

# UNIVERSITY *of* **INDIANAPOLIS**

---

## *School of Occupational Therapy*

Impact of a Fall Risk Education Program on Productive Aging:

Motivators and Barriers to Change

Fiona Brown, Meghan Crull, Kiersten Ham, Aundrea Sellers, Ellen Thomas, & Katherine

Zaborowicz

University of Indianapolis

December, 2017



A research project submitted in partial fulfillment for the requirements of the degree of Master in Occupational Therapy in the School of Occupational Therapy at University of Indianapolis.

Under the direction of the research advisor:

Brenda S. Howard, DHSc, OTR

# A Research Project Entitled

Impact of a Fall Risk Education Program on Productive Aging:

Motivators and Barriers to Change

Submitted to the School of Occupational Therapy at University of Indianapolis in partial fulfillment for the requirements of the degree of Doctor in Occupational Therapy.

By

Fiona Brown, Meghan Crull, Kiersten Ham, Aundrea Sellers, Ellen Thomas, & Katherine Zaborowicz

Approved by:

\_\_\_\_\_  
Research Advisor (1<sup>st</sup> Reader)

\_\_\_\_\_  
Date

\_\_\_\_\_  
2<sup>nd</sup> Reader

\_\_\_\_\_  
Date

Accepted on this date by the Director of Occupational Therapy:

\_\_\_\_\_  
Dr. Kate E. DeCleene Huber  
Director of Occupational Therapy

\_\_\_\_\_  
Date

### Abstract

Falls are a leading cause of fatal and non-fatal injury, and fear of falling decreases older adults' independence and ability to do typical activities. Multifactorial falls prevention programs have been effective in decreasing the number of falls and fear of falling. The purpose of this study was to determine whether the implementation of a brief fall risk education program increased the awareness of fall risk among older adults in the surrounding community. A total of 25 participants, with a mean age of 78.64 years, from four different community-based sites were included in the mixed methods pretest-posttest design. The participants were educated on the eight aspects of the *My "Safe and Sound" Plan* workbook, filled out the S-FES-I pre- and post-education, and participated in a focus group after the educational component. Data were analyzed using a Related Samples Wilcoxon Signed Rank Test. Investigators noted, although not significant, raw S-FES-I scores trended toward an improvement from pre- to post- scores. The program was viewed as a quality resource for individuals who followed through with the intervention, and those that did not follow through with the workbook had priorities other than fall risk. The results suggested that a brief educational falls prevention program increased the fall risk awareness of the participants and can be an effective resource for clinicians.

### Acknowledgements

This project was affiliated with the University of Indianapolis and was completed in partial fulfillment for the degree of Doctor of Occupational Therapy (OTD) for Fiona Brown, Meghan Crull, Kiersten Ham, Aundrea Sellers, Ellen Thomas, and Katherine Zaborowicz.

We extend our deepest gratitude for the assistance of this project to Beth Ann Walker for being our second-reader, Stephanie Combs-Miller for assistance with data analysis, and the Baxter YMCA, Perry Seniors, University Heights United Methodists Church, and Altenheim for partnering with us for completion of this project.

This project was funded in part through an InQuery Grant from The University of Indianapolis, 1400 East Hanna Ave., Indianapolis, IN 46227.

## Impact of a Fall Risk Education Program on Productive Aging:

### Motivators and Barriers to Change

Approximately one-third of Americans aged 65 and older fall each year (National Council on Aging [NCOA], n.d.). Falls and fall related injuries have been a threat to the health of older adults (Centers for Disease Control and Prevention [CDC], 2015). Falls have been the leading cause of fatal and non-fatal injury for older Americans (NCOA, n.d.). Approximately \$34 billion a year have been spent on 2.5 million older adults treated in emergency rooms due to falls (CDC, 2015). Even just the fear of falling has inhibited older adults from doing typical activities (Bertera & Bertera, 2008). Many factors have impacted fall risk such as: lower body weakness, vitamin D deficiency, poor footwear, medication use, vision problems, home/living hazards, and gait abnormalities (American Geriatrics Society and British Geriatrics Society [AGS & BGS], 2010; CDC, 2015). Falls and fear of falling have decreased independence (Ward-Griffin et al., 2004) and social engagement (Seo & Kim, 2014), and have increased anxiety (DeGuzman et al., 2013) and depression (Eggermont, Penninx, Jones, & Leveille, 2012). As the population has aged, fear of falling and fall risk has increased (Elliott, Painter, & Hudson, 2009).

Previous studies have shown that multifactorial falls prevention programs have been most effective in decreasing the number of falls and fear of falling (Chase, Mann, Wasek, & Arbesman, 2012; Gitlin et al., 2006; Tse, 2005; Zijlstra et al., 2007). There has been a need to provide community-dwelling older adults with information regarding all aspects of multifactorial fall risks to help prevent injuries and death (Gitlin et al., 2006). Based on feedback from community focus groups in the surrounding Perry Township area of Indianapolis, there is a need for brief accessible educational falls prevention programming (Howard, Baca et al., 2016).

The purpose of this study was to determine whether the implementation of a brief

educational falls prevention program increased the awareness of fall risk among older adults in the surrounding community. Specifically, the study examined if a one-time educational intervention was effective for increasing fall risk awareness in older adults in four community settings near the University of Indianapolis. A secondary objective was to examine the effectiveness of the intervention on increasing falls-self efficacy, measured using the Short Falls Efficacy Scale International (S-FES-I; Kempen et al., 2008). The S-FES-I was administered at the beginning of the educational session and at one-month post intervention.

### **Background and Significance**

Older adults, defined as age 65 and older, have been most likely to experience a fall, and falls were the second highest leading cause of death throughout the world (World Health Organization, 2012). The World Health Organization (WHO, 2012) defined a fall as “an event which results in a person coming to rest inadvertently on the ground or floor or other lower level.” According to the Center for Disease Control (CDC, 2015), one fall doubled the likelihood of falling again, which increased the older adult’s chances of acquiring a traumatic brain injury, bone fractures, fear of falling, and admission into a hospital. A single fall could increase an older adult’s risk of being admitted to a nursing home within 12 months by four to five times, and multiple falls could double the risk of death for older adults within 12 months (Power & Clifford, 2013). Males have had a greater likelihood of sustaining a fall that leads to a significant increase in the potential years of life lost, whereas older women have been more prone to falls in general (WHO, 2012). As the Baby Boomer generation has entered into the age of being considered an older adult, it has been important to register the impact of falls and the subsequent medical costs in the United States. As the population has aged and falls have increased, it has been crucial to introduce educational programs to support the decrease of falls of older adults (CDC, 2015).

### **Risk Factors**

There have been a number of factors associated with falling. In order to help prevent falls in community-dwelling older adults, the investigators explored the fall risk factors that have increased the risk of falling. Some fall risk factors were modifiable and may decrease the likelihood that older adults will fall. Risk factors such as vitamin D deficiency, use of more than four prescription medications, poor footwear, and vision problems have increased the likelihood of falling (CDC, 2015). Physical activity has been a first line of defense against falls because it strengthens muscles, increases flexibility, and improves balance (NIH Senior Health, 2013). The home environment has been another risk factor for older adults, considering half of all falls have occurred within the home (Rogers, Rogers, Takeshima, & Islam, 2004). Older adults have been able to modify their fall risk factors by attending to them, as well as participating in daily exercise and improving home safety (CDC, 2015). Therefore, it is imperative that older adults in the community are educated on fall risks and falls prevention strategies. An educational program would provide them with the necessary information to reduce fall risks as they age.

### **Health & Medication**

A variety of fall risk factors have increased the likelihood of falling, including diet (DeGuzman et al., 2013), depressive symptoms (Eggermont et al., 2012), and medication usage (Askari et al., 2013). DeGuzman et al. (2013) found that a poor diet increased the use of ambulatory aids, which increased the risk of falling. Obesity was significantly correlated with poor coordination, body instability, and dizziness, which has put people who are obese at a greater risk for falling (Mitchell, Lord, Harvey, & Close, 2014). Eggermont et al. (2012) reported a relationship between depressive symptoms and the increased use of medication, poor balance, low physical activity, and poor cognitive function. Medications that have had the strongest risk

for falls included psychotropic medications and polypharmacology (AGS & BGS, 2010). Buatois et al. (2010) found that an older adult was at a higher risk for falls if they were taking more than four medications. Older adults have often experienced cataracts, macular degeneration, glaucoma, and other visual conditions that affect their risk of falling (AGS & BGS, 2010). Specifically, low vision was a characteristic of older adults that could usually be improved, but if unresolved may have caused an increased risk for older adults to fall (Ray & Wolf, 2010). Incorporating information on polypharmacology, poor diet, low vision, and depressive symptoms into an educational program could increase awareness of the need to manage these factors in order to reduce the risk of falls in older adults.

