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EVALUATION OF A FALL PREVENTION PROGRAM FOR OLDER ADULTS IN A
RURAL COMMUNITY

A Scholarly Project Submitted to the Graduate School in Partial Fulfillment of the
Requirements for the Degree of Doctor of Nursing Practice

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EVALUATION OF A FALL PREVENTION PROGRAM FOR OLDER ADULTS IN A
RURAL COMMUNITY

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EVALUATION OF A FALL PREVENTION PROGRAM FOR OLDER ADULTS IN A RURAL COMMUNITY

An Abstract of the Scholarly Project by
Candice Lynn Morris

This project set out to evaluate fall prevention interventions for older adults in a rural community. A literature review was performed to identify evidence-based fall prevention programs that could be modified to meet the needs of the community. Stopping Elderly Accidents, Deaths, and Injuries (STEADI), the Otago Exercise Program, and Stepping On were selected as the most appropriate fit for the needs of this project. The researcher combined and modified the programs in order to bring the intervention to participants in the community. The modified fall prevention intervention successfully reduced key fall risk factors in the participants that completed the program. Feedback from participants was overall positive with reported interest in continuing the program long term. While there was not enough time to assess long term fall reduction outcomes, the program provides strong evidence that fall prevention interventions would be a beneficial addition to rural communities.

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CHAPTER I

Introduction

Geriatric falls are the leading cause of injuries among elderly adults aged 65 years and older (Centers for Disease Control and Prevention [CDC], 2017). One out of every four older adults fall each year, with one out five of those falls causing serious injury. The Centers for Disease Control and Prevention (CDC) report from 2017 states that falls have increased thirty percent from 2007 to 2016 and continue to rise.

Approximately 2.8 million older adults were seen and treated in emergency departments (ED) for fall related complaints, which include fractures of various sites and head injury, including traumatic brain injury and hemorrhage (CDC, 2017). Hip fractures are a common fracture that can have serious consequences for older adults including decreased mobility, loss of independence, anxiety, and long-term care needs. The CDC reported in 2017 that 95% of hip fractures in older adults were directly related to a fall, and that falls are the leading cause of traumatic brain injury for older adults.

Falls are preventable (CDC, 2017). Identification of individuals at greater risk for falls can help healthcare providers implement prevention strategies. Research has identified multiple factors that increase older adult's risk of falls including lower body weakness, vitamin D deficiency, difficulty with walking and balance, certain medications, vision problems, foot pain and/or poor footwear, and household hazards.

These risk factors are modifiable and can guide healthcare providers on which strategies would be most effective for the individual.

Statement of the Problem

Falls are a serious threat to the health of elderly adults in the community. Elderly adults that fall may end up in the ED for evaluation and treatment of injuries. The CDC (2017) estimates that 2.8 million older adults are seen in the ED related to falls.

Elderly adults residing in rural communities face even more challenges. There are many older adults that live more than fifteen miles from the nearest acute care facility, so transportation can be delayed. If an elderly adult experiences a fall with a serious or life-threatening injury, rural hospitals are unlikely to be equipped to handle the challenge of caring for the patient. While a patient can be stabilized, this could result in further delay of care.

Another concern is that of the older adults living by themselves. An individual may fall and spend hours on the floor before someone finds them. This researcher has personally cared for a patient that had fallen in the shower and received significant burns from being exposed to hot water for a prolonged period. The patient was stabilized and transferred to the closest trauma/burn center, which happened to be two hours away by ambulance.

Rural communities do not have adequate fall prevention resources or fall prevention strategies for older adults. An internet search for fall prevention interventions in rural southeast Kansas uncovered that there is no program that specifically targets fall prevention. A similar search uncovered there is also a limited number of community programs that promote physical activity and/or ways to keep older adults active.

Older adults could also experience an increase in their quality of life as a result of fall prevention programs. Older adults would be able to maintain their independence and continue living at home if the risk of falling was reduced.

Significance to Nursing

Nurses are impacted by older adult falls in many ways. Many nurses will be assessing and reassessing older adults for fall risks and can be the first caregivers to identify increased fall risks. Nurses will see these patients frequently in the ED, and then care for them throughout their course in the hospital if the patient requires admission. In long-term care facilities, nurses are tasked with monitoring and providing the care for older adults that are admitted for fall related conditions. It is also more likely that patients would confide in them and discuss falls at home, since nursing is consistently ranked as the most trusted profession (Brenan, 2018).

Healthy People 2020 has added new objectives for nursing specifically related to the care of older adults (U.S. Department of Health and Human Services [DHHS], 2019). In the overview for the newly proposed objectives, nurses and nurse practitioners are identified as potential falls care managers (DHHS, 2019). Healthy People 2020 also set the objective to increase the number of registered nurses (RN) with geriatric certification to 10% by the year 2020 (DHHS, 2019).

Specific Aims/Purpose

The specific aim of this project is to assess if the hospital can implement an effective program that will help older adults learn effective strategies to prevent and cope with falls in the community. The project includes identifying evidence-based fall

prevention strategies, developing, and implementing a fall prevention program provided to the community.

This project has the potential to increase awareness of primary providers about the need for fall prevention interventions. By increasing awareness, primary providers could start assessing their older patients for increased fall risk, subsequently recruiting those patients for the fall prevention programs. As more healthcare workers are made aware of the ability to prevent older adult falls, other communities might recognize and adopt fall prevention strategies.

It is the goal of this project to reduce the number of falls of older adults in the community. A reduction in geriatric falls would result in decreased ED visits by older adults, which helps to decrease the cost of healthcare. Reducing geriatric falls also decreases morbidity and mortality due to fall-related injuries.

Theoretical Framework

Betty Neuman's systems model was used as the theoretical framework for this scholarly project. This model was chosen due to the focus of the theory on prevention (Betty Neuman's systems model, 2012). The systems model also focuses on the reactions of the patient system to potential and actual environmental stressors.

The areas of focus for this theory translate well for fall prevention. The entire patient system is assessed and evaluated in a holistic manner. Prevention is one of the most important factors impacting a decrease in the number of older adults experiencing a fall at home. The environment has a huge impact on the prevention of falls. The program includes evaluation of the environment to remove potential hazards.

The systems model nursing process is broken down into six steps (Petripin, 2016).

It includes specific categories of data to be obtained about the patient.

1. Assessment of the patient

- Actual and Potential Stressors
- Condition/strength of basic factors and energy sources
- Characteristics of normal and flexible lines of defense
- Lines of resistance
- Degree of reaction
- Interaction between patient and environment
- Coping factors for optimal wellness
- Perceptual difference between caregiver and patient

2. Interpret the data collected and formulate a diagnosis

- Health-seeking behaviors
- Activity intolerance
- Ineffective coping
- Ineffective thermoregulation

3. Set goals – Keep client system stable

4. Plan created from the goals – strengthen lines of defense and resistance

5. Implement plan using primary, secondary, and tertiary prevention

6. Process evaluated to determine if balance was restored and stable state maintained

Practice Questions

- Can a community fall prevention program help decrease the number of falls by elderly people in a rural community?
- Can fall prevention strategies be modified to effectively fit the needs of a rural community with limited resources?
- What are the most effective evidence-based fall prevention strategies that can be implemented in a rural community?

Definition of Key Terms

1. Older Adult – individuals aged 65 years and older (CDC, 2016)
2. Rural Community – any area that is not included in an urbanized area or urban cluster with a population less than 50,000 (American Association of Retired Persons [AARP], 2020)
3. Fall Prevention – interventions that prevent individuals from falling (CDC, 2016)

Logic Model

The tearless logic model was used to help bring ideas for this project together. This model was designed by a group of community psychologists who recognized that logic models are critical for outcome- based planning to move organizations toward set goals, but the construction process needed to be simplified (Lien et al., 2011). Key terms were exchanged for a series of less complex, jargon-free questions. The result was a less intimidating eight-step method that allowed more organizations and community-based groups the ability to easily construct a logic model.

The first step of the tearless logic model is to begin with the end in mind (Lien et al., 2011). The primary objective of the scholarly project is to implement effective fall

prevention strategies that will decrease falls of older adults. The focus of the fall prevention strategies is on older adults in a rural community.

