease in falls for the control group (Day et al., 2002).

One study in the United Kingdom tested the effectiveness of a multi-factorial intervention to reduce falls using a 12-14 week program that incorporated exercise, staff education, medical reviews, environmental modification, and vision and podiatry assessments (Dyer et al., 2004). Participants were 60 years and older living in residential care homes. Occupational therapy assistants conducted the home visits, and medical reviews were performed targeting poly-pharmacy. No statistical significance in falls post intervention was found however, with 54.3% fall rate in the intervention group and 54.9% in the control group.

Jenson, Lundin-Olsson, Nyberg, and Gustafson achieved positive results with a multi-factorial fall-prevention program, which included educating staff, exercise, reviewing medications, and providing free hip protectors (2002). This study took place in residential care facilities in Sweden, with 439 residents age 65 and older with cognitive or physical impairments. Medical teams included occupational therapists, physical therapists, physicians, and nurses. After 11 weeks of implementation, fewer residents in the intervention group fell, 82 of 188 (44%) compared to 109 of 196 (56%) in the control group, and falls per resident ranged from 0 to 16 versus 0 to 26, respectively (Jenson et al., 2002). Furthermore, those in the intervention

group that did sustain falls had a reduced number of femoral fractures compared to the control group due to wearing hip protectors. A limitation noted was the under-reporting of falls by staff, particularly in the control group. It indicates the intervention may have been more effective than reported. While some multi-factorial fall-prevention programs may yield stronger results than others, the design of the program and the various of interventions used must be considered in the outcomes.

Summary

Falls remain one of the most common problems in people who are aging. Community-dwelling adults who are aging with serious mental illness need support in decreasing their high prevalence of falling. Therefore, it is important to utilize evidenced-based practice to develop solutions to help reduce falls in this population. Within older adult communities, the staff serving the older adults continually strives to address problems such as falls that may compromise the safety, health, and well-being of their residents. Understanding factors that increase fall risk for adults with serious mental illness allows project developers to determine the most effective solutions to falling and developing a fall-awareness program.

Statement of Purpose

The residents at Voyager Carmel, a residential mental health facility in San Rafael, are adults with mental illnesses who are aging in the community. The staff has voiced concern about the prevalence of falls in residents. If residents continue to fall, they may sustain injuries and disorders such as fractures or traumatic brain injuries. Falling may also negatively impact the residents' quality of life, their ability to engage in their occupations and activities of daily living, and most importantly their ability to continue to live at Voyager Carmel. Therefore, the purpose

of this project was to develop and implement a multi-faceted fall-awareness program to reduce the risk of falling for the residents at Voyager Carmel. The interventions chosen for this program were developing an exercise program for the residents, completing an environmental assessment with recommended modifications, and educating staff on risk factors related to falling and psychotropic drug management.

Theoretical Framework: Person, Environment, Occupation (PEO)

The PEO model explores the relationship between three components: the person, the environment, and the occupation in facilitating optimal occupational performance. The PEO theory helps to describe the transactional relationship between these components and how they affect occupational performance (Law et al., 1996). This model guides the occupational therapist in helping a client perform purposeful occupations within the client's environment.

The first component, the person, includes many characteristics. These characteristics include the physical, emotional, cognitive, and spiritual components (Law et al., 1996). Each person contains a unique set of characteristics. As a person lives his life, the characteristics change over time. A person's characteristics interact with the environment and his occupations (Dunbar, 2007; Law et al., 1996). This interaction creates the quality of the occupational experience for the person.

The second component of the PEO model is the environment. According to Dunbar (2007), the environment is a general and global context that includes cultural, social, psychological, organizational, and physical components. The environment can include the home, school, work, and community. Everything in the environment has the potential to facilitate a positive or negative occupational response from the person. The environment shapes a person's

behavior, which can produce positive or negative results. The environment is the context in which the person's activities and occupations take place (Dunn, Brown, & McGuigan, 1994).

The last component of the PEO model is occupation. Occupations are "groups of self-directed, functional tasks and activities in which a person engages over the lifespan" (Law et al., 1996, p. 175). Like the characteristics of a person, occupation changes throughout time and is influenced by choices a person makes in his or her lifetime. The interaction between person, environment, and occupation creates the occupational performance.

Together, the person, environment, and occupation form a transactional relationship with one another. This transactional relationship is also called occupational performance. According to Dunbar, occupational performance is the result of the transactional relationships between the person, environment, and occupation (2007). In PEO, the transactional relationship of occupational performance is evaluated. As the relationship between the person, environment, and occupation increases, the occupational performance increases, thus providing a better PEO fit. The PEO fit emphasizes a balance between person, environment, and occupation. This is important in the PEO model. When there is an imbalance between the person, the environment, and the occupation, there is a minimized fit and a diminished occupational performance. However, when there is balance between the person, the environment, and the occupation, optimized fit and maximized occupational performance can be achieved. In PEO, the foundation of occupational therapy interventions is the assumption that altering the person, environment, or occupation can enhance and improve the PEO fit and resulting in an enhanced occupational performance (Law et al., 1996).

