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# ADVANCED PRACTICE NURSES KNOWLEDGE AND USE OF FALL PREVENTION GUIDELINES

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ADVANCED PRACTICE NURSES KNOWLEDGE AND USE OF FALL PREVENTION  
GUIDELINES

Presented in Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Nursing Practice

By

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2015

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2015

# ADVANCED PRACTICE NURSES KNOWLEDGE AND USE OF FALL

## Executive Summary

Falls are a significant public health issue resulting in a significant economic and social burden on society. Specific strategies are available that can reduce the risk of falling for older adults age 65 and older; however, providers have failed to integrate these guidelines into clinical practice (Rubenstein, Solomon & Roth, 2004; Chou, Tinetti, King, Irwin, & Fortinsky, 2006; Jones, Ghosh, Horn, Smith, & Vogt, 2011). The CDC has published the STEADI toolkit, a healthcare resource for integrating fall prevention guidelines into clinical practice; but little information is available on the knowledge and use of the STEADI toolkit by Advance Practice Nurses (APNs) or other providers.

The purpose of this quasi-experimental study was to examine APNs knowledge and use of fall prevention guidelines. A total of 28 APNs voluntarily participated in a continuing education program entitled “Fall Prevention and the new CDC STEADI Toolkit. After informed consent and the purpose of the study was explained, participants completed a pre-survey and post-survey on knowledge and intent to use the STEADI tool. Results indicated that the majority of APNs are aware of the significance of this health issue and consider themselves knowledgeable on the topic; however, are not consistent in their practice of fall prevention assessment and management. Barriers to fall risk assessment identified by participants included lack of time, lack of resources, and lack of ownership, which is consistent with previous findings (Chou et al., 2006 and Wenger et al., 2003). Additional studies are needed to determine strategies for increasing the use of the STEADI Toolkit, and to determine whether the use of the toolkit by providers actually reduces the occurrence of falls among their patients or actually facilitate provider compliance with fall prevention guidelines.

### Advanced Practice Nurses' Knowledge and Use of Fall Prevention Guidelines

Falls are the leading cause of both fatal and nonfatal injury for persons aged 65 and older in the United States (Centers for Disease Control and Prevention [CDC], 2013). From 2000-2010, the death rates from falls increased from 29.68 per 100,000 to 54.04 per 100,000, accounting for 44% of all injury deaths in the geriatric population. In 2000, the number of older adults who suffered injuries as a result of a fall exceeded 2.4 million, accounting for over \$19 billion in healthcare related costs (Stevens, Finkelstein, & Miller, 2006). To further compound this problem, the CDC (2013) estimates that by the year 2050, nearly 89 million Americans (~30% of the total population) will be age 65 or older, increasing the need for fall prevention interventions in community dwelling elderly adults (CDC, 2013).

Several meta-analyses of randomized controlled studies on fall interventions have been completed and found that there are specific strategies that can reduce falls including: assessing and addressing fall risk factors; identifying and treating co-morbidities; and participation in exercise programs aimed at improving balance, strength, and flexibility (Chang et al., 2004; Gillespie et al., 2012; Moyer, 2012). The first clinical practice guideline for fall prevention in the outpatient setting was written by the American Geriatrics Society/British Geriatrics Society in 2001 and was subsequently revised in 2010. Since that time, several groups including the US Preventative Task Force and National Institute of Health Care and Excellence have written recommendations (Moyer, 2012; National Institute for Clinical Excellence, 2004). However, despite considerable evidence that these interventions can reduce the occurrence of falls, healthcare providers have failed to integrate guidelines into clinical practice (Rubenstein, Solomon & Roth, 2004; Chou, Tinetti, King, Irwin, & Fortinsky, 2006; Jones, Ghosh, Horn, Smith, & Vogt, 2011).