Next, the researcher must identify what changes need to be made in order to achieve long-term outcomes and intermediate outcomes (Lien et al., 2011). The fall prevention program will need to be maintained to achieve the long-term goal. Policies for assessment of individuals for fall risk will also need addressed. Hopefully, nurses will see the benefits of the programs and help recruit more participants. Also, the researcher hopes that the community would become more aware of the need for fall prevention and the programs available.

Evaluating changes needed for long-term goals, enables identification of the short-term outcomes, which is the fifth step in the process (Lien et al., 2011). The fall prevention program aims to improve the stability and balance of participants, which would increase the quality of life, decrease morbidity, and decrease mortality for participants.

Next, the tearless model is used to identify activities that need to be included to ensure outcomes are reached, followed by stating the outcomes or resources that can be measured (Lien et al., 2011). Activities for fall prevention strategies include developing fall prevention strategies, recruiting participants, and implementation of the program. Participants completion of the program and falls experienced by participants are important outcomes to measure. The physical space where the program will occur is one resource to consider. Staffing which will consist of registered nurses, a nurse practitioner and a physical therapist is also a resource.

The eighth and final step of the tearless logic model is to compile all the information and organize it (Lien et al., 2011). The content is placed in a flow chart that can be altered, improved, or added to as goals are achieved and outcomes may change. The result is the completed logic model for the fall prevention program.

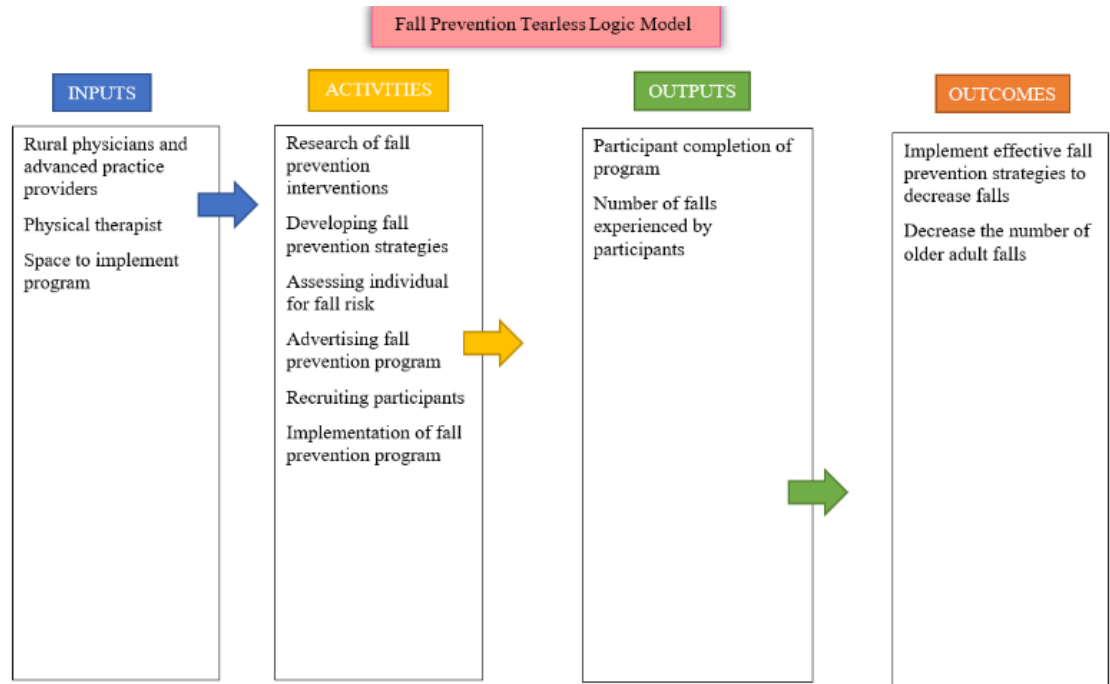


Figure 1 – Fall Prevention Logic Model

Summary

Falls are a serious threat to older adults in the community. The primary cause of traumatic injury in the elderly population are falls, and falls are preventable. There is a significant need in rural communities to identify fall prevention strategies with development and implementation of fall prevention programs. The purpose of this scholarly project is to address these needs with effective fall prevention strategies that can be easily adopted and used in the future.

The theoretical framework in this project is Betty Neuman's Systems Model. This theory focuses on the reaction of the patient system in response to perceived and

actual environmental stressors. It also relies on multiple levels of prevention: primary, secondary and tertiary. Prevention is the primary theme seen throughout this project.

The goals of the program can be broken down into levels of prevention. Primary preventative measures set the goal of enrolling the participants in the program before they have a fall. However, this will also help with tertiary goals when older adults that have already experienced falls do not have any more in the future.

Successful fall prevention strategies are projected to have a broad range of benefits. If the program is successful, quality of life can be improved for older adults living in the community. There would be a decrease in healthcare expenditure for older adults resulting in lower costs for everyone.

Chapter II

Integrated Review of the Literature

Preventing falls in the older population is an important topic in healthcare. As the population ages, more emphasis has been placed on the need to identify different interventions that could help achieve this goal. According to the CDC in a 2017 report, the number of older adults in the United States is estimated to reach 74 million people by 2030. If fall rates progress at that current rate of 1 out of 4 older adults, the number of falls is estimated to increase to 49 million by 2030 (CDC, 2017). The time to start implementing fall prevention interventions is now, if healthcare hopes to slow down the potential strain on the healthcare system not to mention the older adult community.

A review of the literature was performed through a review of multiple online databases that included Current Index to Nursing and Allied Health Literature (CINAHL), ProQuest Nursing & Allied Health Database, and PubMed. Key words were utilized to obtain peer-reviewed, evidence-based research that supported fall prevention interventions and supportive data. The key words for the search were “fall prevention,” “community,” and “older adults.” The same strategies were used with Google and Bing search engines on the internet.

Literature Review

An Aging Population at Risk

As mentioned previously, the number of older adults in the United States is expected to climb to 49 million by 2030 (CDC, 2017). The number of falls will also increase with the increase in the older adult population, the estimate increasing to 7 million by 2030 (CDC, 2017). One in four older adults experiences a fall every year (CDC, 2017). An older adult presents to the ED every 14 seconds for a fall-related injury in the United States (Administration on Community Living [ACL], 2020).

The need to stop the trend of increasing older adult falls has already been identified in the literature and recognized by leaders worldwide. Healthy People 2020 has added the fall prevention objective of reducing the number of older adults presenting to the ED for falls (U.S. Department of Health and Human Services, 2020). Healthy People 2020 utilized the United States Preventative Task Force recommendations for fall prevention as a resource to complete this objective (U.S. Department of Health and Human Services, 2020). Despite the evidence of effective interventions and recognition of importance, healthcare has been slow to adopt interventions or promotion of fall prevention.

Evidenced-based Fall Prevention Strategies

In response to healthcare's slow adoption of fall prevention, the CDC initiated its own fall prevention program titled Stopping Elderly Accidents, Deaths, & Injuries (STEADI) (CDC, 2016). This initiative is designed for healthcare providers treating patients who have fallen, at a risk for falling, or who have a fear of falling (CDC, 2016).

The STEADI website provides tools and resources that assist providers with the daunting task of implementing fall prevention strategies.

The STEADI initiative focuses on three core elements. The first element is to screen patients for fall risk (CDC, 2016). The second element is to assess for modifiable risk factors (CDC, 2016). The third core element is to intervene with effective clinical and community strategies to reduce the risk of falls (CDC, 2016).

STEADI is easy to locate and access. There are numerous resources available on the website, which includes tools focusing on the three core elements mentioned previously. Many of these resources are free to the public. A CDC report from 2019 states that some electronic health record platforms have started incorporating STEADI, making it even easier for providers to include fall prevention in their care.

A study by Johnston et al. (2018) reported a statistically significant decrease in the number of fall-related hospitalizations of older adult when they were prescribed a fall plan of care. The study was designed to evaluate the effectiveness of the STEADI program when implemented in a primary care setting. The electronic health record was modified to prompt nurses to implement fall risk screening for adults aged 65 and older. The results of the screening were reviewed by the physician; who then performed an assessment and established a fall plan of care for the patient.

Johnston et al. (2018) identified important factors that contribute to the success of implementation of the STEADI initiative. It is important to have a strong clinical champion leading the integration of the STEADI initiative into the workflow along with trained clinical and administrative staff that are available for reference, identified as

“superusers”. Superusers will ensure that everyone understands the initiative and are implementing it correctly.