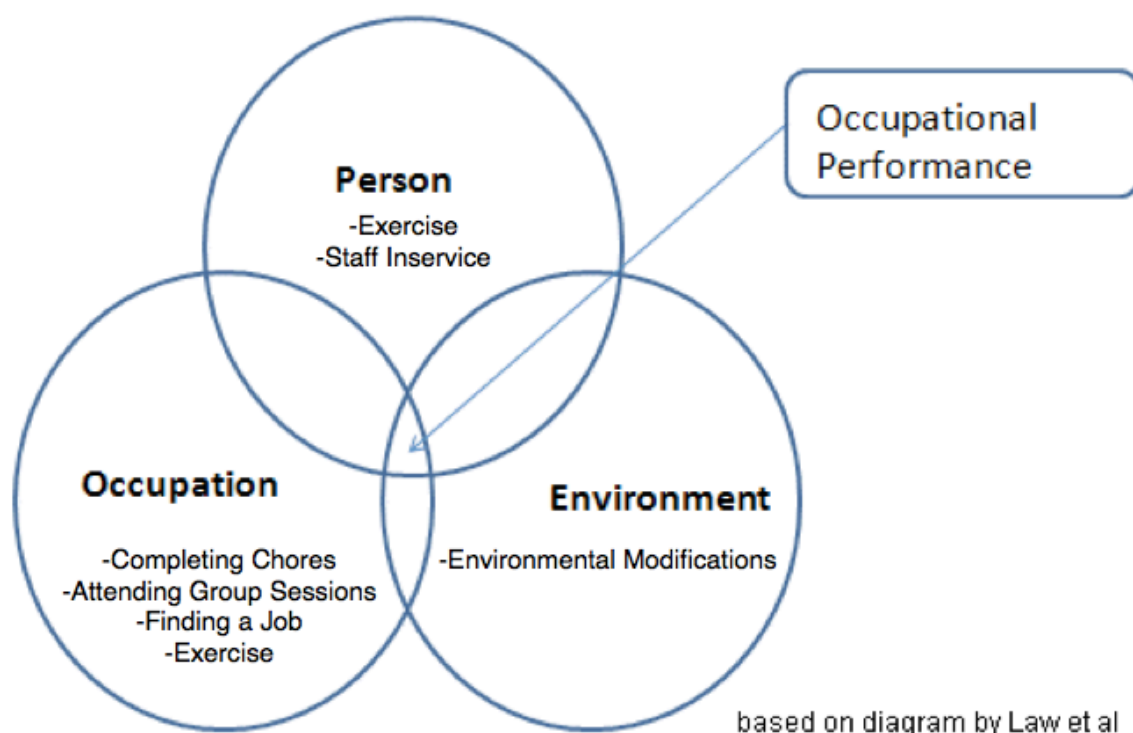


Figure 1 The Person-Environment-Occupation (PEO) Model

The concepts and assumptions of the PEO model can be applied to this thesis project. People that fall and have injuries experience an imbalance in their occupational performance. For example, a person who loves to go bowling may not be able to participate due to an injury caused by a fall in the household. This person experiences an imbalance in his or her occupational performance. This results in a minimized PEO fit, thus resulting in negative results from the environment, decreased quality of life, and poor participation in meaningful occupations. The purpose of this project was to develop and implement a multi-factorial fall prevention program for the residents of Voyager Carmel. One of the components of this fall prevention program was a specialized exercise video with effective exercises to improve balance, strength, endurance, and range of motion that may help prevent future falls. In Voyager Carmel, these exercises may positively impact the person aspect of the PEO model.

Another component of the project is to provide modifications to the environment. One of the modifications includes placing red, reflective, adhesive strips on the edge of stair steps. This will provide visual cue for the client and provide awareness of the need to be safe. This modification in this particular fall prevention program will target the environment aspect of the PEO model. We will also provide a list of suggestions during the staff inservice to help modify the facility. Other materials given to staff will include an environmental hazards checklist (see Appendix D) and fall log (see Appendix C) to address the environment of the facility. The environmental hazards checklist will help staff remove obstacles in the environment contributing to falls. The fall log addresses safety by identifying areas of the facility where a fall has occurred. Together with the exercise video, environmental modifications, and staff inservice, an increase in occupational participation is expected. With this in mind, an expected outcome of this project is a balanced and maximized PEO fit for the residents in Voyager Carmel.

Methodology

Agency Description

Voyager Carmel is an independent living facility, and a branch of Homeward Bound. Homeward Bound is a non-profit community organization providing housing and services for people experiencing homelessness. The mission of Homeward Bound is to provide residents with a sense of community and life skills to transition back into the community (Homeward Bound of Marin, 2011). Multiple Homeward Bound locations and houses are spread throughout Marin County. Housing for people with mental health needs is offered in two locations in Marin. Voyager Carmel is considered to be an entry-level facility, a first stop for people who are

homeless, mentally ill, or both. As residents become more independent they may transfer to the other facility available, Palm Court.

Voyager Carmel has two programs for adults with persistent mental illness experiencing homelessness. The Voyager program is focused on short-term living. Each of the 12 residents stay for approximately three months. These residents have curfew, more household rules, and are considered a part of transitional housing. These residents hope to move into more permanent homes. The Voyager program provides them with a temporary shelter while the residents attempt to return to work or seek medical help. The Carmel program offers long-term housing for 24 residents. Some residents of the Carmel program have lived there for 16 years. Rooms are spread across three stories of a former hotel in San Rafael. The building was built over a hundred years ago, and not many changes have been made since. There are exposed pipes, narrow stairs and dim lighting. There are typically two people per room, and there are only a few single rooms. Bathrooms are shared between multiple residents, and there are as many as four bathrooms on one floor. There are a total of 36 beds in the program; ten beds are designated for the Voyager program and 26 for the Carmel program.

Design

Our thesis project was to develop a multi-factorial fall-awareness program for the Voyager Carmel Center. To ensure the project has long-term impact, we addressed three different areas of fall prevention. The staff were educated on fall prevention. Environmental modifications were made to decrease fall risks. Third, residents of Voyager Carmel were provided with an exercise video to increase strength and balance. A pilot exercise group was conducted with 12 residents to ensure the exercises were understood.

Target Population

The target population for this project were older adults living with severe mental illness in the community. The sample population for this program was the Voyager Carmel residents. Most of the residents at Voyager Carmel were 23-70 years of age, with an average age of 50-55 years. A majority of the residents are living with mental illnesses, and the primary diagnoses include schizophrenia, bipolar disorder, and schizo-affective disorder. Due to the short stay of the Voyager program, our main focus was on residents in the Carmel program.