To address this issue, the Centers for Disease Control and Prevention developed and released the STEADI (Stopping Elderly Accidents, Deaths, and Injuries) toolkit, a fall prevention resource for health care professionals (Stevens & Phelan, 2012). STEADI contains provider resources aimed at identification of patients at risk for falling in the community, accurate assessments of balance and mobility, and

identification of appropriate interventions and referrals. The kit also contains patient resources aimed at self-risk assessment, risk education, and prevention strategies.

Healthcare providers have the opportunity to dramatically reduce the occurrence of community dwelling falls through early identification of at-risk patients, risk factor modification, and referral to intervention programs. To facilitate provider compliance with guideline recommendations, the CDC developed the STEADI toolkit. While clinical trials are underway to determine whether use of the toolkit will decrease the occurrence of falls, no results have been published.

### **Literature Review**

Falls in the elderly are a major public health issue and as a result, this topic has been the focus of considerable research over the last two decades. The majority of research to date has been on epidemiology and risk factor identification, assessment tool validation, guidelines and management in the acute care setting and most recently, guidelines and management in the community-dwelling elderly.

#### **Epidemiology of Falls and Impact on Healthcare**

Every year one in three adults age 65 or older will fall, resulting in significant morbidity, mortality, and healthcare costs (Tinetti et al., 1994). In 2000, falls for this age group accounted for 10,300 fatal and 2.6 million non-fatal injuries resulting in an estimated direct medical cost of \$0.2 billion dollars for fatal and \$19 billion dollars for non-fatal falls (~45% of all inpatient stays (Stevens, Finkelstein, & Miller, 2006; Greenspan et al., 2006). Roudsari et al. (2005) further estimated the mean cost per fall to be \$17,483 for hospitalization, \$236 for ED visits, and \$412 for outpatient visits. Adding to the problem, Shumway-Cook et al. (2009) found that 22.1% of Medicare beneficiaries age 65 and older reported falling one or more times; with 10% reporting more than one fall in the last year and 33% reporting they required medical attention. When aggregate health care costs were compared to non-fallers, those with one fall were found to be \$2000 (29%) higher while those with more than one fall were found to be \$5600 (79%) higher (Shumway-Cook et al., 2009). Unfortunately, the rate of falls has not

decreased since these studies, but rather increased to 42% in 2006 and 52.4% in 2010 (Hu and Baker, 2010; Centers for Disease Control and Prevention [CDC], 2013).

Fall risk factors can be classified as intrinsic (originating within the person) or extrinsic (originating outside the person) (Rubenstein & Josephson, 2006). Extrinsic factors include such things as area rugs, stairs without railings, or other environmental hazards, and are more easily modifiable. Intrinsic factors can be further divided into biological and behavioral. Stevens and Phelan (2012) describe biological factors as leg weakness, mobility issues, balance problems, poor vision; and behavioral factors as polypharmacy (>4 meds), risky behaviors, psychoactive medications, and inactivity. These intrinsic factors can be more difficult to modify because they require prolonged lifestyle modifications. Additional factors include increased age, history of falls, cognitive impairment, use of fall-risk-increasing drugs (FRIDs), and comorbidities such as orthostatic hypotension, vertigo and Parkinson's disease (American Geriatrics Society/British Geriatrics Society [AGS/BGS], 2010; Woolcott et al., 2009; Tinetti, Speechley, & Ginter, 1988).

### **Interventions for Fall Prevention**

The first clinical practice guideline for fall prevention in the outpatient setting was written by the American Geriatrics Society/British Geriatrics Society in 2001 and was subsequently revised in 2010. Recommendations included screening all patients age 65 or older for history of two or more falls in the last 12 months or self-reported balance or gait difficulty. These guidelines included recommendations that patients with positive screening should receive a multifactorial fall risk assessment including a review of medications, assessment of gait, balance, mobility, visual acuity, muscle strength, postural hypotension, and feet condition. Interventions for patients felt to be at increased risk after the multifactorial risk assessment should include: minimization of medications, individually tailored exercise program, vision correction, management of postural hypotension and rhythm abnormalities, Vitamin D supplementation, management of foot and footwear issues, home modification, and education (AGS/BGS, 2010).