Barriers to implementation of the STEADI program in primary care are frequently seen prior to adding the new initiative. As with most primary care clinic visits, there were reports of time constraints as the screening process can increase the amount of time spent with each patient (Johnston et al., 2018). Other concerns or demands for the provider’s time competed with fall prevention efforts and decreased the chances that providers would focus on fall prevention.

This study does highlight the importance of taking the extra time to implement the STEADI initiative. The utilization of this framework does demonstrate that it can reduce the number of fall injuries in older adults (Johnston et al., 2018). Fall prevention intervention programs will also need to be implemented in the community so that providers can refer patients to these services. Johnston et al. identified Stepping On, Tai Chi, and STEADI as significantly effective programs at reducing falls.

The National Falls Prevention Resource Center is an addition to the Administration for Community Living (ACL) that provides resources and funding for fall prevention strategies. The resource center can be found within the National Council on Aging’s (NCOA) Center for Healthy Aging. NCOA (2015) leads the National Falls Prevention Action Plan with the goal to “implement a National Action Plan with specific goals and strategies to effect sustained initiatives that reduce falls among older adults” (p. 5).

The National Falls Prevention Action Plan is a plan of action to prevent older adult falls (NCOA, 2015). The document outlines the actions to be taken in order to meet specific goals; also identifying domains that are key elements for fall prevention: physical mobility, medication management, home safety, environmental safety in the community, and cross cutting. Cross cutting is expanded to include funding and reimbursement, expansion of evidence-based programs, public awareness and education, along with public policy and advocacy.

Frontiers in Public Health (2018) is an online journal that published an electronic book (eBook) that contains information regarding evidence-based fall prevention programs and practices. The compilation of material that reviews community-based interventions, clinical integration and intervention, special populations, and policy and systems. This publication is intended to expand the number and availability of fall prevention interventions by providing evidence and strategies proven to work.

The Otago Exercise Program (OEP) is a fall prevention intervention developed in New Zealand in the late 1990's (Shubert et al., 2017a). Shubert et al. (2017a) reports that evaluation of this program demonstrated "improvements in functional outcomes and a 35% reduction in falls for frail, high-risk older adults" (p. 128). Most importantly, these results have been replicated; and the OEP is recognized as an evidence-based fall prevention program by the CDC.

Shubert et al. (2017a) identified that the OEP has had limited usage in the United States even though this program boasts high levels of adherence to the program up to one year after the start. The decreased application of this program was largely identified as related to barriers with documentation and billing practices. Shubert et al. set out to

attempt to develop a modified OEP program that would remove these barriers and continue with the adherence rate.

The findings from the study by Shubert et al. (2017a) indicate that the community OEP can be an effective fall prevention program in underserved and rural settings. Funding for the programs were obtained by the NorthWest Senior and Disability Services (NWSDS,) which was able to remove the barrier of billing; therefore, retaining patients in the program longer. Shubert et al. (2017a) demonstrated that a community OEP modified to fit the community needs can be as effective as the original OEP. Shubert et al. states “improvements in functional and self-perceived outcomes are similar to those reported in the literature” (p. 132).

In another study designed to evaluate the effectiveness of a modified OEP, Shubert et al. (2017b) used a certified occupational therapist assistant instead of a physical therapist to provide the program. A key factor was that patients were no longer required to have a physician referral to participate. The results found no significant differences in the traditional United States version of OEP when compared against the modified community OEP. This indicates that the program can be delivered by someone other than a physical therapist and may offer a greater reach than the traditional OEP.

Multifactorial Approach

A study performed through the Massachusetts Prevention and Wellness Trust Fund (PWTF) by Coe et al. (2017) demonstrated the importance of the multifactorial approach with its fall prevention strategies; reducing falls up to 34% in older adults. The PWTF used Community Health Care Workers (CHW), an electronic referral system, and

other traditional methods to link clinical care with resources in the community. Fall prevention interventions and referrals were based on the CDC's STEADI toolkit and algorithm: PWTF organizers chose Tai Chi, Matter of Balance (MoB), and Assisted Home Safety Assessment and Modification (AHSA).

The study conducted by Coe et al. (2017) revealed some considerations when implementing fall prevention strategies. The STEADI program is a complex process that requires a team-based approach and strong support from those involved. It is important to maintain patient-centered approaches; such as transportation to and from fall prevention classes and clinic visits. The Assisted Home Safety and Assessment program was effective at keeping individuals independent and safe in their homes and should be offered to a broad range of patients. Assistance should be provided to install and purchase medical equipment when identified.

Stepping On is a fall prevention program that was developed in Australia at the University of Sydney; proven to be reduce falls by up to 30% with reproduceable results (KDHE, 2019). Stepping On utilizes the multifactorial system to provide fall prevention: strength and balance exercises, medication review, vision exam, home safety, review of safe footwear and strategies should participants experience a fall. The 7-week program uses guest speakers from other professions including physical therapists, pharmacists, and optometrists. It is followed by a home visit or phone call and later a three-month booster session.

Stepping On was brought to the United States by the Wisconsin Institute for Healthy Aging (WIHA). In order to provide the Stepping On program as it is designed by the University of Sydney, leaders must attend a 3-day training workshop that is

conducted by the WIHA or someone certified as a master trainer by this agency (KDHE, 2019).

After implementation of the Stepping On program by the WIHA, many program leaders started modifying the program in different ways to fit the needs in their community (Mahoney et al., 2017). Mahoney et al. took on the task of identifying the key elements of Stepping On in response to a funding opportunity announcement by the CDC; ensuring that the modifications being made by other leaders included the elements needed for success of Stepping On programs. The study used a modified Delphi consensus.

Adult learning theory was identified as essential; perceiving the participants as having an active role and sense of ownership for the strategies and solutions created with guidance from the leader (Mahoney et al., 2017). Incorporation of the principles of self-efficacy were also highly rated: mastery of skills, optimism and positive affirmation, and the power of storytelling. Another key element for a successful program was that of decision making.

Home-based balance and strength exercises is an essential element of Stepping On (Mahoney et al., 2017). Aspects of the program pertaining to home environmental safety and medication management were only considered essential if it included participant discussion. Participants were also instructed to reflect on their accomplishments, and this practice was reinforced by leaders at the end of the program.

The panel agreed that the home visits and the 3-month follow up booster session were essential (Mahoney et al., 2017). The evidence has indicated that these are

important to improve exercise maintenance of participants, along with confronting issues related to relapse.

Some aspects were considered essential depending on the context in which it would be implemented (Mahoney et al., 2017). An example of this was the guest speakers: Preparation was necessary prior to having guest speakers present in the program. However, without the prepping, this aspect was not considered essential.

The findings from the Delphi consensus were included in the provider manual by noting which elements were considered essential or strongly advised (Mahoney et al., 2017). Mahoney et al. report that “subsequent evaluation of the US Stepping On program with over 2,300 participants was associated with over 30% reduction in falls ... (p. 27).” This remains consistent with the reduction in falls found in previous evaluations of the Stepping On program.

Schlotthauer et al. (2017) further evaluated elements that could affect the delivery of Stepping On. These elements included: profession of the leaders, the difference in implementation depending on the site, differences in rural versus urban sites, and phone call versus home visit at the completion of the program. The research found that the profession of the leader did appear to impact the delivery of the program. Health professionals were identified as better leaders for the program. However, the data indicated that this could be related to individual differences and experience, rather than educational backgrounds.

Some differences in implementation occurred based on the site selected for the program. In sites where leaders reported greater time restraints and less familiarity with

the leadership role; difficulty with implementation was recorded (Schlotthauer et al., 2017). All sites agreed implementation was smoother when allowing several months' notice to recruit physical therapists.

Schlotthauer et al. (2017) showed that participants tended to come from a radius of five miles or less, regardless of rural or urban setting; indicating that Stepping On would be well suited for a small town or urban setting. Leaders should not anticipate participation from individuals that live greater than five miles from the designated site.

Finally, this study showed that there was a difference between the phone call follow up versus a home visit at the completion of the program. While the home visit was found to be more time consuming, both participants and leaders tended to agree that the home visit was much more beneficial (Schlotthauer et al., 2017). The phone call was easier to implement, but leaders voiced concerns about inability to evaluate body language as well as the exercises that the participant learned. Interestingly, there was no obvious difference in implementation of strategies or exercises after one year when comparing phone call visit versus home visit.