Project Development

The first step in developing the project was conducting a focus group with the staff at Voyager Carmel. The focus group took place on September 14, 2011 at 12:30 during the staff lunch meeting. The program developers prepared a list of questions to learn more about the residents and staff (see Appendix A). The researchers asked the staff their opinion on why certain residents had fallen, whether the prevalence of certain diagnoses and medication correlated with their falls, how falls may have impacted residents' occupations, and what measures were taken to prevent these falls. The goal was to find out what the researchers could do to help. The questions were grouped into five sections, including demographics, incidence of falls, diagnoses/medication, social support/occupations, and staff/facility (see Appendix A). Notes were taken during the interview, and an audio recording was used throughout after obtaining verbal consent from the staff. This initial meeting helped the program developers to gather information on the Voyager Carmel residents and staff and guided us in the research and development of the project.

Following the focus group, a staff member provided a tour of the community and facility. The tour of the residents' living space included bedrooms, bathrooms, hallways and stairways, and community designated areas-kitchen and dining room, laundry room, television area, and backyard. The second visit in February 2012 allowed the program developers to focus on the areas noted as hazards to falling, such as uneven floors, lack of rubber mats in bathrooms, and insufficient lighting in hallways and stairs. These areas were photographed to document where modifications are necessary to decide what specific changes can be made at Voyager Carmel (see Appendix B).

A review of the literature on falls in older adults with mental illness was completed to determine the most effective programs and interventions. Based on the literature, interventions holding promising results for fall prevention were multi-factorial or combinations of several types of interventions; therefore, our project incorporated three different areas of fall prevention. After interviewing the staff, completing a site tour, and researching the contributing factors of falls and fall prevention interventions, the project developers developed and implemented a project focused on fall awareness tailored to the participants.

Project Implementation

All three implementations took place between February and April at Voyager Carmel, either in the staff office or the communal areas such as the dining hall and living room. First, the project developers received approval from the director of Voyager Carmel to implement simple environmental modifications at the facility. After touring the community and documenting areas requiring changes, a written plan was developed with recommendations for modification. For example, signs did not mark uneven steps, emergency exits, or steep stairs throughout the entire

facility. Simple modifications such as creating signs could help residents be more aware of possible fall risks. Most lights in the building were dim, with missing bulbs and absent lighting in some hallways. The stair wells were dimly lit even during the daytime, and railings were difficult to see, therefore the project developers suggested improved lighting in specific locations of the facility. It was unsure whether the staff carried out the suggestions. Some areas such as the entrance to a bathroom had uneven or damaged flooring. In this case, ramps or slopes were recommended to even out the surface. In some bathrooms, non-slip mats, elevated toilet seats, and railings can be added while throw rugs can be removed. A handout was provided to train the staff and residents on home safety and environmental hazards using a checklist (see Appendix D). The environmental modifications completed on March 13, 2012 include the removal of scatter rugs and additions of bright light bulbs, non-slip mats, non-skid tape, signs, reflector tape, and raised toilet seats provided to the facility. The project developers have provided the director with a list of suggested modifications that require the work of carpenters, such as the installation of grab bars and ramps (see Appendix H).

The exercise portion of the program was implemented with the residents on March 13, 2012. The project developers held a class in the communal dining hall and living room that involved exercises focusing on strength and balance training (see Appendix E). Also, the project developers created and provided a video with simple instructions for the residents to practice the strength and balance exercises on their own time. Lastly, the residents were encouraged to organize group activities such as walking to the park to incorporate endurance and aerobic exercise into their lifestyle to actively participate in reducing their risks in falls. Twelve participants attended and most of them participated throughout the entire duration of the

program. A few who attended chose not to participate, but instead listened to our group and watched.

For educating the staff, the project developers presented an in-service on April 3, 2012 on factors that contribute to falling, the role of occupational therapy in fall prevention, management of medication to reduce fall risk, and the importance of exercise to reduce fall risk. Handouts such as fall logs were also provided to help the staff keep track of resident falls (see Appendix C). This tracking will enable the staff to possibly determine patterns such as time of day or activities that cause falls in order to prevent these incidences.

Project Evaluation

Project evaluation surveys were given to the staff and residents upon completion of the implementations to evaluate the effectiveness of the project. One survey was for staff members who have attended the staff in-service (see Appendix F). The survey evaluated whether our in-service presentation was helpful in increasing knowledge about methods to prevent falls. The survey asked staff whether they believe they can employ some of the proposed suggestions for environmental modifications, management of medication, promoting more exercise, and keeping a fall log for residents. Of the seven who were surveyed, the majority (65 out of 69) of the responses were positive (see Table 1).

Table 1
Staff In-service Post-Test Results

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. This program was helpful and increased my awareness on falls.				3	4
2. Promoting health and well being in clients is important to me.					7
3. I understand the possible consequences of falling (ex: injuries, removal from the facility, premature mortality)			1	1	5
4. Falling can greatly affect quality of life and occupations.				2	5
5. The program informed me about factors that can contribute to falls.				3	4
6. I learned new ways to reduce fall risk in the community.				3	3
7. The use of fall logs is an efficient and pragmatic way to keep track of residents' fall risk.			1	2	4
8. Residents adhering to medication regimens and taking the proper dose on schedule may decrease they chances of falling.		2			5
9. Simple environmental modifications can help residents safely navigate around the community.				2	5
10. Incorporating healthy habits such as eating nutritious foods and staying active, are achievable goals that may lower fall risk.				1	6
Total	0	2	2	17	48

Another survey was offered to the residents who participated in the exercise course (see Appendix G). This survey evaluated whether they found the course to be useful, if they would be able to practice the exercises on their own, and whether they would continue to engage in any form of exercise to decrease their risk for falling. Results of the survey indicate that of the 12 participants, 40/47 responses were positive. The following table demonstrates responses to the survey:

Table 2

Resident Exercise Post-Test Results

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. This program was helpful and made me aware of the importance of exercise.	1		1	6	4
2. Staying active is a goal that may keep me from falling.	1			5	6
3. I understand that strength, balance, and aerobic/endurance training are the best types of exercises in fall prevention.	1		1	6	4
4. I can do these exercises on my own with the help of the video and/or instructional guides provided.	1		1	4	5
Total	4	0	3	21	19

Both surveys for the participating staff and residents addressed whether we were able to communicate how falling can affect various areas of occupations. Increased awareness of falling

and its impacts on community mobility, the ability to carry out activities of daily living, and engaging in hobbies may encourage participants to make changes to their lifestyle that will help them maintain their independence and community living.