In 2012, the U.S. Preventive Services Task Force (USPSTF) published their recommendations for prevention of falls in community-dwelling older adults (Moyer, 2012). Like the AGS/BGS guidelines, the USPSTF recommends primary care providers consider increased age, history of falls and history of mobility problems as risk factors for identifying fall risk patients. However, the USPSTF also recommends balance and gait assessment. Patients with these risk factors should receive exercise or physical therapy and Vitamin D supplementation. The USPSTF does not recommend all patients age 65 or older receive multifactorial risk assessment and feels there is inadequate evidence to support the use of interventions such as vision correction, hip protectors, medication withdrawal, and protein supplementation (Moyer, 2012).

Several meta-analyses of randomized controlled studies on fall interventions have been completed and found that there are specific strategies that can reduce falls including: assessing and addressing fall risk factors; identifying and treating co-morbidities; and participation in exercise programs aimed at improving balance, strength, and flexibility (Chang et al., 2004; Gillespie et al., 2012; Moyer, 2012).

### **Provider Practice Patterns**

Despite considerable evidence that these interventions can reduce the occurrence of falls, research shows healthcare providers have failed to integrate guidelines into clinical practice. Rubenstein, Solomon and Roth (2004) found that community physicians failed to identify falls or adequately evaluate patients who reported falling. Of 372 geriatric charts reviewed, only half of the patients who reported a history of two or more falls in an interview had been identified within the documentation. Further review of the medical documentation found only 6% of fallers were evaluated for orthostatic hypotension, 7% for gait or balance, 25% for vision, and 28% for neurologic disturbances. A similar study of 470 vulnerable elders age 65 or greater found only 37% of older patients were asked about falls by their providers (Wenger et al., 2003). (Chou, Tinetti, King, Irwin, & Fortinsky, 2006); and only 8% of providers used clinical guidelines to direct their care (Jones, Ghosh, Horn, Smith, & Vogt, 2011). Barriers to fall

prevention identified within these studies included providers' lack of knowledge, training and awareness as well as issues with reimbursement, resources, and competing medical issues (Chou et al., 2006; Wenger et al., 2003).

### **Centers for Disease Control STEADI Toolkit**

In an effort to facilitate the incorporation of fall prevention into provider practice, the Centers for Disease Control and Prevention (CDC) developed the STEADI (Stopping Elderly Accidents, Deaths, and Injuries) toolkit in 2012, which includes recommendations and resources for assessment, treatment, and referral. The CDC recommends all patients age 65 or older complete an annual self-risk assessment, followed by assessment of the following risk factors: history of fall in the last year, feeling unsteady when standing or walking, worrying about falling, and score equal to or greater than 4 on the self-risk assessment. At-risk patients should then undergo gait, balance and strength evaluation using the Timed Up and Go Test, 30-second Chair Stand, and/or 4 Stage Balance Test. Patients are then classified as low-risk, moderate-risk or high-risk for falling. Low-risk patients should be given education on fall prevention and referred to community fall prevention programs. Moderate-risk patients should undergo a multifactorial risk assessment, receive fall prevention education, and be given a referral to a community fall prevention program. And finally, high-risk patients should undergo multifactorial risk assessment, risk factor interventions, referral to physical/occupational therapy and appropriate follow-up. Multifactorial risk assessment should include review of fall history, physical exam, evaluation of postural hypotension, cognitive screening, medication review, feet and footwear evaluation, use of mobility aids, and visual screening; followed by appropriate interventions addressing each risk (Stevens & Phelan, 2012).

### **STEADI Toolkit**

Developed from the American Geriatrics Society/British Geriatrics Society Guidelines on fall prevention with input from a panel of subject matter experts, this toolkit provides healthcare providers with an evidence-based protocol for the assessment, treatment, and referral of patients at risk for falling.

