A Comprehensive Fall Risk Screening Protocol for Older Adults in Primary Care Setting: A Quality Improvement Project

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Abstract

Falls are a frequent problem among older adults. Despite fall prevention, falls in older adults remain an issue in clinical practice. There is a need to screen older adults for fall risk in primary care to decrease falls. The overall objective of this quality improvement project is to implement a comprehensive fall risk screening using the evidence-based STEADI tool in the primary care setting for providers that will improve fall risk screening rates in older adults 65 and over. This project sought to enhance providers' knowledge of falls in older adults and adherence to fall risk screening protocol. There is an evidence-based practice (EBP) guideline that outlines providers' process when screening older adults 65 and over for fall risk. The EBP protocol was made available to physicians, nurse practitioners, and nurse assistants and outlined the process for providers to follow when screening older adults of falls to enhance adherence to the protocol and formulate individualized fall prevention based on patients' fall risks. An increase in provider's knowledge and adherence to fall risk screening protocol implementation increased the incidence of fall risk screening. The result showed that the provider's adherence to the protocol increased the pre-implementation fall risk screening from 37.2% to 95.7% post-implementation using the STEADI tool. Therefore, its optimism for a sustainable long-term change in fall risk screening at the project site and in similar primary care settings.

Keywords: *fall prevention, fall assessments, fall screening, primary care, older adults fall, Stay Independent brochure, STEADI*

A Comprehensive Fall Risk Screening Protocol for Older Adults in Primary Care Setting: A Quality Improvement Project

Falls are the leading cause of injury, premature institutionalization, and long-term disability in elderly adults worldwide, with a fall-related fatality in the United States every 19 minutes (Bolton, 2019). Every second of every day in the United States, an older adult fall, making falls the number one cause of injuries and deaths from injury among older Americans (CDC, 2016). Unintentional falls among older adults aged 65 years and older are a significant public health issue. In the United States, falls result in over 32,000 deaths, three million emergency department (ED) visits, and more than 950,000 hospitalizations per year (CDC, 2020) and cost $50 billion in annual healthcare expenses (Florence et al., 2018). Significant morbidity and mortality may result from falls in older individuals, and falls are the leading cause of injury, both fatal and nonfatal, among older adults in the United States (Moreland et al., 2020). Death rates from falls have increased about 30% in the last decade. Healthcare costs are also on the rise. Falls also incur substantial costs to hospitals and healthcare providers, insurers, and individuals (Shaw et al., 2020). Falls are still an ongoing problem because of the aging growing population. Measures to decrease falls should be a continuous process to improve care quality by screening for falls and decreasing healthcare expenditures (Rotondi et al., 2020).

Falls are a major health problem for older adults with significant physical and psychological consequences. The American Geriatric Society and the Centers for Disease Control and Prevention recommend screening fall risks in older adults at least annually by physicians. Effective fall risk screening is still underutilized and not routinely integrated into clinical practice (Sun et al., 2018). Preventing patient falls with an accurate assessment of a patient's risk of falling followed by the initiation and continued evaluation of a fall prevention program based on patient-

specific identified risks (Murray et al., 2016). The first step to successful fall prevention is identifying those at risk of falling (Sun et al., 2018).

There is little published research about the specific use of the Stopping Elderly Accidents, Deaths & Injuries (STEADI) tool for fall screenings in the primary care setting. This project aims to promote a comprehensive approach when screening older adults in primary care for falls while implementing best evidence-based practices in primary care. With an average cost of over $30,000 for a fall-related hospitalization (Burns et al., 2016) and the increased burden on informal caregivers (Wilkinson et al., 2018), more comprehensive implementation of STEADI in primary care across the United States may be able to reduce expensive health care expenditures for fall injuries among older adults (Johnston et al., 2018).

Background

Falls are a significant cause of injury and death annually for millions of individuals 65 and older (Kruschke et al., 2017). In 2018, 27.5% of adults aged ≥65 years reported at least one fall in the past year, and 10.2 % of adults aged ≥65 years reported at least one fall-related injury (Moreland et al., 2020). Falls result in a substantial burden for patients and health care systems, and given the aging of the population worldwide, the incidence of falls will continue to rise (Tricco et al., 2017). The consequences of falls are often devastating. Physical injuries caused by falls, such as hip fractures and head injuries, are often associated with high mortality and morbidity among older people (Hu et al., 2016). In 2014, more than 27.000 people aged 65 and older died from falls, and an additional 2.8 million older adults were treated in hospital emergency departments for falls (Stevens et al., 2017). Falls can impact an individual in many ways, including physical injuries, negative social consequences, and psychological distress (Moyle, 2016). Not only can falls result in serious injury or death, but older adults who

experience falls also report increased anxiety and depression and reduced quality of life (Tricco et al., 2017). Older people who fall are likely to develop a "fear of repeated falls" after a fall-related incident, which often leads to the loss of mobility and independence (Hu et al., 2016).

Data from 2010 the National Institute on Aging showed that the 2-year prevalence of falls among individuals aged 65 years or older was 36%. Falls cause a substantial burden to patients and health care systems (Tricco et al., 2017). Falls are relatively common among older people, and they can be costly for the individual in terms of injury and loss of self-confidence. Falls may also cause the loss of the patient's independence and ability to self-care while recovering from the injury or over the longer term (Newgard et al., 2020). Falls are relatively common among older people, and they can be costly for the individual in terms of injury and loss of self-confidence. Falls may also cause the loss of the patient's independence and ability to self-care while recovering from the injury or over the longer term (Enderlin et al., 2015). Falls-related injuries are classified as fatal or nonfatal, with most falls being within the nonfatal category. Although most falls are nonfatal, 37.3 million people worldwide require medical attention every year due to falls (Moyle, 2016). In 2015, $50 billion in medical expenditures were attributable to fatal and nonfatal falls among older adults in the United States (Newgard et al., 2020). According to the CDC, 3 million people over 65 years of age receive emergency room treatment for fall injuries at an average cost of 30.000 dollars. Due to the demographic changes and high prevalence of falls in the elderly, the necessity of systematic, regular fall risk assessments and subsequent interventions in this group is essential (Siegrist et al., 2017). The practices of screening falls in older adults do not include a comprehensive approach that considers different factors that contribute to fall. Additionally, health care professionals are not properly trained to incorporate comprehensive fall risk screening using the STEADI tool. Adding a multifactorial approach with educational protocol

endorsement to fall risk screening would address gaps in current practices. The continued implementation of comprehensive fall prevention as the standard of care in practice is essential in delivering primary care.

Problem Statement

There is significant evidence on fall-risk screening tools, fall rates and factors, costs associated with falls in older adults, fall reduction approaches, and overall adverse outcomes related to patients falling. There is limited evidence about a comprehensive fall screening in primary care as part of the practice. Multiple fall factors need to be explored and considered when addressing fall screening. As the population of persons aged ≥65 years in the United States increases, the rising number of deaths from falls in this age group can be addressed by screening for fall risk and intervening to address modifiable risk factors such as polypharmacy or gait, strength, and balance issues (Burns & Kakara, 2018). Falls are the leading cause of accidental death and injury in older adults. One in three older adults over the age of 65 and one in two over 85 years of age will experience a fall in the next year, and a significant portion of those that fall will suffer an injury (Sun et al., 2018). Many people become afraid of falling and limit their physical activity, leading to muscle weakness and increased fall risk (Stevens et al., 2017). This can then reduce their independence and consequently their quality of life, which can then place an increased burden on their family and caregivers to undertake more care responsibilities for the individual (Moyle, 2016). Besides, falls are associated with a prolonged length of stay in hospitals, increased cost to the patient, and early placement in an aged care institution (Latt et al., 2016).

As individuals age, they may encounter more comorbid conditions and higher medications (Cameron et al., 2018). Hence, medications are one of the most important potentially modifiable risk factors for falls among the elderly. Beyond the number of medications that an elderly patient is

taking, it is crucial to consider drug therapy's appropriateness, given that polypharmacy also increases the risk of adverse effects (Lawson et al., 2018). Adverse effects may also result from medication nonadherence, either by choice or because of memory loss. Regardless of the reasons that may contribute to adverse effects, these adverse effects can result in mechanisms that increase the likelihood of falling, such as dizziness, orthostatic hypotension, sedation, and confusion (Lawson et al., 2018). Identifying patients at an increased risk for falling is essential (Cameron et al., 2018).

Improving fall risk assessment is the key to preventing falls, enhancing the quality of care, and decreasing health care costs among elderly patients (Phelan et al., 2015). Some healthcare providers report they do not feel confident about assessing fall risk or do not have adequate knowledge about fall prevention (Sarmiento et al., 2017). Due to the predicted increase in fall and related fall injuries in older adults, it is essential to implement a comprehensive fall risk screening using the STEADI screening tool in the primary care setting to reduce falls and improve quality of life. Interventions that target multiple risk factors can reduce falls and can be initiated during annual wellness visits. Initiatives such as CDC's STEADI (Stopping Elderly Accidents, Deaths, and Injuries) can help health care providers assess fall risk, educate patients, and select interventions (Burns & Kakara, 2018).

The compliance incidence for fall risk screening is an ongoing issue that needs to be addressed in primary care settings. The improvement of comprehensive fall risk screenings in primary care will benefit patients and improve older adults' quality of life. The project site does not currently STEADI comprehensive fall risk screening for older adults as part of primary care visits. The implementation of comprehensive fall risk screenings using the STEADI tool at the project site improving older adults' quality of life and developing fall prevention that addresses multifactorial

aspects of older adults. The STEADI screening tool intervention will be useful by improving knowledge and encouraging compliance with national guidelines regarding comprehensive fall risk screening as a standard practice in primary care settings, improving health prevention and health promotion in healthcare.

Project Question

In primary care providers caring for adults over age 65, will implementing comprehensive fall risk screenings using the STEADI tool and staff education significantly increase the incidence of fall risk screening compared to current protocol over a four-week timeframe?

PICOT, a nursing term, is an acronym that stands for population, intervention, comparison, outcome, and time. PICOT is used as the model in formulating this DNP project question. The population was healthcare providers caring for adults over age 65 in a primary care setting. The intervention was the implementation of comprehensive fall risk screening using the STEADI screening tool at the practice site. The expectation was that the implementation of the protocol post-intervention would surpass the lack of implementation pre-intervention. Expectations were quantified, increased compliance to the protocol, improved knowledge of the STEADI screening tool, decreased risk of fall, and increased patient outcomes due to the STEADI tool's implementation.

Search Terms

A crucial step in the search process is gathering current scholarly and peer-reviewed evidence to collect information to address the clinical question. The literature review’s inclusion and exclusion criteria considered four aspects: the date of publication, significance to the research question, peer- review, and the reported outcomes. The studies included in the literature review section of the research were restricted to publications after 2015. Further, studies included had to

detail and correlate with the research question regarding fall risk screening in primary care to evaluate outcomes providing answers to the question. The research is founded on peer-reviewed articles and published in scholarly journals to increase validity and reliability. The search engines utilized were Cumulative Index of Nursing and Allied Health Literature (CINAHL), ProQuest Central, PubMed, Cochrane, Embase, and Google scholar to evaluate the gap in evidence supporting the PICOT question.

The search terms used to identify relevant articles and narrow down the literature include *"fall prevention, fall assessments, fall screening, AND primary care, older adults fall, Stay independent brochure, STEADI*." The inclusion criteria were limited to peer-reviewed articles published after 2015 worldwide, provided substantiated results, focused on adults over age 65, and written in the English language. Criteria of exclusion of studies included falls in children, articles published before 2015, editorials, dissertations, and articles not written in English. The search resulted in over 1,200 relevant peer-reviewed and non-peer- review articles not based on the project published before 2015. The articles were then evaluated based on the exclusion and inclusion criteria and narrowed down to a total of 37 articles that were directly related to the subject matter and research question.

Review Synthesis

A literature review was conducted to identify the most significant current literature on factors associated with falls, the impact of falls on health and quality of life, related healthcare expenditures, STEADI screening tool, and different fall risk screening tools used in primary care. In addition, a literature review strengthens the project's significance by proving the research topic's background, establishing research gaps, and supporting the project's relevance. The research strengthens the imperative for health care professionals to incorporate a comprehensive

fall risk screening for the early detection of patients at high-risk for falls, appropriate development of fall prevention protocol, and implementation of fall prevention. There were extensive data regarding falls, fall prevention, and screening in older adults in different settings. For this quality improvement project, literature was reviewed in a primary care setting to establish gaps in the literature, identify deficits in quality of life among older adults attributed to falls, and fall screening in primary care settings. A systematic review of literature articles was utilized. The literature included: observational studies, mixed methods comparative studies, cross-sectional studies, a systematic review of peer-reviewed research studies, retrospective cohort studies, and exploratory qualitative studies. These methods are relevant to the aim of the studies performed and are relevant to this DNP project. These studies documented the effectiveness of fall screening interventions worldwide. The study methods are relevant to this DNP project because they are reliable, valid, and reproducible since all generate the same results of fall screening, decrease the incidence of falls, reduce healthcare costs, increase patient safety, and improve life quality. The strength of the studies is the large and variety of research resources available worldwide. Weakness included a lack of definitive results from comprehensive fall screening in a primary care setting. Health care providers cite limited time and cost as barriers to incorporating preventive services, such as those proposed by STEADI, into their clinical practice (Bergen et al., 2016). Understanding the factors associated with falls in this population is essential to designing appropriate fall-prevention and treatment strategies (Rotondi et al., 2020).

Impact of the Problem

Falls can be detrimental to the independence and quality of life of older adults. In adults older than 65, falls can cause injuries, decreased mobility, loss of independence, and death. An individual's fear of falling can lead to activity limitation, social isolation, and depression

(McConville et al., 2020). In a survey, 37.5% of fallers responded that they required medical treatment or activity restriction (Moncada, 2017). Fall injuries result in 2.8 million emergency department visits annually, and 25% of falls cause serious injuries, such as fractures or traumatic brain injury (Moncada, 2017). Fall-related injuries are the leading cause of death and disability among older adults (CDC, 2017), accounting for 10% of emergency department visits and consuming 25% of all trauma care resources (CDC, 2016). Of the 2.8 million older people treated in emergency departments after a fall, nearly 30% are hospitalized with traumatic brain injury or hip fractures (CDC, 2016). Falls have a multifactorial etiology, and numerous risk factors have been identified, including impairments of gait and balance, visual impairments, syncope, cardiac arrhythmias, polypharmacy, foot disorders, and environmental hazards (Bruce et al., 2017). According to the World Health Organization, socioeconomic risk factors for falls include low income and educational levels, inadequate housing, lack of social interactions, limited access to health and social services, and lack of community resources (WHO, 2007). There are several evidence-based interventions available to prevent falls. However, these are not always well implemented in the primary care setting (Meekes et al., 2020). According to Johnston et al. (2019), implementing STEADI fall risk screening and prevention strategies among older adults in the primary care setting could reduce falls and lower associated health care expenditures. Although the CDC recommends providers use the accessible, evidence based STEADI concept to improve fall prevention practice and enhance patient safety, primary care providers do not consistently assess patients for falls (McConville et al., 2020). Understanding the factors associated with falls in this population is essential to designing appropriate fall-prevention and treatment strategies (Rotondi et al., 2020).

Fall Related Factors

The health consequences of falls suggest a continuing need to improve fall screening as the condition remains one of the leading causes of disabilities in the United States (Moreland et al., 2020). Falls are preventable, and health care providers can help their older patients reduce their risk for falls (Moreland et al., 2020). Screening older patients for fall risk, assessing modifiable risk factors (e.g., use of psychoactive medications or poor gait and balance), and recommending interventions to reduce this risk (e.g., medication management or referral to physical therapy) can prevent older adult falls (Moreland et al., 2020). Factors that should be considered for collection include the history of falls, medications, mobility/balance, strength, cardiovascular health, footwear, and environmental hazards (Berg et al., 2017). A cross-sectional descriptive study by Kantu et al. (2019) among physiotherapists concluded that 89% rated their level of knowledge about preventing falls among older adults as high, and 64% rated their level of practice on this topic high. Among the items that measured knowledge, 40% of the participants reported a moderate level of knowledge about multiple medications as a risk factor for falls. Fifty percent of the participants reported a low level of referral to other health care professionals, whereas 40% and 41% reported a moderate level of practice on documenting risk factors and treatment plans, respectively (Katu et al., 2019).

A pilot study conducted in 49 patients with an average age of 78 years revealed that white (93.9%), female (53.1%): and most (63.3%) patients had fallen before (Berg et al., 2017). The study recommended collecting information regarding a patient's fall event (including assessing for a history of falls, medications, mobility/balance, strength, cardiovascular health, footwear, and environmental hazards) to guide interventions and prevent future falls (Berg et al., 2017). Another cross-sectional pilot study of the Falls Risk Questionnaire (FRQ) in 21 adults aged ≥65 receiving

systemic cancer therapy showed nearly one-fifth of participants (4/21) reported a fall in the past six months, and 6 reported a fall within the past year (Wildes et al., 2017). A quality improvement strategy can help implement evidence-based clinical interventions, such as fall screening protocol. QI strategies can target patients (e.g., patient education), health care providers (e.g., clinician education), and the health care system (e.g., financial incentives) (Tricco et al., 2019).