Vitamin D Supplementation

Stepping On has traditionally included an assessment of the participants vitamin D level and/or recommendations for supplementation (KDHE, 2019). This was in line with the United States Preventative Services Task Force (USPSTF) recommendation to give supplemental Vitamin D and calcium to prevent falls and fracture in community dwelling older adults (USPSTF, 2020). New research has given light to potential

increased of falls and fractures when using Vitamin D and calcium supplementation, which has caused the USPSTF to change their recommendation for this supplementation.

Sanders and Seibel (2016) note that randomized controlled trials of Vitamin D supplementation have shown an association with increased falls and fractures. The increased risk of falling and fractures seems to correlate with increasing dosage of Vitamin D supplementation. Even moderately high doses of the vitamin increased the risk of falls. Unfortunately, there has been very little evidence to indicate the appropriate dosing of Vitamin D supplementation.

Collaboration with Pharmacists

Karani et al. (2016) emphasized the important role that pharmacists play in a team-based approach to fall prevention. Pharmacists are skilled in understanding the effects of medications on the human body and how those medications may interact with each other. Since older adults can be more sensitive to certain medications, pharmacists can be recruited to evaluate patient's medications and provide recommendations on stopping, substituting or reducing those that may increase the risk of falls.

Cost Effectiveness

An additional concern related to falls is the economic burden placed on the healthcare system. The direct cost of health care expenditure related to falls totaled \$34 billion in 2013 alone (National Council on Aging [NCOA], 2015). The average cost per hospital stay related to a fall by an older adult is approximately \$34,000. Johnston et al. (2018) reported a 31% increase in age-adjusted death rates due to falls between 2007 and

2016. Without interventions, it is obvious that the cost will also increase to staggering numbers; therefore, preventing falls is important to help decrease healthcare costs.

A study by Carande-Kulis et al. (2014) set out to evaluate the cost effectiveness of three fall prevention interventions: The Otago Exercise Program, Stepping On, and Tai Chi: Moving for Better Balance. The analysis showed that all three programs had a greater than 100% return on investment. Carande-Kulis et al. (2014) report that the results “showed that benefits not only covered the implementation costs but also exceeded the expected direct program delivery costs” (p. 5). These findings could help future program leaders by providing incentives for investors.

Summary

Fall prevention is a serious threat to the well-being of older adults in the community. The government has recognized this need and begun to implement agencies and programs along with allocated funding (Johnston et al., 2018). STEADI is a program offered through the CDC that helps patients and health care professionals find resources and tools for fall prevention. Current research has shown that STEADI can be effectively utilized by clinicians but can be challenging to start. The National Falls Prevention Action Plan is another government funded fall prevention resource to start expanding the reach of fall reduction programs (NCOA, 2015).

There are multiple fall prevention interventions available. The Otago Exercise Program and Stepping On have been focused on in this project due to the evidence reviewed above that supports the efficacy of these programs. Both the Otago Exercise Program and Stepping On have at least 30% success in reducing falls in the older

population (CDC, 2017). Stepping On utilizes a multifactorial approach that includes important guest speakers from other fields of health care (Coe et al., 2017). Pharmacists are one of the important members in team-based care for multifactorial fall prevention interventions (Karani et al., 2016).

Chapter III

Methodology

Project Design

This project was designed to identify, plan, and implement fall prevention strategies that could decrease the number of older adults experiencing falls in the community. The fall prevention strategies were tailored to fit the needs of a rural community with limited resources. The fall prevention program took place in the local senior center along with some of the participant's residences.

After reviewing the literature, it was determined that two evidence-based programs, Stepping On and the Otago Exercise Program (OEP), were a good fit for this project. The OEP is primarily an exercise program (Shubert et al., 2017a). While exercise is fundamental in fall prevention, there are also important aspects of fall prevention that should be included, which makes Stepping On better suited to this project (Coe et al. 2017).

Both interventions require training for course leaders prior to initiation of the programs (KDHE, 2019; Shubert et al., 2017a). The headquarters for the United States' version of Stepping On is in the Wisconsin Institute for Healthy Aging (WIHA) (KDHE, 2019). The training for Stepping On is a three-day live course delivered by WIHA or

those licensed by WIHA or Master Trainers. In Kansas, the training is not provided on a regular basis; instead it is offered when there is a high enough demand.

The OEP training is an online course made available by Carolina Geriatric Education Center. The program has a fee of \$35. The course is self-paced, online, and even available for continuing education credits (CEU) (Carolina Geriatric Education Center [CGEC], 2020). Training for OEP is readily available. It is advised that the OEP is led by a physical therapist, but it can be led by another healthcare professional. There are a limited number of physical therapists in the area where the study will be performed, so the OEP exercises were led by a nurse practitioner with OEP certification.

In order to maintain the holistic approach for fall prevention strategies, the program was organized to combine elements of the OEP and Stepping On. This idea maintained the OEP foundation of strength and balance exercises while incorporating important topics of contributing factors of fall prevention from Stepping On: medications, home safety, outdoor safety, vision, appropriate clothing and the importance of maintaining independence (Mahoney et al., 2017). By developing this program, fall prevention strategies were implemented in a timely fashion.

Target Population

The target population for the fall prevention strategies were adults 65 years of age and older. The participants had to reside in the community. The older adults are required to be cognitively intact and able to move on their own or with the help of an aid, such as a cane or walker.

Participants were referred to the fall prevention program by any individual aware of the program, it was not required that the referral come from an advanced practice provider. Primary care providers (PCP) at either of the local clinics were asked to identify and refer older adults that were at a higher risk of falling, expressed a fear of falling, or those who had experienced a fall within the past year. Home health caregivers, physical therapists, and emergency department providers were also able to refer patients fitting the previously mentioned criteria.

Instruments

The instruments used in the project were the functional assessments. These assessments were performed by the participants under the guidance and supervision of the certified nurse practitioner at the first meeting and the final meeting. The four functional assessments advocated by the CDC in the STEADI toolkit for providers are the 30-Second Chair Stand test, the 4-Stage Balance test, the Timed Up and Go test and orthostatic vital signs (CDC, 2019).

30-Second Chair Stand

The 30-second chair stand test assesses a patient leg strength and endurance (CDC, 2019). The participant sits down in a chair without armrests and cross their arms across their chest. Participants stand straight up from the chair and sit back down in the chair while keeping the feet flat against the floor, maintaining a straight back, and the arms crossed on the chest. The participant repeats this action as many times as possible in 30 seconds. The number of times that participants complete this action is documented.

The goal of this assessment is to increase the number of sit-stands the participant is able to complete in 30 seconds.

4-Stage Balance Test

The 4-stage balance test assesses the participant's static balance (CDC, 2019). The leader demonstrates four standing positions that participants will need to maintain. Each position gets progressively harder. The leader will assist the patient to get into position, ready to assist if necessary. The leader will let go of the participant when the participant is ready. The leader starts timing the participant at that time. Participants are only required to maintain the balance position for ten seconds. The ability to complete these balance assessments indicates a decreased fall risk. The goal of this assessment is for the participant to be capable of completing all four stages of the balance test.

Timed Up and Go (TUG)

The TUG test is used to assess a participant's mobility (CDC, 2019). The participant wears their normal footwear. The participant may use a walking aid if needed. The participant begins the assessment by sitting back in a standard chair with arms. The leader will mark a spot on the floor ten feet away. When the leader tells the participant to go, the participant will stand up from the chair and walk to the line on the floor at his/her normal pace. The participant will then turn, walk back to the chair, then sit back down in the chair. Leaders will time the patient on the word "Go" and stop when the patient sits back down. This time will be recorded, and any time greater than or equal to twelve seconds identifies the patient at risk for falls. The goal of this exercise is for the participant to decrease the amount of time needed to complete the task.

Orthostatic Blood Pressure

Orthostatic blood pressures are functional assessments that indicate if a patient is at increased risk of falls (CDC, 2019). Participants are instructed to lie down for five minutes. The blood pressure and pulse rate are then measured and recorded. The participant is then instructed to stand, and his/her blood pressure and heart rate is measured again at one minute and three minutes. These measurements are recorded, along with any patient complaints or observations. The measurements are considered abnormal if the systolic blood pressure drops greater than or equal to 20 mm Hg or diastolic blood pressure drops greater than or equal to 10 mm Hg. Participant complaints of lightheadedness or dizziness are also considered abnormal.