The STEADI Toolkit contains the following:

1. Provider Resources

- a. Algorithm for fall risk assessment and interventions
- b. Fact sheets
- c. Case Studies
- d. Fall risk checklist
- e. How to talk with your patient
- f. Direction for measuring orthostatic blood pressure
- g. Instructions on how to use 3 functional assessment tools
- h. Patient referral forms
- i. Recommended fall prevention programs
- j. Pocket guide summarizing the toolkit
- k. Wall chart summarizing the toolkit

2. Patient Education Resources

- a. Stay Independent brochure: self-assessment of fall risk
- b. Brochure on Fall Prevention
- c. Brochure with Home Safety Checklist
- d. Brochure on managing postural hypotension
- e. Handout explaining Chair Rise Exercise

Although many of the items contained within this toolkit have been standardized and validated through research, the CDC STEADI toolkit has yet to be internally validated (Stevens & Phelan, 2012). It is currently in the pilot phase of research.

Falls are a significant public health issue resulting in a significant economic and social burden on society. Research has shown that there are specific strategies that can reduce the risk of falling for older adults age 65 and older; however, providers have failed to integrate these guidelines into clinical practice.

As a result, the CDC published the STEADI toolkit, a healthcare resource for integrating fall prevention guidelines into clinical practice; however, no studies have evaluated providers' knowledge of fall prevention guidelines as it relates to the STEADI toolkit.

### **Theoretical Framework**

The Precaution Adoption Process Model (PAPM) was first presented by Weinstein and Sandman in 1988 in response to perceived flaws within earlier theories of behavior change, such as the Health Belief Model (Janz & Becker, 1984), Theory of Reasoned Action (Ajzen & Fishbein, 1980), and Protective Motivation Theory (Rogers, 1975). These earlier theories of behavior change were based on the idea that action was an outcome of the cognitive process of evaluating the benefits of an action against the costs and the probability of action was based on a single prediction equation. If the benefit of a change outweighed the potential harm, then an individual would make a change. In contrast, stage theories such as the Transtheoretical Model (TTM) and PAPM, are based on the idea that health related behaviors cannot be described by a single prediction equation, but rather as a transition through stages of change and the variables which influence movement between those stages (Weinstein & Sandman, 2002; 1988). Variables include an individual's perceived susceptibility, severity, effectiveness of precautionary measures, and cost of change (financial, emotional, or social).

The Transtheoretical Model, from which PAPM was adapted, consisted of four stages: Precontemplation, Contemplation, Action, and Maintenance (Weinstein & Sandman, 1992). The precontemplation stage is defined as the period in which an individual may be aware of a health risk but are not considering a change in behavior. Individuals in the contemplation stage are in the process of determining whether or not they will make a change, while those in the action stage are actively taking steps to make a change. And finally, the maintenance stage is defined as the period in which an individual is working to maintain their behavior change. Weinstein & Sandman (1988; 1992; 2002) felt that the stages of TTM failed to recognize two significant groups of people: those who had no knowledge of a risk and those who had awareness but had not yet personalized the risk. As a result, the authors

separated the pre-contemplation stage and contemplation stage into four new stages, resulting in a seven stage model.

The seven stages of PAPM are as follows:

- Stage 1: unaware of a health risk.
- Stage 2: aware but engaged.
- Stage 3: engaged and considering change.
- Stage 4: decided not to act.
- Stage 5: decided to act but not implementing change.
- Stage 6: implementing change.
- Stage 7: maintaining change.

Transition through the stages, according to Weinstein and Sandman (2002), is usually in sequence without skipping stages; however, movement back to prior stages can occur with the exception of Stage 1 as it is not possible to return to a stage of unawareness. Individuals move through the various stages of the model as a reaction to knowledge acquisition, risk identification, social/peer influences, and evaluation of the cost associated with the change. As a result, interventions needed to move individuals closer to action will vary from stage to stage (Weinstein, 1988). For example, to move an individual from stage 1 to stage 2, the intervention should focus on increasing the person's knowledge of the health risk; whereas the intervention required to move an individual from stage 2 to stage 3 should focus on increasing the person's awareness of the benefits resulting from changing their behavior.