Healthcare Related Costs

Falls not only take a toll on human suffering but are also associated with staggering direct and indirect medical costs. Fall-related Medicare expenditures are estimated at more than $31 billion and are expected to grow to $100 billion by 2030 (Burns et al., 2016). The financial and economic burden is further linked to the government's support for clinical services with falls. The financial and economic costs vary depending on the severity of the fall. They can measure them in terms of the services offered, lost productivity, and premature death caused by the fall of comorbid disease processes. Falls cost the U.S approximately $31 billion annually, and by 2020, the direct and indirect cost of falls is expected to reach more than $54 billion annually (CDC, 2016). Health care providers and systems are given incentives to implement STEADI fall protocol through the Medicare Access and CHIP Reauthorization Act (MACRA's) Merit-based Incentive Payment System (MIPS). One study revealed that fall-related measures in CMS' Physician Quality Reporting System (PQRS), the predecessor to MIPS, reduce fall-related injuries and costs by 10 % (Landis et al., 2015).

Current Practice

As older adult falls continue to increase, there is a growing urgency for health provider intervention and management. Less than one-half of older adults who fall have talked with their health care providers about the fall (Phelan et al., 2015). Although American and British

Geriatrics Societies' clinical practice guidelines recommend fall screening, primary care providers have been slow to put these guidelines into practice. Many providers report they do not know how to conduct fall risk assessments or do not have sufficient knowledge about fall prevention (Stevens et al., 2017). Effective fall risk screening is still underutilized and not routinely integrated into practice (Sun et al., 2018). A 2015 exploratory cross-sectional survey in Australia determined that only 27% of primary care providers asked their older patients about falls, and 13.5% asked patients about their fear of falls (Kielich et al., 2017). Although the providers felt that it was their responsibility to assess and intervene with specific fall risk interventions, they concluded that demands of clinical practice, lack of training, workload, and lack of patient engagement were barriers to properly screen and assess patients in clinical practice (Kielich et al., 2017). Providers also report that they have limited time to spend with each patient. To address these implementation barriers, scientists at the Centers for Disease Control and Prevention's injury center developed the STEADI (Stopping Elderly Accidents, Deaths, and Injuries) initiative (Stevens et al., 2017). Consequently, health care professionals must routinely inquire about falls, assess, and screen patients, and address risk factors with appropriate modifications and interventions as needed (McConville et al., 2020). Education of primary care providers, including nurse practitioners and nursing staff, should be expanded to combat further the issue of falls in the primary care setting (McConville et al., 2020).

Fall Screening

Screening of falls as part of routine checkups in primary care is not often promoted. Due to the demographic changes and high prevalence of falls in the elderly, the necessity of systematic, regular fall risk assessments and subsequent interventions in this group seems mandatory (Siegrist et al., 2016). The rates of falls and fall-related injuries and the percentages of

older adults reporting a fall-related injury did not significantly change from 2012 to 2018 (Moreland et al., 2016). A fall risk assessment is required as part of the Welcome to Medicare examination. Primary care providers can receive reimbursement for fall risk assessment through the Medicare Annual Wellness visit and incentive payments to assess and manage fall risk through voluntary participation in the Physician Quality Reporting System (Phelan et al., 2015). Health care providers cite limited time and cost as barriers to incorporating preventive services, such as those proposed by STEADI, into their clinical practice (Bergen et al., 2016).

The CDC has sought to reduce falls through the evidence based STEADI initiative. The STEADI toolkit was designed to improve falls risk screening and prevention rates in primary care settings (Casey et al., 2016). The CDC created the STEADI initiative, which offers tools and resources for health care providers to screen their older patients for fall risk, assess modifiable fall risk factors, and intervene with evidence-based fall prevention interventions (Moreland et al., 2016).

The STEADI algorithm and educational materials included in the toolkit facilitates fall prevention awareness and communication between providers and patients (CDC, 2015). Surprisingly, less than half of older adults will disclose having had a fall to a health care provider (CDC, 2015). The CDC developed the STEADI algorithm based on the 2010 American Geriatric Society and British Geriatric Society Guidelines to help primary care providers identify patients at risk of falls, identify modifiable risk factors, and develop appropriate interventions to reduce risk. The STEADI algorithm includes screening (three critical questions related to fall risk, such as the number of falls in the past year); evaluation of gait/balance; assessment of risk factors (e.g., medications and cognitive impairment); and interventions (CDC, 2016) (see Appendix C). The CDC (2015) projects that for every 5,000 providers implementing STEADI over a 5-years, more

than 6 million older adults could be screened; 1 million falls prevented, $3.5 billion in direct medical costs saved. The first step in a multifactorial clinical fall prevention approach is fall risk screening to identify older adults at increased risk of falling. The initial screening step is critical because it determines who will receive additional assessments and follow-up care (Eckstron et al., 2017).

Older adults of any age can, together with their health care providers, take measures to reduce falls risk. To decrease the incidence of falls and increase fall risk screening/prevention in older adults, CMS also links health care provider incentives to fall prevention quality measures through the Physician Quality Reporting System (PQRS) in the Merit-Based Incentive Program (Bergen et al., 2016). The lack of screening and assessment regarding fall risk identification demonstrates a gap in older adults' management in primary care (McConville et al., 2020). Using the evidence- and theory-based Stopping Elderly Accidents, Deaths, and Injuries toolkit and algorithm is an effective method to assist practitioners with fall assessment and preventative measures (McConville et al., 2020).

American Geriatric Society and British Geriatric Society Guidelines

The American Geriatrics Society and British Geriatrics Society (AGS/BGS) have published a clinical practice guideline on fall risk screening, assessment, and management. The AGS/BGS guideline recommends screening all adults aged 65 years and older for fall risk annually (Stevens et al., 2017). The American and British Geriatrics Societies (AGS/BGS) Clinical Practice Guideline recommends that health care providers use a multifactorial approach to prevent falls that include activities such as asking about falls, assessing gait and balance, reviewing medications, and prescribing interventions such as strength and balance exercises, or

taking vitamin. This type of approach has been estimated to be capable of reducing falls by 24% (Bergen et al., 2016).

Project Site Contextual Information

The practice site underutilized the STEADI screening tool. The implementation of comprehensive fall risk screenings using the STEADI tool at the project site is one step in improving older adults' quality of life and developing fall prevention that addresses older adults' multifactorial aspects. This intervention will help improve knowledge and encourage compliance with national guidelines regarding comprehensive fall risk screening as a standard practice in primary care settings, motive health promotion, and healthcare prevention. STEADI can be integrated into primary care settings when adapted to fit into the practice workflow and when training is customized for each practice (Stevens et al., 2017).

Conclusion

Although falls can happen at any age, older adults are more at risk than other age groups. The causes of falls are multifactorial, and screening falls by using a comprehensive approach is needed to address these issues in older adults (Rotondi et al., 2020). As part of a large-scale provincial fracture screening program, using an adapted tool (STEADI) to screen for fall risk revealed that nearly 45% of the population of fragility fracture patients were screened at high fall risk (Rotondi et al., 2020). Polypharmacy (use of four or more prescription medications daily) caused a 1.5–2 times higher possibility of recurrent falls in older adults (Phelan et al., 2015). Chronic conditions, acute illnesses, medications, footwear, alcohol and drugs, and assistive devices place an individual at an increased risk for falling (Phelan et al., 2015). A cohort study conducted by Rotondi et al. (2020) in the United States reported nearly 38% of patients with osteoporosis were at high fall risk based on an adapted version of the STEADI algorithm. Aging

also is associated with changes in gait and balance, increased inactivity, more severe chronic conditions, and more prescription medication use, all of which are risk factors for falls (Bergen et al., 2016).

Due to the predicted increase in the proportion of older adults in the population and known complications of falls in this population, it is crucial to assess the risk factors associated with falls. Providers should educate patients and families about the risk factors of falls and potential consequences (Cameron et al., 2018).

Fall Risk Screening Protocol Implementation

There are several evidence-based interventions available to prevent falls. However, these are not always well implemented in the primary care setting (Meekes et al., 2020). Therefore, systematic implementation of fall prevention with a targeted screening strategy at general practitioner practices appears to be essential for making falls prevention more accessible to independently living, frail older people (Meekes et al., 2020). In 2006, researchers in Connecticut conducted a qualitative study to identify facilitators and barriers to the implementation of fall risk management in the primary care setting and concluded that only 30% of older patients in the primary care setting were questioned about falls (McConville et al., 2020). To improve the implementation and make long-term engagement in fall prevention possible, it is essential to identify and understand the experienced barriers and facilitators of implementing the fall risk screening strategy (Meekes et al., 2020). The resources in STEADI are designed for all members of the health care team. They are intended to help healthcare providers incorporate fall risk screening, assess patients' modifiable risk factors, and implement evidence-based prevention strategies (Stevens et al., 2017).

Review of Study Methods

The study methods that have been used in the literature analyzed in the literature review section are qualitative research designs. The qualitative research designs are aimed to implement a comprehensive fall screening protocol using the STEADI tool, assess the knowledge and attitudes of healthcare providers about the STEADI tool in the primary care setting. One of the techniques used to gather data is interviews. The study's relevance is to qualify a qualified response to the research problem of implementing comprehensive fall screening using the STEADI screening tool in primary care. Assessing healthcare providers' knowledge and attitudes about caring for older adults on the STEADI screening tool is vital for determining the appropriate educational materials approach. The study methods that have been analyzed in the literature review section are qualitative research designs. The qualitative research designs are aimed to implement a comprehensive fall screening protocol using the STEADI tool, assess the knowledge and attitudes of healthcare providers about the STEADI tool in a primary care setting.

The qualitative and quantitative research published between 2004 and 2018 on barriers to fall prevention management in primary care were examined. Five themes barriers in fall risk management in the primary care setting were identified: provider beliefs and practice, lack of provider knowledge, time constraints, patient engagement, and financial issues out of 37 articles, two meta-analyses, two cohort studies, one cluster-randomized study, twenty-three systematic review of peer-reviewed research studies, three retrospective cohort studies, one prospective study, four randomized controlled trials, and one exploratory qualitative study. These studies used a large sample and documented the effectiveness of fall screening interventions worldwide and the efficiency of the STEADI screening tool in primary care. The study methods are relevant to this DNP project because they are reliable, valid, and reproducible since all generate the same

results of fall screening, decrease the incidence of falls, reduce healthcare costs, increase patient safety, and improve life quality. Johnston et al. (2019) conducted a cohort study using 12,346 participants in 14 outpatient clinics. A fall prevention referral form for each participant was completed at the end of the assessment. Participants were grouped into three categories: At-risk and no Fall Plan of Care (FPOC), (b) At-risk with an FPOC, and (c) Not-at-risk. Poisson regression analyzed the group's effect on medically treated falls when controlling for other variables. As a result, older adults at risk for falls with an FPOC were 0.6 times less likely to have a fall-related hospitalization than those without an FPOC *(p = .041*). Their post-intervention odds were similar to those who were not at risk. The study concluded that implementing STEADI fall risk screening and prevention strategies among older adults in the primary care setting can reduce falls and lower associated health care expenditures. Crow et al. (2018) conducted cross-sectional and longitudinal data from the National Health and Aging Trend Study (NHATS) 2011-2015. Participants were aged 65 and older *(N = 7,392).* Of the 7,392 participants, 3,545 (48.0%) were classified as being at low risk of falling, 2,966 (40.1%) as being at moderate risk, and 881 (11.9%) as being at high risk. The adjusted risk of falling over the four following years was 2.5 times as significant for the moderate-risk group (hazard ratio (HR) = 2.50, 95% confidence interval (CI) = 2.16-2.89) and almost four times as significant (HR = 3.79, 95% CI = 2.76-5.21) for the high-risk group as for the low-risk group. The risk of falling was more significant for those who were prefrail (HR = 1.34, 95% CI 1.16-1.55) and frail (HR = 1.20, 95% CI = 0.94-1.54) than for those who were robust. The study concluded that the STEADI score is a strong predictor of future falls.

This study's relevance is to have a qualified response to the research problem of implementing comprehensive fall screening using the STEADI screening tool in primary care.

Assessing healthcare providers' knowledge and attitudes about caring for older adults on the STEADI screening tool is essential for determining the appropriate educational materials approach.

Theme Development

From 2012 to 2018, there has been no significant decrease or improvement in the number of falls and falls-related injuries in older adults (Moreland et al., 2016). Older adults of any age can, together with their health care providers, take steps to reduce their risk for falls. The CDC created the Stopping Elderly Accidents, Deaths & Injuries (STEADI) initiative, which offers tools and resources for health care providers to screen older patients for fall risk, assess modifiable fall risk factors, and intervene with evidence-based fall prevention interventions (Moreland et al., 2016).

Project Aims

The CDC developed a comprehensive fall screening using the STEADI algorithm that simplified the fall screening protocol to prevent older adults' falls (Sarmiento, 2016) (see Appendix A). Clinical interventions aimed at assessing and mitigating an individual's fall risk factors can reduce the incidence of falls among older patients. The percentage of adults aged ≥65 years reporting a fall, or a fall-related injury increased with age ($p<0.001$) (Moreland et al., 2016). However, integration of fall prevention in primary care practices is low (Sarmiento, 2016)**.** This QI project aims to improve fall risk screening by conducting chart audits, educating the staff, implementing the protocol, and evaluating the process.

Project Objectives

The project's first aim is to implement a comprehensive fall risk screening protocol using the STEADI tool in a primary care setting. The timeframe for this DNP project is as follows:

1. Conduct a 3-month retrospective chart audit two weeks before education to assess the number of patients 65 years and older who reported falls.
2. Provide an educational session on fall risk screening, the STEADI algorithm screening tool, and stay independent questionnaires to medical assistants, nurse practitioners, and one physician at the project site.
3. Implement the STEADI screening tool in the project site.
4. Evaluate the project findings by conducting a post- chart audit of the number of patients 65 years old and older screened for falls during implementation.

Theoretical and Conceptual Framework

The project will incorporate the Plan-Do-Study-Act (PDSA) cycle (see Appendix A). The PDSA cycle's essence is to structure the process of improvement by the scientific method of experiential learning (Knudsen et al., 2019)**.** The PDSA cycle and the concept of iterative change are central to many qualities' improvement approaches (Reed et al., 2016). PDSA cycles constitute the cornerstone of the improvement model, and this method has advantages when put into practice (Leis et al., 2016). In healthcare's complex social systems, the flexibility and adaptability of PDSA are essential features that support the adoption of interventions to work in local settings (Reed et al., 2016). The PDSA cycle uses small change tests to optimize a process and provides a structured experimental learning approach to testing changes (Coury et al., 2017; Reed et al., 2016). Each change test should be tested individually and on a small scale (Christoff, 2018). The PDSA cycle is shorthand for testing a change by planning, trying, observing, and acting on what is learned. The cycle can provide feedback about what does and does not work and measure and test small but significant improvements in most industries, including health care (Coury et al., 2017). The PDSA cycle is an iterative four-step problem-solving cycle used for

improving processes and is the most frequently used tool in health care quality improvement (Christoff et al., 2018; Knudsen et al., 2019). PDSA cycles offer a supporting mechanism for iterative development and scientific testing of improvements in complex healthcare systems (Taylor et al., 2014). The purpose of the PDSA method is to learn as quickly as possible whether an intervention works in a specific setting and make adjustments accordingly to increase the chances of delivering and sustaining the desired improvement (Reed et al., 2016).

Historical Development of the Theory

The PDSA theory was developed by W. Edwards Deming, an electrical engineer who later specialized in mathematical physics, teaching, and consulted to many governments globally (Moen, 2010). The PDSA method originates from Walter Shewhart and Edward Deming's articulation of iterative processes, which ultimately became known as the four stages of PDSA. Deming developed the PDCA (plan–do–check–act) terminology following his early teaching in Japan (Taylor et al., 2014). In 1986, Deming restructured and renamed the Deming wheel as the "Plan-Do-Check-Act (PDCA) cycle**."** Later, Deming modified the Shewhart cycle in 1993 and named the “Plan-Do-Study-Act cycle (PDSA)” to reflect a revised cycle for learning and improvement**.** The PDSA methodology figures predominantly in the Institute for Healthcare Improvement’s Model for Improvement (Christoff, 2018). The PDSA cycle's applicability helps build fundamental knowledge necessary to enable improvement (Christoff, 2018). PDSA cycles provide one method for structuring iterative changes, either as a standalone or broader quality improvement approach (Taylor et al., 2014). The PDSA is an extremely flexible method that can be adapted to support the scale-up of interventions and used in conjunction with monitoring activities to support sustainability (Reed et al., 2016).