Ethical and Legal Considerations

Beneficence is the first principle of the Occupational Therapy Code of Ethics (Reed et al., 2010). The thesis team upheld this principle by attending to the well-being and safety of the staff and residents at Voyager Carmel. The goal was to implement an effective fall awareness program to reduce residents' fall risk. Long-term benefits to staff and residents may include improved health status, greater awareness of falls, and increased knowledge of ways to reduce fall risk for residents within the facility. Apart from research on fall prevention programs needed to develop and deliver the project, as occupational therapy students the thesis team took prerequisites and graduate level courses in human anatomy, physics, and human movement analysis that have helped us in developing an appropriate exercise program.

Confidentiality and autonomy were respected throughout the duration of this project. The staff and residents chose to participate in the program and were informed that their refusal to participate would not affect their relationship with Voyager Carmel. Informed consent was acquired from residents before holding the exercise program. Signed consent forms were kept in a locked file to protect the confidentiality of the participants. Surveys from the staff and residents were kept anonymous to safeguard confidentiality. The project developers obtained verbal consent from the director of Voyager Carmel for permission to photograph and document environmental hazards.

Adapted documents such as the environmental hazards checklist and exercise program present accurate notations and references. Review and approval of the project was obtained from the thesis supervisor in the department of occupational therapy at Dominican University.

Disucussion, Summary and Recommendations

The process of planning and implementing this project required in-depth research from the project developers and consideration of the target population at Voyager Carmel. Characteristics of the samples in research included factors of mental illness, older population, and community dwelling, similar to the residents. Research of relevance was obtained and reviewed. The project developers then created a multi-modal fall risk awareness program that included an exercise program, environmental modifications and suggestions, and a staff in-service on fall risk assessment and prevention. Before implementing the project, assessment of the facility and residents was completed. Approval from the director was obtained. Needs assessments included a focus group with the staff to learn about the residents with fall risks, tour and photographed documentation of fall hazards in the facility.

Based on findings from the surveys completed by staff and the residents who participated in the exercise program, most were satisfied with the project. Approximately 90% of the responses on the survey were positive. Despite these positive results, it may be difficult to ensure compliance. For example, the project developers are unable to determine whether residents will continue with the exercise program, or whether staff will complete suggested modifications of installing ramps and grab bars. Without knowing whether the residents and staff complied with recommendations, the project developers are unable to state whether fall risk for residents has been reduced at Voyager Carmel. The environmental modifications that were

implemented, however, have generated positive verbal feedback from both the staff and residents.

The purpose of the project was to develop and implement a multi-faceted fall-awareness program. Through a multifaceted approach, the thesis team promoted increased fall-risk awareness to the staff and the residents. People with mental illness are subject to a higher risk for falling due to the negative effects of psychotropic and antipsychotic medication and polypharmacy. Suggestions of medication management or gradual withdrawal after consulting with the facility physician are ideal and in accordance with evidenced-based research. The environmental modifications and suggested modifications may reduce residents' fall rates as home visits from occupational therapists have been beneficial in literature. If the residents and staff at Voyager Carmel follow the recommendations, it may result in a decrease of falls for residents living in the facility.

The staff and residents were provided with evidenced-based information from the thesis team regarding falls and methods to prevent falls. Reducing the risk of falling can improve quality of life by supporting people to fully participate in desired occupations, as well as ease burden of care for professional staff. Occupational therapy values health and wellness promotion so that individuals can live a more fulfilling life. The residents were provided with an exercise program, a modified and improved community environment, and staff were motivated to decrease falls in the facility. Further action that can be taken by future occupational therapy students are to evaluate the number of falls post implementation and compliance of the staff and residents. This evaluation may be difficult if the staff are not using fall logs or the residents report incorrect information in regards to following the recommended duration of exercise.

Conclusion

As the large population of older adults continues to grow, increasing fall awareness is important. Older adults experience decreased cognition and physical capabilities, leaving them at an elevated risk for falls. Falling results in decreased participation in occupations, quality of life, and functioning. People aging with a serious mental illness living in the community are even more susceptible to falls. When aging with a serious mental illness there is an increase in cognition decline. When accompanied by physical impairments, these individuals are at an elevated risk for falling. Many residents at Voyager Carmel are older adults living with a serious mental illness. Negative outcomes of falls can include removal from housing facilities, orthopedic or neurological injuries, increased risk for premature mortality, and decreased quality of life.

The purpose of this project was to increase awareness about falls and fall risks, and decrease the risk of falling in residents at Voyager Carmel who are older adults with serious mental illness. Environmental modifications were made to decrease fall risk throughout the hotel, including: non-slip and reflective tape, shower mats, elevated toilet seat, hazard signs, and a grab bar. A pilot exercise group was completed with 12 residents and one staff member to introduce strength and balance exercises. The staff were also educated on fall risks and provided with information on how to prevent falls.

Aging with a mental illness is an area of concern for society in general, and for occupational therapy. This thesis project was tailored for the residents at Voyager Carmel. The video was designed for individuals with cognitive impairments by talking slowly, using simple exercises, and providing the words along the bottom of the screen. Even though this project was

specific for the Voyager Carmel residents, a similar program could be useful to other sites with similar populations and settings. Creating fall awareness programs for older adults aging with a serious mental illness could be utilized outside of Marin County. Any program with residents similar to those at Voyager Carmel could benefit from a fall awareness program. This thesis project was unique because it incorporated fall awareness and community dwelling older adults living with a persistent mental illness. As the population ages and the number of people diagnosed with mental illness increases, more programs like these will be essential to improve the quality of life and lifespan of residents like those at Voyager Carmel. Occupational therapists are able to target and effectively treat these areas. Therefore, their knowledge and expertise will be valuable to this population as it grows and increase at a rapid rate.