Although there is considerable evidence that falls are a major public health issue, providers are not identifying patients at risk for falling; are not evaluating patients who report falling; and are not using clinical guidelines for the assessment and management of fall prevention (Chou, Tinetti, King, Irwin, & Fortinsky, 2006; Rubenstein, Solomon, & Roth, 2004; Jones, Ghosh, Horn, Smith, & Vogt, 2011). Lack of knowledge, training, and awareness were identified as provider barriers to fall prevention (Chou et al., 2006). Based on these findings, providers can be classified into Stage 1 (unaware), Stage 2 (unengaged),

Stage 3 (engaged, but undecided), or Stage 5 (decided, but not acting) of PAPM. Providers in Stage 1 are unaware of the magnitude of the problem and may not be aware of the financial, social, and emotional impact of falls on society. Due to this lack of knowledge, fall assessment and prevention may not even be on their radar. Providers in Stage 2 are aware of the problem of falls in the elderly, but do not feel compelled to change their practice based on their awareness. Providers in Stage 3 are engaged by the issue of falls but are contemplating whether to change their practice. These providers may feel their time is better spent addressing other healthcare concerns; may feel that changing their practice will not change outcomes; or may feel that the cost of addressing fall prevention will outweigh the benefits. And finally, providers in Stage 5 have made the decision to change their practice, but don't know how to implement the change or perceive barriers to changing practice; and therefore, have not taken action. Using the Precaution Adoption Process Model, interventions and information aimed at motivating providers to change their current practice and implement fall prevention should address the barriers associated with moving between each stage.

### **Implementation**

The purpose of the study was to increase advanced practice provider use of the STEADI toolkit in clinical practice. To achieve this, the project examined advanced practice providers' knowledge and use of fall prevention guidelines before and after an education intervention. The education intervention included a review of the epidemiology of falls, instruction on the Centers for Disease Control (CDC) STEADI toolkit for outpatient fall prevention, and suggestions for practice implementation. The overall goal of the project was to address fall awareness among providers, increase knowledge of fall assessment and management guidelines, and reduce barriers to implementation.

Objectives for the project included:

- Assessment of self-perceived knowledge of fall prevention guidelines before an intervention

- Provision of an education intervention based on the CDC STEADI toolkit for outpatient fall prevention
- Assessment of self-perceived knowledge of fall prevention guidelines following the intervention

### **Design**

The study was conducted using a quasi-experimental, pretest-posttest design. The project was approved by the IRB of the Otterbein University in order to protect human participants. Leaders from two professional state organizations were contacted and offered the opportunity to invite advanced practice nurse members within their organizations to attend a continuing education event on fall prevention. Advanced Practice Nurses (APNs) who attended these events were given a letter explaining the study and requesting their participation. Half of the subjects were asked to complete and return a pre-survey prior to the educational intervention. All of the subjects were sent an email 3-4 weeks after the intervention asking them to complete a post-survey on Survey Monkey. Completion of either the pre- or post-surveys by subjects implied their consent to participate. Participants were assured all data would be reported as aggregated data and no data would be identified with individual participants. All subjects were given one contact hour of continuing education for attending the program, regardless of their participation in the study. Subjects were informed of their rights to decline participation and withdraw at any time.

### **Intervention**

The education intervention consisted of a one hour PowerPoint presentation entitled “Fall Prevention and the new CDC STEADI Toolkit”. To increase awareness and encourage engagement on the issue, the epidemiology of falls and its impact on healthcare were addressed. Risk factor identification, interventions for fall prevention, and current provider practice patterns were also reviewed. Following this, the CDC STEADI toolkit was reviewed in detail and strategies for implementation were provided.

## **Tools**

Currently, there are no validated tools designed to evaluate a provider's knowledge of fall prevention guidelines. Jones, et al. (2011) conducted a study evaluating primary care physicians' perceptions and practices regarding fall prevention in the elderly. Because their survey did not address all the variables of this study, the use of their tool was not pursued; however, it was used as the foundation for the pre- and post-intervention surveys in this study. Both surveys for this study were validated by three content experts to ensure measurement of desired variables.