Procedures

Fall Prevention Intervention Development

Development of the fall prevention intervention program began in January 2020. Stepping On was chosen as the program that would fit the needs of the rural community. WIHA was contacted about available training in Kansas, who in turn directed the question to the Kansas Master Trainers. Training was slated for late March 2020 or early April 2020 but was cancelled due to the novel coronavirus so the leader was unable to become certified for Stepping On.

Since Stepping On includes some of the exercises that are utilized in the OEP, these programs were combined into a six-week program that incorporated elements of both. The program focused on the strength and balance exercises while incorporating important aspects of modifiable risk factors highlighted in Stepping On.

Provider Involvement

Two local clinics were recruited to assist with participant referrals for the fall prevention intervention. The STEADI toolkit was made available to each family practice provider that agreed to recruit participants. The Fall Risk Factors checklist form found in the STEADI toolkit was highlighted as a resource for providers that would help identification of individuals to refer to the program (CDC, 2019).

The hospital-based home health agency was notified of the new program. The home health providers were asked to refer any patients that fit the criteria. The home health agency has a built-in fall risk assessment tool in their documentation and used this tool to determine referrals (D. Thuston, personal communication, January 19, 2020).

The emergency department was identified as another resource for patient recruitment, since many older adults visit the ED after experiencing a fall. The ED already had fall risk assessments built into their documentation. Patients that presented to the ED without fall related complaints still received the fall risk assessment with the potential for a referral.

Program Structure

The fall prevention program was set up with weekly meetings, each lasting one hour in length. Most participants met in the group setting but four of the participants had individual home sessions. Each week the exercises were reviewed and practiced ensuring that participants continued to understand the exercises and reinforced the importance of the exercises. The remainder of time was spent covering different topics important in fall

prevention and are outlined below. Approval by the Pittsburg State University Internal Review Board was obtained prior to starting the fall prevention program.

Since the program emphasized exercises as the foundation to help decrease fall risk of the participants, participant's primary care providers were contacted and asked to complete a medical release form. The medical release deemed the individual capable of participating in the program from a medical standpoint. This was obtained prior to the first weekly meeting.

Week One. The first week of the program started with an overview of what participants could expect from the program. The instructor(s) introduced themselves and provided participants with contact information. The participants signed consent forms and completed a short survey at the beginning of the first meeting. Participants received the following program materials:

- Fall Prevention Toolkit
- Calendar to track exercises
- Diary
- Contact information

Week Two. The second week of the program began with a review of the exercises, followed by practice by the participants. The instructor provided guidance on appropriate technique and execution. Participants were invited to share experiences or lessons learned since the last meeting.

The participants discussed barriers that may be encountered that could prevent them from doing the exercises at home. The benefits of exercise were included in this

discussion. The instructor emphasized reflection of the benefits of exercise can help overcome the barriers.

Week Three. The third week began with a review of the exercises along with practice. The instructor assessed the participants and advanced the exercises as appropriate for the individual. Participants were asked to share experiences, lessons learned, and success stories since the last meeting.

The third week of the program focused on hazards in the home. The instructor identified hazards that participants may have in their home, and incorporated props to ensure participants' understanding. As a group, participants used problem-solving skills on how to remove the hazards and/or make the home environment safer.

When meeting with participants in their home, the discussion for hazards in the home included a walk-through of the residence. Together the participant and instructor identified potential hazards and figured out ways to decrease or eliminate the hazard. A checklist of home hazards was provided for the participant to review as needed.

Week Four. After participants reviewed and practiced the exercises again, the group discussed medications that can increase the participants' risk of falls. Participants were informed about possible interactions between certain medications that could impair balance and coordination. The instructor stressed the importance of keeping accurate documentation of medications that participants were currently taking.

If the information was available, the instructor spent time individually with participants to review their medications. The instructor discussed recommendations regarding the participant's medications, which included decreasing doses, alternative

medications or therapies, or discontinuation of medications. The instructor documented these recommendations and the information was forwarded to the patient's PCP.

Week Five. Again, participants reviewed and practiced exercises, and recommendations for advancement are provided by the instructor. This was followed by discussion about vision, proper footwear, and clothing. The instructor educated participants on the role of vision in fall prevention and importance of regular eye exams.

After discussing clothing hazards and the problems associated with shoes that do not fit appropriately, the instructor met with participants individually to assess and discuss footwear.

Week Six. The sixth week of the program was the last meeting. During the meeting, the instructor reviewed the material learned throughout the program. Participant's questions were answered, and clarification was provided for material that participants felt was not clear.

The functional assessments were repeated at this meeting. Participants that demonstrated improvement in any of the areas were acknowledged and achievements celebrated. The meeting ended with a discussion of how the program has helped the participants, along with their future plans to continue lessons learned.

Resources

The following resources have been identified to successfully implement the fall prevention program as described above:

- A room large enough for participants to perform the exercises safely

- Ankle weights
- A stopwatch
- Tables
- Chair
- Participant Fall Prevention Toolkits
 - Step by step guides for exercises
 - Illustrations of toolkit
 - Medication documentation
 - Home safety tips
 - Home modification tips
- Exercise cards
- STEADI toolkits
- Documentation of participants' progress
- Personnel
 - Instructor

Evaluation of Outcomes

Each participant performed the functional assessments at the beginning of the program and at the conclusion of the program. The results of these assessments were compared when evaluating the effectiveness and benefits of the program. Participants demonstrated increased strength and balance at the end of the program.

Sustainability

The fall prevention program developed for this project has potential for long term benefits for participants. The home visit helped reinforce the education in the participants' own home. The home visit made older adult's homes safer by providing a professional assessment and environmental modifications. By going to the patient's home and assisting with modifications, instructors set up participants for long term success by reducing fall risks.

Fall prevention has become an important topic and one that has gained government attention (NCOA, 2019). The National Council on Aging provides funding through grants for fall prevention programs. The program costs are minimal, especially when compared against the cost of falls, and the rural community would have no worry regarding the cost of implementing the program with grant funding (Carande-Kulis et al., 2015).

The fall prevention program developed for this project is available for replication. The materials were saved for further reproduction and participant outcomes recorded. Future fall prevention programs will have the benefit of reviewing previous programs to better understand what works and what does not work. As mentioned previously, the evidence has shown that Stepping On and the OEP were more effectively implemented when instructors gained experience with the programs (Shubert et al, 2017b).

Chapter IV

Evaluation Results

Purpose

The purpose of this project was to evaluate the utilization of fall prevention interventions in a rural community with minimal resources. The project helped identify what resources are necessary for a successful program. It also demonstrated the ability to modify a program to fit the rural community needs. The necessity of an effective program has been a topic of interest for the Southeast Kansas Trauma Council, which highlighted the need to evaluate fall prevention interventions in our community. Data was collected to address the aforementioned needs and the following research questions:

- Can a community fall prevention program help decrease the number of falls by elderly people in a rural community?
- What are the most effective evidence-based fall prevention strategies that can be implemented in a rural community?
- Can fall prevention strategies be modified to effectively fit the needs of a rural community with limited resources?

Description of Population

The population that was targeted for this project were adults 65 years old or older. The individuals were required to live independently and able to ambulate; but were permitted the use of assistive device such as a cane or walker. There was no restriction on race or gender.

The final project ended up with 10 participants. Nine out of the 10 participants were 65 years old or older, one participant was 58 years old. All participants were white, non-Hispanic females. Three of the participants used canes and three participants used a walker on an as-needed basis. All of the participants were living independently in their own residence. Data was collected over a period of six weeks at each weekly meeting and was completed October 2020 at the final meeting.

Key Variables

The variables identified in this project were time, program adherence, and provider buy-in. These are all independent variables that affected the outcome of the project, but the researcher was unable to control.

The outcomes of the program would likely be more significant if participants had been performing the exercises for a longer period of time. The participants would need more time to build strength, endurance and balance. It would be beneficial to follow participants over six months to one year.

Another important aspect of time variable is the amount of time the instructor needs to complete the program. The time demands can be extensive for the instructor when implementing the intervention individually. Individual instruction with each

session lasting 45 minutes to one hour, which decreases the number of participants that can be included in the program.

The program is more beneficial when participants are attending the meetings and doing the exercises as prescribed at home. In the group setting, there was no way to ensure that each participant would attend every meeting, whereas going to the participants home ensured attendance. The honor system was utilized for the completion of the exercises at home, which means that the instructor cannot be certain that the exercises were performed correctly, or at all.