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Appendix A: Resident and Staff Questionnaire

Demographics:

1. Voyager is short-term, Carmel is long term...which are we working with and have been most susceptible to falls)
2. How many people in facility? Staff and residents
3. How old are the residents? Age range?
4. What activities do they do? interests, hobbies
5. When do they have the most free time and when are they most attentive?

Falls:

1. What is their fall history? Have they fallen in the past?
2. What do you suspect is the reason for their falls? Cause of falls?
3. Where did they fall? In what situations? What were they doing when they fell? (mornings, afternoons, evenings)
4. What have they tried to do to prevent falls? Any successes?
5. Negative consequences of falls?

Dx/meds:

1. What mental illnesses do they have? What are the most common ones?
2. Do most take medications? What kind?
3. What kinds of medications are they taking?
4. How do you ensure that they take appropriate amounts?
5. How are they getting their medications?

Social support/occupations:

1. How often do they leave? What is their schedule like?
2. Do they have social support? Family friends visit?
3. What do they wish they could do more of in terms of occupation and goals but can't/compromised bc of fall risk?
4. What activities do they do as a community and individually?

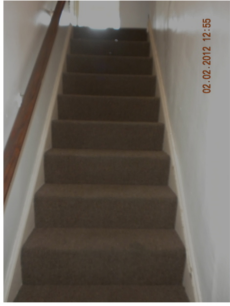
Staff/facility:

1. What are the roles of the staff?
2. Do they have financial resources to make any environmental modifications? How much?
3. Nutrition? Who controls what they eat? Do they cook their own food?
4. What's their main concern on falls? What will be the consequences?

Things to look for:

- What kind socks/shoes wearing?
- Handrails
- Rugs
- Lighting
- What type of flooring
- Any obstacles in the way

Appendix B: Photographs of Facility for Documentation



Stairs (BEFORE)



Stairs (AFTER)



2nd Floor Toilet (BEFORE)



2nd Floor Toilet (AFTER)



Tub Shower Combo (BEFORE)



Tub Shower Combo (AFTER)



Outside Stairs (BEFORE)



Outside Stairs (AFTER)



Bathroom Floor (BEFORE)



Bathroom Floor (AFTER)



Raised Lip (BEFORE)



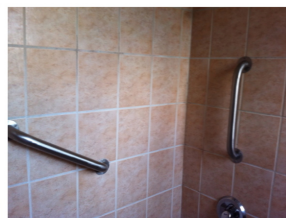
Raised Lip (AFTER)



Shower (BEFORE)



Shower (AFTER)



Grab Rails



Caution Sign

Appendix C: Fall Log

Fall Log

[illegible]

Appendix D: Environmental Hazards Checklist

Name _____ Date _____

ENVIRONMENTAL HAZARDS CHECKLIST

Throughout Homes	YES	NO
Floors are not slippery.	<input type="checkbox"/>	<input type="checkbox"/>
Pathways are clear of extension cords and other objects.	<input type="checkbox"/>	<input type="checkbox"/>
Rugs have no ripples or tears.	<input type="checkbox"/>	<input type="checkbox"/>
Scatter mats are removed or taped to the floor.	<input type="checkbox"/>	<input type="checkbox"/>
Low tables are removed from the middle of the living room.	<input type="checkbox"/>	<input type="checkbox"/>
All furniture is sturdy.	<input type="checkbox"/>	<input type="checkbox"/>
Chairs have armrests and are the correct height.	<input type="checkbox"/>	<input type="checkbox"/>
All light fixtures have a minimum of 60 watt bulbs.	<input type="checkbox"/>	<input type="checkbox"/>
Entrance to every room has a light switch.	<input type="checkbox"/>	<input type="checkbox"/>
Stepladder or step stool is sturdy, and the step surface is not slippery.	<input type="checkbox"/>	<input type="checkbox"/>
Items used every day are stored within easy reach.	<input type="checkbox"/>	<input type="checkbox"/>
Entrance	YES	NO
Doors open easily.	<input type="checkbox"/>	<input type="checkbox"/>
There is a sturdy seat with arm rests.	<input type="checkbox"/>	<input type="checkbox"/>
Mail is within easy reach.	<input type="checkbox"/>	<input type="checkbox"/>
Exterior and interior lighting is good.	<input type="checkbox"/>	<input type="checkbox"/>
Outside pathways are free of lawn furniture and other objects.	<input type="checkbox"/>	<input type="checkbox"/>
Bedroom	YES	NO
A telephone is easily reached from bed.	<input type="checkbox"/>	<input type="checkbox"/>
A lamp is easily reached from bed.	<input type="checkbox"/>	<input type="checkbox"/>
The bed is correct height.	<input type="checkbox"/>	<input type="checkbox"/>

Bathroom**YES NO**

A rubber mat is used for every bath or shower.

☐☐

Anti-slip decals on the bottom of the bath tub are no more than 2” apart.

☐☐

There are at least two grab bars in the tub area.

☐☐

Rug outside the bath tub has a rubber backing.

☐☐**If resident has any problems getting into or out of the bath tub, can they use:****YES NO**

➤ A bath seat?

☐☐

➤ A hand held shower?

☐☐**Stairs (inside and outside)****YES NO**

Stair edges are marked with contrasting color.

☐☐

All steps are the same height.

☐☐

All steps are the same depth.

☐☐

Stairs have a non-slip surface.

☐☐

Hand rails are present on both sides of stairs.

☐☐

Hand rail height feels comfortable when used for support.

☐☐

Hand rails extend 12 inches beyond the top and bottom steps.

☐☐

Hand rails are round.

☐☐

Recommended Change/ Comments:

Appendix E: Strength and Balance Exercises

Dominican University of California Department of Occupational Therapy

Exercise Program

Quick Warm Up:

1. Breathe in deeply through nose, lift arms above head and stretch. Lower arms and breathe out 6 times.
2. Roll shoulders by gently rotating shoulders up to ceiling, backwards, and down. Then reverse; up, forward and down. Do shoulder rolls 6 times each way.
3. Sit on floor with one leg straight to the side and one leg bent. Gently reach for toes or shins, then switch sides.