The pre-intervention questionnaire consisted of demographic items, such as specialty certification, practice setting, years of experience, percent of geriatric patients, as well as questions regarding current practice patterns and self-perceived knowledge of fall prevention guidelines (see Appendix A).

The post-intervention questionnaire re-evaluated self-perceived knowledge of fall prevention guidelines and changes in practice since the intervention (see Appendix B).

## **Analysis and Outcomes**

### **Data Collection**

At the presentation, participants were given one of two sets of packets, in an alternating order. One set contained the study letter, pre-intervention survey with a pre-assigned identification (ID) number, handouts of the educational presentation, and a copy of the STEADI toolkit. The second set contained only the study letter, handouts, and the STEADI toolkit. Prior to beginning the intervention, subjects who received a pre-survey were asked to return it to the investigator, regardless of whether they had chosen to complete it. These survey results were manually entered into Survey Monkey by the investigator. All post-intervention surveys were completed through an electronic link to Survey Monkey. Participants who completed a pre-survey were asked to enter their assigned identification number on the post-survey; while those who did not complete a pre-survey or had lost their ID numbers were asked to enter "0" for their ID number.

## Data Analysis

A total of 28 Advanced Practice Nurses (APN) were recruited for this study and participated in the intervention, with 7 completing only pre-intervention surveys, 17 completing only post-intervention surveys, and 4 completing both pre- and post-intervention surveys. The demographics of each of these groups are summarized in Figure 1 below. When comparing the pre-intervention and post-intervention groups, most APNs in both groups strongly agree that falls are a major public health issue affecting their

**Figure 1**

<b>DEMOGRAPHICS</b>	<b>PRE-INTERVENTION ONLY N=7</b>	<b>POST-INTERVENTION ONLY N=17</b>	<b>PAIRED PRE AND POST N=4</b>
<b>SPECIALITY</b>			
<b>CNS</b>	0	2 (12%)	0
<b>FNP</b>	0	5 (29%)	0
<b>ACNP</b>	5 (71%)	5 (29%)	3 (75%)
<b>AGACNP</b>	0	0	0
<b>ANP</b>	2 (29%)	4 (24%)	1 (25%)
<b>AGANP</b>	0	1 (6%)	0
<b>OTHER</b>	0	0	0
<b>PRACTICE AREA</b>			
<b>OFFICE</b>	0	3 (18%)	0
<b>HOSPITAL</b>	7 (100%)	14 (82%)	3 (75%)
<b>SNF/LTACH</b>	0	0	1 (25%)
<b>OTHER</b>	0	0	0
<b>% PRACTICE GERIATRICS</b>			
<b>&lt;25%</b>	0	2 (12%)	1 (25%)
<b>25-50%</b>	2 (29%)	5 (29%)	1 (25%)
<b>50-75%</b>	4 (57%)	2 (12%)	2 (50%)
<b>&gt;75%</b>	1 (14%)	8 (47%)	0
<b>YEARS EXPERIENCE</b>			
<b>&lt;5</b>	4 (57%)	7 (40%)	3 (75%)
<b>6-10</b>	3 (43%)	4 (24%)	0
<b>11-15</b>	0	2 (12%)	1 (25%)
<b>16-20</b>	0	2 (12%)	0
<b>&gt;20</b>	0	2 (12%)	0

patients (71% and 59%, respectively). The majority of both groups also considered themselves somewhat or very knowledgeable on fall prevention assessment and management. However, in the pre-intervention group, only one APN (14%) reported routinely conducting fall risk screening in their practice, as compared to 14 (82%) in the post-intervention group (See Figure 2). Only two (18%) of the 7 APNs in the pre-intervention group reported having ever heard of the STEADI Toolkit and considered themselves somewhat familiar.

APNs in both groups who denied routinely conducting fall risk screening in their practices were asked to identify barriers to implementing fall prevention. Of the six APNs in the pre-intervention group, lack of knowledge, more pressing health issues, and a view that fall risk screening should be conducted by other members of the team were identified. More pressing health issues, lack of time, and a view that screening should be conducted by others were the most commonly identified barriers in the post-intervention group (See Figure 3).