The conduct of PDSA can reveal issues that need to be addressed to achieve the improvement goal. Such issues may relate to minimal changes to current practices or care processes but can often reveal more significant cultural or organizational issues that need to be addressed (Reed et al., 2016). One of the main problems faced is the misperception that the PDSA can be used as a standalone method. PDSA needs to be used as part of a suite of quality improvement methods (Reed et al., 2016). Many of the barriers to success in the Do, Study, and Act phases can be predicted and mitigated through more effective planning (Reed et al., 2016).

One of the main strengths of using PDSA in healthcare is that it is easy and can be applied in practice by anyone due to the simplicity of the PDSA method and its applicability to many different situations (Reed et al., 2016).

Applicability of Theory to Current Practice

Quality improvement relies on innovative, evidence-based practice to bring about the delivery of care that meets the need for safe, high quality, and efficient disease prevention and health promotion (AHRQ, 2013). Delivering improvements in the quality and safety of healthcare remains an international challenge. In recent years, quality improvement (QI) methods such as PDSA cycles have been used to drive such improvements (Taylor et al., 2014). The PDSA method is widely used in quality improvement (QI) strategies (Knudsen et al., 2019). Despite increased research into healthcare improvement, evidence of sufficient quality improvement interventions remains mixed, with many systematic reviews concluding that such interventions are only useful in specific settings (Taylor et al., 2014). Several evidence-based studies using the PDSA framework include a cluster-randomized pragmatic trial testing the effectiveness of a direct-mail fecal immunochemical testing kits (FIT) program at health clinics serving low-income populations, found the PDSA cycle to be an effective tool for the implementation of the project

(O'Connor et al., 2020). In the quality improvement project conducted by Brown et al. (2018), the researchers aimed to increase the interprofessional education model for geriatric fall risk assessment and prevention using the PDSA cycles over 18 months. The study indicated that the educational model can be easily replicable and used to teach interprofessional teamwork competency skills in falls and other geriatric syndromes. Coe et al. (2017) conducted a study that integrated fall screening for individuals aged 65 years and older based on the CDC's STEADI toolkit and algorithm into community clinics. The authors used multiple PDSA cycles to implement the STEADI screening tool over a 9-month period. A STEADI expert provided training to participants. Quarterly data-feedback reports track partnership progress on the falls-specific charter goals and provide an opportunity to assess areas of need and troubleshoot barriers to improvement (Coe et al., 2017). Collected data quarterly from clinical and community-based organizations. During that 9-month period, 48% (20,317) of patients aged 65 years and older were screened for falls risk, and 30% (1,564) of those who screened positive received an evaluation of their gait, strength, and balance most often a Timed Up and Go (TUG) or "TUG" test. Of those who screened positive, 37% (2,133) received a plan of care and multifactorial clinical risk assessment. The key is to understand that this framework will need to be implemented differently for large and complex problems than for smaller problems; one size does not fit all (Reed et al., 2016).

Major Tenets

Quality improvement concepts initially utilized in the industry have been applied to healthcare to reduce error and variation in outcomes (Christoff, 2018). The pragmatic principles of PDSA cycles promote the use of a small-scale, iterative approach to test interventions. This enables rapid assessment and provides flexibility to adapt the change according to feedback to

ensure fit-for-purpose solutions are developed (Taylor et al., 2014). The central tenets of the PDSA cycle for improvement are reflected in its name. According to AHRQ (2013), the four-step approach identifies improvement opportunities as the first step to "Plan" change with precise predictions of the outcomes. The second step, "Do," is the implementation phase. The third step, "Study," scrutinizes data and results on a small group of patients. The last step, "Act," is based on the testing period results, incorporates changes, and develops quality improvement plans. The documentation of each stage of the PDSA cycle is essential to support scientific quality, local learning and ensure knowledge is gained to support the organization and transfer learning to other settings (Taylor et al., 2014). The adoption of PDSA to address different problems and different stages in each improvement project's life cycle requires an extensive repertoire of skills and knowledge (Reed et al., 2016).

Plan

In the Plan stage, a change aimed at improvement is identified. This step involves developing objectives, answering the questions of what, when, who, and where, and establishing methods to collect data to determine the change's effectiveness (Taylor et al.,2014). Brown et al. (2018) conducted a quality improvement project and developed an interprofessional education model for geriatric fall risk assessment and prevention using the PDSA cycle. The researchers plan to process materials and develop education evaluation forms at this stage.

The use of PDSA must be supported by a significant investment in leadership, expertise, and resources for change to be successful (Reed et al., 2016). The project lead will utilize leadership skills and knowledge to implement the STEADI screening tool to improve fall screening in older adults and improve quality of care.

The Plan for this QI project will be to conduct 3-month retrospective chart audit two weeks prior to implementation to determine the number of persons 65 and older screened for falls. This QI project will involve one physician, two nurse practitioners, and three medical assistants in private practice as stakeholders for this QI project. The project leads plans to implement the project in one cycle and conduct an evidence-based educational session utilizing the published educational tools to enhance stakeholders' awareness and knowledge of the STEADI algorithm. The project lead will develop and administer pre-and post-test to assess knowledge prior to and after the educational session. During this implementation phase, tools will be applied to help stakeholders maintain compliance with the screening protocol and assist the project lead in data collection. The project lead intends to consult a statistician to ensure that planned statistical analyses are appropriate to measure the project's objectives.

Do

The ‘Do’ stage sees the change tested (Taylor et al., 2014). In this phase, the team carrying out the plan and documenting relevant data identifies successes, problems, or unexpected outcomes (Christoff, 2018). The Do phase implements the plan, including both the QI intervention and the data collection plan (Reed et al., 2016). Ideas to implement the plan into practice are mainly discussed. While implementing quality improvement projects, organizations may establish changes by utilizing proven principles and approaches to quality improvement (AHRQ, 2013).

The educational section is one of the priorities for the implementation of the project. After the educational session is completed, the plan will be to test the process of screening every older adult age 65 and older at least once during their visit to the clinic. The “Stay Independent brochure” in English or Spanish (see Appendices B&C) will be administered to each patient aged

65 and older in the exam room after vital signs are taken. Once completed, the medical assistant will retrieve the form and add up the score. A patient that scores four or more or checks “yes” on one of these questions, "fell in the past year, feels unsteady when standing or walking or worries about falling," will be a screen for fall risk using the STEADI screening tool (see Appendix E). The stakeholder will discuss the patient's results and determine the appropriate fall intervention. The project lead will continue to support the participants, address any concerns that may arise, and document findings. The data collection is crucial to measure the quality improvement project systematically. The project lead will begin analyzing data during this phase.

Study

The ‘Study’ stage examines the success of the change (Taylor et al., 2014). There is a reflection and summary of what was learned compared to previous predictions (Moen, 2010). This phase includes evaluating the documented data to determine if the plan is working (Christoff, 2018). This phase analyzes data and compares results to the definition of success; distill and communicate what has been learned from the formal data analysis and unanticipated learning (Reed et al., 2016). Questions are asked in this cycle to assess the value of the plan. Results are then compared to those predicted and those of previous performances and are discussed and documented (Christoff, 2018).

The project leader will collect and analyze data and compare it with pre-implementation data. A statistics testing will be performed to integrate the scientific underpinning for this QI project. Results of the pre-and post-implementation falls and trends in fall screening rates will be valuable in establishing the intervention plan's efficiency. The project lead will examine data and determine what worked or what did not work and revise and modify the process for another cycle.

Findings will conclude if the QI project process successfully made fall risk screening changes in primary care.

Act

The ‘Act’ stage identifies adaptations and next steps to inform a new cycle (Taylor et al., 2014). In this phase, the intervention being tested is adopted, adapted, or abandoned based on evaluating the initial phase data (Christoff et al., 2018). There can be a determination to restart the cycle at the planning stage due to the plan working well or failing to meet intended results (Hall, 2016). The PDSA cycle is designed to be an uninterrupted development for improvement. Based on what has been learned in the Act phase, the Plan is either revised; a new PDSA cycle begins, fully implements, sustains the intervention, or ends the project without investing further efforts (Reed et al., 2016). The PDSA provides a structure for experimental learning to examine whether a change has worked or not and to learn and act upon any new information as a result (Reed et al., 2016).

In this phase, once the analysis of the results of the project is finalized, it will examine results to learn what can be improved or where it can be further improved or adjusted and evaluate the plan's effectiveness that will substantially enhance fall screening, decrease fall incidence, and improve care quality at the project site. Adjustment of the process will be suggested to the project site if only small changes or no changes occur after completion of the QI project. The project lead will disseminate the results after completing the QI project to the stakeholders, the practice site, fellow students, practice mentor, and team mentors. The project lead will meet with stakeholders to ensure the sustainability of the project.

Project and Study Design

Setting

This QI project will take place in a private practice specializing in Family Medicine and General Practice in Los Angeles, California that serves low-income families. There is one board-certified physician, two certified family nurse practitioners, and four medical assistants. At the project site, providers care for patients in lower income with diverse cultural, ethnic, and economic backgrounds. The practice has approximately 600 primary care visits per month with approximately 70,000 patients seen. These patients seek healthcare for annual wellness and geriatrics as well as children's and women's health care. The project site owner is a practicing board-certified physician and university professor who provides training for nurse practitioner students and physician assistants students. The project site has a lobby, triage area, providers office ,and several exam rooms. The personnel team include: the owner of the practice, two certified family nurse practitioners, two front office receptionists, one medical biller, three medical assistants, and an office manager. The practice uses an electronic system called Office Ally for charting. For health record maintenance, physical charts are scanned into the patient's accounts to ensure continuity of care. Patients are seen either on their scheduled appointment days or via a walk-in appointment either by a physician or nurse practitioner. The patients seeking care at the project site are covered under Medi-Cal insurance (The California Medical Assistance Program), Medicare, and private insurance (either health maintenance organization or preferred provider organization). The patient population ranges from pediatric patients up to the geriatric population**.**

Populations of Interest

The population of interest for the QI project included both the direct and indirect population at the project site. The direct population involved in the QI project will be healthcare providers consisting of one physician, two certified family nurse practitioners, and four auxiliary staff who are medical assistants. Inclusion criteria for this QI project require that the project site currently employ full-time, part-time, or per-diem board-certified providers to implement the fall risk screening at the project site. Exclusion criteria apply to any nurse practitioner students, physician assistant students, medical students, office manager, clerk, or any non-contracted board-certified providers who would not participate in implementing the QI project at the project site. The indirect population will include all adult patients 65 years and older seeking care at the project site.

Stakeholders

The project site employs one certified physician who also owns this project site. The other healthcare staff are two board-certified family nurse practitioners and four medical assistants. The physician, who is the key stakeholder and content expert, will support this QI project and collaborate with the project lead to evaluate the fall screening protocol. The project lead will consult the key stakeholder for the design and implementation of the QI project. Other instrumental stakeholders are the two-board certified family nurse practitioners, and the four medical assistants will serve as auxiliary stakeholders. The medical assistants will assist with distributing the “Stay Independent brochure” to the patient to be reviewed by providers. The goal of the project is to incorporate evidence-based into practice. With this objective set, the physician and nurse practitioners will regularly participate in continuing education training to stay compliant with current evidence-based guidelines. Participation in this QI project will be

mandatory for stakeholders and the project lead will provide educational training and email staff the QI process to improve collaboration and maintain effective communication with the stakeholders**.** The project site granted permission to implement this evidenced-based QI project from the content expert who also owns the project site. The affiliation agreement between the university and the project site was not required (see Appendix B).

Interventions/Project Timeline

The proposed project implementation timeline will be as follows:

A week before implementation of the QI project, the project lead will email a notification to the physician who is the owner of the practice, nurse practitioners, and medical assistants to remind them about the implementation of fall risk screening protocol and the starting date. During that week, a pre-chart audit will be conducted to determine the pattern of fall risk screening at the project site. The project lead will also input collected data from the chart audit sheet (see Appendix H) into the Excel spreadsheet. During week one of QI project implementation, the project lead will administer a pre-test (see Appendix F) to physician who is the owner of the practice, nurse practitioners, and medical assistants to evaluate their knowledge before the educational session and document results utilizing the pre/post-test score sheet (see Appendix G). The project lead will conduct a one-hour educational session (see Appendix J) to the physician who is the owner of the practice, nurse practitioners, and medical assistants regarding the importance of fall screenings, the Stay Independent brochure, the STEADI algorithm, and the CDC fall resources. An opportunity will be provided for a one-on-one educational session for anyone absent for different reasons or more clarifications.

After completing the educational session, a post-test will be administered to the physician, nurse practitioners, and medical assistants to evaluate knowledge outcomes and validate their

understanding of the comprehensive fall screening and the STEADI tool. The score will be recorded on the test score sheet (see Appendix G). The pre and post-tests will be identified by participant numbers instead of names to maintain confidentiality. The implementation will immediately begin after the completion of the educational session introducing fall risk screening protocol. The Stay Independent brochure" will be available for medical assistants to use during the screening. The QI project will be implemented over the next four weeks. Every week for a four-week period, the project lead will be available by phone or email to provide support as needed, collect data, and evaluate the fall risk screening and the use of the screening tool. At the end of each week, the project lead will collect data from the chart audit sheet, input it into the Excel spreadsheet, and store the data in a USB flash drive that will be safely locked in a clinic assigned cabinet that is only accessible to the project lead. On week five after the implementation of QI project is completed, the project lead will input the data in the Excel spreadsheet by extracting from the chart audit and analyze the data to determine if the fall risk screening compliance using the screening tool and the intervention were statistically significant. The project lead will also determine if there was an increase in fall screenings using the STEADI tool. Once all data has been compiled via the Excel spreadsheet, the results will be analyzed using SPSS and with the help of a statistician for accuracy of data and tests. The final results will be shared with the physician, nurse practitioners, and medical assistants at the project site. Depending on the result, the project lead will discuss improvements or adoption of the QI project into practice.

Tools/Instrumentation

Stay Independent Brochure

The CDC developed the Stay Independent brochure in collaboration with the Veterans Administration Greater Los Angeles Healthcare System, Geriatric Research Education & Clinical

Center (GRECC), and the Fall Prevention Center of Excellence. The Stay Independent brochure can be easily self-administered by elderly individuals or be conducted via frontline healthcare personnel, then can be followed by specialized assessment procedures (Time Up and Go test (TUG), 30-Second Chair Stand, 4-Stage Balance Test), and detailed health history and physical examination (Loonlawong et al., 2019). The Stay Independent brochure will be completed by patients 65 and older at least once during their scheduled office visit. Each answer on the Stay Independent brochure will be scored as a zero, one, or two (CDC, 2016) by the medical assistants. A total score of 4 or higher or a "yes" answer on one of the three key questions, "fell in past years, feels unsteady when standing or walking, worries about falling" is considered positive for risk of fall (CDC, 216). In the U.S., the content validity and reliability of the initial Stay Independent brochure fall risk assessment were consistent across cultures, language, and communities and covered all relevant fall-related factors (Loonlawong et al., 2019; Vivrette et al., 2011). The Stay Independent brochure will be reviewed by the healthcare provider with the patient during the visit and will be part of the education and screening tool completed by the patient; the brochure will be available in English and Spanish (see Appendices C&D) (CDC, 2016). No permission is needed to download the Stay independent brochure on the CDC website. The CDC allowed the reproduction of the Stay Independent brochure without further consent or cost.

STEADI Tool

The CDC developed the STEADI tool and validated it by the American Geriatric Society and British Geriatric Society Guidelines to help primary care providers identify patients at risk of falls, identify modifiable risk factors, and develop appropriate interventions to reduce risks. The STEADI tool combines several screening tools in a stepwise manner, starting with a quick and

simple assessment tool, the Stay Independent brochure (Loonlawong et al., 2019). The STEADI tool is the most widely disseminated fall risk screening tool (CDC, 2016). To initiate development of STEADI, CDC conducted a literature review to assess the current knowledge and use of fall prevention strategies in clinical care settings (Sarmiento & Lee, 2017). CDC also engaged internal and external content experts to review and provide feedback to ensure accuracy and credibility of the content and design (Sarmiento & Lee, 2017).

According to Lohman et al. (2017), the STEADI clinical fall risk screening tool is a valid measure for predicting future fall risk using survey cohort data. Furthermore, the adapted STEADI fall risk algorithm also had a high predictive validity for future fall risk when assessed using U.S. survey cohort data in a nationally representative sample (Loonlawong et al., 2019; Lohman et al., 2017). The STEADI tool will be available in English (see Appendix E). The tool will be introduced into the project site for use during the fall screening. The project site owner approved the tool (see Appendix B). No permission is needed to download the Stay independent brochure on the CDC website. The CDC allowed the reproduction of the STEADI tool without further consent or cost.

Educational PowerPoint

An educational presentation and handout PowerPoint developed by the project lead (see Appendix J) will be distributed to physician who the owner of the practice, nurse practitioners, and medical assistants at the educational session in the project site to educate staff regarding the consequences of falls, the importance of screening, and educating patients. This educational session will convey falls and guidelines to support the evidence-based initiative to screen falls using the STEADI tool. It will also discuss fall screening tools, protocol, and the impact of falls on patients. Staff may refer to this PowerPoint handout for educational purposes. Patient

education of fall awareness, screening, and education is essential for patients 65 and older. Given that 90% of older adults seek medical care once a year, primary care providers are well-positioned to identify patients at high risk for a fall and offer effective interventions (Sarmiento et al., 2017). The CDC estimates that increasing fall risk screenings and addressing modifiable risk factors may result in a 25% decline of future falls (Houry et al., 2016).

The healthcare providers at the project site will discuss fall prevention options based on the STEADI algorithm for each patient screened positive on the Stay Independent brochure. The STEADI tool kit algorithm is also used to assess and treat patients at all fall risk levels. The healthcare providers will educate the patient on risk levels (low, moderate, and severe) and fall prevention. The recommended interventions are based on the assessment findings but can include patient education, vitamin D or calcium prescriptions, or referral to physical therapy or a community fall prevention program (CDC, 2016). Adopting a whole care team-based approach distributing work among physicians, medical assistants, nurses, front desk staff can also facilitate the integration of STEADI into primary care and other practices (Sarmiento et al., 2017). Fall screening and education are essential to developing a comprehensive fall program that matches the patient's needs. By reducing their patients' risk of falls, providers will enable older adults to remain healthy and independent as long as possible (Stevens, 2013). The STEADI resources are available on the CDC website and distributed and promoted through various channels, including the CDC website, partner organizations' websites, email lists, newsletters, events, conferences, and different social media platforms and regularly updated in both English and Spanish. The educational tool was validated and approved by the physician who is the content expert, project mentor and the academic mentors.

Pre/Post Test

The pre and post-test (see Appendix F) will be offered in a paper format before and after the educational session. The test consists of a brief ten-question multiple-choice quiz about the STEADI algorithm developed by the project lead based on CDC resources. The two tests are the same to measure the knowledge before and after the educational intervention. The tools will measure stakeholders' knowledge, skills, and attitude towards fall risk factors, fall screening, and the STEADI tool. An opportunity for remediation will be given to stakeholders who score low on the test. A score of at least 80% is required to pass the test. Only the project lead will have access to scores. The scores from pre and post-test will be entered on a scoresheet that will contain participant scores (see Appendix G). The content validity index utilized was to determine the content validity and reliability of the questionnaires. The CVI tool (see Appendix I)went to three expert raters for validity. The questionnaires received mean I-CVI scores of 1.0 from the three expert raters, suggesting that all the questions were moderately to highly relevant to this quality improvement project. The tool was approved by the project mentor and the academic mentors.

Chart Audit Sheet

The chart audit tool (see Appendix H) developed by the project lead is a table format tool used to collect data from the patients' charts. The tool will collect data about fall screening for patients 65 and older before implementing the protocol and after implementation. The chart audit sheet will contain a generated patient number to maintain confidentiality. The variables in the chart audit tool will include a total of five questions to review. The audit will record the patient's gender, age, Stay Independent brochure scores, and if the STEADI tool algorithm was used to screen the patient. Information gathered will be entered into an Excel database and stored on a USB flash drive in which only the project lead will have access. The tool was validated and

approved by the project mentor and the academic mentors based on the Touro University requirements.

SPSS Software

The Statistical Package for the Social Sciences (SPSS) Version 23 for data analysis will be used to perform statistical analysis. The software is validated by the school statistician. The project lead plans to consult a statistician to assist with data analysis.

Study of Interventions/ Data Collection

The data collection procedure will consist of administering pre- and post-educational tests to participants and conducting pre-and post-fall risk screening implementation chart audits. A post-educational test will be administered after completing the education session to evaluate the effectiveness of the educational session and improvement of the participants' fall screening knowledge, skills, and attitude. The project lead will measure the educational session's effectiveness by comparing the pre-and post-educational tests and conducting a chart audit. During the implementation of the QI project, randomly generated three-digit identification numbers will identify patients and participants to maintain the confidentiality of collected data from the electronic health record system. The pre-and post-educational test data and chart audits will be recorded into the score sheet and stored in a locked filing cabinet for data analysis; only the project lead has access to the audit and educational test results. Data will be destroyed two years after the project has been completed.

Ethics and Human Subject Protection

The project lead has completed all required Collaborative Institutional Training Initiative (CITI) programs to ensure ethical conduct and human subjects' protection. This QI project will not involve any direct patient care activities or human subjects. This quality improvement project

meets the Touro University Nevada Institutional Review Board (IRB) exemption criteria; hence, this project did not require IRB approval before implementation. The physician, nurse practitioners, and medical assistants at the facility will participate in this QI project. The clinic engages in various quality improvement projects, health care providers, and medical assistants are mandated to participate. Participation in the QI project is not a condition of employment or benefits to which the participants are currently entitled. A week before implementing the project, a reminder email will be sent to participants about implementing the QI project. The project lead will conduct one educational session on week one of implementing the QI project at the project site. Monetary compensation will not be awarded to participants. There is no risk for participating in this QI project. The project lead deidentify all patient and participant information to adhere to the Health Insurance Portability and Accountability Act (HIPAA). There will be no identifying data collected from the participants or patient records. The patient charts and pre- and post-educational tests will be assigned a random numeric identifier instead of the patient name or medical record number. The project lead will input all data collected from the pre-and post-implementation chart audits and pre- and post-educational tests into Excel for analysis. Collected data will be stored in a secured file cabinet and flash drive that only the project lead will have access to until completion of the project.

Measures/Plan for Analysis

The QI project addresses the improvement of fall risk screening utilizing the STEADI tool to improve providers' knowledge and adherence to fall risk screening protocol. The data from pre- and post-tests and chart audits will be analyzed using the Statistical Package for the Social Sciences (SPSS) version 23. A paired t-test will compare the pre-educational and post-educational test knowledge scores for statistical significance. Paired samples or repeated measures techniques

are utilized when the same set of people are tested more than once (Pallant, 2016). The pre-implementation educational test data's values will be compared against the post-implementation educational test data to determine a significant difference in the mean values between the pre-and post-implementation educational tests. By testing for statistical significance in the difference between the mean values, the t-test indicates whether there has been an improvement after the proposed intervention (Wang & Liu, 2016). If The probability (p) value is less than .05, there were statistically significant differences between the pre-post test scores (Pallant, 2016).

A 95% CI will be to evaluate the compliance to the STEADI screening tool/intervention by participants. The Confidence interval (CI) indicates the precision or reliability of the observations—the narrower the CI of a sample statistic, the more reliable is the estimation of the underlying population parameter (Hazra, 2017). A 95% CI of the mean implies that if the samples originate from the same population with the same extraction method, 95% of their CI ranges would include the population means (Lee, 2016). The project lead will hire a statistician to ensure the accuracy of data analysis.

Analysis of Results

This quality improvement (QI) project aims to improve compliance with fall risk screening in a primary care setting. Each year, 28.7% of older adults over 65 years sustain a fall (Dellinger, 2017). At the national level, this represents 29 million falls resulting in 27,000 deaths and 7 million injuries requiring medical treatment or restricted activity for at least one day (Dellinger, 2017).

The primary objective of this QI project was to implement and increase compliance with comprehensive fall risk screening in adults 65 years old using the STEADI tool through educational sessions for the target populations to increase fall screening knowledge. The

effectiveness of the educational sessions was measured by comparing pre and post-test scores. The statistical tests used were parametric (paired t-test). Based on chart audits, the healthcare providers' adherence to the fall risk screening protocol in adults 65 years and older was determined using the 95% confidence interval around estimate based on Clopper-Pearson's exact method. The analysis of the collected data was completed utilizing SPSS version 23.

Educational Session/ Pre and Post Test Knowledge Scores

A total of seven staff members *(N=7)* attended the educational training session on fall risk screening in adults 65 years of age and older. Of the seven stakeholders, one staff member was a primary care physician, two staff members were nurse practitioners (NP), and four were medical assistants (MA). All participants completed a ten-item pre-and -post-test to evaluate their fall risk screening and the STEADI tool knowledge. The pre- and post-test questionnaire has a score of one point each. The overall knowledge test score increased from a mean score of 83% (SD 0.11) before attending the educational session to a mean score of 99% (SD 0.04) after attending the educational session (Table 1). This 16% increase was statistically significant ($t=3.667(df = 6)$, $p=0.010$). The assumption of normality to perform the paired t-test was assessed by histogram and a Shapiro Wilk's test. All appropriate assumptions were checked for each test, and violations were handled accordingly. Based on these results, the educational session improved the participant's knowledge of fall risk screening which aligned with the project objectives to increase the provider's fall risk screening knowledge.

Table 1. *Paired t-test results to assess the knowledge scores of a fall risk screening protocol pre-and-post educational session on providers (n=7) in a primary care setting.*

Outcome	PRE Mean (SD)	POST Mean (SD)	Difference (post-pre) Mean (95% CI)	Paired t test (df)
Knowledge score	0.83 (0.11)	0.99 (0.04)	0.16 (0.05, 0.26)	$3.667_{(6)}$

*** P< 0.05 based on paired t-test.**

There is a statistical significance (p< 0.05) between the pre-and- post-test scores, showing an increase in providers' knowledge from the mean score of 83% to 99%, which is a 16 % increase, aligning with project objectives to increase fall risk screening in adults 65 and over (Figure 1).

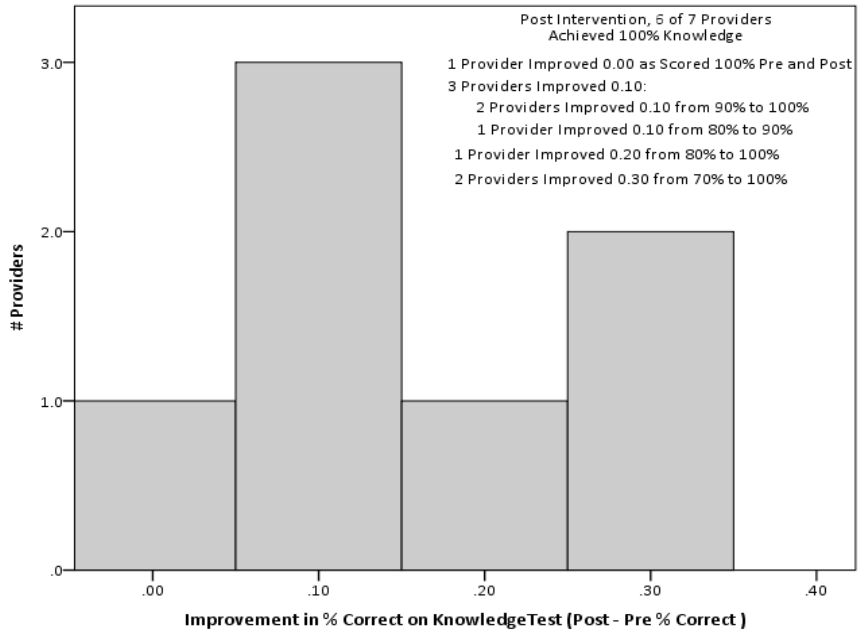


Figure 1. *Providers' pre-post fall risk screening knowledge test*

Chart Audit

A total of 133 charts were audited two weeks before and four weeks after the educational session to determine if the providers were adherent to the protocol and increased fall risk

screening in adults 65 years of age and older. Each chart was assigned a random number (001-140). No patient identifiers were used to maintain confidentiality. Chart audits were performed, and a codebook was developed to identify variables: age, gender, stay independent brochure, and STEADI tool in data input. The majority of patients were female (53.4%), and the minority were male (46.6%). The patient's age ranges from a minimum of 65 to a maximum of 85, for an average age of 73.9 years. Over half were between 65 and 74 years of age (59.4%), with 28.6% between 75-84, and 12.0% >=85 years of age (Table 2).

Table 2. *Demographics of patient population*

	Overall N (%)	Pre-Group N (%)	Post Group N (%)	χ^2 (df)	p-value
	N=133	N=86	N=47		
Age, years:				0.851 (2)	0.653
65-74	79 (59.4%)	50 (58.1%)	29 (61.7%)		
75-84	38 (28.6%)	24 (27.9%)	14 (29.8%)		
85+	16 (12.0%)	12 (14.0%)	4 (8.5%)		
Gender:				0.482 (df=1)	0.487
Female	71 (53.4%)	44 (51.2%)	27 (57.4%)		
Male	62 (46.6%)	42 (48.8%)	20 (42.6%)		

Provider Compliance

The provider's compliance to the fall risk screening in adults 65 years and older was determined during the chart audit of the 133 eligible patients. Of the 133 charts audited, 86 charts were audited before implementing the fall risk screening protocol using the STEADI tool, and 47

charts were audited post-implementation. There was no chart documentation of the fall risk screening protocol using the STEADI tool noted. The chart audit pre-and post-implementation of the fall risk screening protocol showed a significant improvement in fall risk screening adherence *(p*<0.05). There was a significant difference between the provider's pre-post adherence to fall risk screening protocol after the project implementation (*p=0.653*).

A 95% CI was used to evaluate the provider's compliance with the fall risk screening protocol. The pre- implementation chart audit represented a completion rate of 37.2%. The post-implementation audits of all 47 patient charts were at a 95.7% rate of completion, which represented an increase in assessment completion rate (Figure 2).There was a significant increase in overall fall risk screening ($\chi 2$(df=1)=42.718, p<0.001) that aligned with the project objectives to increase compliance to the protocol using the STEADI tool.

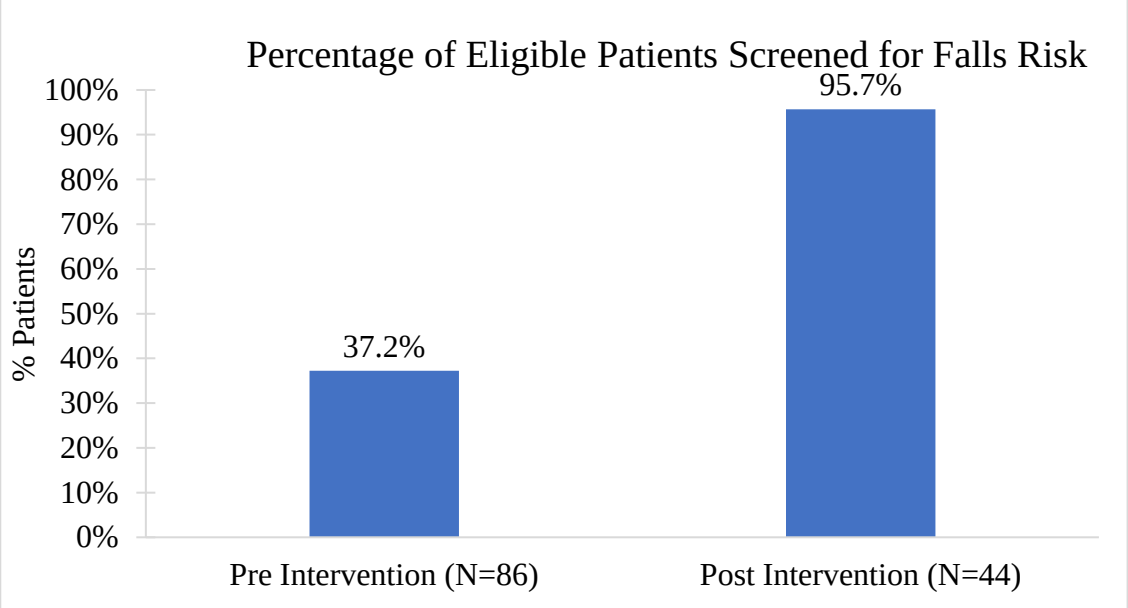


Figure 2. *Distribution of fall risk screening pre-and post-intervention (N=133).*

The high adherence by providers to the STEADI protocol across patients in the post-period likely contributed to this outcome with 95.7% adherence (95% CI 85.5, 99.5), especially

important when 70.2% (95% CI 55.1, 82.7) were identified at risk of a fall by the STEADI algorithm (Table 3).

Table 3. *Provider's adherence to fall risk screening protocol using the STEADI algorithm*

	Percentage (95% CI)
The patient was identified at risk of fall using the STEADI algorithm	70.2% (55.1, 82.7)
The patient's provider completed the brochure	95.7% (85.5, 99.5)
The patient's provider was adherent with STEADI protocol.	95.7% (85.5, 99.5)

Note. 95% confidence interval estimated using Clopper-Pearson exact method.

These findings indicate that patients identified as at risk of fall were screened, and there was a significant increase in the number of patients' screenings completed using the STEADI tool. All providers increased their adherence to protocol and completed the Stay Independent brochure with an overall rate of 95.7%. The percentage of eligible patients screened for fall risk increased from 37.2% pre-implementation to 95.7% post-implementation, aligned with project objectives. This suggests that a more substantial proportion of providers have completed the Stay Independent brochure at post-intervention and, most likely, have been screened for fall risk screening by providers using the STEADI tool. The outcomes indicate that the intervention successfully increased staff knowledge about fall risk screening and utilizing the STEADI tool in adults 65 years of age and older. Analysis was highly consistent with the project objectives and question(s) and served to address and answer them. The project results are in alignment with the project aims and objectives.

Discussion of Findings

Falls are the leading cause of fatal and non-fatal injuries among adults aged 65 years and older in the United States (McCarthy, 2016). The purpose of the DNP project was to implement a quality improvement project to improve fall risk screening in older adults 65 and older in primary care.

The first objective of this DNP project was to conduct a 3-month retrospective chart audit two weeks before the educational intervention to assess the number of patients 65 years of age and older who reported falls. The project lead audited 133 charts; 86 were audits before implementing the fall risk screening protocol using the STEADI, and only 37.2% of older adults were screened for falls. The STEADI tool helps providers identify patients at risk for a fall, identify modifiable risk factors, and implement effective strategies to treat or reduce risk (Sarmiento & Lee, 2017).

The second objective was to provide an educational session on fall risk screening, the STEADI algorithm screening tool, and the Stay Independent brochure to the medical assistants, nurse practitioners, and the physician at the project site. An aging population benefits from healthcare providers trained in the care of older adults; interprofessional education (IPE) and service-learning activities focused on geriatric conditions like falls may address this need (Taylor et al., 2019). A total of seven staff members attended the educational training session on fall risk screening in adults 65 years of age and older. Of the seven stakeholders, one staff member was a primary care physician, two staff members were nurse practitioners (NP), and four were medical assistants (MA). The conducted educational session conveys falls in older adults and guidelines to support the evidence-based initiative to screen falls using the STEADI tool. After administration of the pre-and post-test questionnaire, it was noted that providers' knowledge scores increased

from 83% before participation in the educational session to 99% after participation. The 16% increase in provider knowledge was statistically significant ($p< 0.05$). The result aligned with the project objective to increase providers' knowledge of falls in older adults through the educational session.

The third objective was to implement the STEADI screening tool at the project site. The STEADI initiative to help primary care providers (PCPs) identify and manage fall risk and comparing a 12-item and a 3-item fall screening questionnaire (Eckstrom et al., 2017). STEADI tool comprises several resources for clinical providers, including guidelines for implementation, assessment, treatment, and referral (Lohman et al., 2017). The STEADI algorithm's first step is the completion of the Stay Independent brochure. The result showed that the percentage of patients at risk of falls using the STEADI algorithm was 70.2%. Completion of the Stay Independent brochure by providers was 95.7%, and providers using the STEADI algorithm was 95.7%. The results showed that the implementation of the STEADI tool at the project site was successful.

The fourth objective was to evaluate the project findings by conducting a post-intervention chart audit of the number of patients 65 and over screened for falls during implementation. The data were recorded and compiled in the Excel spreadsheet and analyzed using SPSS version 23. One hundred thirty-three charts were audited, 86 were audited before implementing the fall risk screening protocol using the STEADI tool, and 47 were audited post-implementation. The result showed that statistical improvement ($p<0.001$) in fall risk screening in older adults 65 and over in primary care was met, aligning with project objectives. The provider's adherence to the fall risk protocol increased from 37.2% pre-implementation to 95.7% post-implementation using the STEADI tool in four weeks.

The QI project answered the following clinical question: will implementing comprehensive fall risk screenings using the STEADI tool and staff education significantly increase the incidence of fall risk screening in older adults 65 and over compared to the current protocol over four weeks? The project's findings demonstrated a significant increase in the utilization of the fall risk screening using the STEADI tool post-implementation. The increased providers' knowledge in falls in older adults and the use of the STEADI tool appear to impact the effort of providers to increase fall risk screening in older adults using the evidence-based STEADI tool.

The STEADI tool improved fall risk screening by taking a comprehensive, consistent approach to screening for fall risk in primary care, resulting in improved quality of care in older adults 65 and over. The AGS/BGS guideline recommends screening all adults aged 65 and older for fall risk annually (Pherlan et al., 2015). The fall screening consists of asking patients whether they have fallen two or more times in the past year or sought medical attention for a fall, or, if they have not fallen, whether they feel unsteady when walking (Phelan et al., 2015). The STEADI tool provides an outlined step to screen, assess, and develop individualized fall prevention based on the patient's risk factors. The project outcomes showed that the fall risk screening using the evidence-based STEADI tool improved provider's knowledge and increased fall risk screening incidence.

Significance/ Implications in Nursing

The DNP project allows the American Association of Colleges of Nursing DNP Essentials synthesis through "real world" translation of evidence into practice (Brown & Crabtree, 2013). The quality improvement project was developed to improve providers' knowledge of falls in older

adults and increase providers' adherence to fall risk screening protocol using the STEADI tool in adults 65 and over in the primary care setting.

The DNP Essentials provide a foundation and guide for knowledge development. The importance of using an evidence-based tool to screen for fall risk and improve patient outcomes aligned with the DNP Essential I, "Scientific underpinnings for practice. Preparation to address current and future practice issues require a strong scientific foundation for practice (AANC,2006). Falls among older adults are neither purely accidental nor inevitable, but research has shown that many falls are preventable (Phelan et al., 2015). A fall among an older adult patient cannot only be fatal or cause a devastating injury, but it can also lead to problems that can affect a patient's overall quality of life (Sarmiento et al., 2017). As primary care providers, nurse practitioners play a critical role in protecting older adult patients from one of the biggest threats to their health and independence- falls (Sarmiento et al., 2017). However, fall risk assessment and management are performed infrequently in primary care settings (Phelan et al., 2015). The protocol was adhered to by the providers at the project site, and utilization of the fall risk screening using the STEADI tool leads to an increase in fall risk screening in older adults 65 and over. Guidelines recommend annual screening to identify patients at increased risk of falling and comprehensive risk assessment and management of modifiable fall risk factors for high-risk patients (Phelan et al., 2015). The project's results are significant to nursing because nurse practitioners play a critical role in reducing fall risk factors among older patients (Phelan et al., 2015). Nurse practitioners can address falls during patient visits. Nurse practitioners can play an important role in fall prevention by identifying older adults likely to fall and providing clinical interventions to reduce their fall risks (Burns et al.,2018). Falls can significantly change patients' level of functioning and

quality of life. As agents of change, nurses play a considerable role in decreasing falls among older adults by educating patients about fall risks and prevention.

The project aligned with the DNP Essential VII founded on health promotion and risk reduction to improve the health of both individuals and communities (AANC, 2006). Given that 90% of older adults seek medical care once a year, primary care medical providers are well-positioned to identify patients at high risk for a fall and offer effective interventions (Sarmiento et al., 2017). It is essential that providers screen patients 65 and over for fall risk factors to develop appropriate fall prevention and decrease fall incidence in older adults. The implementation of clinical prevention and population health activities is central to achieving the national goal of improving the health status of the population of the United States (AACN,2006). However, the literature indicates that many providers feel they do not know how to conduct fall-risk assessments or have adequate knowledge about fall prevention (Smith et al., 2015). By evaluating patients for fall risk and encouraging them to adopt evidence-based prevention strategies, primary care providers can help patients reduce their chances of falling and experiencing functional decline, injury, or death (Phelan et al., 2015). The project results showed that the percentage of patients at risk of falls using the STEADI algorithm was 70.2%, the Stay, Independent brochure completion by providers was 95.7%, and providers using the STEADI algorithm was 95.7% which improved the fall risk screening, therefore improving quality of life.

The quality improvement project required interprofessional collaboration, which aligned with Essential VI: Interprofessional Collaboration for Improving Patient and Population Health Outcomes (AACN, 2006). Involving the multidisciplinary team in care planning is also crucial to promote patient safety and improve outcomes. Quality improvement involves a combined effort among health care staff and stakeholders to diagnose and treat problems in the healthcare system

(Silver et al., 2016). NPS should not function ancillary to medicine but in a collaborative way that leverages the unique training of each discipline to enhance the delivery of effective patient care (Stucky & Stucky, 2021). Adopting a whole care team-based approach—distributing work among physicians, medical assistants, nurse practitioners, front desk staff—can also facilitate the integration of STEADI into primary care and other practices (Sarmiento & Lee, 2017).

Limitations

The current pandemic had shifted the way care is provided, coupled with a short period of the implementation of the DNP project, resulting in a lower number of patients seeking care to the clinic and, therefore, a small sample size.

Project Design:

The implementation of this QI project came across some limitations concerning recruiting participants and the timeline for project implementation. The staff inconsistencies and limited resources to provide care to the growing underserved population may also play a role in a small number of patients and may have limited the results of this project. Another design limitation encountered was maintaining an accurate understanding of the project and effective participation in the project.

Recruitment Methods

Due to the complexities of the COVID-19 pandemic, the clinical site was faced with challenges to maintain constant staffing to meet the underserved population's needs. COVID-19 exposure exacerbated healthcare staffing shortages and increased workload for unexposed clinicians (Stucky & Stucky, 2021). The small number of providers at the practice site for this DNP project affected the project sample. Another limitation was low health literacy. Some patients face significant challenges understanding the Stay Independent brochure and need more

time to discuss the brochure with providers. Low health literacy is associated with older patients with limited education, lower income, chronic conditions, and those who are non-native English speakers (Prince et al., 2018). The last limitation of the DNP project is associated with the short timeline for implementing the project intervention; the project implementation took place over four weeks. Chart audits on fall risk screening adherence to the protocol were collected for four weeks after the educational session provided to the providers.

Data Collection Methods

A limitation of the data collection phase was shortened due to the project implementation time. The implementation of the project through the final collection of data was only four weeks. The period time for data collection revealed adherence to the fall risk protocol. However, there is no long-term data collection to assess how the educational session impacts providers' knowledge to comply with the fall risk protocol. Subsequently, a long-term follow-up of about six months and one year of compliance would be beneficial to track the utilization of the project's results after completing the project.

Data Analysis

One physician, two nurse practitioners, and four medical assistants provided a minimal sample size. Too small a sample may prevent the findings from being extrapolated, whereas too large a sample may amplify the detection of differences, emphasizing statistical differences that are not clinically relevant (Faber & Fonseca, 2014). Analysis of the small sample size of the project was a limitation, and data analysis of the project included a paired-samples t-test and 95% CI. The small sample size of providers may limit the value of the conclusions. An appropriate sample renders the research more efficient (Faber & Fonseca, 2014). To accurately assess the full extent of the intervention, the project period needs to be extended.

Dissemination

The dissemination of the DNP project is essential because it is the accumulation of hard work and provides the collaborators with the project's results (Bemker & Schreiner, 2016). The project lead disseminated the project results via email to the physician, the practice site owner. The implementation outcomes were reviewed with the physician who recognized the need to take a comprehensive approach to screen adults aged 65 and over for fall risk using the STEADI tool. In partial fulfillment of the Doctor of Nursing Practice requirements via an online PowerPoint presentation, an official presentation of this DNP project results and conclusions will be presented to the Touro University Nevada faculty and students on October 20, 2021. The project lead plans to submit the QI project to the Doctor of Nursing Practice repository through electronic submission; the results of this quality improvement project will be open to being accessed by the public for the foreseeable future, thereby serving as a model for other quality improvement projects. The project lead plans to submit an abstract for presentation at 2022 American Association of Nurse Practitioners (AANP) National Conference in Orlando, Florida. The project lead also intends to submit an abstract for presentation at the 2022 California Association for Nurse Practitioners conference in Pasadena (CANP), California, on March 31-April 3, 2022.

The project's results will also be disseminated through "Anciens de la Faculte de Medecine de l'Universite de Kinshasa "(AFMED Unikin) to increase knowledge about fall risk in adults age 65 and over. This non-profit association brings together all former students of the Faculty of Medicine of the University of Kinshasa in the Democratic Republic of Congo. This association aims to share medical knowledge, promote high quality of care, improve medical education and practice.

Sustainability

The STEADI toolkit includes an evidence-based algorithm to screen for individual fall risk during clinical visits, with suggestions for appropriate intervention at each risk level (Stevens, 2013). This QI project can be translated and replicated in any primary care setting. The CDC's STEADI tool can be adopted in a busy primary care practice; the STEADI algorithm embedded into the clinic workflow and electronic health records, primary providers and their clinical teams could consistently recommend interventions (Eckstrom et al., 2017). Sustainability consists of organization stakeholders such as the physician, who is the owner of the project site, and can provide the support needed to sustain the goals of this quality improvement project. The project results indicated a need for providers' continued education at the practice site. Project sustainability will be accomplished through the integration of the protocol for all providers at the project site. The Stay Independent brochure will be incorporated in the EHR, and yearly CEU training will be provided to educate providers on the fall risk screening protocol adherence. The physician, practice owner, has approved this intervention to serve as a healthcare model for the clinic for future providers.

Conclusion

Falls in older adults are on the rise and indicate a need to improve fall risk screening among older adults**.** Falls are a significant threat to older adults' quality of life, often causing a decline in self-care ability and participation in physical and social activities (Phelan et al., 2015). Primary care providers play a critical role in protecting older adult patients from one of the biggest threats to their health and independence-falls. To assist providers in incorporating fall risk screenings, assessing modifiable risk factors, and implementing evidence-based treatment strategies into practice, the CDC developed the STEADI toolkit (Nithman & Vincenzo, 2019).

The STEADI tool was incorporated into the practice of providers at the project site. An educational session using a PowerPoint was used to increase the providers ‘knowledge of fall risk screening in older adults 65 years of age and older. The chart audits pre-implementation increased from 37.2% to 95.7% post-implementation, revealing an increased provider knowledge and increased adherence to fall risk screening while using the STEADI tool. The project demonstrates the need for providers to improve fall risk screening in older adults and develop individualized fall prevention based on fall risk factors.

References

American Association of Colleges of Nursing. (2006). *The essentials of doctoral education for advanced nursing practice*. http://www.aacn.nche.edu/publications/position/DNPessentials.pdf

Aging and life course, family, and community health: WHO global report on falls prevention in older age. (2015). https://www.who.int/ageing/publications/Falls_prevention7March.pdf

Agency for Healthcare Research and Quality (AHRQ) (2013). Module 14. Creating Quality Improvement Teams and QI Plans. Retrieved from https://www.ahrq.gov/professionals/prevention chroniccare/improve/system/pfhandbook/mod14.html

Agency for Healthcare Research and Quality, Patient Safety Network (2019). Falls. Retrieved from https://psnet.ahrq.gov/primer/falls#:~:text=Death%20or%20serious%20injury%20resulting,can%20be%20serious%20as%20well

Bemker, M., & Schreiner, B. (2016). *The DNP degree & capstone project : A practical guide*. Destech Publications, Inc.

Bergen, G., Stevens, M. R., & Burns, E. R. (2016). Falls and fall injuries among adults aged ≥65 years –The United States, 2014. *Morbidity and Mortality Weekly Report*, *65*(37), 993–998. https://doi.org/10.15585/mmwr.mm6537a2

Berg, G. M., & Carlson, T. (2017). Development of a fall's registry: A pilot study. *Journal of Trauma Nursing*, *24*(4), 224–230. https://doi.org/10.1097/JTN.0000000000000295

Blank, W. A. (2016). Fall prevention in a primary care setting. *Deutsches Ärzteblatt*

International, *113*(21), 365–372. https://doi.org/10.3238/arztebl.2016.0365

Bolton L. (2019). Preventing fall injury. *Wounds: A Compendium of Clinical Research and Practice, 31*(10),269–271.

Burns, E. R., Haddad, Y. K., & Parker, E. M. (2018). Primary care providers' discussion of fall prevention approaches with their older adult patients-DocStyles, 2014. *Preventive Medicine Reports*, *9*, 149–152. https://doi.org/10.1016/j.pmedr.2018.01.016

Burns, E., & Kakara, R. (2018). Deaths from falls among persons aged ≥65 years — The United States, 2007–2016. *MMWR. Morbidity and Mortality Weekly Report*, *67*(18), 509-514. https://doi.org/10.15585/mmwr.mm6718a1

Burns, E. R., Stevens, J. A., & Lee, R. (2016). The direct costs of fatal and nonfatal fall among older adults - United States. *Journal of Safety Research, 58*, 99–103. https://doi.org/10.1016/j.jsr.2016.05.001

Bruce, J., Ralhan, S., Sheridan, R., Westacott, K., Withers, E., Finnegan, S., Davison, J., Martin, F. C., & Lamb, S. E. (2017). The design and development of a complex multifactorial falls assessment intervention for fall prevention: The prevention of falls injury trial (PreFIT). *BMC Geriatrics*, *17*(1). https://doi.org/10.1186/s12877-017-0492-6

Brown, M. A., & Crabtree, K. (2013). The development of practice scholarship in DNP programs: A paradigm shift. *Journal of Professional Nursing*, *29*(6), 330–337. https://doi.org/10.1016/j.profnurs.2013.08.003

Brown, D. K., Fosnight, S., Whitford, M., Hazelett, S., Mcquown, C., Drost, J. C., Kropp, D. J., Hovland, C. A., Niederriter, J. E., Patton, R., Morgan, A., Fleming, E., Steiner, R. P., Scott, E. D., & Ortiz-Figueroa, F. (2018). Interprofessional education model for geriatric

falls risk assessment and prevention. *BMJ Open Quality*, *7*(4), e000417. https://doi.org/10.1136/bmjoq-2018-000417

Casey, C. M., Parker, E. M., Winkler, G., Liu, X., Lambert, G. H., & Eckstrom, E. (2016). Lessons learned from implementing CDC's STEADI falls prevention algorithm in primary care. *The Gerontologist*. https://doi.org/10.1093/geront/gnw074

Falls are the leading cause of injury and death in older Americans. (2016, January 1). CDC. https://www.cdc.gov/media/releases/2016/p0922-older-adult-falls.html

Christoff, P. (2018). Running PDSA cycles. *Current Problems in Pediatric and Adolescent Health Care*, *48*(8), 198–201. https://doi.org/10.1016/j.cppeds.2018.08.006

Coe, L. J., St. John, J. A., Hariprasad, S., Shankar, K. N., MacCulloch, P. A., Bettano, A. L., & Zotter, J. (2017). An integrated approach to falls prevention: A model for linking clinical and community interventions through the Massachusetts prevention and wellness trust fund. *Frontiers in Public Health*, *5*. https://doi.org/10.3389/fpubh.2017.00038

Coury, J., Schneider, J. L., Rivelli, J. S., Petrik, A. F., Seibel, E., D'Agostini, B., Taplin, S. H., Green, B. B., & Coronado, G. D. (2017). Applying the plan-do-study-act (PDSA) approach to a large pragmatic study involving safety net clinics. *BMC Health Services Research*, *17*(1). https://doi.org/10.1186/s12913-017-2364-3

Crow, R. S., Lohman, M. C., Pidgeon, D., Bruce, M. L., Bartels, S. J., & Batsis, J. A. (2018). Frailty versus stopping elderly accidents, deaths, and injuries initiative fall risk score: Ability to predict future falls. *Journal of the American Geriatrics Society*, *66*(3), 577–583. https://doi.org/10.1111/jgs.15275

Dieleman, J. L., Baral, R., Birger, M., Bui, A. L., Bulchis, A., Chapin, A., Hamavid, H., Horst,

C., Johnson, E. K., Joseph, J., Lavado, R., Lomsadze, L., Reynolds, A., Squires, E., Campbell, M., DeCenso, B., Dicker, D., Flaxman, A. D., Gabert, R., Highfill, T., … Murray, C. J. (2016). US spending on personal health care and public health, 1996-2013. *JAMA*, *316*(24), 2627–2646. https://doi.org/10.1001/jama.2016.16885

Enderlin, C., Rooker, J., Ball, S., Hippensteel, D., Alderman, J., Fisher, S. J., McLeskey, N., & Jordan, K. (2015). Summary of factors contributing to falls in older adults and nursing implications. *Geriatric Nursing*, *36*(5), 397–406. https://doi.org/10.1016/j.gerinurse.2015.08.006

Eckstrom, E., Parker, E. M., Lambert, G. H., Winkler, G., Dowler, D., & Casey, C. M. (2017). Implementing STEADI in academic primary care to address older adult fall risk. *Innovation in Aging*, *1*(2), igx028. https://doi.org/10.1093/geroni/igx028

Faber, J., & Fonseca, L. M. (2014). How sample size influences research outcomes. *Dental Press Journal of Orthodontics*, *19*(4), 27–29. https://doi.org/10.1590/2176-9451.19.4.027-029.ebo

Florence, C. S., Bergen, G., Atherly, A., Burns, E., Stevens, J., & Drake, C. (2018). Medical costs of fatal and nonfatal falls in older adults. *Journal of the American Geriatrics Society*, *66*(4), 693–698. https://doi.org/10.1111/jgs.15304

Green, B. N., & Johnson, C. D. (2015). Interprofessional collaboration in research, education, and clinical practice: Working together for a better future. *Journal of Chiropractic Education*, *29*(1), 1–10. https://doi.org/10.7899/jce-14-36

Hall L., L (2016). Quality improvement using plan-do-study-act: Strategies for local quality improvement. AMA Retrieved https://edhub.ama-assn.org/steps-forward/module/2702507

Hazra A. (2017). Using the confidence interval confidently. *Journal of Thoracic Disease*, *9*(10),

4125–4130. https://doi.org/10.21037/jtd.2017.09.14

Houry, D., Florence, C., Baldwin, G., Stevens, J., & McClure, R. (2015). The CDC injury center's response to the growing public health problem of falls among older adults. *American Journal of Lifestyle Medicine*, *10*(1), 74–77. https://doi.org/10.1177/1559827615600137

Howland, J., Hackman, H., Taylor, A., O'Hara, K., Liu, J., & Brusch, J. (2018). Older adult fall prevention practices among primary care providers at accountable care organizations: A pilot study. *PloS One*, *13*(10), e0205279. https://doi.org/10.1371/journal.pone.0205279

Hu, X., & Qu, X. (2016). Pre-impact fall detection. *Biomedical Engineering Online*, *15*(1), 61. https://doi.org/10.1186/s12938-016-0194-x

Johnston, Y. A., Bergen, G., Bauer, M., Parker, E. M., Wentworth, L., McFadden, M., Reome, C., & Garnett, M. (2018). Implementation of the stopping elderly accidents, deaths, and injuries initiative in primary care: An outcome evaluation. *The Gerontologist*, *59*(6), 1182-1191. https://doi.org/10.1093/geront/gny101

Kalu, M. E., Vlachantoni, A., & Norman, K. E. (2019). Knowledge about risk factors for falls and practice about fall prevention in older adults among physiotherapists in Nigeria. *Physiotherapy Research International*, *24*(1), N.PAG. https://doi.org/10.1002/pri.1742

Kielich, K., Mackenzie, L., Lovarini, M., & Clemson, L. (2017). Urban Australian general practitioners' perceptions of falls risk screening fall risk assessment, and referral practices for falls prevention: An exploratory cross-sectional survey study. *Australian Health Review: A Publication of the Australian Hospital Association*, *41*(1), 111–119. https://doi.org/10.1071/AH15152

Knudsen, S. V., Laursen, H., Johnsen, S. P., Bartels, P. D., Ehlers, L. H., & Mainz, J. (2019). Can quality improvement improve the quality of care? A systematic review of reported effects and methodological rigor in plan-do-study-act projects. *BMC Health Services Research, 19*(1), 683. https://doi.org/10.1186/s12913-019-4482-6

Kruschke, C., & Butcher, H. K. (2017). Evidence-based practice guideline: Fall prevention for older adults. *Journal of Gerontological Nursing, 43*(11), 15-21. https://doi:10.3928/00989134-20171016-01

Latt, M. D., Loh, K. F., Ge, L., & Hepworth, A. (2016). The validity of three fall risk screening tools in an acute geriatric inpatient population. *Australasian Journal on Ageing, 35*(3), 167–173. https://doi.org/10.1111/ajag.12256

Lawson, K., Vinluan, C. M., Oganesyan, A., Gonzalez, E. C., Loya, A., & Strate, J. J. (2018). A retrospective analysis of prescription medications correlates to falls for older adults. *Pharmacy Practice, 16*(4), 1283. https://doi.org/10.18549/PharmPract.2018.04.1283

Lee D. K. (2016). Alternatives to P value: Confidence interval and effect size. *Korean Journal of Anesthesiology, 69*(6), 555–562. https://doi.org/10.4097/kjae.2016.69.6.555

Leis, J. A., & Shojania, K. G. (2016). A primer on PDSA: Executing plan–do–study–act cycles in practice, not just in name. *BMJ Quality & Safety*, *26*(7), 572–577. https://doi.org/10.1136/bmjqs-2016-006245

Lohman, M. C., Crow, R. S., DiMilia, P. R., Nicklett, E. J., Bruce, M. L., & Batsis, J. A. (2017). Operationalize and validate the stopping elderly accidents, deaths, and injuries (STEADI) fall risk algorithm in a nationally representative sample. *Journal of Epidemiology & Community Health*, *71*(12), 1191-1197.

Loonlawong, S., Limroongreungrat, W., & Jiamjarasrangsi, W. (2019). The stay independent

brochure as a screening evaluation for fall risk in an elderly thai population. *Clinical Interventions in Aging*, *14*, 2155–2162. https://doi.org/10.2147/CIA.S233414

Mark, J. A., & Loomis, J. (2017). The STEADI toolkit: Incorporating a fall prevention guideline into the primary care setting. *The Nurse Practitioner*, *42*(12), 50-55.

McCarthy, M. (2016). Falls are leading cause of injury deaths among older people, US study finds. *BMJ*, i5190. https://doi.org/10.1136/bmj.i5190

McConville, A., & Hooven, K. (2020). Factors influencing the implementation of falls prevention practice in primary care. *Journal of the American Association of Nurse Practitioners*, 10.1097/JXX.0000000000000360. Advance online publication. https://doi.org/10.1097/JXX.0000000000000360

Meekes, W., Leemrijse, C. J., Korevaar, J. C., Henquet, J., Nieuwenhuis, M., & Van de Goor, L. (2020). Implementation and evaluation of a fall risk screening strategy among frail older adults for the primary care setting: A study protocol. *Clinical Interventions in Aging*, *15*, 1625–1636. https://doi.org/10.2147/CIA.S254864

Moen Ronald (2010). Foundation and history of the PDSA cycle. Retrieved from https://deming.org/uploads/paper/PDSA_History_Ron_Moen.pdf

Moncada, L., & Mire, L. G. (2017). Preventing falls in older persons. *American Family Physician*, *96*(4), 240–247.

Moreland, B., Kakara, R., & Henry, A. (2020). Trends in nonfatal falls and fall-related injuries among adults aged ≥65 Years - the United States, 2012-2018. *Morbidity and Mortality Weekly Report*, *69*(27), 875–881. https://doi.org/10.15585/mmwr.mm6927a5

Moyle, S. (2016). Falls prevention. *Australian Nursing & Midwifery Journal*, *24*(1), 32–33.

Newgard, C. D., Lin, A., Caughey, A. B., Eckstrom, E., Bulger, E. M., Staudenmayer, K.,

Maughan, B., Malveau, S., Griffiths, D., & McConnell, K. J. (2020). The cost of a fall among older adults requiring emergency services. *Journal of the American Geriatrics Society*. https://doi.org/10.1111/jgs.16863

Nithman, R. W., & Vincenzo, J. L. (2019). How steady is the STEADI? Inferential analysis of the CDC falls risk toolkit. *Archives of Gerontology and Geriatrics*, *83*, 185–194. https://doi.org/10.1016/j.archger.2019.02.018

O'Connor, E. A., Vollmer, W. M., Petrik, A. F., Green, B. B., & Coronado, G. D. (2020). Moderators of an intervention's effectiveness to increase colorectal cancer screening through mailed fecal immunochemical test kits: results from a pragmatic randomized trial. *Trials*, *21*(1). https://doi.org/10.1186/s13063-019-4027-7

Pallant, J. (2016). SPSS survival manual: A step-by-step guide to data analysis using IBM SPSS. (6th ed.). New York: McGraw Hill

Phelan, E. A., Mahoney, J. E., Voit, J. C., & Stevens, J. A. (2015). Assessment and management of fall risk in primary care settings. *The Medical Clinics of North America*, *99*(2), 281–293. https://doi.org/10.1016/j.mcna.2014.11.004

Prince, L. Y., Schmidtke, C., Beck, J. K., & Hadden, K. B. (2018). An assessment of organizational health literacy practices at an academic health center. *Quality Management in Health Care*, *27*(2), 93–97. https://doi.org/10.1097/QMH.0000000000000162

Reed, J. E., & Card, A. J. (2016). The problem with plan-do-study-act cycles. *BMJ Quality & Safety*, *25*(3), 147–152. https://doi.org/10.1136/bmjqs-2015-005076

Reeves, S., Pelone, F., Harrison, R., Goldman, J., & Zwarenstein, M. (2017). Interprofessional

collaboration to improve professional practice and healthcare outcomes. *The Cochrane Database of Systematic Reviews, 6*(6), CD000072. https://doi.org/10.1002/14651858.CD000072.pub3

Rotondi, N. K., Beaton, D. E., Sujic, R., Bogoch, E., Inrig, T., Linton, D., Weldon, J., Jain, R., & Sale, J. (2020). Factors associated with screening positive for high falls risk in fragility fracture patients: A cross-sectional study. *BMC Musculoskeletal Disorders, 21*(1), 372. https://doi.org/10.1186/s12891-020-03410-2

Sarmiento, K., & Lee, R. (2017). STEADI: CDC's approach to make older adult fall prevention part of every primary care practice. *Journal of Safety Research, 63*, 105–109. https://doi.org/10.1016/j.jsr.2017.08.003

Shaw, L., Kiegaldie, D., & Morris, M. E. (2020). Educating health professionals to optimize falls screening in hospitals: protocol for a mixed methods study. BMC Health Services Research, 20(1), 54. https://doi.org/10.1186/s12913-020-4899-y

Siegrist, M., Freiberger, E., Geilhof, B., Salb, J., Hentschke, C., Langendoerfer, P., Linde, K., Halle, M., & Stevens, J. A., Smith, M. L., Parker, E. M., Jiang, L., & Floyd, F. D. (2017). Implementing a clinically based fall prevention program. *American Journal of Lifestyle Medicine, 14*(1), 71–77. https://doi.org/10.1177/1559827617716085

Silver, S. A., Harel, Z., McQuillan, R., Weizman, A. V., Thomas, A., Chertow, G. M., Nesrallah, G., Bell, C. M., & Chan, C. T. (2016). How to begin a quality improvement project. *Clinical Journal of the American Society of Nephrology, 11*(5), 893–900. https://doi.org/10.2215/cjn.11491015

Smith, M. L., Stevens, J. A., Ehrenreich, H., Wilson, A. D., Schuster, R. J., Cherry, C. O. B., &

Ory, M. G. (2015). Healthcare providers' perceptions and self-reported fall prevention practices: Findings from a large New York health system. *Frontiers in Public Health*, *3*(17).

Sun, R., & Sosnoff, J. J. (2018). Novel sensing technology in fall risk assessment in older adults: A systematic review. *BMC Geriatrics*, *18*(1), 14. https://doi.org/10.1186/s12877-018-0706-6

Sun, S. & Yu, X. (2016). HMM-Fisher: Identifying differential methylation using a hidden markov model and fisher's exact test. *Statistical Applications in Genetics and Molecular Biology*, *15*(1), pp. 55-67. doi:10.1515/sagmb-2015-0076

Stevens, J. A., Smith, M. L., Parker, E. M., Jiang, L., & Floyd, F. D. (2017). Implementing a clinically based fall prevention program. *American Journal of Lifestyle Medicine*, *14*(1), 71-77. https://doi.org/10.1177/1559827617716085

Stucky, C. H., Brown, W. J., & Stucky, M. G. (2021). COVID 19: An unprecedented opportunity for nurse practitioners to reform healthcare and advocate for permanent full practice authority. *Nursing Forum*, *56*(1), 222–227. https://doi.org/10.1111/nuf.12515

Taylor, D., McCaffrey, R., Reinoso, H., Mathis, M. W., Dickerson, L., Hamrick, J., Madden, S. L., Heard, H. H., Perlow, E., & Klein, C. M. (2019). An interprofessional education approach to fall prevention: Preparing interprofessional healthcare team members to implement STEADI into practice. *Gerontology & Geriatrics Education*, *40*(1), 105–120. https://doi.org/10.1080/02701960.2018.15302

Taylor, M. J., McNicholas, C., Nicolay, C., Darzi, A., Bell, D., & Reed, J. E. (2014). A

systematic review of the application–do–study–act method to improve quality in healthcare. *BMJ Quality & Safety*, *23*(4), 290–298. https://doi.org/10.1136/bmjqs-2013-001862

Tricco, A. C., Thomas, S. M., Veronika, A. A., Hamid, J. S., Cogo, E., Strifler, L., Khan, P. A., Robson, R., Sibley, K. M., MacDonald, H., Riva, J. J., Thavorn, K., Wilson, C., Holroyd-Leduc, J., Kerr, G. D., Feldman, F., Majumdar, S. R., Jaglal, S. B., Hui, W., & Straus, S. E. (2017). Comparisons of interventions for preventing falls in older adults: A systematic review and meta-analysis. *Journal of the American Medical Association*, *318*(17), 1687–1699. https://doi.org/10.1001/jama.2017.15006

Tricco, A. C., Thomas, S. M., Veroniki, A. A., Hamid, J. S., Cogo, E., Strifler, L., Khan, P. A., Sibley, K. M., Robson, R., MacDonald, H., Riva, J. J., Thavorn, K., Wilson, C., Holroyd-Leduc, J., Kerr, G. D., Feldman, F., Majumdar, S. R., Jaglal, S. B., Hui, W., & Straus, S. E. (2019). Quality improvement strategies to prevent falls in older adults: A systematic review and network meta-analysis. *Age and Ageing*, *48*(3), 337–346. https://doi.org/10.1093/ageing/afy219

Vivrette, R. L., Rubenstein, L. Z., Martin, J. L., Josephson, K. R., & Kramer, B. J. (2011). Development of a fall-risk self-assessment for community-dwelling seniors. *Journal of Aging and Physical Activity*, *19*(1), 16–29. https://doi.org/10.1123/japa.19.1.16

Vonnes, C., & Wolf, D. (2017). Fall risk and prevention agreement: Engaging patients and families with a partnership for patient safety. *British Medical Journal Open Quality*, *6*(2), e000038. https://doi.org/10.1136/bmjoq-2017-000038

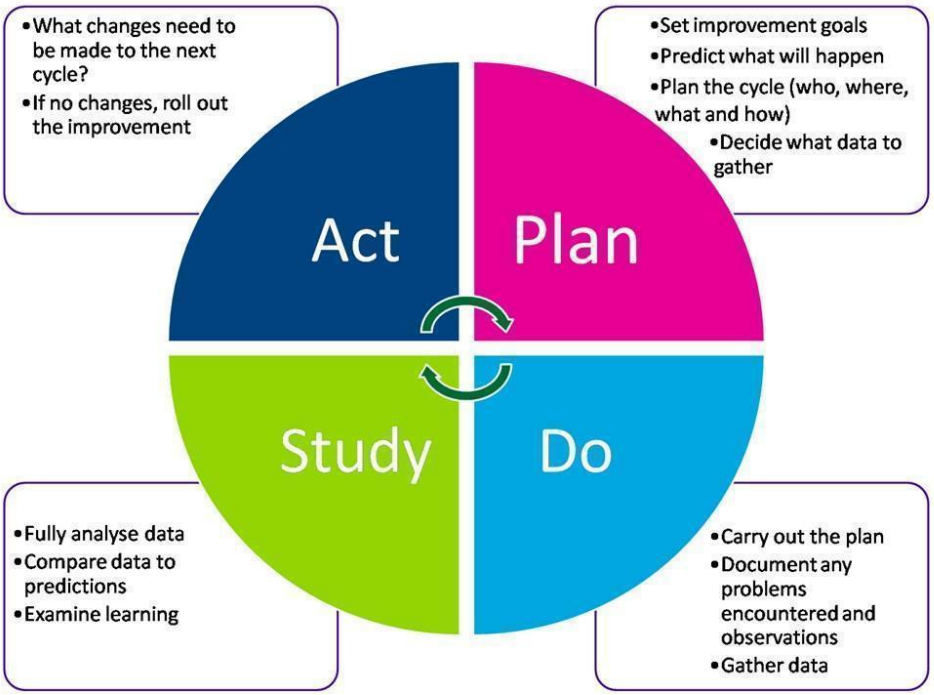
Wang, M., & Liu, G. (2016). A simple two-sample bayesian t-test for hypothesis testing. *American Statistician*, *70*, 195-201. https://doi.org/10.1080/00031305.2015.1093027

Wildes, T., Depp, B., Colditz, G., Stark, S., & Wildes, T. M. (2016). Fall-risk prediction in older adults with cancer: An unmet need. *Supportive Care in Cancer, 24*(9), 3681–3684. https://doi.org/10.1007/s00520-016-3312-1

Wilkinson, A., Meikle, N., Law, P., Yong, H. J., Butler, P., Kim, J., Mulligan, H., & Hale, L. (2018). How older adults and their informal careers prevent falls: An integrative review of the literature. *International Journal of Nursing Studies, 82*, 13-19. https://doi.org/10.1016/j.ijnurstu.2018.03.002

Appendix A

Figure 1. PDSA Cycle Source: HealthCare Improvement Scotland.



https://ihub.scot/project-toolkits/diabetes-think-checkact/diabetes-think-check-act/getting-started/plan-do-study-act/

Appendix B

Project Site Permission Letter

Jack Azad, M.D., Inc.
TRI-CITY MEDICAL GROUP
11900 South Avalon Boulevard
Suite 100
Los Angeles, California 90061
Tel: (323) 756-1317
Fax: (323) 756-4015

March 4,2021

To whom it may concern:

This is to certify that Tri-City Medical Group does not require Affiliation Agreement for Mrs. Mamie Mandela, student at Touro University to use our facility for her DNP project site. We agree to assist Mrs. Mamie Mandela with all our support to facilitate the completion of her project.

For any additional information, feel free to contact me at the above phone number or by email at jackazad@gmail.com

Sincerely,

Jack Azad, M.D.

Appendix C

The Stay Independent Brochure

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

CDC(2016). Stay Independent brochure (English version)

Appendix D

The Stay Independent Brochure (Spanish Version)

Averigüe cuál es su riesgo de tener una caída

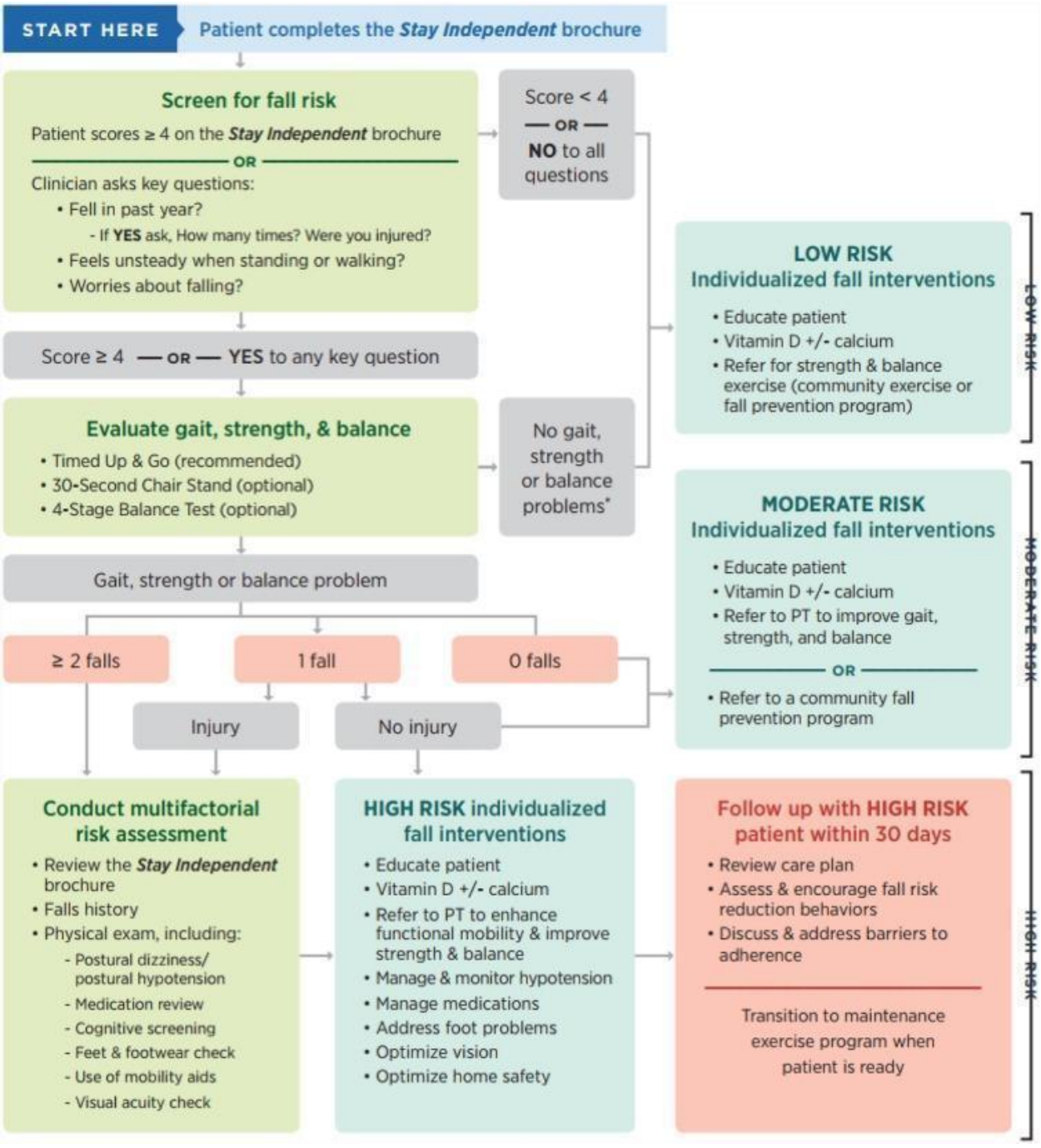
Encierre en un círculo "Sí" o "No" para cada uno de los siguientes enunciados			Por qué es importante
Sí (2)	No (0)	He tenido una caída en el último año.	Las personas que han tenido una caída tienen probabilidades de volver a caerse.
Sí (2)	No (0)	Uso o me han recomendado que usara bastón o un caminador para desplazarme con seguridad.	Las personas a quienes se les ha recomendado usar un bastón o un caminador posiblemente ya tengan más probabilidades de tener una caída.
Sí (1)	No (0)	A veces siento que no tengo estabilidad al caminar.	La falta de estabilidad y sentir la necesidad de apoyarse al caminar son señales de falta de equilibrio.
Sí (1)	No (0)	Me sostengo de los muebles para estabilizarme cuando camino en casa.	Esto también es señal de falta de equilibrio.
Sí (1)	No (0)	Me preocupa caerme.	Las personas que tienen preocupaciones de caerse tienen más probabilidades de tener una caída.
Sí (1)	No (0)	Necesito ayudarme con las manos para levantarme de una silla.	Esta es una señal de debilidad muscular en las piernas, una de las principales causas de caídas.
Sí (1)	No (0)	Tengo algo de dificultad para subir el borde de la acera.	Esto también es señal de debilidad muscular en las piernas.
Sí (1)	No (0)	Frecuentemente tengo urgencia de llegar al baño.	Correr para llegar al baño, especialmente durante la noche, aumenta las probabilidades de caerse.
Sí (1)	No (0)	He perdido un poco de sensibilidad en los pies.	Tener los pies entumecidos puede hacer que se tropiece y se caiga.
Sí (1)	No (0)	Tomo medicamentos que a veces me hacen sentir aturdido o más cansado de lo normal.	A veces, los efectos secundarios de los medicamentos pueden aumentar sus probabilidades de caerse.
Sí (1)	No (0)	Tomo medicamentos para ayudarme a dormir o para mejorar el estado de ánimo.	Estos medicamentos a veces pueden aumentar sus probabilidades de caerse.
Sí (1)	No (0)	Con frecuencia me siento triste o deprimido.	Los síntomas de depresión, como no sentirse bien o sentirse aletargado, se relacionan con las caídas.
Total _____		Sume la cantidad de puntos para cada respuesta de "Sí". Si obtuvo un puntaje de 4 o más, es posible que esté en riesgo de tener una caída. Hable con su médico los temas tratados en este folleto.	

Esta lista fue elaborada por el VA Greater Los Angeles Healthcare System, Geriatric Research Education & Clinical Center (GRECC) y sus afiliados y es una herramienta validada de autoevaluación de riesgo de caídas (Rubenstein et al. J Safety Res; 2011:42(6)493-499). Adaptado con autorización de los autores.

CDC (2016). Stay Independent brochure (Spanish version)

Appendix E

The STEADI Algorithm



CDC STEADI falls screening and management algorithm. CDC= Centers for Disease Control and Prevention; STEADI= Stopping Elderly Accidents, Deaths, and Injuries.

Appendix F

Pre- Post Knowledge Questionnaire on Fall Risk Screening

Test your knowledge of Fall risk by taking this quiz.

1. **What is the leading cause of fatal and non-fatal injury among adults 65 years of age and older?**
   a) Fires/ burns
   b) Motor vehicle accidents
   c) Falls
   d) Drowning

2. **Which is NOT a modifiable risk factor for falls in older adults?**
   a) Upper body weakness
   b) age
   c) Decreased mobility
   d) postural hypotension

3. **Which is NOT a key question when screening older adults for fall risk**?
   a) Have you fallen in the past year?
   b) Do you feel unsteady when standing or walking?
   c) Do you worry about falling?
   d) Do you ever use a walker to help you get around?

4. **Which is the quickest test to assess gait and balance?**
   a) timed up and go test
   b) 4-stage balance test
   c) Romberg balance test
   d) functional reach test

5. **Which patient education brochure is included in STEADI?**
   a) how alcohol can interfere with your medications
   b) facts about arthritis
   c) managing your diabetes
   d) stay independent

6. **Patients who score 4 or more or answers yes on the key's questions should be considered positive for fall screening:**
   a) I fell in past years, feels unsteady when standing or walking
   b) I live with my dog
   c) I love baking with my friends
   d) I was late to my doctor's appointment

7. **According to the STEADI, two fall risk screening options include The Stay Independent questionnaire and/or 3 Key Questions. What are the 3 Key Questions?**
   a) Do you take medications that make you dizzy? Are you often in a hurry? Do you have pets that you can trip over?
   b) Do you wear shoes frequently? Are you using a cane? Do you have carpeting in your home?
   c) Have you fallen in the past year? Do you feel unsteady when standing or walking? Do you worry about falling?
   d) All of the above

8. **Follow up is needed within 30 days for which group of older adult patients?**
   a) all those at high risk for falls
   b) all those who answer Yes to a key screening question
   c) all those who fail a physical performance test for gait, strength, or balance but have not fallen
   d) all older adults

9. **The CDC is recommending fall screening for older adults starting age**
   a) 80- 85
   b) 65 and older
   c) 60- 64
   d) 18-24

10. **Which statement best describes the purpose of the Stopping Elderly Accidents, Deaths & Injury (STEADI) initiative?**
    a) Developed to facilitate fall risk identification and management in primary care
    b) Designed as a printout for caregivers to evaluate patients and loved one's
    c) Part of a larger campaign to get people to purchase products and furniture that are less likely to contribute to falls
    d) A program designed exclusively for skilled nursing facilities which specialize in physical rehabilitation

Appendix G

Implementation of a Comprehensive fall screening Protocol

PRE AND POST TEST SCORE

Participants	Pre-test Score	Post-test Score	Comments

Appendix H

Implementation of a Comprehensive Fall Screening Protocol

Chart Audit Tool

#/Code	GENDER:M/F	AGE	STAY INDEPENDENT BROCHURE COMPLETED YES OR NO	FALL RISK COMPLETED YES OR NO	STEADI TOOL USED YES OR NO

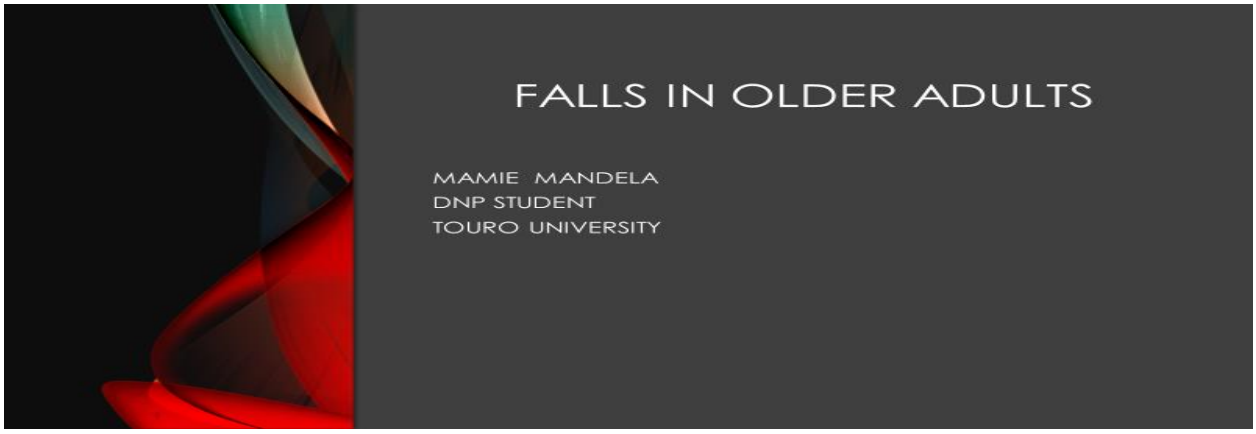
Appendix I

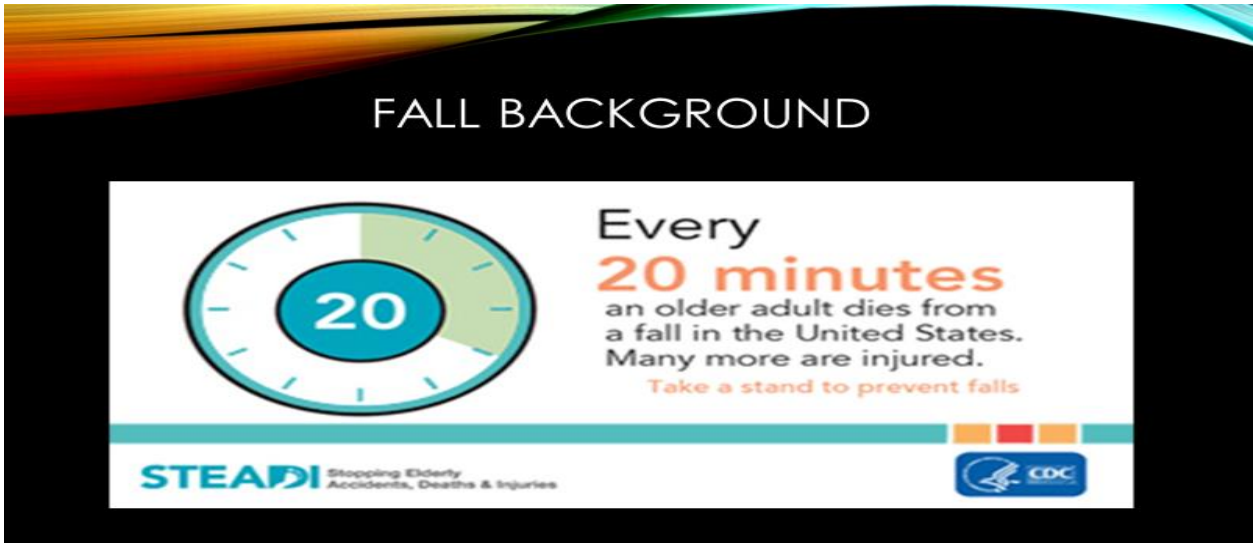
Content Validity Index Table

Item	Expert1	Expert 2	Expert 3	Mean I-CVI
1	4	4	3	1
2	3	4	4	1
3	4	4	4	1
4	4	4	4	1
5	3	4	4	1
6	4	3	4	1
7	3	4	4	1
8	4	4	4	1
9	4	4	3	1
10	4	4	3	1
				1.0

Appendix J

Falls in Older Adults Educational PowerPoint



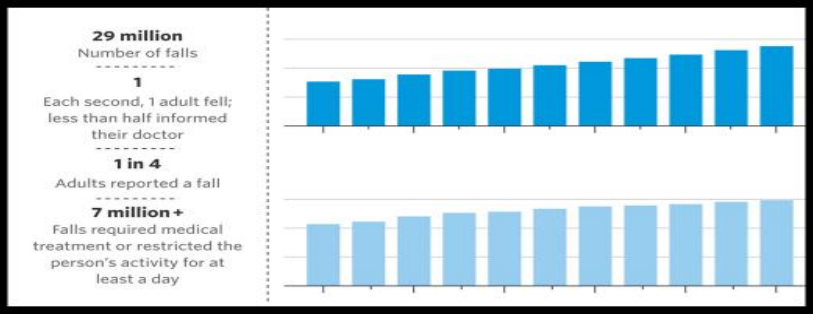


FALL BACKGROUND

Falls are the leading cause of :

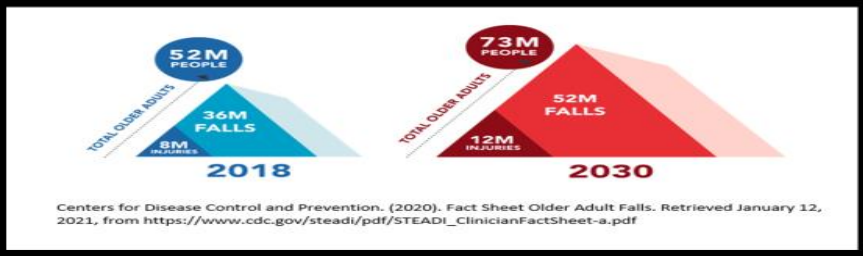
- Injury,
- Premature institutionalization
- Long-term disability in elderly adults worldwide
- Unintentional falls among older adults aged 65 years and older are a significant public health issue.

FALL BACKGROUND



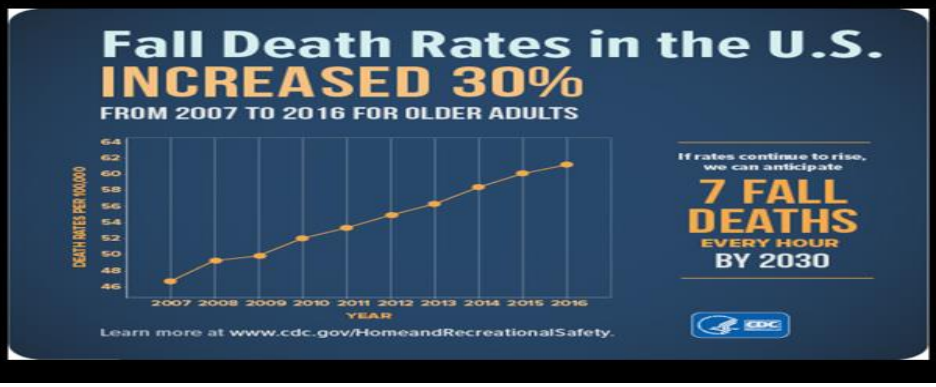
FALL DEMOGRAPHIC

- High prevalence of falls in the elderly



Centers for Disease Control and Prevention. (2020). Fact Sheet Older Adult Falls. Retrieved January 12, 2021, from https://www.cdc.gov/steadi/pdf/STEADI_ClinicianFactSheet-a.pdf

FALL RATE IN THE U.S



RISK FACTORS FOR FALLS

- Non-Modifiable Risk Factors:
  - Age
  - Sex
  - Race/Ethnicity
  - History of falls
- Modifiable Risk Factors:
  - Orthostatic hypotension
  - Visual impairment
  - Adverse drug events and polypharmacy
  - Difficulties with gait and balance
  - Home hazards
  - Foot issues or improper footwear
  - Vitamin D deficiency

CONSEQUENCES OF FALL

IMPACT OF FALL

ECONOMIC IMPACT OF FALL

In the United States,

- Falls result in over 32,000 deaths
- Three million emergency department (ED) visits
- More than 950,000 hospitalizations per year
- Cost $50 billion In annual healthcare expenses

CDC,2020

ECONOMIC IMPACT OF FALL

CDC RECOMMENDATION

- The CDC created the STEADI initiative, which offers tools and resources for health care providers to screen their older patients for fall risk, assess modifiable fall risk factors, and intervene with evidence-based fall prevention interventions

FALL SCREENING RECOMMENDATION

- The American Geriatric Society and British Geriatrics society (AGS/BGS) and the Centers for Disease Control and Prevention recommend screening fall risks in older adults 65 years and older at least annually by physicians
- Health care providers and systems are given incentives to implement STEADI fall protocol through the Medicare Access and CHIP Reauthorization Act (MACRA's) Merit-based Incentive Payment System (MIPS)
- To decrease the incidence of falls and increase fall risk screening/prevention in older adults, CMS also links health care provider incentives to fall prevention quality measures through the Physician Quality Reporting System (PQRS) in the Merit-Based Incentive Program

COMPREHENSIVE FALL SCREENING

- History of falls
- Medications: psychoactive medications, blood pressure medications etc.
- Mobility/ balance, strength
- Cardiovascular: hypotension
- Cognitive
- Visual acuity
- Footwear
- Environment hazards

THE STEADI TOOL

- The CDC developed the STEADI algorithm based on the 2010 American Geriatric Society and British Geriatric Society Guidelines to help primary care providers identify patients at risk of falls, identify modifiable risk factors, and develop appropriate interventions to reduce risk
- The STEADI algorithm includes screening (three critical questions related to fall risk, such as the number of falls in the past year); evaluation of gait/balance; assessment of risk factors (e.g., medications and cognitive impairment); and interventions

STEADI COMPORTMENTS

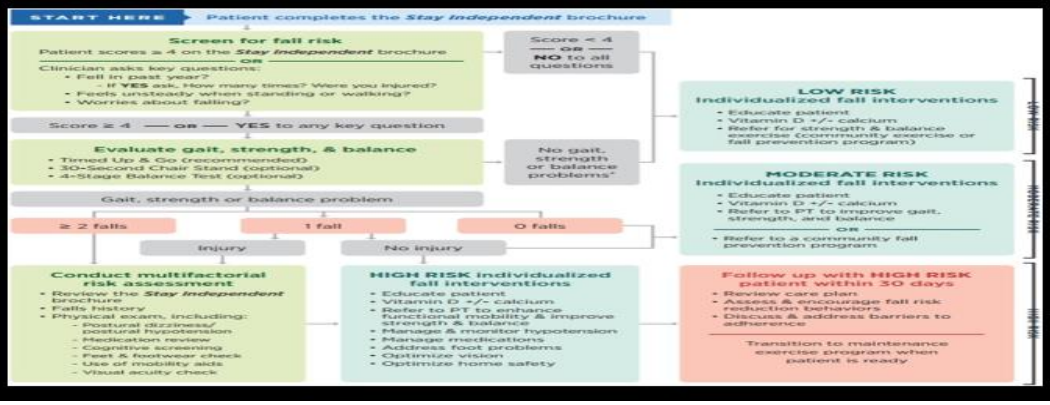
STAY INDEPENDENT QUESTIONNAIRE (ENGLISH VERSION)

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

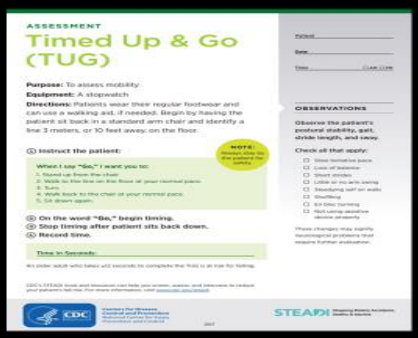
STAY INDEPENDENT QUESTIONNAIRE (ENGLISH VERSION)

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

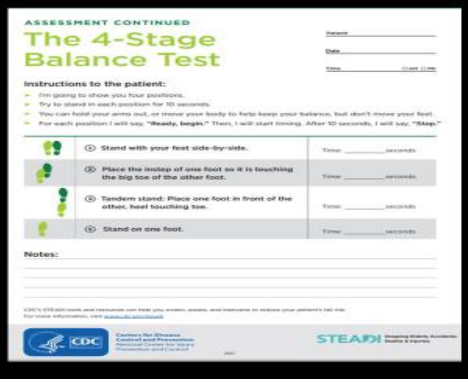
STEADI ALGORITHM



SCREENING AND ASSESSMENTS



SCREENING AND ASSESSMENTS



ASSESSMENT CONTINUED

The 4-Stage Balance Test

Instructions to the patient:

- I'm going to show you four positions.
- Try to stand in each position for 10 seconds.
- You can hold your arms out, or move your body to help keep your balance, but don't move your feet.
- For each position I will say, "Ready, begin." Then, I will start timing. After 10 seconds, I will say, "Stop."

A. Stand with your feet side-by-side.

B. Place the instep of one foot so it is touching the big toe of the other foot.

C. Tandem stand: Place one foot in front of the other, heel touching toe.

D. Stand on one foot.

Notes:

Fall Risk Checklist

Patient: Date: Time:

Fall Risk Factor Identified	Factor Present?	Notes
Falls History		
Any falls in past year?	☐ Yes ☐ No	
Worries about falling or feels unsteady when standing or walking?	☐ Yes ☐ No	
Medical Conditions		
Problems with heart rate and/or rhythm	☐ Yes ☐ No	
Cognitive impairment	☐ Yes ☐ No	
Incontinence	☐ Yes ☐ No	
Depression	☐ Yes ☐ No	
Foot problems	☐ Yes ☐ No	
Other medical conditions (Specify)	☐ Yes ☐ No	
Medications		
Any psychoactive medications, medications with anticholinergic side effects, and/or sedating OTCs? (e.g., Benadryl, Tylenol PM)	☐ Yes ☐ No	
Gait, Strength & Balance		
Timed Up and Go (TUG) Test ≥ 12 seconds	☐ Yes ☐ No	
30-Second Chair Stand Test Below average score (See table on back)	☐ Yes ☐ No	
4-Stage Balance Test Full tandem stance <10 seconds	☐ Yes ☐ No	
Vision		
Acuity <20/40 OR no eye exam in >1 year	☐ Yes ☐ No	
Postural Hypotension		
A decrease in systolic BP ≥20 mm Hg or a diastolic bp of ≥10 mm Hg or lightheadedness or dizziness from lying to standing?	☐ Yes ☐ No	
Other Risk Factors (Specify)		
	☐ Yes ☐ No	
	☐ Yes ☐ No	

IMPORTANCE OF COMPREHENSIVE FALL SCREENING

- Falls are a major health problem for older adults with significant physical and psychological consequences
- Improving fall risk assessment is the key to preventing falls, enhancing the quality of care, and decreasing health care costs among elderly patients (Phelan et al., 2015).
- The first step in a multifactorial clinical fall prevention approach is fall risk screening to identify older adults at increased risk of falling (Eckstron et al., 2017)
- A comprehensive fall screening approach helps providers develop a fall prevention that fit the patient needs.

PATIENT EDUCATIONAL MATERIAL

- The STEADI toolkit's content contains provider resources, training materials, and patient education brochures as well as links to online material (www.cdc.gov/steadi/about.html)
- Stay Independent: A validated self-risk assessment brochure
- Postural Hypotension: What it is and how to manage it
- What YOU Can Do to Prevent Falls: Proven strategies to prevent falls
- Check for Safety: A home safety brochure
- Family Caregivers: Protect your loved ones from falling
- Chair Rise Exercise: One-page instructional handout

CONCLUSION

- The STEADI toolkit to help PCPs incorporate a simple but comprehensive and effective approach to fall risk assessment and prevention into routine clinical practice
- The STEADI tool is an evidence, standardized and validated tests, and fall prevention interventions
- It also emphasizes identifying and addressing individualized risk factors for falls
- STEADI was drafted and grounded on research evidence and AGS/BGS guidelines To make it user-friendly in the primary care setting, the toolkit incorporated feedback from healthcare providers

REFERENCES

Bolton L. (2019). Preventing fall injury. *Wounds: A compendium of clinical research and practice*,*31*(10),269–271.

Burns, E., & Kakara, R. (2018). Deaths from falls among persons aged ≥65 years — the United States, 2007–2016. *MMWR. Morbidity and Mortality Weekly Report*, *67*(18), 509-514. https://doi.org/10.15585/mmwr.mm6718a1

Casey, C. M., Parker, E. M., Winkler, G., Liu, X., Lambert, G. H., & Eckstrom, E. (2016). Lessons learned from implementing CDC's STEADI falls prevention algorithm in primary care. *The Gerontologist*, gnw074. https://doi.org/10.1093/geront/gnw074

Falls are the leading cause of injury and death in older Americans. (2016, January 1). CDC.

https://www.cdc.gov/media/releases/2016/p0922-older-adult-falls.html

Hu, X., & Qu, X. (2016). Pre-impact fall detection. *Biomedical Engineering Online*, *15*(1), 61. https://doi.org/10.1186/s12938-016-0194-x

REFERENCES

Loonlawong, S., Limroongreungrat, W., & Jiamjarasrangsi, W. (2019). The stay independent brochure as a screening evaluation for fall risk in an elderly thai population. *Clinical Interventions in Aging*, *14*, 2155–2162. https://doi.org/10.2147/CIA.S233414

Mark, J. A., & Loomis, J. (2017). The STEADI toolkit: Incorporating a fall prevention guideline into the primary care setting. The Nurse Practitioner, 42(12), 50-55.

Millor, N., Lecumberri, P., Gómez, M., Martínez-Ramírez, A., & Izquierdo, M. (2013). An evaluation of the 30-s chair stand test in older adults: Frailty detection based on kinematic parameters from a single inertial unit. Journal of Neuroengineering and Rehabilitation, 10, 86. https://doi.org/10.1186/1743-0003-10-86

Moreland, B., Kakara, R., & Henry, A. (2020). Trends in nonfatal falls and fall-related injuries among adults aged ≥65 Years - the United States, 2012-2018. *Morbidity and Mortality Weekly Report*, *69*(27), 875–881. https://doi.org/10.15585/mmwr.mm6927a5

REFERENCES

Moyle, S. (2016). Falls prevention. *Australian Nursing & Midwifery Journal*, *24*(1), 32–33.

Newgard, C. D., Lin, A., Caughey, A. B., Eckstrom, E., Bulger, E. M., Staudenmayer, K., Maughan, B., Malveau, S., Griffiths, D., & McConnell, K. J. (2020). The cost of a fall among older adults requiring emergency services. *Journal of the American Geriatrics Society*. https://doi.org/10.1111/jgs.16863

Phelan, E. A., Mahoney, J. E., Voit, J. C., & Stevens, J. A. (2015). Assessment and management of fall risk in primary care settings. *The Medical Clinics of North America*, *99*(2), 281–293. https://doi.org/10.1016/j.mcna.2014.11.004

Rotondi, N. K., Beaton, D. E., Sujic, R., Bogoch, E., Inrig, T., Linton, D., Weldon, J., Jain, R., & Sale, J. (2020). Factors associated with screening positive for high falls risk in fragility fracture patients: a cross-sectional study. *BMC Musculoskeletal Disorders*, *21*(1), 372. https://doi.org/10.1186/s12891-020-03410-27

Stevens, J. A., Smith, M. L., Parker, E. M., Jiang, L., & Floyd, F. D. (2017). Implementing a clinically based fall prevention program. *American Journal of Lifestyle Medicine*, *14*(1), 71-77. https://doi.org/10.1177/1559827617716085

THANK YOU

END