Strengthening:

1. Ankle strength: Hold onto back of chair with 2 hands. Rise up onto toes of both feet, hold for 5 seconds, then lower. Keep heels on the floor and lift toes off the floor, hold for 5 seconds. Repeat both movements 6 times.
2. Knee bend: Hold onto back of chair with 2 hands. Stand with knees soft and back straight. Keep knees pointing over toes. Bend your knees gently, and then raise your body by strengthening your knees. Do this 6 times.
3. Sit to stand: Sit in chair against wall. Stand up without using your hands 6 times. If this is too hard use a pillow on the chair to start until you get stronger. (For more safety, use a chair with arm rests).

Balance Training:

1. Altered base of support: Stand by the side of a chair and hold on for support if needed. Stand with feet hip-width apart and focus eyes on target at eye level. Cross arms over chest and bring feet together, then hold position for 10-30 seconds. Place right foot forward in front of left so that the right heel is touching left toes. Shift weight forward and hold position for 10-30 seconds. Return to starting position and switch sides. Lift right leg off floor and hold for 10-30 seconds. Switch sides.

2. Toe walking: Stand tall with feet hip-width apart and close to a wall. Focus eyes on target level. Rise up onto balls of feet and begin walking forward on toes for 10 steps while keeping body tall, head up, and shoulders directly above hips.

3. Heel walking: Stand tall with feet hip-width apart and close to a wall. Focus eyes on target level. Lift balls of feet off floor and begin walking forward on heels for 10 steps while keeping body tall, head up, and shoulders directly above hips.

(adapted from Falls Prevention Project Stay Safe Stay Active from South Western Sydney Area Health Service, Health Promotion, A Unit of the Division of Population Health & Fall Prevention Center of Excellence: Balance Basics)

Appendix F: Staff Inservice Post-Test

	strongly disagree	disagree	neutral	agree	strongly agree
1. This program was helpful and increased my awareness on falls.	_____	_____	_____	_____	_____
2. Promoting health and well being in clients is important to me.	_____	_____	_____	_____	_____
3. I understand the possible consequences of falling. (ex: injuries, removal from the facility, premature mortality)	_____	_____	_____	_____	_____
4. Falling can greatly affect quality of life and occupations.	_____	_____	_____	_____	_____
5. The program informed me about factors that can contribute to falls.	_____	_____	_____	_____	_____
6. I learned new ways to reduce fall risk in the community.	_____	_____	_____	_____	_____
7. The use of fall logs is an efficient and pragmatic way to keep track of residents' falls.	_____	_____	_____	_____	_____
8. Residents adhering to medication regimens and taking the proper dose on schedule may decrease their chances of falling.	_____	_____	_____	_____	_____
9. Simple environmental modifications can help residents safely navigate around the community.	_____	_____	_____	_____	_____
10. Incorporating healthy habits such as eating nutritious foods and staying active, are achievable goals that may lower fall risk.	_____	_____	_____	_____	_____

Thank you for your participation in the fall awareness program and completing this survey! We are grateful for the opportunity to work with you and hope we can make a difference in the community.

Kellie Hislop, Rey Ballesteros, & Chanita Panchasarp

Appendix G: Resident Survey Post-Test

	strongly disagree	disagree	neutral	agree	strongly agree
1. This program was helpful and made me aware of the importance of exercise.	_____	_____	_____	_____	_____
2. Staying active is a goal that may keep me from falling.	_____	_____	_____	_____	_____
3. I understand that strength, balance, and aerobic/endurance training are the best types of exercises in fall prevention.	_____	_____	_____	_____	_____
4. I can do these exercises on my own with the help of the video and/or instructional guides provided.	_____	_____	_____	_____	_____

Thank you for your participation in the fall awareness program and completing this survey! We are grateful for the opportunity to work with you and hope we can make a difference in the community.

Kellie Hislop, Rey Ballesteros, & Chanita Panchasarp

Appendix H: Suggested Modifications

Dominican University of California Department of Occupational Therapy

Environmental Assessment (2nd tour with documentation on February 2, 2012)

1. Flights of stairs inside facility	Use reflector tape and non skid tape to increase contrast on top three stairs and bottom stair of all flights of stairs
2. 2 nd floor bathroom	Install railings and grab bars by tub, use non slip mat inside shower
3. 2 nd floor larger bathroom	Remove scatter rug or place grips on bottom, level uneven floor upon entrance or post sign & reflector tape
4. 2 nd floor single toilet only	Level uneven floor entrance or post sign & reflector tape, install hand rails by toilet, install elevated toilet seat
5. 2 nd floor single shower only	Level entrance or post sign & reflector tape, install hand rails and grab bars, use non slip mat, remove scatter rug or place grips on bottom
6. 3 rd floor hallway sink	Use non slip mat or non slip rug Toilet across sink: install elevated toilet seat, install hand rails/grab bars, level uneven floor entrance or post sign & reflector tape
7. 3 rd floor tub	Remove scatter rug or place grips on bottom, use non slip mat inside shower
8. Entrance to dining room	Increase contrast with reflector and non skid tape
9. Laundry room	Increase lighting since only one light bulb
10. All stairs to backyard	Use reflector and non skid tape to increase contrast
11. TV room	Rearrangement and organization of furniture to reduce clutter Fix loose tile on floor Increase hallway lighting from TVs room to backyard

Appendix I: Thesis Project Proposal Form

Name (s): Reynaldo Ballesteros
Kellie Hislop
Chanita Panchasarp

E-mail address(es) Reynaldo.Ballesteros@students.dominican.edu
Kellie.Hislop@students.dominican.edu
Chanita.Panchasarp@students.dominican.edu

Phone Contact(s): Reynaldo: 707-315-8755
Kellie: 510-449-8664
Chanita: 925-324-7272