**Figure 2**

	<b>Pre-Intervention N=7</b>	<b>Post-Intervention N=17</b>
<b>Falls are a major public health issue</b>		
<b>Strongly Agree</b>	5 (71%)	10 (59%)
<b>Agree</b>	2 (29%)	6 (35%)
<b>Knowledge of fall prevention assessment and management</b>		
<b>Very Knowledgeable</b>	0	4 (24%)
<b>Somewhat Knowledgeable</b>	7 (100%)	12 (71%)
<b>Not Very Knowledgeable</b>	0	1 (5%)
<b>Routinely Screen for fall risk</b>		
<b>Yes</b>	1 (14%)	14 (82%)
<b>No</b>	6 (86%)	3 (18%)

Figure 3

	Pre-Intervention only	Post-Intervention only
<b>Routinely Screen for Falls</b>		
Yes	1 (14%)	14 (82%)
No	6 (86%)	3 (18%)
<b>Barriers to implementing fall prevention into clinical practice</b>	n=6	n=3
<b>Knowledge</b>		
Resources	2 (33%)	0
More Pressing Issues	1 (17%)	0
Lack of Time	3 (33%)	1 (33%)
<b>Not my responsibility</b>	0	3 (100%)
	3 (33%)	2 (66%)

When the post-intervention group was further analyzed, 12 of the 14 (86%) APNs felt the STEADI Toolkit made integration of fall prevention into clinical practice easier. Six (43%) reported conducting fall risk screening on every visit, while three (21%) reported conducting screening annually. Four APNs out of 17 felt the STEADI toolkit did not make integration of fall prevention easier and described limitations of STEADI as too time consuming (33%) and a lack of resources/staff (100%).

Four APNs who attended the intervention completed both a pre- and post-intervention survey. No statistical significance could be determined from the results due to the small sample size. However, all APNs in this group agreed or strongly agreed that falls are a major public health issue affecting their patients and considered themselves somewhat knowledgeable on fall management before and after the intervention. None of the APNs in this group reported routinely screening for fall risk prior to the intervention; as compared to two out of four after the intervention. None of the APNs had ever heard of the STEADI Toolkit, while three out of four felt the STEADI Toolkit made integration of fall prevention into clinical practice easier following the intervention. The one APN who denied that STEADI facilitated integration of fall prevention into practice felt STEADI was too time consuming and would be better used by other members of the healthcare team.

## **Limitations**

This study does have limitations. Due to the small number of total subjects recruited and the even smaller number of subjects who completed the intervention and both the pre- and post-intervention surveys, a statistical correlation was unable to be obtained. While there was a difference between practice patterns in the pre- and post-only groups, it is unclear whether that difference can be attributed to the intervention. Results of this study can only be reported as aggregate data. Some conclusions can be drawn from these results but they lack statistical strength.

## **Conclusions**

The majority of advanced practice providers studied considered falls to be a major public health issue affecting their patients and considered themselves to be somewhat knowledgeable on fall prevention assessment and management. These results were similar between the pre-intervention only and post-intervention only groups as well as the group who completed both. In addition, the majority of APNs studied had not heard of or were not familiar with the CDC STEADI Toolkit prior to the intervention. Although only 1% of APNs in the pre-intervention only group routinely performed fall risk screening as compared to 76% in the post-intervention only group, generalizability related to this intervention is limited. The majority of APNs screened after the intervention did feel the STEADI toolkit made integration of fall prevention into clinical practice easier. However, some felt the toolkit was too time-consuming, required too many resources, and was better suited for other members of the healthcare team.

## **Summary**

Falls are a major public health issue affecting millions of elderly adults every year and resulting in billions of dollars spent in healthcare related costs. Although this sample size is small, it shows that the majority of APNs are aware of the significance of this health issue and consider themselves knowledgeable on the topic; however, are not consistent in their practice of fall prevention assessment and management. Similar to studies such as Chou et al., 2006, and Wenger et al., 2003, this study also found lack of time, lack of resources, and lack of ownership to be barriers to fall prevention for providers.