### **Fear of Falling**

It has been important to older adults to maintain independence without falls or the fear of falling controlling their everyday lives (Ward-Griffin et al., 2004). Therefore, one of the largest components discussed in the literature has been fear of falling. Fear of falling has been used as an umbrella term to cover multiple psychological phenomena in older adults, including balance confidence (Filiatrault et al., 2013). Yardley et al. (2005) defined the concept of falls self-efficacy as “confidence in performance activities without falling” (p. 615). DeGuzman et al. (2013) found that a history of falls, mental status, and fear of falling had a significant impact on fall risk. The CDC (2015) suggested that fear of falling may have caused an older adult to become less active and therefore increase their risk of falling. Older adults’ fear of falling and self-confidence have played a role in the dynamic tension between exercising precaution while remaining independent (Ward-Griffin et al., 2004).

Living alone has constituted a fall risk factor, but it was a factor that adults may have preferred in order to remain independent (Buatois et al., 2010). Elliott et al. (2009) suggested that



living alone has been a risk factor that increased fear of falling. Among a sample size of 338 adults who lived alone, 51% expressed fear of falling (Elliott et al., 2009). Living alone also significantly correlated with the seriousness of injuries after falls, use of ambulatory aids, safety equipment, emergency services, and the increased likelihood of avoiding activities (Elliot et al., 2009). Older adults who displayed the greatest fear of falling were those who lived alone (Bertera & Bertera, 2008). DeGuzman et al. (2013) hypothesized that with a better support system, older adults would be less likely to fall.

### **Autonomy & Activity Avoidance**

The struggle to maintain autonomy has been considered a modifiable risk factor and has been defined as “self-determination, self-rule, liberty of right, freedom of will, and being one’s own person” (DeGuzman et al., 2013, p. 671). Older adults placed great value in maintained independence and staying active in their own communities (McMahon, Talley, & Wyman, 2011). Older adults’ desire to continue living independently has become more important than recognizing limitations or revealing those limitations to others and jeopardizing one’s independent living arrangement. Therefore, older adults have self-imposed limitations or created their own adaptations for performing tasks (DeGuzman et al., 2013). This activity restriction has been found to lead to a decline in physical and mental function that could lead to more falls (DeGuzman et al., 2013). Additionally, Bertera and Bertera (2008) found that activity avoidance increased as falling increased. From a sample of 3,474 older adults, 66.6% avoided activities because of their fear of falling. Avoiding activities led to a decrease in socialization, independence, and physical activity (Bertera & Bertera, 2008). Seo and Kim (2014) found that an increase in social participation had a significant benefit on leg strength. This improvement demonstrated the effect social participation could have on falling; therefore, maintaining

socialization and independence could have a positive impact on decreasing fall risk (Seo & Kim, 2014). Painter et al. (2012) found significant relationships between activity level, fear of falling, and anxiety. The investigators found that as activity level decreased, fear of falling increased (Painter et al., 2012). While previous research has shown that an increase in social participation decreased fall risk, many of these studies suggested that avoiding activities has been a chronic problem among older adults and could increase the likelihood of experiencing falls (Bertera & Bertera, 2008; DeGuzman et al., 2013; McMahon et al., 2011; Painter et al., 2012; Seo & Kim, 2014).

There have been a few non-modifiable risk factors that older adults have experienced, which increased fall risk. Gender was a non-modifiable fall risk factor. Women have been the most likely to sustain a fall as well as live alone (Buatois et al., 2010; Elliott et al., 2009; WHO, 2012). As women age, they were also more likely to live alone (Elliott et al., 2009). Lim and Sung (2012) found that the non-modifiable risk factor of chronic disease was the most significant risk factor to produce falls. Given the evidence in the literature on preventing falls, the components of non-modifiable fall risk factors, modifiable fall risk factors, and causes of falls have been important components to be integrated into educational falls prevention programs.

### **Prevention Plans**

#### **Physical Activity and Exercise**

Older adults who were more active had a significantly lower chance of falling (Perracini, Teixeira, Ramos, Pires, & Najas, 2012). According to Ward-Griffin et al. (2004), there was a dynamic tension between the desire to be independent and the exercise precautions of older adults. Yamada et al. (2013) found that a multi-target stepping test along with a standardized exercise program had effectively improved the balance and coordination of older adults, and this

improvement had an impact on the prevention of future falls. Exercise programs that included balance were more effective than those that did not (Power & Clifford, 2013; Tiedemann, Sherrington, & Lord, 2013). Additionally, investigators found that participants who completed Pilates exercises demonstrated strength and balance improvements, but those who continued Pilates for a longer period of time exhibited a significantly greater improvement (Bird & Fell, 2014). Li et al. (2008) found that participants in a 12-week tai chi intervention showed significant improvements in functional reach, up and go test, chair stands, and 50-ft speed walk (Li et al., 2008). Another intervention, the Lifestyle integrated Functional Exercise (LiFE) program, incorporated balance and strength training activities into the daily lives of older adults living at home, and that the implementation of the LiFE activities, as well as balance training exercises three days a week, increased quality of life, balance abilities, activities of daily living, and overall health, and decreased the rate of falls among older adults (Clemson et al., 2012; Kuptniratsaikul et al., 2011). It is evident from the literature that a variety of means of increasing physical activity have proven effective in improving balance and physical functioning.

### **Home Modifications and Environmental Risk Factors**

Another important risk factor for falls is the safety of the home. Many older adults have preferred to age in place within their homes; however, their environment has not always been conducive to this desire. Previous literature has made it a goal to identify the prevalence of home hazards that contribute to falls (Carter et al., 1997; Connell, 1996; Northridge, Nevitt, Kelsey, & Link, 1995). The CDC (2015) suggested that modifications to the home, including removing trip hazards, adding grab bars to showers and toilets, placing railings on both sides of staircases, and making sure the home is well lit would aid in the reduction of fall risk. Self-assessments encouraged older adults to think about all areas of their home that could cause a fall (You,

Deans, Liu, Zhang, & Zhang, 2004). Due to the predictability of experiencing falls in the home, it has been important to educate clients on home hazards (Northridge et al., 1995). Additionally, investigators found that a home safety intervention that assessed environmental hazards and potential for change, facilitated modifications within the home, and educated clients on the use of technological and mobilization aids was significantly effective in reducing the risk of falling in older adults (Nikolaus & Bach, 2003). Comprehensive home assessment interventions could successfully reduce the likelihood of serious falls (Currin, Comans, Heathcote, & Haines, 2012). Since certain specific environmental variables have contributed to a majority of falls, focus should be on removing these potential hazards from the home environment (Pynoos, Steinman, & Nguyen, 2010; Rogers et al., 2004). Having a well-designed home environment in conjunction with appropriate modifications should help re-establish the balance between new challenges adults face due to aging and the demands from their environment (Pynoos et al., 2010).

### **Multifactorial Falls Prevention Programs**

Multifactorial falls prevention intervention programs have had the greatest effect on decreasing falls and fall risk (Chase, Mann, Wasek, & Arbesman, 2012; Gitlin et al., 2006; Tse, 2005). Multifactorial programs have been designed to address factors that can include exercise, education, home modifications, medication management, self-efficacy, tracking falls with a calendar, proper footwear, community safety, and vision management problems (AGS & BGS, 2010). The most effective multifactorial programs are those which can be individualized to participants; multicomponent programs with exercise; and programs that included environmental modifications (Filiatrault et al., 2007; Kramer et al., 2014; Zijlstra et al., 2007). A falls prevention program within the community reported increased vitamin D intake, amount of physical activity per week, and home safety scores, and found that those with the greatest fall

risk prior to intervention displayed the greatest improvements during the posttest (Teems, Hausman, Fischer, Lee, & Johnson, 2011). According to Filiatrault et al. (2007), programs that included educational and exercise components which could be completed independently at home successfully raised fall risk awareness for community-dwelling older adults. According to York, Shumway-Cook, Silver, and Morrison (2011), the most valued component of the educational prevention intervention was exercise information (72% valued), health information (54% valued), footwear and foot care information (21% valued), home safety information (20% valued), medication safety information (10% valued), and assistive devices information (8% valued). With a 12-month long community-based education program, participants demonstrated significant increases in strength, balance, and mobility, proving effectiveness of the “Stay Active and Independent for Life (SAIL)” program within the community (York et al., 2011). Therefore, multifactorial educational programs have been effective falls prevention intervention programs for older adults.