Initially, local providers voiced enthusiasm about the project and agreed to refer patients. However, for unknown reasons, no referrals were made by any of the local providers. Providers would be more likely to make a referral if they valued the program and felt that it was necessary to help reduce the risk of falls. The information was made available, but the researcher cannot ensure that the providers fully appreciate the value of referring patients to the fall prevention program.

Analysis of Project Questions

The first question asked was, “Can a community fall prevention program help to decrease the number of falls by elderly people in a rural community?” The project leader followed the participants throughout the six-week study and monitored the number of falls. The participants did not experience any falls during the study period.

Another method of addressing this question is by observing if the participants increased their strength and balance. The functional assessments did improve by the end of six weeks for the majority of participants. One participant was not present at the final

meeting, and one participant stopped coming to the meetings after the first week, so they were unable to participate in the final functional assessment.

Eight out of the eight participants completing the functional assessments decreased the amount time needed to complete the TUG test, which demonstrates a decreased risk of falling. Six participants increased the number of stands performed during the 30 second chair stand assessment, demonstrating increased strength. Two participants completed the same number of stands at each assessment. Even though two participants did not improve, their performance did not decline.

Seconds to Complete TUG Test	Improved	Unchanged	Declined
Number of Participants	8	0	0

Table I - TUG test results

Number of Chair Stands Completed	Improved	Unchanged	Declined
Number of Participants	6	2	0

Table II - 30 second chair stand results

The four-stage balance test was the most challenging for participants. Four participants advanced the level of balance at the completion of the program. The remainder of the participants remained at their baseline. The decreased improvements in this area could be attributed to the small window of time that the program took place.

Four-Stage Balance Test	Improved	Unchanged	Declined
Number of Participants	4	4	0

Table III - Four-stage balance test results

“What are the most effective evidence-based fall prevention strategies that can be implemented in a rural community?” was the second research question addressed.

Evidence-based programs were identified in a review of the literature. The Otago Exercise Program, Stepping On, and STEADI were identified as the most effective and most easily accessible.

These programs have shown to reduce the fall rate in older adults up to 30%. STEADI and Stepping On are free programs, while OEP is very low cost with free printable resources. However, Stepping On was difficult to access due to very limited availability of leader training; program material is not free to the public and only available to course leaders.

“Can fall prevention strategies be modified to effectively fit the needs of a rural community with limited resources?” was the final question addressed in this project. One of the most important resources for a successful fall prevention program are available personnel. Physical therapists would be beneficial to the program with their knowledge of exercises that are used to improve strength and balance. It was found that physical therapists were not necessary to successfully complete the program. In fact, the program can be completed with a single individual leader if necessary.

The rural community where the program was implemented ended up having more available resources than anticipated. The senior center was a free facility that provided enough space to have a large group when necessary. When the project was implemented on an individual basis, space was utilized within the client’s home. Most notably, the local churches had programs available that donated fall prevention devices to those in need such as risers for the toilet, canes, walkers, and even hospital beds.

Overall, the modifications that were made to the program to adapt it for the rural community were effective. Participants showed overall improvement in fall risk assessment tools as noted in the findings above. Course evaluations also demonstrated satisfaction with the course and increased feelings of confidence in living independently without fear of falling.

The course evaluation contained twelve statements and asked participants to rate that statement on a Likert scale ranging from one to five (Appendix G). One meant that the participants strongly disagreed with the statement and five indicated that they strongly agreed with the statement.

All of the participants gave a rating of five to multiple statements: “The course was presented in an organized manner,” “Exercises were demonstrated so the you fully understood ...”, “You are likely to use the knowledge ... in the future”, “The leader was knowledgeable about this topic”, “The leader was easy to follow”, and “Overall satisfaction with the course.”

“Course material was clear ...”, “Participant packet ... enhanced material covered in the course”, “You have already started making long-term changes ...”, and “You are likely to continue these exercises ...” were all rated favorably by participants. These statements all had ratings of four or five. Three participants gave two statements a rating of three which was identified as neutral. The statements were “You feel less afraid of falling” and “You are more confident living at home”. The likely explanation for this lower rating is that these participants did not report an initial fear of falling or lack of confidence living at home.

There was also a space provided for participants to make a comment. All of the comments made by participants were positive. “Presenter is easy to follow, demonstrates each exercise, works with me through each one. I am more aware of my balance and muscle strength than I have ever been before. I will continue to better myself.” “Had fun!” “Enjoyed new exercises.” “Enjoyed the program very much.” “We will continue the exercises at the center.”

Additional Analysis

At the initial meeting, participants were asked to complete a survey about falls and fall risk factors (Appendix B). This survey was comprised of eleven yes or no questions. Three participants reported that they had fallen in the past year. Eight participants reported that they feel unsteady, dizzy or lightheaded sometimes. Six participants said they had to use their hands to push themselves up when standing from a chair. Nine out of the ten participants were already exercising regularly, but only five of those participants exercise for 30 minutes or more. Only two participants reported taking medications that make them feel lightheaded or dizzy. However, seven participants report taking medications for sleep or mood. Nine participants had an eye exam within the past two years. Nine participants also indicated that they were worried about falling. All of participants reported feeling safe at home and no participants indicated concern about living at home by themselves.

Summary

Ultimately, the goal of this study is to decrease the risk of falling in older adults. Even though six weeks did not seem like enough time for participants to gain strength

and balance, the improvement in functional assessments indicate this did occur.

Individuals also indicated that they learned important aspects of fall risk and how to decrease these risks. Participants were also more aware of the resources that are available to them.

Chapter V

Discussion

The purpose of this study was to determine how to effectively implement a fall prevention program in rural community. It was found that it is possible to implement an effective program and there are multiple ways in which to do it. The study found that there was better attendance and improvement in functional assessments for the participants that were seen individually than for those in the group. There was a greater time commitment when seeing participants individually, which decreases the number of participants that can be included in each six-week session. Overall, participants improved their strength and balance, and reported increased awareness of important fall risk factors.

Relationship of Outcomes to Research

The first research question encompasses the entire project by asking if a rural fall prevention project can reduce the number of falls. There was some difficulty answering this question due to time constraints to complete this project. In order to fully understand if the participants had experienced a decrease in falls, it would be beneficial to follow these participants over the period of six months to one year.

However, participants did see increased strength and balance when comparing functional assessments at the beginning and completion of the program. In addition to increased strength, participants reported decreased fear of falling and increased knowledge of important fall risk factors. These findings indicate that the answer to the first research question is yes, the program can reduce the number of falls in older adults.

The second research question was addressed through a review of the literature. Two programs, Stepping On and the Otago Exercise Program, stood out amongst other fall prevention interventions with fall reduction rates of up to 30%. Further research indicated that these programs could also be modified and retain the impressive fall reduction rates. The CDC's STEADI provided resources materials for providers, potential group leaders, and participants.

The combination and modification of these programs worked well in the rural community. The time commitment for the leader and participants appeared to be appropriate. There were also not many other materials needed to perform this program which makes it ideal for small communities.

This project did demonstrate that a rural community with apparently limited resources could implement an effective fall prevention program. Physical therapists were not necessary in order to effectively implement the exercise portion of the program. Any healthcare provider can easily become certified and assist participants safely. While it would be helpful to have an assistant to perform the functional assessments, this can be done by an individual leader. Therefore, the program does not require a certain number or type of personnel, which is important if there is a lack of PT or available providers in the community.

Most of the participants already had the ankle weights necessary for strength exercises. Those individuals that did not have weights available decided to purchase their own ankle weights. Participants felt that the benefits of the exercises and adding weights was enough to justify the small cost of purchasing them. The leader did not have to purchase any weights for this program meaning that the cost to implement the program remained low.

Local churches offered free durable medical equipment to members of the community when needed. The churches also took donations of equipment which made the free donations possible. The equipment available included walkers, wheelchairs, ramps, toilet risers, shower chairs, grab bars, and even a hospital bed. Members of the church volunteered to install the equipment if necessary. This was a resource that could make the program even more successful at preventing falls and easier to implement as there is no cost to the provider.

When the program was provided in the group setting, the local senior center provided a space large enough for 10 to 12 participants. This space provided multiple advantages. The space was large enough to ensure social distancing and to provide the space needed to safely perform the exercises. The senior center was also used for recruitment of participants since the people that visit the senior center tend to be those fitting the population necessary for the program. It should also be noted that the individuals from the senior center that participated in the fall prevention program had already been doing their own informal exercise group daily.

Small rural communities may not appear to have the resources available to implement a fall prevention program but this is likely an inaccurate assessment.

Providers may find that the community has many more resources after some investigation and discussion with community members.

Observations

Participant Recruitment

Local healthcare providers were contacted and given information regarding the fall prevention program. The providers seemed to be very interested in the project and agreed to help. However, none of the physicians, nurse practitioners, or physician's assistants contacted ended up sending any referrals.

The information was shared with cardiopulmonary rehab in hopes that some referrals to the program could be made. The leader spent a lunch with the cardiopulmonary rehabilitation clinic provider who had a different plan for the program. The providers expressed interest in using the fall prevention program as an addition or supplement to the cardiopulmonary rehabilitation program. Unfortunately, the program as it is designed cannot be billed to insurance, making it unlikely to be picked up by hospital administration. No referrals were obtained from this resource either.

The actual recruitment of participants started with the researcher contacting older adults in the community. After contacting one possible participant, the door was opened to many more potential participants. The researcher was directed to follow up at the senior center as a possible well for recruitment. The members of the senior center were enthusiastic about the program and offered the space to implement the program if needed. The leader designed and distributed a flyer to the senior center to encourage more participants to attend the program.

The difficulty in getting providers to recruit participants came as a shock. Many of the local providers expressed concern about the number of falls in the community and expressed enthusiasm in the possibility of decreasing falls. It would seem that the program would need more buy in from the providers and increased community attention before researchers started seeing referrals.

Program Resources

The program did not require a large amount of resources and those resources turned out to be surprisingly easy to find in the community. Resources included personnel available to help with the program, space to provide the program, and any material necessary to complete the program.

There are a limited number of physical therapists in the rural community where the program took place. The local physical therapists reported that they had fallen behind due to the global COVID-19 pandemic and would not be able to participate in the fall prevention project this year. Physical therapy also mentioned that they had a fall prevention program already in place but were not offering it this year due to the pandemic. However, there was no information available at the time for the researcher to review the program.

The program was presented to the local hospital who had expressed interest in hosting the fall prevention program in the past. The hospital had also hosted a successful diabetes health education program. Hospital administration felt that the program would be a good fit and help meet trauma council criteria but ultimately declined accepting the

program at this time. Administration felt that gathering a group of older adults who are at a higher risk of contracting and dying from COVID-19 would be too great of a risk.

It was interesting and eye-opening to find that the local community had resources that would enable implementation of the program. The senior center is obviously a valuable resource for programs aimed at older adults in the community. The ability of the church to provide durable medical equipment is beneficial for community members as well.

Fall Risk Program in Action

The researcher ended up providing this program in two slightly different methods. One was in a small group that consisted of six members and met weekly for one hour. The other method was individually in the participant's residence. Each method had benefits and each had pitfalls.

The group meeting allowed the leader to engage more participants at one time, decreasing the time needed to perform the program. The participants were able to interact with each other and encourage each other when performing the exercises. Group discussions were engaging and allowed for the inclusion of many ideas.

The attendance rate of the meeting was variable. Two participants were late to every group meeting. One participant came to every other meeting and one participant did not return after the initial meeting. When meeting in a place other than the participant's residence, it was hard to ensure participation and attendance.

It would have been beneficial to have an assistant when performing the functional assessments. This would have allowed the assessments to be performed quicker so participants did not have to wait for all the assessments to be completed.

Meeting with individuals on a one-on-one basis did ensure that participants were available and participating in each weekly meeting. The leader was able to correct exercise techniques and ensure proper body mechanics while performing the exercises. The group leader was also able to perform the assessment of the home and address any fall risks.

The greatest drawback with the individual sessions was time. The instructor was limited in the number of participants that could be seen in one day. In addition to the hour-long meeting, time spent travel to participants' residences was also considered.

Overall, there were no significant differences in the outcomes of the functional assessments of the participants, when compared between group and individual sessions. Further exploration into the long-term benefits of each of the methods of program delivery would help identify which method would be better for participants.

Isolation

The fall prevention program happened to take place during an extraordinary time when the human population was facing the COVID-19 pandemic. The CDC has recommended decreased travel particularly for older adults, social distancing, frequent hand washing, and using masks when going out in public. This led to many older adults becoming isolated. Many participants mentioned having decreased visits from family members and friends along with decreased outings.

Participants in the fall risk program mentioned that the program helped decrease the feeling of isolation. Participants completing individual session in their home felt especially grateful to have visitors again. Even when not faced with a pandemic, some older adults may feel lonely or isolated when family or friends do not visit. Helping older adults feel less lonely and less isolated was an unexpected yet positive outcome of the fall prevention project.

Evaluation of Theoretical Framework

Betty Newman's systems model was a good fit for this project. The focus was on prevention of falls which aligns with the foundation for the system's model. Discussions in the program focused on potential stressors that could cause the participant to experience a fall. The exercises in the program helped protect the participant from experiencing a fall along with providing protection against a serious complication should a fall occur. The program continually reevaluated the participants for advancement or the need to revisit fundamentals.

Evaluation of the Logic Model

The logic model was used to identify short-term, intermediate, and long-term goals. The short-term goal of improving strength and balance of participants was met with this project. Participants also experienced a reported improvement in quality of life. The intermediate-goals have also been met in the project. The author has identified the resources necessary to continue implementation of the fall prevention program. The long-term goal will need further evaluation to assess whether there was a reduction in the number of falls by participants.

Limitations

The primary limitation of this study was time. While there were noticeable improvements in the functional assessments, participants would likely see greater improvement after a longer period of time. It can take time to increase strength and balance. Six-weeks does not provide enough time to give an accurate assessment of participants' gains.

Participant adherence is a limitation of this study also. In the group, there were some participants that did not fully attend the program. Participants were expected to do the exercises on their own but there is no way to verify completion of exercises at home. The exercise record was to be completed by participants and the instructor was unable to validate the accuracy of this tool.

Implications for Future Projects

The author believes that this project should continue in the future, utilizing both the in-home and group meetings. The participants all reported enjoying the program and the desire to continue or repeat the program.

For future projects, additional instructors or an assistant would be beneficial. This would ensure that the functional assessments are completed in a timely manner. By having an assistant, meetings could continue at their designated time. An additional instructor or assistant could help with the assessment of patient medications as well.

The program would also benefit by adding two or three extra weekly meetings with the participants. This would enable participants to see greater improvements and increased confidence in strength, balance, and independence. Adding extra time would

allow for more discussion of fall risk interventions or concerns experienced by the participants. Furthermore, following up with the patients via phone calls or home visits would allow evaluation of the long-term effectiveness of the program.

Implications for Future Practice

The author felt that the most important finding in this project was that even in a short period of time, participants began seeing improvements in strength, balance, and confidence and a decrease in their fears of falling. Nurse Practitioners can refer patients to fall prevention programs or even start their own in their community. While there is some time commitment, it will not take long to start seeing the benefits.

There remains a large need for increased awareness of the need for fall risk prevention for the older adults in our community. Nurse Practitioners are likely to address this need, especially when made aware of the ability to reduce the risks. Nurse practitioners can easily advocate for fall risk prevention interventions in their communities. As evidenced by the lack of referrals, increasing awareness may be the first step.

Conclusion

The overall aim of this project was to identify an effective fall prevention intervention that could reduce the risk of falls of older adults in the rural community. The modified program comprised of evidence-based programs has shown that there is real possibility of helping the older adults in rural communities. The project has also demonstrated that it is possible to successfully implement the program with limited resources and only one group instructor.

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APPENDIX

Appendix A
Fall Prevention Flyer

Maintaining Independence

6 Weekly Meetings

Date and Time: TBD

Offering an in home fall prevention program.

Spend time learning strength and balance boosting moves with a trained professional.

These programs have been proven to decrease falls by up to 35%. Please call for more information.

Candice Morris
Family Nurse Practitioner

* Certified Otago Exercise Program Provider *

Phone: (620) 365-9748
Email: burnsterry@sbcglobal.net

*No cost for participants

*Must be 65 years of age or older

*Must live at home

Appendix B
Fall Questionnaire

1. Have you fallen in the past year?	Yes	No
2. Do you sometimes feel unsteady on your feet, dizzy, or lightheaded?	Yes	No
3. Do you have to push up with your hands when standing from a chair?	Yes	No
4. Do you exercise?	Yes	No
5. If you exercise, do you exercise for 30 minutes or more?	Yes	No
6. Do you take medications that make you feel lightheaded/dizzy or more tired than usual?	Yes	No
7. Do you take medication to help you sleep or improve your mood?	Yes	No
8. Have you had an eye exam in the past 2 years?	Yes	No
9. Are you worried about falling?	Yes	No
10. Do you feel safe at home?	Yes	No
11. Are you concerned about living at home by yourself?	Yes	No

Appendix C

Functional Assessment Documentation

Participant ID: _____

Functional Assessments								
	Baseline				Week 6			
TUG Record tenth of a second (0.0 seconds)								
30 Second Chair Stand Number of Raises								
Four Stage Balance Test Hold for 10 second? Y, N, or X	1	2	3	4	1	2	3	4

Appendix D

CDC Fall Risk Factor Checklist

CHECKLIST

Fall Risk Factors

Patient _____

Date _____

Time _____ ☐ AM ☐ PM

Fall Risk Factor Identified	Present?	Notes
FALLS HISTORY		
Any falls in past year?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Worries about falling or feels unsteady when standing or walking?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
MEDICAL CONDITIONS		
Problems with heart rate and/or arrhythmia	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Cognitive impairment	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Incontinence	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Depression	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Foot problems	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Other medical problems	<input type="checkbox"/> Yes <input type="checkbox"/> No	
MEDICATIONS (PRESCRIPTIONS, OTCs, SUPPLEMENTS)		
Psychoactive medications	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Opioids	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Medications that can cause sedation or confusion	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Medications that can cause hypotension	<input type="checkbox"/> Yes <input type="checkbox"/> No	
GAIT, STRENGTH & BALANCE		
Timed Up and Go (TUG) Test ≥ 12 seconds	<input type="checkbox"/> Yes <input type="checkbox"/> No	
30-Second Chair Stand Test: Below average score based on age and gender	<input type="checkbox"/> Yes <input type="checkbox"/> No	
4-Stage Balance Test: Full tandem stance < 10 seconds	<input type="checkbox"/> Yes <input type="checkbox"/> No	
VISION		
Acuity $< 20/40$ OR no eye exam in > 1 year	<input type="checkbox"/> Yes <input type="checkbox"/> No	
POSTURAL HYPOTENSION		
A decrease in systolic BP ≥ 20 mm Hg, or a diastolic BP of ≥ 10 mm Hg, or lightheadedness, or dizziness from lying to standing	<input type="checkbox"/> Yes <input type="checkbox"/> No	
OTHER RISK FACTORS (SPECIFY BELOW)		
	<input type="checkbox"/> Yes <input type="checkbox"/> No	



Centers for Disease
Control and Prevention
National Center for Injury
Prevention and Control

2017

STEADI Stopping Elderly Accidents,
Deaths & Injuries

Appendix E Patient Referral Form

REFERRAL FORM

Fall Prevention Patient Referral

PATIENT INFORMATION	
Patient:	Referred to:
Sex: <input type="checkbox"/> Male <input type="checkbox"/> Female DOB: / /	
Address:	Address:
Phone:	Phone:
Email:	Email:
Diagnosis:	
TYPE OF REFERRAL	
Type of specialist:	
Exercise or fall prevention program:	
Additional recommendations:	
REASON FOR REFERRAL	
<input type="checkbox"/> Gait or mobility problems	<input type="checkbox"/> Medication review & consultation
<input type="checkbox"/> Balance difficulties	<input type="checkbox"/> Inadequate or improper footwear
<input type="checkbox"/> Lower body weakness	<input type="checkbox"/> Foot abnormalities
<input type="checkbox"/> Postural hypotension	<input type="checkbox"/> Vision <20/40 In <input type="checkbox"/> Right <input type="checkbox"/> Left <input type="checkbox"/> Both
<input type="checkbox"/> Suspected neurological condition (e.g., Parkinson's disease, dementia)	<input type="checkbox"/> Home safety evaluation led by occupational therapist
Other reason:	
Other relevant information:	
Referrer signature: _____	Date: _____



Centers for Disease
Control and Prevention
National Center for Injury
Prevention and Control

2017

STEADI | Stopping Elderly Accidents,
Deaths & Injuries

Appendix F

Informed Consent

Informed Consent

Name: _____

Date: _____

Dear Participant,

I am a student at Pittsburg State University in the Doctor of Nursing Practice program. In order to fulfill requirements of the program, I am conducting a study to evaluate the effects of a fall prevention program in a rural community. You have been asked to participate in this research of a fall prevention program. Please read all the information and ask the researcher if there is an information that is unclear of if you would like any further information.

Your healthcare provider has referred you to this program because he/she believes that you would benefit from the fall prevention program, regardless of whether you have experienced a fall in the past. Participation in this program may increase your confidence in living at home independently, which would increase your quality of life. The program may also strengthen muscles, improve balance, and increase your agility; thereby, decreasing your risks for falling and sustaining an injury at home.

The program is designed to last eight-weeks, beginning July 6, 2020 and ending August 20, 2020. Participants will meet for two-hour sessions once per week. In order to evaluate participant perceptions of falls, a short survey will be distributed and collected at the first group session and the final group session.

At each group session, you will be instructed on exercises and asked to do these exercises three times per week. In addition to these exercises, you will be asked to spend thirty minutes walking. You will be asked to keep a log of the activities, prescribed exercises and walking, that you are completing at home. The effectiveness of these exercises will be assessed by completing and documenting four assessments that evaluate your strength and balance.

The last session is designated as a home visit. I will perform an assessment for fall risks in your residence, and I will assist you with modifications as needed. I may include NMRMC case management to help with those modifications if we are unable to determine a plan during the home visit. During this visit, we will also review the exercises to determine if the home environment allows for you to perform them safely.

It is not mandatory to attend all eight sessions, but request that you notify the researcher if you are unable to attend. Additionally, if you do not feel comfortable with an in-home visit for the final session, arrangements could be made for an alternative method for the visit (i.e. telephone, FaceTime, or Zoom).

In order to protect other participants in the project and follow state mandated guidelines, you will be required to wear a face mask during group sessions. It is asked that you provide your own mask for these sessions; however, a mask will be made available to you if you can not provide your own. Please follow social distancing guidelines as appropriate during the group sessions.

Your participation is voluntary, and you are free to withdraw at any time. As a result of this program you may or may not have benefits to your physical or general health. There are also risks of injury including, but not limited to, muscle aches and pains. As a participant you choose to pursue this program and assume personal liability for any injuries incurred.

Any information obtained will be kept confidential and shredded after completion of the program. This program will also maintain patient rights as designated by the Health Insurance Portability and Accountability Act (HIPAA). By signing below, you are agreeing to the use of your results for study purposes, the program has been explained, you have no further questions, and you are personally responsible for your health and safety.

Thank you,

Candice Morris MSN, APRN-C, FNP

Participant Signature: _____ Date: _____

Appendix F

Physician Medical Clearance

Medical Clearance Form

Your patient _____(name), _____(DOB) has been selected to participate in a fall prevention program, which uses exercise to build strength and balance. In order for your patient to participate, medical clearance is required. Medical clearance indicates that this patient has contraindications for participation in a gentle exercise program.

_____ is medically stable to participate in the fall prevention program as well as perform the exercises prescribed in the program.

Please list any restrictions or concerns (including medications)

Provider Details

Name: _____

Address: _____

Phone No: _____

Email: _____

Signature: _____ Date: _____

Appendix G Course Evaluation

	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
The course was presented in an organized manner					
Course material was clear and easy to understand					
Participant packet was clear and enhanced the material covered in this course					
Exercises were demonstrated so that you fully understood how to perform them					
Guest speakers were beneficial to the content covered					
You are likely to use the knowledge gained in this program in the future					
You have already started making long term changes from the lessons learned through this program					
You will modify your risk factors at home					
You are likely to continue the exercises at home after completing the program					
You feel less afraid of falling					
You are more confident living at home alone					
The leader was knowledgeable about this topic					
The leader was easy to follow					
Overall satisfaction with this program					
Comments:					