Thesis advisor information:

Name: Dr. Ruth Ramsey
Campus Phone: 415-257-1393
E-mail address: Ruth.Ramsey@dominican.edu

Project Information:

Proposed title of project: Promoting Healthy Aging and Fall Risk Awareness in Older Adults with Mental Illness

Contact Person at Agency/Setting: Ms. Alison Buck

Phone Number of Contact & e-mail: 415-459-5843 & buckalison@yahoo.com

Duration of Project: Fall 2011 - Spring 2012

What problem will be addressed with this project:

People with mental illness who are aging in a community setting have a higher fall risk due to various factors such as the effects of medication, inactivity, and environmental hazards. The staff at Voyager Carmel has stated their concerns over the prevalence of falls in the community; residents continue to fall that could lead to injuries such as hip or pelvic fractures and further complications such as the inability to maintain community living. Also, these falls could impact various areas of their occupations including their activities of daily living, work, and leisure. Our project is a fall awareness program that will address the concerns of the staff and incorporate both staff and resident involvement. Over the last few months, we have organized interviews with the staff, a focus group with the residents, and toured the facility for a documented environmental assessment to develop our project specific to their needs. Based on a review of current research and the interviews, focus group, and environmental assessment, we will develop

and implement a multifaceted fall awareness program to reduce resident risk of falling at Voyager Carmel.

What are current approaches to this problem:

Currently, the staff have attempted to decrease fall risks in the residential facility by holding group activities that promote exercise and active living. Home health nurses visit the community to address any health concerns and to ensure the residents are following doctors' orders in regards to medication. Random drug tests are given to the residents to discourage substance abuse that could lead to negative side effects contributing to falls.

Description of participants and agency/setting.

This project will be implemented at Voyager Carmel, an independent living facility which houses up to 36 residents. Voyager Carmel is part of Homeward Bound Marin, a program supporting the homeless. Homeward bound provides housing and the tools needed to help participants find jobs. Voyager Carmel is one of two mental health facilities within the Homeward Bound program that offer long-term living. The program is located in the Carmel Hotel, a 100-year-old building. There are rooms spread across three separate floors. Within Voyager Carmel there are two programs. The Voyager program is considered short-term living, only allowing residents to stay up to three months. There is room for 12 residents in this program, whereas the Carmel program supports 24 residents. The Voyager's have a curfew and more household chores. The Carmel program offers long-term housing; some residents have been living there for 16 years. Most of the residents at Voyager Carmel are around 50-55 years of age. The majority of residents are living with a severe mental illness with the main diagnoses of schizophrenia, bipolar disorder, and schizo-affective disorder.

Recruitment Procedure.

We first sent an email to Alison Buck expressing our interest in her concern regarding fall prevention. We were able to set up a face-to-face meeting with Ms. Buck and the staff. During the meeting we met the members of the staff, conducted a question/answer session with the staff, and toured the facility. A focus group with the residents will allow us to meet them and learn about their concerns regarding falling.

Setting/Participant Consent Process:

Consent forms will only be used for the exercises session of our project. The residents will have a choice of participating in our group exercise course of the fall awareness program. A copy of a consent cover letter will also be provided to briefly describe the group activity that they can choose to attend. (see attachments)

Procedures.

The only thing that will be requested of the residents is participation in our exercise program. A class will be held in the community-dining hall. The exercise program will include chair exercises that will focus on strength and balance training. Next, we will be creating a video which will provide instructions for the residents to do the same exercises from the program.

With this video, they can view it at any time in which they please. Lastly, we will facilitate and encourage group walks to the park that will incorporate endurance and aerobic exercise incorporated into their lifestyle. With the exercise program, video, and group activities, participants may experience an improvement in overall health in their balance, strength, and endurance. These activities may also improve quality of life and may help with the reduction of falls within the community.

Potential Risk to Participants.

We are implementing an exercise video. With exercise, there is a possibility that participants could become injured with a pulled muscle, a strain, overall soreness that participants may not be used to. Exercising can leave participants in an unstable position making them susceptible to falling and sustaining further injury. Dealing with participants with serious mental illness may encounter emotional risks. Change of routine or environment can cause distress in those with a mental illness.

Minimization of Potential Risk.

Before starting any exercise, stretching will be done to help minimize the risk of pulling a muscle or sustaining an injury. All exercise will be explained thoroughly in simple steps and instructions to ensure that participants understand what they are being asked to do. Guidance will be provided from all three members of the thesis team, which will help minimize falls. Participants will be taught about the correct stances during exercise to address the issue of balance. To prepare the residents of Voyager Carmel, we will be posting flyers and signs around the hotel to inform them we are coming. This will eliminate some of the emotional shock of the changes we will be completing. Residents will also be invited to our focus group where we will be able to get to know each other and discuss our plans and find out what their interests are.

Potential Benefits to Participants.

The benefits for the participants may include: decreasing the risk of being transferred to another facility because of falling, increased endurance, a heightened awareness of environmental hazards that could result in a fall, and a guide to how to prevent falls. The exercise video will bring residents together and give them a sense of community while at the same time they will be working on endurance. Environmental modifications will help them identify dangerous steps and areas that may result in a fall. If the residents are more aware of falling, they may be less likely to fall or help prevent someone else from falling. As a result, residents will not have to worry as much about being transferred. Residents at risk for falling could be moved to a different facility because of falls. However, if we raise their awareness about falling and give them tools to help prevent falls, they may feel a decreased risk for moving.

Intended Outcomes of the Project.

We intend that the residents of Voyager Carmel will be more aware of fall risks and more motivated to participate in an exercise program to help decrease their chances of falling. It is also our plan to educate the staff so they can help residents exercise and increase the awareness

of falling around the facility. We will be making environmental modifications to the facility and it is our hope that they are effective in warning residents of hazards and uneven surfaces.

What are the Project Deliverables.

Upon finishing this project, we will leave the agency with an exercise video, some suggestions for environmental modifications, and fall awareness materials for the staff.

Costs to Participants.