### **Brief and Low Intensity Programs**

Brief programs (Elliott et al., 2012; Filiatrault et al., 2007; Garcia et al., 2012; Howard, Beitman, Walker, & Moore, 2016; Ness, Gurney, & Ice, 2003) and low intensity programs (Kramer et al., 2014) demonstrated effectiveness in increasing behaviors that prevent falls in participants. A brief educational falls prevention program increased knowledge of fall risks (Schepens, Panzer, & Goldberg, 2011). Elliott et al. (2012) provided evidence that conducting a fall risk screen at a community based fall prevention event was both feasible and efficient in changing activities and the environment in reducing fall risk. A brief program such as a screening and educational intervention has promoted behaviors that reduce fall risk among older adults (Ness et al., 2003). A low intensity exercise program including a self-administered home

assessment and self-administered fall risk checklist reduced falls and improved self-perception of gait (Kramer et al., 2014). The implementation of a brief falls educational program in addition to a low intensity exercise program improved overall awareness and influenced the development of behaviors that decrease fall risk (Elliott et al., 2012; Garcia et al., 2012; Ness et al., 2003; Schepens et al., 2011).

### **Role of the Occupational Therapist**

When older adults have been provided with education on falls prevention, even prior to their first fall, it reduced falls (Cohen, Miller, Shi, Sandhu, & Lipsitz, 2015; Schepens et al., 2011). Occupational therapy (OT) practitioners have been actively engaged in implementing and researching falls prevention education programs. Occupational therapy practitioners are knowledgeable given their expertise in conduction of home evaluations and education on home modifications, ability to educate on assistive technology, and training to implement activities to improve strength and balance (Chase, Mann, Wasek, & Arbesman, 2012; Clemson, Donaldson, Hill, & Day, 2014; Leland, Elliott, O'Malley, & Murphy, 2012). This type of training, as well as the use of a client-centered approach, positively impacted the delivery and quality of home intervention (Clemson et al., 2014). Clemson et al. (2008), upon their meta-analysis, found that interventions in which the interventionist had professional training in falls prevention interventions demonstrated greater success. Research also supported the benefits of home intervention conducted by an occupational therapist (Chase et al., 2012; Clemson et al., 2014; Clemson et al., 2008; Pighills, Torgerson, Sheldon, Drummond, & Bland, 2011). Pighills et al. (2011) further supported the benefits of a home intervention conducted by occupational therapists, finding that an occupational therapist's home modification assessment had a higher impact on reducing falls than a trained assessor. A client-centered approach, when used in

combination with intervention has been successful in limiting the number of falls and maintaining independence in community-dwelling older adults.

An evidence-based falls prevention program is needed for community-dwelling older adults in the area surrounding the University of Indianapolis (Howard, Baca, et al., 2016). In 2014, there were 103,039 older adults aged 65 and older living within the 396 square miles of Marion County, Indiana (United States Census Bureau, 2014). When statistics were compared with information from the National Council on Aging (n.d.), it could be expected that approximately 34,346 of older adults within Marion County would experience a fall this year. With the average cost of hospital stays after falls being \$35,000 per person (CDC, 2015), the associated cost of falls for this population could exceed \$1.2 billion. With Medicare paying for approximately 78% percent of the costs (CDC, 2015), the other \$940 million would have come from the pockets of the older adults in our community. The implementation of a brief falls prevention program for these individuals could decrease falls and the subsequent financial burden.

### **Summary of Literature**

The literature indicated that community-based falls prevention programs were a positive tool to implement change in the lives of older adults and decrease risk of falls (Elliott et al., 2012; Filiatrault et al., 2007; Gitlin et al., 2006; Kramer et al., 2014; Tse, 2005; Zijlstra et al., 2007). A multi-factorial program that included information on risk factors, physical activity, home modifications, fear of falling, autonomy, activity avoidance, and general falls information would be beneficial to the participants in this study. The purpose of this study was to determine whether the implementation of a brief educational falls prevention program increased the awareness of fall risk among older adults in our community.

Based on the literature, the primary investigator incorporated information on strategizing, medication management, heart health, vision, footwear and foot care, vitamin D and calcium, exercises for falls prevention, and a home safety check in the *My "Safe and Sound Plan"* workbook (Howard, 2016). Addressing these fall risk factors with the guidance of a skilled occupational therapist could further strengthen the educational component within the falls prevention program, leading to an increased awareness of fall risk, which in turn could reduce the number of falls in this population.

### **Methods**

A mixed-methods design was used to determine the effectiveness of a brief educational falls prevention program and whether it increased the awareness of fall risk among older adults in our community. The research question was addressed through use of pre- and post-intervention S-FES-I questionnaires (Kempen et al., 2008), self-report of number of falls, and focus groups to explore increase in awareness of fall risk, in order to investigate change in falls self-efficacy after intervention.

### **Ethics**

This study was approved as Exempt by the University of Indianapolis Institutional Review Board on June 23, 2016 (UIndy Study #0779). Informed consent was obtained from focus group participants with a written consent document prior to the educational session.

### **Recruitment**

The investigators sought to recruit a maximum of 12 participants in each of four community groups, for a maximum total of 48 participants. Participants were recruited by responding to flyers that were posted at each of the four locations. Upon request for location 1, the lead investigator and two students spoke with potential participants inquiring further



information than what the flyer entailed regarding participation in the research study. The community locations included a fitness club serving older adults, a community lunch program, a church group, and a retirement living center. Inclusion criteria included: 65 years of age or older, attended one of the four community locations, attended both sessions (educational component and focus group) led by the investigators, able to ambulate independently or with modified independence using a device, and were community-dwelling individuals. Exclusion criteria included altered mental status and did not return for the second session.

### **Procedures**

This study was a mixed methods design pretest-posttest study that used a questionnaire for the quantitative data and a focus group for the qualitative data. Investigators conducted two sessions at each of the four different locations. First, participants were asked to read over an informed consent document that outlined the study, fill out a demographic questionnaire (see Appendix A), and complete the pre-intervention S-FES-I questionnaire (Kempen et al., 2008; see Appendix B). Participants were assigned a number upon check-in in order to de-identify them when pre- and post-intervention S-FES-I scores were compared. Second, participants engaged in the educational component, which consisted of eight aspects of the workbook. Next, participants applied the workbook at home for a month as they saw fit. Participants then returned one month later and engaged in a recorded focus group to gather perspectives on the educational session and their own increase in fall risk awareness following use of the workbook. Participants also filled out a post-intervention S-FES-I questionnaire and turned in their calendar from the previous month. See Appendix D for the questions that were asked during the focus group. During data collection, investigators kept field notes on each session at the four locations.

## **Intervention**

Participants were educated on the eight aspects of the *My “Safe and Sound” Plan* workbook (Howard, 2016). See Appendix C for the contents of the *My “Safe and Sound” Plan* workbook. Investigators completed screenings, activities, and exercises included in the *My “Safe and Sound” Plan* workbook, with the participants. Investigators then educated the participants on how to utilize the workbook, checklists, and falls calendar as part of the educational intervention.

## **Measures**

The Short Falls Efficacy Scale-International (S-FES-I; Kempen et al., 2008) had exceptional construct validity and reliability. Lower S-FES-I scores indicate a decrease in concern of falling. It has been a sufficient measure to assess fear of falling in older adults (Kempen et al., 2008). Additionally, the investigators collected demographic data from the participants in the focus groups. Along with the quantitative data, a qualitative approach in the form of a focus group was used to best encapsulate the lived experience of the participants (Cheng, 2007). The focus group questions were also designed to collect data on whether the educational falls prevention intervention increased participants’ awareness of falls risk.

## **Analysis**

Investigators completed a Related Samples Wilcoxon Signed Rank Test based on the nonparametric nature of the data, to compare means of the S-FES-I scores pre- and post-intervention (total score and scores on individual question items). Throughout the qualitative data analysis process, the investigators kept an audit trail. The researchers transcribed the recordings and read through them until code saturation was reached and all investigators agreed on codes. The grounded theory approach was used to analyze transcriptions in order to investigate themes (Charmaz, 1996). Investigators took field notes during focus group sessions in

order to identify themes discussed. Investigators kept an audit trail to track analysis of themes. Investigators coded transcriptions based on *a priori* codes (fall risk awareness and falls self-efficacy) and open coding, and further organized into related themes. Prolonged engagement with the data and multiple readings were completed until code saturation and investigator agreement were reached, in order to assure trustworthiness of the data.

## **Results**

### **Participant Characteristics**

A total of 35 participants attended the educational component of the study. Location 1 had four participants, location 2 had 16 participants, location 3 had seven participants, and location 4 had nine participants. Though the initial inclusion criteria only included 12 participants per location, location 2 included 16 individuals due to the quality of group and how well they all knew one another prior to the workshop. All participants were Caucasian or an undeclared ethnicity, and were able to ambulate independently or with use of an assistive device. Two of the participants used wheelchairs for longer distances only, therefore they were still included in the study.

All four participants from location 1 returned for the focus group session. There were three participants that did not return to location 2 due to illness and being unavailable, two participants did not return to location 3 due to travel and an unknown reason, and five participants were unable to return from location 4 due to a fall resulting in an injury and four did not return for an unknown reason. A total of 25 participants, with a mean age of 78.64 years old, were included in the results of the study (Table 1). Females made up 64% (n=16) of participants, and males made up the remaining 36% (n= 9). Out of these 25 participants, 44% expressed a moderate fear of falling prior to the intervention (Table 2). After completing the demographic

sheet and S-FES-I, 28% of participants reported experiencing a fall within the last year and 8% reported falling six or more times within the last year. Out of those that had experienced a fall, 32% indicated they suffered an injury related to their fall(s).

### **Quantitative Results**

Investigators found no significant difference between pre- and post-test of the S-FES-I total scores, nor on individual question scores (Table 3). However, a review of the raw data suggested that the data trended toward a decrease in scores (Table 4).

### **Qualitative Findings**

From analyzing the qualitative data, investigators agreed upon common themes that were found from each of the four focus groups. Participants reported the intervention increased their fall risk awareness due to the communication of common fall risk concerns. Some older adults even reported making changes to decrease their fall risk factors from the previous intervention session. Other adults reported that they were going to make some changes resulting from the falls education workbook, but had not yet done so. Additionally, some older adults claimed that they had recommended or were going to recommend the workbook to other adults in the community.

Participants occasionally stated they were already completing components of the workbook prior to the educational session. Some participants acknowledged previously engaging in exercises, removing throw rugs, and wearing supportive shoes. Although participants gave positive reviews about the workbook, not all individuals used or intended to use the workbook. Some of the participants stated that they did not use the workbook at all, with varying reasons.

**Summary of Themes.** The investigators created a visual diagram to represent major themes observed throughout this study (see Figure 1). Fall risk concerns were expressed throughout the educational sessions and focus groups. Concerns with balance and behaviors recurred as common intrinsic fall risk concerns. Additional extrinsic concerns were identified as

home modifications, throw rugs, and lighting. The participants verbalized that they had integrated some recommendation to decrease fall risk awareness prior to the intervention, such as footwear, exercise, vitamins, and walking devices. Factors related to aging recurred as additional fall risk concerns throughout the groups. Participants occasionally expressed that additional priorities overshadowed the workbook in the month between the educational sessions and the focus groups. Responses to the workbook were variable. The overall response to the workbook was positive, however not all participants utilized the workbook during the one-month study period. Many participants expressed that the workbook was a good resource they planned to utilize in the future and share with friends.

***Fall risk concerns.*** Throughout the educational sessions, the participants identified a variety of intrinsic and extrinsic concerns. Participants commonly identified balance and behavioral changes as intrinsic fall risk concerns. One participant stated, *“You have walked all your life so you think that’s just you know, a regular thing. And then you find out that you are not walking the way you were before, you’re not doing the same things, you are weaving around, your balance is not good.”*

Additionally, participants identified a surplus of extrinsic concerns that could result in a fall, such as home changes, tripping over pets, rugs, and poor lighting. One participant addressed her concern for tripping over her dog by stating, *“The dog is a problem, too. Getting up in the middle of the night and she’s right in the middle of the hall.”* Participants attempted to overcome the extrinsic fall concerns by discussing how awareness can play a role in falls. One participant stated that they needed to be *“...more aware while I’m walking. Because if I’m walking the dog I’m paying more attention to what he’s doing and where he’s going. Because if I don’t that’s*

*when I get in trouble I've learned I have to pay attention and know what's happening in the sidewalk along the way."*

The participants attempted to encourage and educate each other throughout the study as well. When one participant was hesitant to remove throw rugs, another participant pointed out that, *"It is cheaper to replace the carpet than to replace the bones in your body."*

***Fall risk awareness prior to intervention.*** Some of the participants identified numerous components of the workbook in which they had been participating prior to the falls prevention intervention. Footwear, exercises, vitamin D/calcium intake, and use of walking devices were some of the pre-falls prevention intervention actions identified. Many participants stated they were already taking vitamin D prior to intervention. In regard to footwear, one participant stated, *"I'm a converted beach bum. Out in California I only wore shoes when I had to. But now it is not safe so I figured I should stop going barefooted."*

***Other concerns related to fall risk.*** Participants identified other concerns related to aging and fall risk. Other concerns identified included: chronic health conditions, medication management, managing home modifications, medical expenses, and navigating the healthcare system. One participant stated, *"How do you know if you need to go to an ER in an ambulance or not? ... There... can be a cost, a big cost...."* Additionally, participants admitted that other priorities overshadowed the workbook in the month between the education session and the focus group. One participant admitted, *"Yeah, we've been painting today and that is probably most of the reason. We just didn't take the time that we needed to do. But honestly ... we need to go through some of that stuff today."* The majority of the participants that stated other priorities came before utilizing the workbook, but suggested they intended to utilize the workbook.

***Response to the workbook.*** Participants had various responses to utilizing Howard's *My "Safe and Sound" Plan* workbook (2016), and responses are represented in Figure 1. Not many participants verbally reported use of the workbook; however, several participants filled out their calendar which demonstrated some participation with the workbook. For individuals who did participate in the workbook, they commented on how the changes took some transition time. One participant gave an example of it taking them 2-3 days to move throw rugs out of their house. Some participants had not yet followed recommendations in the workbook, but commented about planning on making changes in the future. Some examples that participants talked about changing were using more lighting in the house, starting to pay more attention to where they were walking, and not carrying as many objects around the house.

Some participants claimed that they had not utilized the workbook. Reasoning for not using the workbook were that participants had other priorities like doing home maintenance or caregiving. Other participants did not make changes from the workbook because they were taking several fall risk preventative measures prior to the intervention. Preventative measures that were mentioned included not wearing open-toed shoes, attending a local balance institute, getting their vision checked yearly, and managing their medications.

Participants discussed how they thought the workbook was a good resource for fall prevention strategies and provided examples of how it was already being shared in the community with other older adults. In fact, participants at three out of four locations said that it was a good resource without being asked directly. One participant described the workbook as, *"If nothing else, it reinforces what maybe you already know but you never thought about. It's just the everyday stuff you do, but you got to stop and think and slow down..."*. Participants agreed if they are already educated about fall risk preventative measures, they can still benefit

from this workbook by it raising their awareness of their own knowledge. Participants demonstrated that they thought the workbook was a good resource by sharing it with other older adults in the community. If they did not share the workbook itself, other participants commented on how they shared specific recommendations to individuals from the workbook (e.g. grab bars, lower shelves). Some participants who did not share the workbook, discussed with the group how they thought it was a good resource to share to prevent falls.

***Changes made as a result of the workbook.*** Several participants commented that they had made changes as a result of the workbook. First of all, participants made some changes in their habits. Habits that the individuals changed highly varied from person to person, but some examples include carrying their cell phone outside while participating in outdoor activities alone, slowing down when completing tasks to prevent a fall, and managing their medication in a new way. Not only did participants change their habits as a result of the intervention, but they added some exercises and environmental changes as well.

During the focus group, participants discussed what exercises they had subsequently included into their daily routine. The exercises that the participants completed was dependent on what they felt was most important to improve (i.e. strength, balance, endurance, or flexibility) and/or if it was convenient to add into their daily routine. Some participants shared how they added specific exercises in their daily routine. For example, one participant stated that while she was doing her hair rollers in the morning, she would stand on one leg for some time and then switch to the other leg. This was an exercise that was included in the workbook but it was modified to best fit into the daily routine of the participant. Participants at location 4 felt there was a lack of resources and accessibility, which created a barrier for them to engage in health promoting activities. Specifically, participants at this location expressed the need for a gym and a



community program where they could engage in exercise classes with their peers. They believed these additions would be motivating and beneficial for them. For this reason, health care providers must consider how lack of accessibility and resources could cause barriers to falls prevention activities.

Environmental changes were made as a result of the recommendations given in the workbook. Again, participants gave a variety of examples of what they had changed in their home to help prevent falls. Some participants moved things around in the house to avoid tripping over objects and causing a fall. One participant commented that they removed five throw rugs to avoid tripping over them. Other participants commented on adding night lights or making flashlights more accessible in case they had to walk around at night.

***Narrative storytelling.*** Participants shared stories with the group to demonstrate their experiences related to fall risk and prevention. A lot of stories shared were about other older adults that participants knew in the community that had already fallen and been injured from the fall. Some adults told stories about what happened after they had a fall and how they sought medical attention. Another popular topic for the participants storytelling was discussing how their home environment affected their fear of falling. Specifically, many of these participants mentioned how they added grab bars and shower mats in the bathroom to prevent a fall from occurring.

## **Discussion**

The purpose of this study was to determine whether the implementation of a brief educational falls prevention program increased the awareness of fall risk among older adults in our community. Investigators confirmed the null hypothesis in relation to the S-FES-I. Review of the raw data indicated a trend toward a decrease in scores, which may have suggested participants were less concerned about fall risk after the intervention. After the qualitative data

were analyzed, investigators determined that those participants who were already knowledgeable about fall risks had become more aware and those who did not demonstrate fall risk awareness, had priorities other than fall risk.

There were several important insights gained after review of the qualitative findings from the four focus group locations. As shown in the visual diagram (Figure 1), several themes emerged from this study that demonstrated the progression of participants' understanding of fall risk and their experiences in response to the workbook. The fall risk concerns expressed by participants included intrinsic and extrinsic variables related to fall risk. Many participants identified balance as a common intrinsic factor that contributed to fall risk. This finding was similar to several other studies that found balance to be a significant fall risk factor among older adults (DeGuzman et al., 2013; Pynoos et al., 2010; Ray & Wolf, 2010). As individuals age, ability to balance may decrease as a result of loss of strength, stability, or other deficits in our sensory systems (CDC, 2015; Clemson et al., 2012).

Other intrinsic variables to fall risk included behavioral changes and attitudes towards fall risk. Many participants were able to identify potential fall risk behaviors such as standing on ladders to clean the gutters, avoiding open toed shoes, and use of throw rugs. However, some participants were still unwilling to make changes. Investigators believed this could be due to a variety of reasons. Some individuals may feel they have no one to assist them with home management tasks, leading to an increase in risk-taking behavior. Other individuals may not be concerned with falls or fall risk, therefore they did not make changes in their current behavior. There were also several extrinsic concerns that participants identified, such as home changes, physical environment, tripping over pets, rugs, and poor lighting, that were consistent with previous literature (AGS & BGS, 2010; CDC, 2015).

Investigators found some participants identified several components of the workbook in which they had been participating prior to the falls prevention intervention. Common areas of the workbook included footwear, exercises, vitamin D/calcium intake, and use of walking devices. As a result of participants already taking part in these areas, participants who were already knowledgeable about fall risks perhaps became simply more aware. It may also have contributed to why there was no significant difference in the S-FES-I data pre- and post-intervention. On the other end of the spectrum, for individuals who were not already incorporating interventions within the workbook, a one-time intervention may not be sufficient alone to motivate these individuals to make changes.

Additional concerns including aging and *other priorities* were common themes participants identified as factors related to fall risk. Some participants felt they lacked accessibility to resources that could facilitate engagement in health promoting behaviors. At each of the four focus group locations, race and class were fairly homogenous, while age and physical ability among participants varied. Given these differences, an individual's environment may either be facilitating or inhibiting to the development of falls and health promoting behaviors. Vision was one age-related health concern that was a common theme among participants, which was consistent with factors contributing to fall risk in the literature (AGS & BGS, 2010; CDC, 2015; Ray & Wolf, 2010).

In response to the workbook, other priorities appeared to be a predominant reason why some individuals did not follow through with the workbook. Participants expressed that other priorities such as home maintenance chores, caring for loved ones, and day-to-day life tasks prevented them from focusing on the workbook. Investigators noted that location 3 had the most other priorities. It was observed that this group as a whole was of lower socioeconomic status

(SES) in comparison to the other locations. Although SES was not collected from participants, it would be worth considering if SES impacted the results of this study. Furthermore, some participants were already partaking in fall risk prevention measures which may have led to poor follow through with the workbook. Interventions addressed in the workbook such as medication management, vitamin D and calcium, balance, exercise, and routine vision checks were areas some participants previously had knowledge on so changes may have been made prior to this study.

Several explanations may exist for the participants that did follow through with the workbook and make changes. First, a sense of community at one location may have contributed to strong follow-through. At location 1, there was a close-knit community among participants which many have led to an accountability factor with the workbook. These participants knew each other well and were already partaking in community programs together on a regular basis. For some participants, their own personal experience with falls may have been a motivating factor that lead to completion of the workbook. Some individuals commented on the fear from watching a neighbor or loved one fall, which may have facilitated adherence to the workbook as well. In general, participants that were already passionate about fall risk awareness utilized the workbook as another means to assist them in taking the steps to reduce their own fall risk.

Investigators discussed the impact on an increase in fall risk awareness and behavior changes that would lead to a reduction in falls. Ward-Griffin et al. (2004) found that low self-efficacy was related to fear of falling and reduced activity engagement and higher fall risk, and postulated that increasing fall risk awareness would increase falls self-efficacy. The current study did not confirm the Ward-Griffin et al. (2004) analysis and found that going over the fall risk awareness workbook alone was not sufficient to affect a change in falls self-efficacy over a

period of one month. Johansson and Jonsson (2013) found that decreased falls self-efficacy and falling were correlated, but did not discuss correlation between fall risk awareness and falls self-efficacy.

Participants felt that the workbook was a great resource to utilize and several individuals had already shared aspects of it with their peers. Regardless of whether or not participants followed through with the workbook, they acknowledged it helped reinforce information they already knew or reflect upon fall risk factors they might have otherwise not considered. Interventions in the workbook included such as exercise, home modifications, and behavioral changes were some areas participants admitted that they did not do, but should incorporate into their lives. One of the biggest barriers to creating fall risk awareness was that many individuals had other priorities that prevented them from focusing on fall risk and the workbook.

Upon reflection of the four focus groups, investigators found a sense of community was an advantage for fall risk awareness in this study, which was an unanticipated result. The locations with a strong and supportive community produced individuals with greater awareness of fall risk. A common theme throughout the intervention was narrative storytelling and a supportive social environment. Social interaction itself has proved to be an advantage to decrease fall risk in other research as well (DeGuzman et al., 2013; Seo & Kim, 2014). The overall findings support the workbook as a program to educate older adults on fall risk factors and prevention. Similar research also found that a brief educational falls prevention program has been effective for fall risk awareness (Chase, Mann, Wasek, & Arbesman, 2012; Gitlin et al., 2006; Tse, 2005; Zijlstra et al., 2007).

### **Implications**

Implications for future research include investigating if targeting a younger population,

those living independently younger than 65, would be more efficacious. The current research suggests that a preventative approach may be beneficial in preventing fall risks before they arise. Such an approach would target individuals at a time in their lives when they may be caring for aging parents or other older adults. The fall risk education program could introduce strategies to age in place and reduce falls before they are at greater risk. Additionally, a longitudinal study could investigate whether the benefits of a brief intervention are retained over time. A study with a larger number of participants would be advantageous to adequately power statistical analysis of the effectiveness of the intervention. Future research in regard to how lower SES correlates with fall risk should be investigated as it may be another contributing factor to falls among older adults. Finally, future investigation could research the correlation between fall risk and a supportive community setting through comparison between types of settings. For example, assisted living communities could be compared to community-based settings such as church groups or senior centers.

Implications for practice include that older adults may benefit from a brief educational program to address fall risks. Activities that encourage home assessment and positive lifestyle choices may reinforce safe behaviors and promote changes that will help individuals adhere to falls prevention strategies. The workbook which includes detailed information on falls prevention strategies, is a tool that can be easily shared with others. Qualitative findings suggested that encouraging older adults to have a support system was beneficial for compliance to falls prevention strategies. Practitioners can create an environment of support through the way the falls prevention program is structured. Qualitative findings also suggested that motivation is a key factor to complying with change; thus, practitioners should consider client motivation prior to falls prevention intervention. Enabling older adults to decrease their risk of falls is crucial to

their quality of life.

### **Limitations**

Sources of limitation in this study included a participant group that was not very diverse in age, sex, or ethnicity. Conversation strayed at times, which may have limited the investigators' ability to discuss the educational component as stories were often unrelated to the workbook. Many individuals did not complete the workbook or fill out the calendar on a regular basis. Additionally, a small sample size resulted in non-parametric data and possibly inadequately powered statistical analysis. The educational program and the workbook may have made the participants more aware of fall risk which in a greater fear of falling following intervention. Some individuals did not complete the workbook, and perhaps fear of falling was not the best measure of impact of the intervention. There were also participants that did not disclose cognitive deficits, but were noted by the investigators.

### **Conclusion**

The number of older adults over the age of 65 will be dramatically increasing over the next several years. Falls and fall related injuries pose a huge threat to older adults and it is essential they are equipped with the proper resources. Current research has indicated a number of multifactorial fall prevention programs have been effective in decreasing the number of falls. The purpose of this study was to examine whether the implementation of a brief educational falls prevention program increased the awareness of fall risk among older adults in the surrounding community. Older adults found a brief educational program with a workbook was a useful tool to increase awareness of fall risks. Group-based intervention with narrative storytelling was advantageous during the educational portion of intervention. Investigators determined that those participants who were already knowledgeable about fall risks had become more aware, and those

who did not demonstrate fall risk awareness had priorities other than fall risk. Although further research in this area is needed, evidence suggests that a brief educational falls prevention program can increase fall risk awareness among those concerned about fall risk, and can be an effective resource for clinicians to utilize in practice to promote fall risk awareness.



## References

- American Geriatrics Society and British Geriatrics Society, Panel on Prevention of Falls in Older Persons. (2010). *Summary of the Updated American Geriatrics Society/British Geriatrics Society Clinical Practice Guideline for Prevention of Falls in Older Persons*. Retrieved from [http://www.americangeriatrics.org/files/documents/health\\_care\\_pros/JAGS.Falls.Guidelines.pdf](http://www.americangeriatrics.org/files/documents/health_care_pros/JAGS.Falls.Guidelines.pdf)
- Askari, M. Eslami, S., Scheffer, A. C., Medlock, S., de Rooij, S. E., van der Velde, N., & Abu-Hanna A. (2013). Different risk-increasing drugs in recurrent versus single fallers: Are recurrent fallers a distinct population? *Drugs & Aging*, 30, 845-851. doi: 10.1007/s40266-013-0110-z
- Bertera, E. M., & Bertera R. L. (2008). Fear of falling and activity avoidance in a national sample of older adults in the United States. *Health & Social Work*, 33(1), 54-62.
- Bird, M. L., & Fell, J. (2014). Positive long-term effects of Pilates exercise on the age-related decline in balance and strength in older, community-dwelling men and women. *Journal of Aging and Physical Activity*, 22(3), 342-347. doi: 10.1123/japa.2013-0006
- Buatois, S., Perret-Guillaume, C., Gueguen, R., Miget, P., Vancon, G., Perrin, P., & Benetos, A. (2010). A simple clinical scale to stratify risk of recurrent falls in community-dwelling adults aged 65 years and older. *The American Physical Therapy Association*, 90(4), 550-560.
- Carter, S., Campbell, E., Sanson-Fisher, R., Redman, S., & Gillespie, W. (1997). Environmental hazards in the homes of older people. *Age & Ageing*, 26(3), 195-202.
- Centers for Disease Control and Prevention. (2015, September 21). *Home and recreational*

safety. Retrieved from

<http://www.cdc.gov/homeandrecreationalsafety/falls/adultfalls.html>

- Charmaz, K. (1996). The search for meanings: Grounded theory. In J. A. Smith, R. Harré, & L. Van Langenhove (Eds.), *Rethinking Methods in Psychology* (pp. 27-49). London: Sage Publications.
- Chase, C. A., Mann, K., Wasek, S., & Arbesman, M. (2012). Systematic review of the effect of home modification and falls prevention programs on falls and the performance of community-dwelling older adults. *American Journal of Occupational Therapy*, 66(3), 284-291. doi:10.5014/ajot.2012.005017
- Cheng, K. (2007). A study on applying focus group interview on education. *Reading Improvement*, 44(4), 194-198.
- Clemson, L., Donaldson, A., Hill, K., & Day, L. (2014). Implementing person-environment approaches to prevent falls: A qualitative inquiry in applying the Westmead approach to occupational therapy home visits. *Australian Occupational Therapy Journal*, 61(5), 325-334. doi:10.1111/1440-1630.12132
- Clemson, L., Mackenzie, L., Ballinger, C., Close, J., & Cumming, R. (2008). Environmental interventions to prevent falls in community-dwelling older people: A meta-analysis of randomized trials. *Journal of Aging & Health*, 20(8), 954-971.
- Clemson, L., Singh, M. A. F., Bundy, A., Cumming, R. G., Manollaras, K., O'Loughlin, P., & Black, D. (2012). Integration of balance and strength training into daily life activity to reduce rate of falls in older people (the LiFE study): Randomised parallel trial. *British Medical Journal*, 345, e4547. doi: 10.1136/bmj.e4547
- Cohen, M. A., Miller, J., Shi, X., Sandhu, J., & Lipsitz, L. A. (2015). Prevention program

- lowered the risk of falls and decreased claims for long-term services among elder participants. *Health Affairs (Project Hope)*, 34(6), 971-977. doi: 10.1377/hlthaff.2014.1172
- Connell, B. (1996). Role of the environment in falls prevention. *Clinics in Geriatric Medicine*, 12(4), 859-880.
- Currin, M. L., Comans, T. A., Heathcote, K., & Haines, T. P. (2012). Staying safe at home. Home environmental audit recommendations and uptake in an older population at high risk of falling. *Australasian Journal on Ageing*, 31(2), 90-95. doi 10.1111/j.1741-6612.2011.00545.x
- DeGuzman, A. B., Ines, J. C., Inofinada, N. A., Ituralde, N. J., Janolo, J. E., Jerezo, J. L., & Jhun, H. J. (2013). Nutrition, balance and fear of falling as predictors of risk for falls among Filipino elderly in nursing homes: A structural equation model (SEM). *Educational Gerontology*, 39(6), 441-453. doi: 10.1080/03601277.2012.661337
- Eggermont, L. H. P., Penninx, B. W. J. H., Jones, R. N., & Leveille, S. G. (2012). Depressive symptoms chronic pain, and falls in older community-dwelling adults: The MOBILIZE Boston study. *Journal of the American Geriatrics Society*, 60(2), 230-237. doi: 10.1111/j.1532-5415.2011.03829.x
- Elliott, S. J., Ivanescu, A., Leland, N. E., Fogo, J., Painter, J. A., & Trujillo, L. G. (2012). Feasibility of interdisciplinary community-based fall risk screening. *American Journal of Occupational Therapy*, 66(2) 161-168. <http://dx.doi.org/10.5014/ajot.2012.002444>
- Elliott, S., Painter, J., & Hudson, S. (2009). Living alone and fall risk factors in community-dwelling middle aged and older adults. *Journal of Community Health*, 34(4), 301-310. doi: 10.1007/s10900-009-9152-x

- Filiatrault, J., Belley, A., Laforest, S., Gauvin, L., Richard, L., Desrosiers, J., Parisien, M., & Lorthios-Guilledroit, A. (2013). Fear of falling among seniors: A target to consider in occupational and physical therapy practice. *Physical & Occupational Therapy in Geriatrics*, 31(3): 197-213. doi: 10.3138/cja.26.3.213
- Filiatrault, J., Parisien, M., Laforest, S., Genest, C., Gauvin, L., Fournier, M., Trickey, F., Robitaille, Y. (2007). Implementing a community-based falls-prevention program: From drawing board to reality. *Canadian Journal on Aging* 26(3), 213-226. doi: 10.3138/cja.26.3.213
- Garcia, A., Marciniak, D., McCune, L., Smith, E., & Ramsey, R. (2012). Promoting self-efficacy and fall risk awareness in older adults. *Physical and Occupational Therapy in Geriatrics*, 30(22), 165-175. doi: 10.3109/02703181.2012.681431
- Gitlin, L., Winter, L., Dennis, M., Corcoran, M., Schinfeld, S., & Hauck, W. (2006). A randomized trial of a multicomponent home intervention to reduce functional difficulties in older adults. *Journal of The American Geriatrics Society*, 54(5), 809-816. doi:10.1111/j.1532-5415.2006.007
- Howard, B. (2016). *My "safe and sound" plan for staying falls-free*. (Unpublished manuscript). University of Indianapolis, Indianapolis, IN.
- Howard, B., Beitman, C., Walker, B.A. & Moore, E. (2016). Cross-cultural educational intervention and fall risk awareness. *Physical & Occupational Therapy In Geriatrics*, 34(1), 1-20. doi: 10.3109/02703181.2015.1105344
- Howard, B., Baca, R., Bilger, M., Cali, S., Kotarski, A., Parrett, Kiana, & Skibinski, K. (2016). *A community needs assessment for falls prevention programming* (unpublished manuscript). University of Indianapolis, Indianapolis, Indiana.

- Johansson, E., & Jonsson, H. (2013). Thinking and acting in a new way: Influences of a falls-prevention program on participants' everyday life. *Physical and Occupational Therapy in Geriatrics*, 31(4), 281-296. doi:10.3109/02703181.2013.85458
- Kempen, G. I., Yardley, L., van Haastregt, J. C., Zijlstra, G. A., Beyer, N., Hauer, K., & Todd, C. (2008). The Short FES-I: A shortened version of the falls efficacy scale-international to assess fear of falling. *Age and Ageing*, 37(1), 45-50. doi:10.1093/ageing/afm157
- Kramer, B. J., Creekmur, B., Mitchell, M. N., Rose, D. J., Pynoos, J., & Rubenstein, L. Z. (2014). Community fall prevention programs: Comparing three InSTEP models by level of intensity. *Journal of Aging and Physical Activity*, 22, 372-379.
- Kuptniratsaikul, V., Praditsuwan, R., Assantachai, P., Ploypetch, T., Udompunturak, S., & Pooliam, J. (2011). Effectiveness of simple balancing training program in elderly patients with history of frequent falls. *Clinical Interventions in Aging*, 6, 111-117. doi: 10.2147/CIA.S17851
- Leland, N. E., Elliott, S. J., O'Malley, L., & Murphy, S. L. (2012). Occupational therapy in falls prevention: Current evidence and future directions. *The American Journal of Occupational Therapy: Official Publication of the American Occupational Therapy Association*, 66(2), 149-160. doi:10.5014/ajot.2012.002733
- Li, F., Harmer, P., Glasgow, R., Mack, K. A., Sleet, D., Fisher, J., ... Tompkins, Y. (2008). Translation of an effective Tai Chi intervention into a community-based falls-prevention program. *American Journal of Public Health*, 98(7), 1195-1198.
- Lim, Y. M., & Sung, M. H. (2012). Home environmental and health-related factors among home fallers and recurrent fallers in community dwelling older Korean women. *International Journal of Nursing Practice*, 18, 481-488. doi: 10.1111/j.1440-172X.2012.02060.x

- McMahon, S., Talley, K. M., & Wyman, J. F. (2011). Older people's perspectives on fall risk and fall prevention programs literature review. *International Journal of Older People Nursing*, 6, 289-298. doi: 10.1111/j.1748-3743.2011.00299.x
- Mitchell, R. J., Lord, S. R., Harvey, L. A., & Close, J. C. T. (2014). Associations between obesity and overweight and fall risk, health status, and quality of life in older people. *Australian and New Zealand Journal of Public Health*, 38(1), 13-18. doi: 10.1111/1753-6405.12152
- National Council on Aging. (n.d.). *Falls prevention facts*. Retrieved from <https://www.ncoa.org/news/resources-for-reporters/get-the-facts/falls-prevention-facts/>
- Ness, K. K., Gurney, J. G., & Ice, G. H. (2003). Screening, education, and associated behavioral responses to reduce risk for falls among people over age 65 years attending a community health fair. *Physical Therapy*, 83(7), 631-637.
- NIH Senior Health (2013). *Falls and older adults*. Retrieved from <http://nihseniorhealth.gov/falls/personalchanges/01.html>
- Nikolaus, T., & Bach, M. (2003). Preventing falls in community-dwelling frail older people using a home intervention team (HIT): Results from the randomized falls-HIT trial. *Journal of the American Geriatrics Society*, 51(3), 300-305. doi:10.1046/j.1532-5415.2003.51102.x
- Northridge, M. E., Nevitt, M. C., Kelsey, J. L., & Link, B. (1995). Home hazards and falls in the elderly: The role of health and functional status. *American Journal of Public Health*, 85(4), 509-515.
- Painter, J. A., Allison, L., Dhingra, P., Daughtery, J., Cogdill, K., Trujillo, L. G. (2012). Fear of falling and its relationship with anxiety, depression, and activity engagement among

- community-dwelling older adults. *American Journal of Occupational Therapy*, 66, 169-176. <http://dx.doi.org/10.5014/ajot.2012.002535>
- Perracini, M. R., Teixeira, L. F., Ramos, J. L. A., Pires, R. S., & Najas, M. S. (2012). Fall-related factors among less and more active older outpatients. *Revista Brasileira De Fisioterapia*, 16(2), 166-172.
- Pighills, A. C., Torgerson, D. J., Sheldon, T. A., Drummond, A. E., & Bland, J. M. (2011). Environmental assessment and modification to prevent falls in older people. *Journal of the American Geriatrics Society*, 59(1), 26-33. doi:10.1111/j.1532-5415.2010.03221.x
- Power, V. & Clifford, A. M. (2013). Characteristics of optimum falls preventions exercise programmes for community-dwelling older adults using the FITT principle. *European Review of Aging and Physical Activity*, 10, 95-106. doi: 10.1007/s11556-012-0108-2
- Pynoos, J., Steinman, B., & Nguyen, A. (2010). Environmental assessment and modification as fall-prevention strategies for older adults. *Clinics in Geriatric Medicine*, 26(4), 633-644. doi:10.1016/j.cger.2010.07.001
- Ray, C. T., & Wolf, S. L. (2010). Gender differences and the risk of falls in individuals with profound vision loss. *Journal of Visual Impairment & Blindness*, 311-316.
- Rogers, M. E., Rogers, N. L., Takeshima, N., & Islam, M. M. (2004). Reducing the risk for falls in the homes of older adults. *Journal of Housing for The Elderly*, 18(2), 29-39.
- Schepens, S. L., Panzer, V., & Goldberg, A. (2011). Randomized controlled trial comparing tailoring methods of multimedia-based fall prevention education for community-dwelling older adults. *The American Journal of Occupational Therapy*, 65(6), 702-709.
- Seo, J., & Kim, S. (2014). Prevention of potential falls of elderly women: Gait asymmetry. *Educational Gerontology*, 40(2), 123-137. doi: 10.1080/03601277.2013.802181

- Teems, J., Hausman, D., Fischer, J., Lee, J. S., & Johnson, M. A. (2011). Older adults attending Georgia senior centers increase preventive behaviors for falls and fractures following a community-based intervention. *Journal of Nutrition in Gerontology and Geriatrics*, 30, 72-85. doi: 10.1080/01639366.2011.545042
- Tiedemann, A., Sherrington, C., & Lord, S. R. (2013). The role of exercise for fall prevention in older age. *Motriz, Rio Claro*, 19(3), 541-547
- Tse, T. (2005). The environment and falls prevention: Do environmental modifications make a difference? *Australian Occupational Therapy Journal*, 52(4), 271-281.  
doi:10.1111/j.1440-1630.2005.00525.x
- United States Census Bureau. (2014). *State & county quick facts*. Retrieved from <http://quickfacts.census.gov/qfd/states/18/18097.html>
- Ward-Griffin, C., Hobson, S., Melles, P., Kloseck, M., Vandervoort, A., Crilly, R. (2004). Falls and fear of falling among community-dwelling seniors: The dynamic tension between exercising precaution and striving for independence. *Canadian Journal on Aging*, 23(4), 307-318.
- World Health Organization. (2012). *Falls*. Retrieved from <http://www.who.int/mediacentre/factsheets/fs344/en/>
- Yamada, M., Higuchi, T., Nishiguchi, S., Yoshimura, K., Kajiware, Y., & Aoyama, T. (2013). Multitarget stepping program in combination with a standardized multicomponent exercise program can prevent falls in community-dwelling older adults: A randomized, controlled trial. *Journal of the American Geriatrics Society*, 61(10), 1669-1675.  
doi:10.1111/jgs.12453
- Yardley, L., Beyer, N., Hauer, K., Kempen, G., Piot-Ziegler, C., & Todd, C. (2005).



Development and initial validation of the Falls Efficacy Scale-International (FES-I). *Age and Ageing*, 34, 614-619.

York, S. C., Shumway-Cook, A., Silver, I. F., Morrison, A. S. (2011). A translational research evaluation of the Stay Active and Independent for Life (SAIL) community-based falls prevention exercise and education program. *Health Promotion Practice*, 12(6), 832-839. doi: 10.1177/1524839910375026

You, L., Deans, C., Liu, K., Zhang, M. F., and Zhang, J. (2004). Raising awareness of fall risk among Chinese older adults: Use of the Home Fall Hazards Assessment too. *Journal of Gerontological Nursing*, 30(6), 35-42.

Zijlstra, R., van Haastregt, J., van Rossum, E., van Eijk, J., Yardley, L., & Kempen, G. (2007). Interventions to reduce fear of falling in community-living older people: A systematic review. *Journal of American Geriatrics Society*, 55(4), 603-615. doi:10.1111/j.1532-5415.2007.01148.x

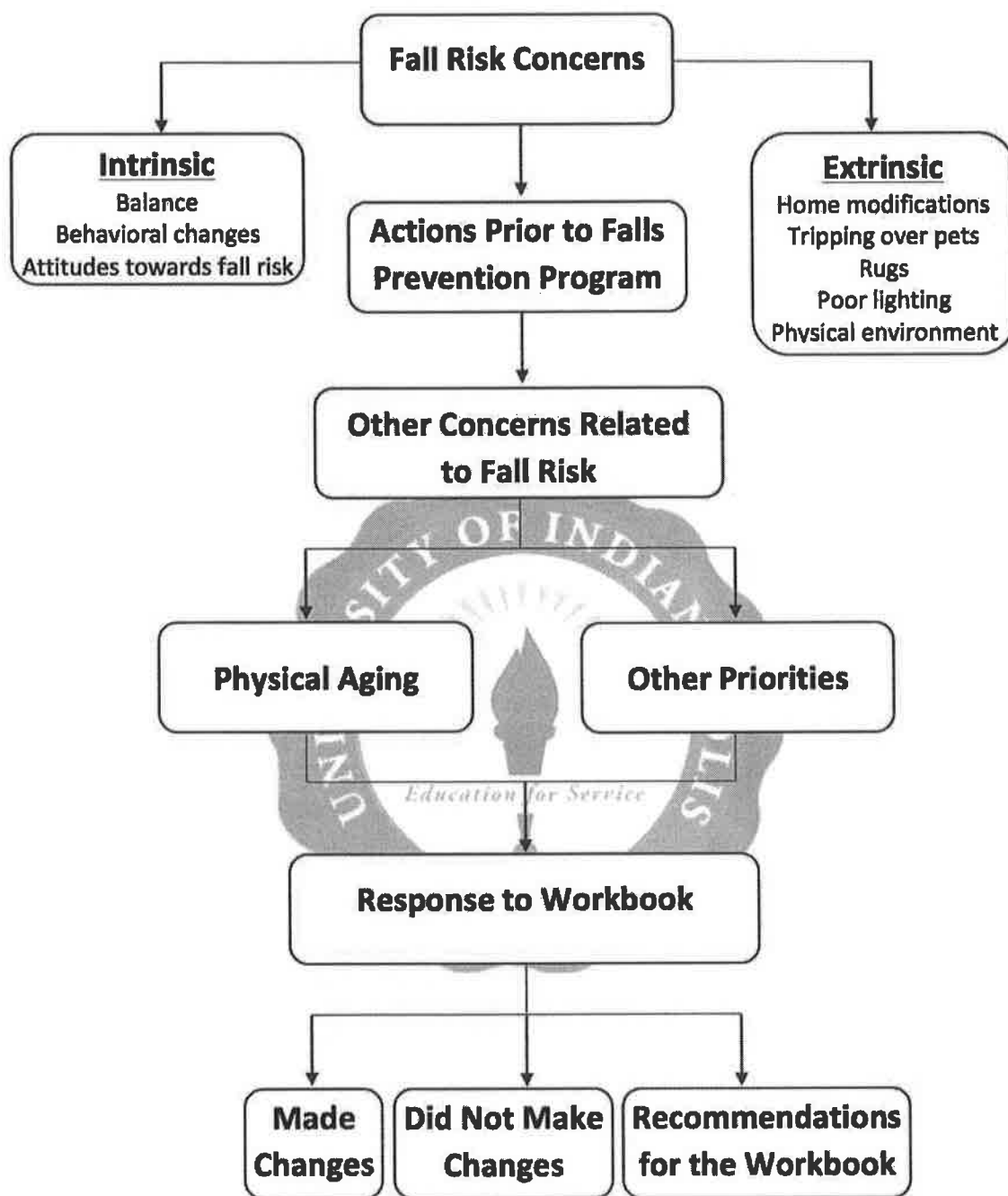


Figure 1. Responses to fall risk awareness education.

Table 1. *Participants*

Participants	Total	Location 1	Location 2	Location 3	Location 4
Number of Participants n(%)	25(100)	4(16)	13(52)	4(16)	4(16)
Gender by Location					
Female n(%)	16(64)	4	9	1	2
Male n(%)	9(36)	0	4	3	2
Mean Age by Location	78.64	74	78.85	74.75	86.5

Table 2. *Falls and Fear of Falling*

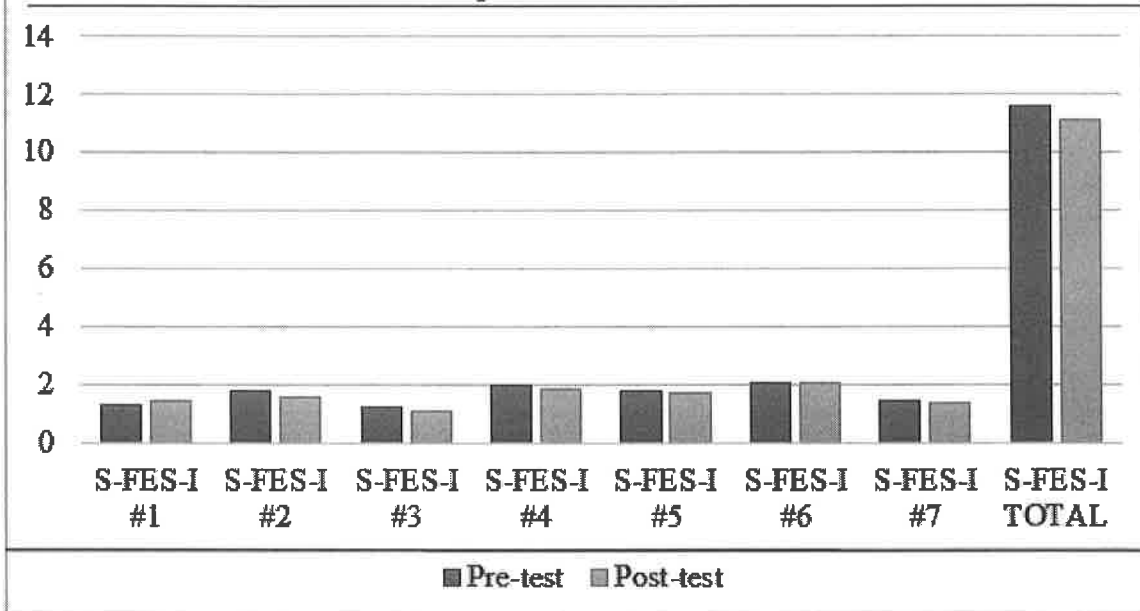
Falls and Fear of Falling	Number of participants	% Sample
Falls in last year		
0 falls	14	56
1 fall	7	28
6 falls	2	8
Falls in last month		
0 falls	19	76
1 fall	2	8
2+ falls	2	8
Injury from fall		
Yes	8	32
No	13	52
Fear of Falling		
No fear	6	24
Little fear	7	28
Moderate fear	11	44
Severe fear	0	0

Table 3. *Short Falls Efficacy Scale - International Results*

Results of Related-Samples Wilcoxon Signed Rank Test for S-FES-I	Significance*
S-FES-I Total	0.330
Getting dressed or undressed	0.257
Taking a bath or shower	0.132
Getting in or out of chair	0.102
Going up or down stairs	0.417
Reaching for something above your head or on the ground	0.527
Walking up or down a slope	1.000
Going out to a social event (e.g. religious service, family gathering or club meeting)	0.705

*Note.* S-FES-I = Short Falls Efficacy Scale - International

\*Significance =  $p \leq .05$

Table 4. *S-FES-I Raw Scores Comparison*

## Appendix A. Demographics questions.

<https://docs.google.com/a/uindy.edu/document/d/1HbsXCrZdAPMk3h431i9vntJvs1wxzNgCONstj2ZH47w/edit?usp=sharing>

## Appendix B. Short Falls Efficacy Scale - International.

[https://drive.google.com/a/uindy.edu/file/d/0B\\_mz625D9kyLVFNyeTBYQmNVeDA/view?usp=sharing](https://drive.google.com/a/uindy.edu/file/d/0B_mz625D9kyLVFNyeTBYQmNVeDA/view?usp=sharing)

## Appendix C. Workbook.

[https://drive.google.com/a/uindy.edu/file/d/0B\\_mz625D9kyLMmZxbDQteThIRE0/view?usp=sharing](https://drive.google.com/a/uindy.edu/file/d/0B_mz625D9kyLMmZxbDQteThIRE0/view?usp=sharing)

## Appendix D. Focus group questions.

<https://docs.google.com/a/uindy.edu/document/d/1nn-s4LmHHCNmeOltvCYeKfevG08R4RupKYzC-1d6-R8/edit?usp=sharing>