The STEADI Toolkit was developed by the CDC in an effort to facilitate the integration of fall prevention guidelines into clinical practice by healthcare providers. Although the interventions included within the toolkit have been proven to reduce the risk of falls, further research must be conducted to determine whether the use of the toolkit by providers actually reduces the occurrence of falls among their patients or actually facilitate provider compliance with fall prevention guidelines.

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## Appendix A: Pre-Intervention Survey

## Specialty Certification

- CNS  FNP       ACNP       AGACNP       ANP       AGANP  
 Other \_\_\_\_\_

## Practice Area

- Clinic/Office  Hospital       Sub acute Care Facility  
 Other \_\_\_\_\_

## Percent of Practice is Geriatrics

- <25%       25-50%       50-75%       >75%  Don't know

## Years of Experience

- <5       5-10       11-15       16-20       >20

Falls among the elderly are a major public health issue that affects many of my patients.

- Strongly Agree       Agree       Disagree       Strongly Disagree

How would you describe your knowledge of fall prevention assessment and management?

- Very knowledgeable       Somewhat knowledgeable  
 Not very knowledgeable       Unsure

In your practice, do you routinely administer fall risk screening or assessments to your patients?

- Yes       No

If yes, how often do you conduct fall risk screening for your patients?

- Annual exam  Every visit       Only if patient expresses concerns  
 Other \_\_\_\_\_

If no, why not?

- Lack of knowledge       More pressing health concerns       Not enough time  
 Lack of referral resources       Doesn't affect my patients  
 Other \_\_\_\_\_

At what age do you initiate fall risk screening?

- 50-55       55-60       65-70       >70       No standard age

Do you base recommendations for fall prevention on clinical guidelines?

- Always       Sometimes       Never       I don't know

If yes, which guidelines do you follow?

- American Geriatrics Society/British Geriatrics Society
- US Preventative Services Task Force Recommendations
- National Institute for Health and Care Excellence
- Centers for Disease Control and Prevention STEADI recommendations
- Other \_\_\_\_\_

Are you familiar with the Centers for Disease Control and Prevention STEADI toolkit for fall prevention?

- Very familiar
- Somewhat familiar
- Never heard of it

Are you interested in learning more about fall prevention assessment and management?

- Very interested
- Somewhat interested
- Not interested

## Appendix B: Post-Intervention Survey

## Specialty Certification

- CNS  FNP       ACNP       AGACNP       ANP       AGANP  
 Other \_\_\_\_\_

## Practice Area

- Clinic/Office  Hospital       Sub acute Care Facility  
 Other \_\_\_\_\_

## Percent of Practice is Geriatrics

- <25%       25-50%       50-75%       >75%  Don't know

## Years of Experience

- <5       5-10       11-15       16-20       >20

Falls among the elderly are a major public health issue that affects many of my patients.

- Strongly Agree       Agree       Disagree       Strongly Disagree

How would you describe your knowledge of fall prevention assessment and management?

- Very knowledgeable       Somewhat knowledgeable  
 Not very knowledgeable       Unsure

Since attending this program, are you routinely screening your patients for fall risk?

- Yes       No

If yes, how often do you conduct fall risk screening for your patients?

- Annual exam  Every visit       Only if patient expresses concerns  
 Other \_\_\_\_\_

If not, what barriers continue to prevent you from incorporating fall prevention in your practice?

- Lack of knowledge       More pressing health concerns       Not enough time  
 Lack of referral resources       Doesn't affect my patients  
 Other

Do you feel the CDC STEADI toolkit has made integration of fall prevention into your practice easier?

- Yes  No

If not, how would you describe the limitations of using the CDC STEADI toolkit in clinical practice?

- Difficult to use  Too time consuming  
 Lack of staffing needed to implement  Lack of understanding  
 Other \_\_\_\_\_