The only costs to participants will be time. Those who choose to participate in the exercise portion of the project will need to contribute one hour of their time to participate. The staff involved in the fall awareness program will be asked to attend two in-services lasting 45 minutes each.

Reimbursement or Compensation to Participants:

There will be no reimbursement or compensation involved in this project.

Confidentiality of Records:

Records will be kept in a locked safe that can be opened with a key to keep confidentiality.

Check which of the following applies:

☒ Data will be anonymous

Describe how anonymity will be ensured: The few surveys that will be handed out will not require participants to list their names. All information gathered at the focus group will not be recorded under the person's name.

☐ Data will not be anonymous

Signatures:

I acknowledge that all procedures will meet relevant local, state, and federal regulations related to the setting and participants. I am familiar with and agree to adhere to the ethical principles set forth by AOTA.

Signature of Applicant

Kellie Hishop

Signature of Applicant

Signature of Applicant

Date

October 2011

Date

Date

Cover Letter for Informed Consent

Dear Residents at Voyager Carmel,

We are occupational therapy students from Dominican University completing a project-based thesis for our program.

The purpose of this project is to develop and implement a fall awareness program in a community-based setting. The prevalence of falls in the community remains a concern, and the staff have invited us to assist in decreasing the risk of falling and promote healthy living at Voyager Carmel.

In the spring of 2012, we will hold an exercise group at your community that will demonstrate ways to decrease your risk of falling. Based on research, the most effective exercises that have been used to reduce falls in several studies have been geared towards training in strength, balance, and aerobic activity. The exercise group will be a simple, educational, and fun activity for the community.

Your voluntary participation to this request and signature on the following page constitutes your informed consent to your participation in this activity. You are not required to participate. If you decide not to participate, your decision will not affect your current or future relations with Voyager Carmel.

This activity has been reviewed and approved by our thesis advisor and chair of the occupational therapy department at Dominican University. If you have any questions or concerns about the activity and our project, please email us at voyager.carmel13@gmail.com.

Thank you for your valuable participation to this project.

Sincerely,

Reynaldo Ballesteros, Kellie Hislop, and Chanita Panchasarp

Dominican University of California
Department of Occupational Therapy

Consent for Participation in Exercise Course

You are being asked to participate in an exercise course, part of a fall awareness program for Voyager Carmel designed by occupational therapy students. This fall awareness program is the students' project-based thesis and has been reviewed and approved by the department of occupational therapy at Dominican University. Please read this form carefully and ask any questions you may have before agreeing to take part in the program.

What the exercise course is about: The purpose of this part of the program is to improve well-being and promote a healthy lifestyle in the community. Exercise correlates to fall risk, and the importance of staying active has been demonstrated in research in reducing the risk of falling.

What we will ask you to do: If you agree to participate in the exercise course, we will hold an exercise group in the dining hall of Voyager Carmel. The students will instruct and demonstrate exercises that focus on strength and balance training. Your active participation is following along and performing the exercises with the students.

Risks and benefits: We do not anticipate any risks to you participating in this program other than those encountered in day-to-day life. You can stop or take a break during the exercises if needed. This course may benefit you in increasing strength and balance if you continue to practice the exercises as recommended.

Confidentiality: The records of this project will be kept private. In any sort of report we make public we will not include any information that will make it possible to identify you. Records will be kept in a locked file; only the researchers will have access to the records.

Taking part is voluntary: Taking part in this exercise course is completely voluntary. If you decide to take part, you are free to withdraw at any time during the course. If you decide not to take part in this project, it will not affect your current or future relationship with Voyager Carmel.

If you have questions: The students conducting the exercise course of the fall awareness program are Rey Ballesteros, Kellie Hislop, and Chanita Panchasarp. Please ask any questions you have now. If you have questions later, you may contact us at voyager.carmel13@gmail.com. You will be given a copy of this form to keep for your records.

Statement of Consent: I have read the above information, and have received answers to any questions I asked. I consent to take part in the exercise course.

Your Signature _____ Date _____

Your Name (printed) _____

Appendix J: Site Selection Verification Form

Dominican University of California Department of Occupational Therapy

Student Names: Reynaldo Ballesteros, Kellie Hislop, Chanita Panchasarp

Title of thesis project or research:

Promoting Healthy Aging and Fall Risk Awareness in Older Adults with Mental Illness

Description of thesis project or research:

We will be implementing a fall awareness program involving an exercise program, environmental modifications, and staff education.

Name of Proposed Site: Voyager Carmel, Homeward Bound of Marin

Person with whom you will be working: Ms. Alison Buck

Type of facility: A mental health independent living facility.

Address: 830 B Street San Rafael, CA 94901

Phone #: 415-459-5843

Contact Person related to approval at the site: Ms. Alison Buck

Title: Program Director

Has initial contact been made? No or Yes, If “yes”, describe:

Yes, initial contact has been made. We have toured the facility, met the members of the staff, and discussed issues and concerns surrounding falling with the staff.

If “no”, state specifically when contact will be made (a site approval is necessary for the thesis proposal to receive approval):

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

A focus group will be held to collect information from residents regarding their views on falling. We will be developing an exercise video to leave with the residents of Voyager Carmel. This will be accompanied by environmental modifications and staff education. The staff will be provided with in-services and materials containing information about fall awareness.

Dates for proposed intervention(s), due date for manual, or dates planned for data collection:

The project will be implemented in Spring 2012. The second tour to document environmental hazards and a focus group will be held in December 2011.

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

We are anticipating that participation will be an issue for the exercise group we have planned as part of our intervention. We are developing a video that can be left for the residents. This video will contain simple, well described and demonstrated exercises for residents to complete.

Residents will be able to use the video whenever they want and even in the future when we are no longer at Voyager Carmel. Lack of facility funding may make home modifications difficult, therefore we will be looking into grants as well as people who would be willing to donate supplies.

Agency Signature  Date 11-3-11

Print Name & Title of Agency person Alison Buck, Program Director

Faculty advisor signature: