Implementing a Fall Prevention Protocol for High Fall-Risk Older Adults in a Skilled Nursing Facility.

STACEY ELETU

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Educating Staff on the Implementation of a Fall Prevention Protocol for High Fall-Risk Older Adults in a Skilled Nursing Facility.

In skilled nursing facilities (SNFs), falls are a common occurrence that can lead to adverse outcomes for older adults (Cameron et al., 2018). Approximately 50% of the 1.6 million older adults in United States (US) SNFs fall yearly (Agency for Healthcare Research and Quality [AHRQ], 2017; Datta et al., 2018). Also, one out of three older adults who fall will experience at least two repeated falls in one year (AHRQ, 2017). Falls in older adults can cause serious injuries such as head trauma, hip fractures, and death (Uymaz et al., 2016). Out of fear, older adults who fall without injury, create a self-imposed limitation on their activity, which reduces their quality of life and functional capacity (AHRQ, 2017). Fear of falling can also cause a loss of independence, and a predisposition to falling again (Centers for Disease Control [CDC], 2021). Epidemiological studies show that the older adults who fall are at risk for long-term immobility and disability (Uymaz et al., 2016).

Falls and fall-related deaths have a substantial economic impact on the medical field (Lee, 2017). Direct costs relating to falls include medical expenses for provider care, rehabilitation, and medications (Uymaz et al., 2016). In 2015, falls and fall-related deaths accounted for about $50 billion in medical expenses (CDC, 2021; Lee, 2017). By 2030, the costs associated with older adult falls are projected to rise to $100 billion (Mark & Loomis, 2017). And over the next 20 years, the number of falls and the associated costs are projected to continue to increase substantially (Florence et al., 2018).

The dire consequences of falls and the associated medical costs highlight the importance of a fall prevention initiative to reduce falls in SNFs. The proposed Doctor of Nursing Practice (DNP) leadership initiative will educate staff at a SNF on the proper implementation of the fall

prevention protocol called the STEADI toolkit. The STEADI toolkit is a comprehensive, straight forward, and effective practical approach for incorporating fall risk assessment and prevention into routine clinical practice (Mark & Loomis, 2017).

Background

Falls amongst older adults at an SNF is a significant health problem (Cooper, 2017). At SNFs, older adults fall at nearly twice the rate of persons living in the general community and are ten times more likely to sustain a significant injury (Cooper, 2017). Several multifactorial risk factors at skilled nursing facilities, place the older adults at risk for falls (AHRQ, 2017). Risk factors include increased age, fear of falling, impaired cognition, mobility device usage, health status, the environment, and medication use. (Cameron et al., 2018).

In SNFs, more than 50% of older adults have a diagnosed cognitive impairment such as dementia or Parkinson's disease (Datta et al., 2018). Cognitive impairments place the older adult at increased risk of falling due to decreased safety awareness to avoid environmental hazards (Datta et al., 2018). Standard pharmaceutical drug classes prescribed for older adults in skilled nursing facilities include sedative-hypnotics, benzodiazepines, antidepressants, and antipsychotics (Datta et al., 2018). Side effects of these medications increase the risk of falls because they include decreased coordination, impaired balance, and sedation (Datta et al., 2018). Environmental hazards can also lead to increased falls in older adults, such as wet floors, unstable furniture, and poor lighting, which account for 16% to 27% of falls in skilled nursing facilities (Datta et al., 2018).

Long-term effects and high associated costs of falls in older adults present a significant burden to the health care system (Burns et al., 2016). As many as 20% of falls result in serious injuries that may require prolonged medical care including hospitalization and rehabilitative

services (Burns et al., 2016). Falls in older adults may result in serious injuries, such as hip fractures, subdural hematomas, or even death (Dykes et al., 2020). Falls are also the most common cause of traumatic brain injuries among older adults (Mark & Loomis, 2017). Of fall-related hospitalizations, head and hip injuries were the most common reasons for admissions (Mark & Loomis, 2017). These severe injuries are associated with increased hospital stays of 6 to 12 days (Mark & Loomis, 2017). In addition, the costs associated with head and hip injuries range from $19, 376 to $32, 215 (Dykes et al., 2020).

Fall prevention protocols implemented by SNFs include completion of an in-depth multifactorial fall risk assessment (MFRA) of the older adult upon facility admission (Mark & Loomis, 2017). The MFRA include functional and environmental assessments, and a focused history and physical exam to evaluate for fall risk factors (AHRQ, 2017; Mark & Loomis, 2017). Additional protocols implemented include enrolling high fall risk older adults in exercise classes to improve muscle balance and strength (Roigk et al., 2018). SNFs also require provider review of medications to identify high fall risk medications (Roigk et al., 2018).

The continued increased incidence of older adult falls in skilled nursing facilities highlight an inadequacy or dysfunction of the fall protocols in place (Mark & Loomis, 2017). Injurious falls are consistently among the top 10 sentinel events reported to The Joint Commission's Sentinel Event database (Joint Commission, 2015). According to an analysis of this database, majority of factors contributing to falls in skilled nursing facilities include communication failures, inadequate assessments, lack of adherence to protocols and safety practices, inadequate staff orientation, and a lack of leadership (Joint Commission, 2015).

The Centers for Disease Control developed the fall prevention initiative called Stopping Elderly Accidents, Deaths, & Injuries (STEADI) (Lee, 2017). The STEADI protocol builds on

and combines fall prevention clinical guidelines from the American and British Geriatrics Societies (Lee, 2017; Mark & Loomis, 2017). There are three core elements in the STEADI initiative: patient screening for fall risk identification, assessment of patient modifiable risk factors for falling, and community-based clinical interventions to reduce fall risks (Lee, 2017). The STEADI toolkit is a practical, evidence-based resource designed to encourage integrating clinical practice guidelines for fall preventions into routine practice (Lee, 2017).

Staff education on the STEADI protocol will address lack of staff knowledge and compliance to fall prevention protocols. Educating healthcare professionals about preventing falls has been recognized as a priority intervention essential for any fall prevention program (Shaw et al., 2020). Healthcare staff needs to develop the necessary skills, knowledge, and attitudes to deliver evidence-based care in fall prevention (Shaw et al., 2020). These contributing factors signal the importance of a DNP leadership initiative that will focus on staff education and compliance regarding the STEADI fall prevention protocol.

Project Question

The PICOT question to be answered by the project is: Does implementing a staff education program for an evidence-based fall prevention initiative (STEADI); at a skilled nursing facility; increase staff knowledge and compliance with implementing the STEADI protocol, therefore reducing the number of falls in high fall risk older adults in one month? The PICOT is broken down as such:

P: (Population): Facility staff that will be educated on proper implementation of the STEADI protocol. Secondary population is the older adult in the SNF.

I: (Intervention): Education of staff regarding the implementation of the STEADI initiative resources

C: (Comparison): Comparing number of falls prior to education program implementation versus the number of falls after STEADI education implementation

O: (Outcome): The primary outcome will be to increase staff knowledge in preventing patient falls, utilizing the STEADI tool, and increasing compliance with the protocol. The secondary outcome is the reduction in the number of falls

T: (Time Frame) One month

Search Methods

Search methods involved exploring articles in websites such as Agency for Healthcare and Research Quality (AHRQ) and the Center for Disease Control (CDC). Literature searches were conducted via online databases such as Google Scholar, CINAHL and PUBMED. Databases were accessed through the Touro University Nevada (TUN) Jay Sexter Online Library. The project's PICOT question guided the themes and phrases used in the search. Key phrases included "falls in older adults," "fall prevention protocols," "STEADI initiative," "staff education on falls", "fall prevention programs", "fall screening tools", "falls in nursing homes" and "falls in skilled nursing facilities". The initial search yielded about 1497 articles and 35 articles were selected. Manual searches of the reference lists in articles discussing fall prevention were also used to find literature relevant to the project topic. Articles were included if they were peer-reviewed, full text, and available in English. The research was limited to studies that were published from 2016 - 2021. Articles that discussed falls and fall-related topics outside of the older adult population were excluded.

Review Synthesis

According to Uymaz & Nahcivan (2016), falls are a significant cause of morbidity and mortality among older adults in SNFs. About half of all older adults in SNFs fall each year and

one-third suffer injuries that range from abrasions to traumatic brain injuries or hip fractures (Schoberer et al., 2019). Older adults who suffer fall-related serious injuries, such as bone fractures, head traumas, and hip fractures, often require hospital treatment. Immobility that leads to long-term disability can also occur after a fall with serious injury (Uymaz & Nahcivan, 2016). Disability and loss of independence often lead to depression, social isolation, feelings of helplessness, and further physical deterioration in the older adult (Mark & Loomis, 2017).

Injuries sustained after falls can cause prolonged use of healthcare services which incur high healthcare costs (Haddad et al., 2019). Given the projected 55% increase in the older adult population in the United States (US) between 2015 and 2030, healthcare spending and fall rates are likely to soar (Haddad et al., 2019). In a data analysis study conducted by Florence et al. (2018), population data from the National Vital Statistics System (NVSS) and cost estimates from the Web-based Injury Statistics Query and Reporting System (WISQARS) were utilized to estimate annual medical costs attributed to falls in 2015. Fatal and nonfatal falls cost approximately 50 billion dollars, and private payers accounted for 12 billion dollars of this cost (Florence et al., 2018). Medicare paid approximately $28.9 billion for nonfatal falls, Medicaid paid $8.7 billion, and the estimated medical spending for fatal falls was $754 million. (Florence et al., 2018).

The STEADI fall protocol initiative will address the detrimental consequences of falls in older adults and associated high costs to the health industry (Eckstrom et al., 2017). Providing education about the STEADI program to the staff at the SNF project site will increase the knowledge of the health care provider team in systematically screening older patients for fall risk, assessing patients for modifiable fall risk factors, and treating the identified risk factors using evidence-based interventions (Eckstrom et al., 2017).

Fall Prevention Techniques

Screening

Morse Fall Risk Scale. The first step in a multifactorial clinical fall prevention approach for older adults is a fall risk screening because it identifies high fall risk older adults who need additional assessments and follow-up care (Noh et al., 2021). SNFs utilize different fall risk factor screenings; however, the Morse Fall Risk Scale (MFS) is the most popular because of its ease of use; nurses can perform the rating in less than three minutes (Noh et al., 2021). The MFS consists of six items, each item is scored between 0–15 points or 0–30 points: history of falling within three months, secondary diagnosis, intravenous (IV) therapy/heparin lock, use of ambulatory aid, gait, and mental status (Noh et al., 2021). A retrospective case-controlled study was conducted with 369 patients in a care facility where MFS scores were compared amongst patients who had experienced a fall versus a control group of patients who had never fallen during their time at the facility (Noh et al., 2021). All patients in the study were assessed for fall risk using the MFS tool at least every two days and whenever the patient experienced a change in condition (Noh et al., 2021). Results showed that MFS scores were higher for fallers than patients in the control group (Noh et al., 2021).

conducted a retrospective study that reviewed the use of the Morse Fall Risk Scale in a 300-bed acute care hospital setting to determine the scale's adequacy for patient fall predictions over a four-month time frame. The use of Chi-Square test statistics and multivariate regressions and revealed the MFS to be a predictor of patients' fall risk (Jewell et al., 2020). Although the study was conducted in an acute care hospital, the results can be applied to the skilled nursing facility setting because both settings utilize the MFS for fall prevention.

Stay Independent Brochure. The fall risk screening algorithm used by the STEADI fall program combines several screening tools in a stepwise manner, starting with a brief and simple assessment tool, the "Stay Independent Brochure" (SIB) (Eckstrom et al., 2017). The SIB is a 12-question screening questionnaire where responses to individual questions can point to specific fall risk factors (Eckstrom et al., 2017; Stevens et al., 2017). A positive answer to each question is worth one or two points, and a score of four or more indicates an increased risk of falling (Eckstrom et al., 2017; Stevens et al., 2017). To reduce the amount of time it takes to screen patients, the STEADI initiative includes three SIB subset key questions that could be used in place of the 12 questions to screen for fall risk. Clinicians ask their patients "have you fallen in the last year, do you feel unsteady when standing or walking, and do you worry about falling?" (Eckstrom et al., 2017). An answer of "yes" to any of the three questions would indicate a fall risk (CDC, 2021; Eckstrom et al., 2017).

In the US, the content validity and reliability of the initial SIB fall risk assessment have been determined to be consistent across cultures, languages, and communities (Loonlawong et al., 2019). Loonlawong et al. (2019), conducted a psychometric study evaluating the effectiveness of SIB on 480 older adults in Nakhon Ratchasima province of Thailand. The psychometric properties of the SIB were cross-culturally adapted for use and evaluated using test-retest, inter-rater reliability, and content and construct validity (Loonlawong et al., 2019). The SIB was determined to be an appropriate initial screening tool for the multi-step fall risk assessment algorithm in predicting falls and can be followed by specialized assessment procedures such as the Time Up and Go test (TUG), 30-Second Chair Stand, and the 4-Stage Balance Test (Loonlawong et al., 2019).

Assessment

Time Up and Go Test. According to Buisseret et al. (2020), mobility assessment tests evaluating gait strength and balance are necessary older adults who screen positive for fall risk . The Time Up and Go (TUG) test is among the assessment tools recommended by STEADI, the British Geriatric Society, and the American Geriatric Society (Buisseret et al., 2020). The TUG timed mobility test begins by having the patient stand up from a chair, walk to a line 10 feet away, turn around, walk back to the chair, and sit down (Buisseret et al., 2020). Buisseret et al. (2020) conducted an observational study with 73 residents at a skilled nursing facility who completed the TUG test at intervals six months apart. The incidence of falls during that 6-month time frame was reviewed and residents were categorized into two groups; fallers and non-fallers (Buisseret et al., 2020). Results showed that the TUG test results improved the accuracy of fall prediction risk (Buisseret et al., 2020).

A cross-sectional study assessing the TUG test was conducted in a tertiary university hospital with 174 older adults with gait instability (Soto-Varela et al., 2020). The study's goal was to confirm that the TUG test is a useful clinical instrument in assessing the falling tendency of an older adult (Soto-Varela et al., 2020). The modified TUG test was performed; time, step count, and the need for support during the test were the analyzed variables (Soto-Varela et al., 2020). The study's key result was the confirmation that time on the TUG test was determined as a critical parameter that correlates most robustly with falls (Soto-Varela et al., 2020). The patients who took more than 15 seconds to complete the TUG test were the most associated with the increased incidence of falls in the past year (Soto-Varela et al., 2020).

30-Second Chair Stand test. The 30-Second Chair Test (30 s-CST) is a Sit to Stand (STS) strength and balance tool utilized in fall assessments, and it requires standing up without

hand support (Reider & Gaul, 2016). The advantages of the STS test are its simplicity, minimal equipment use, a chair, and its quick administration time (Reider & Gaul, 2016). Reider & Gaul (2016) evaluated the performance of 167 older adults demonstrating the STS in a randomized control study. Results showed the STS as a suitable fall-risk assessment instrument in the long-term care setting (Reider & Gaul, 2016). Older adults in the study who experienced difficulties completing the STS had higher incidences of falls than the older adults who completed the test (Reider & Gaul, 2016).

A longitudinal, observational cohort study was conducted from 2014 to 2015 with 62 older adult participants at St. Anne's Veterans Hospital in Quebec, Canada. St. Anne's Veterans Hospital specializes in Veterans' long-term care (Applebaum et al., 2017). The objective was to determine if a modified 30-second Sit to Stand test predicted falls in institutionalized Veterans (Applebaum et al., 2017). The ability of the tests to indicate the number of falls was examined using negative binomial regression (Applebaum et al., 2017). Results concluded that the 30-second Sit to Stand was significantly related to the incidence and the number of falls (Applebaum et al., 2017). The STEADI protocol incorporates the 30-second Sit to Stand test as a fall risk assessment tool (CDC, 2021).

4-Stage balance test. The 4-Stage balance test is a test that assesses static balance in four different and increasingly challenging positions that include feet together, the instep of foot advanced to toe of other foot, foot in front of other foot (tandem), and single-leg stance (Renfro et al., 2016). Success is determined by the maintaining each position for 10 seconds; less than 10 seconds indicates stage failure (Renfro et al., 2016). Passing is the completion of the third stage for ten or more seconds (Renfro et al., 2016). The 4-Stage Balance test can also be implemented as an exercise program to improve balance and reduce the risk of falls (Renfro et

al., 2016). Renfro et al. (2016) implemented a one-hour-a-week, 7-week exercise program that included the 4-stage balance test and a Sit-to-Stand test, was implemented for 15 older adults in Montana. This exploratory pilot study showed that the participant's abilities to perform the tests improved each week progressively; the participants experienced an improvement in ambulation and reported no falls during the exercise program period (Renfro et al., 2016).

Risk Factors For Falls

Prescribed Medications

In addition to fall risk screening, effective fall prevention requires assessing modifiable risk factors associated with falls in older adults residing in an SNF (Cameron et al., 2018). Prescribed medications have been shown to be an extrinsic risk factor for falls (Cameron et al., 2018). Aging older adults may encounter more co-morbid conditions and higher numbers of medications than younger individuals (Cameron et al., 2018). Hence, medications are one of the most important potentially modifiable risk factors for falls in older adults (Cameron et al., 2018). According to Cameron et al. (2018), medications such as benzodiazepines, neuroleptics, sedatives, and anti-hypertensive drugs are associated with increased falls in older adults.

In a retrospective cross-sectional study, Andersen et al. (2020) reviewed 200 patient records of older adults who had fallen to evaluate whether their medication use likely contributed to their falls. Medications taken by patients were placed into two categories: fall risk increasing drugs (FRIDs) and potentially inappropriate medications (PIMs) (Andersen et al., 2020). FRIDs include psychotropic medications, cardiovascular medications, and spasmodic urinary medications, and PIMs include antidepressants and benzodiazepines (Andersen et al., 2020). These medications were shown to be a likely contributor to falls in 82 of the patients. The

patients who fell, mainly were on psychotropics only or psychotropics combined with anti-hypertensive or antidiuretics (Andersen et al., 2020).

Cameron et al. (2018) conducted an observational study using data from a care-based design (CBD) study to explore fall risk factors in 365 older adults living in a long-term care facility in Nova Scotia, Canada. Data on the number of falls and categories of medication use in these older adults was collected by chart review during a six-month time frame (Cameron et al., 2018). Results indicated use of Selective Serotonin Reuptake Inhibitors or Selective Serotonin Norepinephrine Reuptake Inhibitors (SSRI/SNRI) ($p = 0.084$) showed statistically significant associations with having fallen (Cameron et al., 2018). Use of any PIMs (β 0.34, 95% CI: 0.037,0.65; $p = 0.028$) were associated with increased risk of having fallen (Cameron et al., 2018). The STEADI protocol requires assessing older adults for use of high fall risk medications (CDC, 2021). The STEADI protocol also recommends health providers optimize patient medications by stopping, switching, or reducing dosage of medications that increase fall risk (CDC, 2021).

Vision Impairment

Visual impairment, a fall risk factor, increases with age among all racial and ethnic groups (Umfress & Brantley, 2016). According to Umfress and Brantley (2016), the most common culprits for vision loss among older adults include cataracts, glaucoma, and age-related macular degeneration (AMD). Older adults in skilled nursing facilities are at greater risk for eye care disparities than their community-dwelling counterparts of the same age (Umfress & Brantley, 2016). Umfress and Brantley (2016), conducted a population-based study that included a review of 604 SNF charts across Oklahoma. The study showed that only 11% of the 604 patients had been examined by either an optometrist or ophthalmologist in the previous two

years (Umfress & Brantley, 2016). Another population-based study review of nursing home charts from patients older than 60, revealed that only 42% had been seen by an eye care professional in the previous two years (Umfress & Brantley, 2016). Overall, older adults, particularly institutionalized, have difficulty obtaining access to the eye care system and, therefore, sight-saving treatment (Umfress & Brantley, 2016).

Saftari & Kwon (2018) conducted an observational study and reviewed data from 46 studies that explored the relationship between visual impairments and falls. Results of the study showed that an impairment in the central visual field was 2.36 times more likely to higher the risk of falls (Saftari & Kwon, 2018). Also, a loss in peripheral visual field was 1.42 times more likely to higher the risk of fall (Saftari & Kwon, 2018). Overall, study results showed that impairments and a decrease in visual functions such as visual acuity, contrast sensitivity, and stereo acuity are correlated with an increased risk of falls (Saftari & Kwon, 2018). The STEADI protocol involves initiating screening for visual checks and a referral to an ophthalmologist/optometrist if a visual impairment is observed (CDC, 2021; Johnston et al., 2016)

Orthostatic Hypotension

Orthostatic hypotension (OH) has also been considered a risk factor for falls in older adults (Schell et al., 2021). A retrospective study was conducted in a hospital to determine if subjects with documented OH experienced falls (Schell et al., 2021). Retrospective de-identified data were obtained from electronic medical records for the years 2015 to 2018 (Schell et al., 2021). Among the 42.8% of patients with OH, 0.9% fell at some point during their stay. The results could not determine if assessment for OH should be mandatory in fall prevention protocols (Schell et al., 2021).

Mol et al. (2019), conducted a systematic review and meta-analysis of cross-sectional and longitudinal studies assessing the association between OH and falls in older adults. The systematic review included 63 studies and 51,800 individuals. 39 of the 63 studies were cross-sectional studies and 24 were longitudinal studies (Mol et al., 2019). The meta-analysis included 50 studies and 49,164 individuals (Mol et al., 2019). Results showed that OH was positively associated with falls; odds ratio of 1.73 and a 95% confidence interval of 1.50-1.99 (Mol et al., 2019). The STEADI fall prevention protocol includes an assessing for OH in high fall risk older adults and initiating interventions to manage OH (CDC, 2021). Assessments include adequate hydration and blood pressure management (CDC, 2021)

Fall Prevention Interventions

Vitamin D Supplementation. According to Thanapluetiwong et al. (2020), the vitamin D supplement is one of the most used pharmacologic agents. It appears to be one of the easiest ways to prevent and reduce falls and fractures (Thanapluetiwong et al., 2020). Fractures occur in approximately 10% of falls and should be prevented to reduce fall-related morbidity and mortality (Thanapluetiwong et al., 2020). Thanapluetiwong et al. (2020) conducted a meta-analysis study to examine the effect of vitamin D supplements in different forms and patient settings on falls and fractures. Fall outcomes from forty-seven randomized control trials (RCTs) with 58,424 participants were identified; twenty-four of 47 studies with 40,102 subjects also reported fracture outcomes (Thanapluetiwong et al., 2020). Results demonstrated that overall, vitamin D supplements demonstrated a significant effect on fall reduction (Thanapluetiwong et al., 2020).

Dyer et al. (2019), conducted a meta-analysis of 7 studies that evaluated the impact of vitamin D supplementation on fall risk, amongst residents in a skilled nursing facility. The study

results revealed that vitamin D did not reduce the risk of falls in older adults in the facility (Dyer et al., 2019). However, vitamin D supplementation demonstrated a reduction in the rate of falls in older adults (Dyer et al., 2019). The fall reduction results were as follows: rate ratio 0.72, 95% confidence interval 0.55-0.95, P=0.02 (Dyer et al., 2019). Overall, there was a 28% reduction in falls rate in a high-risk care population (Dyer et al., 2019). Results support a recommendation for vitamin D supplementation in older adults residing in an SNF (Dyer et al., 2019).

Education of Professional Staff

Staff education about fall prevention has been recognized as a priority to improve patient safety in SNFs (Shaw et al., 2020). Teresi et al. (2018), conducted a randomized control study to evaluate the effectiveness of a training program for nursing and other front-line staff on resident falls and injuries. Interview and observational data from a sample of 1,201 residents and staff were collected at baseline, 6 months, and 12 months after program initiation (Teresi et al., 2018). The study showed a 5% net reduction in falls and injuries, translating to 10 saved events per year in an average-sized facility (Teresi et al., 2018). The study had some limitations in that it was not possible to control for unmeasured factors in the intervention group that may have led in part to the reduction in falls, such as cultural or environmental factors (Teresi et al., 2018).

Taylor et al. (2019), conducted an observational study that involved training healthcare students on the STEADI initiative through Interprofessional education (IPE) and service-learning activities. The sample included 31 students in health sciences programs trained in STEADI and conducted a fall risk screening, assessment, and intervention activity with older adults using STEADI tools (Taylor et al., 2019). The results observed a statistically significant improvement in fall prevention knowledge from the STEADI algorithm (Taylor et al., 2019). Student surveys

indicated an improved understanding of the roles and responsibilities of participating disciplines, related to the management of falls in older adults (Taylor et al., 2019). Overall, the CDC's STEADI initiative provides a practical framework and resources for fall prevention IPE activities (Taylor et al., 2019).

Education Methods. There is a need to understand the best ways to structure and deliver falls education program for staff (Shaw et al., 2020). In a scoping study, Shaw et al. (2020) reviewed thirty-nine publications on education methodology for staff education on fall prevention programs. Shaw et al. (2020), utilized the Arksey and O'Malley methodological framework and the PRISAM checklist for the scoping reviews. The most reported method of education utilized in over half of the reviewed studies(n=22) were didactic lectures and formal delivery of content (Shaw et al., 2020). Other methods of delivery included in-service trainings (n=8), self-directed learning (n=8) or video presentations and demonstrations (n=8) (Shaw et al., 2020). The study concluded that effective interventions included formal educational delivery methods such as didactic lectures, video presentations, interactive learning activities, experiential learning, supported learning such as coaching, and written learning material (Shaw et al., 2020).

STEADI includes a suite of materials to help health care providers implement fall prevention clinical practice (Eckstrom et al., 2017). STEADI includes: (1) a 12-question patient screening fall risk factor questionnaire (Stay Independent); (2) an algorithm to guide clinical teams on the assessment and management of fall risks (3) educational materials for providers that include online training, case studies, and standardized gait and balance assessments with instructional videos; and (4) educational brochures for older adults and care providers (Eckstrom et al., 2017). All the STEADI resource materials are accessible on the CDC's website, and they include downloadable printed materials, videos, webinars, and continuing education credits

(Mark & Loomis, 2017). The staff at the project site will be provided links to the CDC website to access all STEADI resource materials.

Barriers

There can be associated barriers with the implementation of the STEADI fall protocol initiatives. In a study that identified clinical teams who were scheduled to implement the STEADI initiative, teams that were unable to implement any falls prevention strategies cited barriers that included high turnover rates of floor staff and administrative staff, insufficient time for new protocol implementation and a lack of readiness for change (Eckstrom et al., 2016).

Staff shortages and high staff turnover burden the STEADI protocol implementation, falling on small numbers of most interested staff, rather than generating change at the facility level (Geerligs et al., 2020). An increase in staff hiring or employing a specific initiative team can successfully address this issue. However, this is dependent on the facility's capacity and finances (Geerligs et al., 2020).

Lack of change readiness and insufficient time for a new program implementation can result in low levels of commitment from staff (Geerligs et al., 2020). This often occurs in response to structural changes, such as high turnover, which leaves staff feeling demoralized and unable to accept additional challenges required by new protocols (Geerligs et al., 2020). Management support is crucial to emphasize the necessary change and a commitment to the new process (Geerligs et al., 2020). Also, utilizing champions or coordinators to motivate staff may assist in addressing this barrier (Geerligs et al., 2020).

The project site is currently experiencing some staffing shortages with direct care staff. However, management is actively working to recruit more staff. The leadership staff has less turnover and consists of individuals who have been with the facility for several years. Training

administrative and leadership staff on the STEADI protocol will help to ensure continuity of the protocol and dissemination of information to new staff employed to the facility.

Current State of Practice at the Project Site and Addressing the Problem with Current Evidence

The project site is a 60- bed SNF in Berkeley, CA. Fall incidents are a core issue that the site is continually working to address. The facility experiences at least 5-6 patient falls each month. Fall prevention practices include use of the Morse Fall Risk Scale for each patient upon admission to the facility, quarterly, and annually. For patients who screen positive for fall risk, an indication is placed in the electronic health record. Facility has generalized fall protocols that include keeping bed lower to ground and close monitoring of fall-risk patients. There are currently no specific care plans or further evaluation of the high-risk fall patients once identified. Continued falls can put the facility at risk for losing money due to costs associated with patient falls.

In 2015, the Centers for Medicare and Medicaid Services (CMMS) adopted policy section 501c of the Deficit Reduction Act of 2005 that indicated that facilities will not be reimbursed for facility-acquired falls (Jewell et al., 2020). Other insurance providers began following this payment structure and consequently, with regard to falls, there has been a shift in focus from a reactive medical approach to a preventive medical approach with a subsequent focus on process improvement to identify ways to prevent falls (Jewell et al., 2020). According to Mark & Loomis (2017), screenings, assessments, and management of fall risk factors are important fall prevention measures components to help combat the growing fall epidemic.

The fall prevention protocol project to be initiated at the project site will focus on educating staff about the implementing the STEADI initiative. The Centers for Disease Control

and Prevention developed STEADI (Stopping Elderly Accidents, Deaths, and Injuries) to assist health care providers screening for fall risk and reducing the risk of falling in older adults (Casey et al., 2017). The staff at the SNF project site will be trained on proper screening tools and fall management according to the STEADI guidelines. The STEADI algorithm includes assessments to identify specific fall risk factors among those who screen at increased fall risk (Sarmiento & Lee, 2017).

Project Aims

The DNP project aims to prevent falls in older adults residing in the SNF by educating staff on implementing the STEADI fall prevention protocol initiative. Using STEADI, the project aims to give the SNF staff the tools and resources to integrate fall prevention into clinical practice (Sarmiento & Lee, 2017). STEADI helps identify patients at risk for falls, identify modifiable risk factors, and implement effective strategies to treat or reduce risk (Sarmiento & Lee, 2017). A meta-analysis and systematic review study reviewed 13 randomized control studies evaluating fall prevention programs in SNFs. Results from those studies demonstrated that multifactorial interventions for fall prevention, as indicated in the STEADI protocol, effectively reduced falls in an SNF by 33% and the number of recurrent fallers by 21% (Moncada & Mire, 2017). Overall, the goal is to implement the STEADI initiative to prevent falls and reduce the incidence of falls among older adults in the SNF (Sarmiento & Lee, 2017).

Project Objectives

In the timeframe for this DNP project, the host site will

I. Implement the STEADI toolkit as a protocol for fall prevention within a 4-week time frame.

II. Administer a training seminar on properly implementing the STEADI fall prevention protocol to 100% of the full-time staff within a 4-week time frame.

III. Increase staff compliance in implementing the STEADI fall prevention protocol evidenced by documented fall risk screenings, assessments, and interventions on all high fall risk older adults.

Reduce the number of falls by 20% within a 4-week time frame.

Conceptual Model

The Donabedian model will guide the DNP project. The Donabedian model (Appendix A) is a conceptual model that provides a framework for evaluating health care quality (Binder et al., 2018). The model describes a synergistic relationship between structures, processes, and outcome measures in an organization (Binder et al., 2018). Binder et al. (2018) define structures or structural measures as the architectural space where care is provided and the equipment available to provide care. Process measures include patient care workflow, and outcome measures describe the impact of health care on populations (Binder et al., 2018).

According to Phonpruk et al. (2018), the Donabedian model evaluates the quality of care in a health care setting. Quality of care evaluation can lead the facility to make structural improvements such as enhancements to their physical environment and policies (Phonpruk et al., 2018). It can also lead to processes that include the facilities routines and practices (Phonpruk et al., 2018). Also, improvements can occur with the facilities outcomes including patient health and satisfaction (Phonpruk et al., 2018). Overall, applying the Donabedian model in the health care setting can improve the total patient care provided (Phonpruk et al., 2018).

Historical Development of the Donabedian Model

The Donabedian model was created by a Lebanese-born physician and health researcher, Avedis Donabedian (Hines et al., 2020 ; Lighter, 2015). Avedis Donabedian is one of the founders of contemporary health care, and he was passionate about the relationship between quality and systems in health care (Hines et al., 2020). Mr. Donabedian published a paper "Evaluating the Quality of Medical Care" in July 1966, which has become one of the most frequently cited public health pieces (Hines et al., 2020). Donabedian described seven pillars of quality in medicine including efficacy, efficiency, optimality, acceptability, legitimacy, equity, and cost; however, he had difficulty measuring these goals (Hines et al., 2020).

Efficacy is the basis against which measurements are made, and it refers to care provided under optimal conditions (Ameh et al., 2017). Efficiency is cost reduction without a compromised effect and optimality balances the costs and benefits of healthcare (Ameh et al., 2017). Acceptability includes the interpersonal provider-patient relationship and encompasses acceptable healthcare (Ameh et al., 2017). Legitimacy refers to the healthcare institution's social acceptability (Ameh et al., 2017). According to Ameh et al. (2017), the seven pillars should be prioritized by the context in which the quality of care is assessed. Donabedian established the Donabedian model which included three types of metrics (structures, processes, and outcomes) to measure the goals and evaluate quality in health care (Hines et al., 2020). According to Lighter et al. (2015), nearly every quality measure in health care can be characterized by the structures, processes, and outcomes metrics.

Model Application

In the Donabedian model, "structure" is the setting of direct patient care; "process" is how the care is delivered' "outcomes" are the effects of the care on the patient's health (Santry et

al., 2020). According to Tossaint-Schoenmakers et al. (2018), the interactions between these three categories can be bidirectional and not simply a separation between cause and effect. Per the Donabedian model, good structures increase the chances of good processes, and good processes increases the possibility of good outcomes (Tossaint-Schoenmakers et al., 2018). Kourtney and Burns (2019) stress the linkage between the three categories by emphasizing that the Donabedian model cannot be understood in isolation but by examining the effectiveness of the structures and processes of care that produce the outcomes. The Donabedian model is essential in improving outcomes in high-risk older adults (Cary et al., 2018). The model's structure, process, and outcomes metrics can guide the implementation of the fall prevention protocol at a skilled nursing facility (Cary et al., 2018). Overall, the Donabedian model has dominated the national discourse on quality health care. The model's flexibility has made it useful in quality improvement initiatives across clinical settings (Santry et al., 2020). For example, the model has been used to improve the outcomes of several specific diseases such as lung cancer, congenital heart defects, and morbid obesity (Santry et al., 2020).

Structures

According to Cary et al. (2018), the structure of care represents the foundational attributes essential for the proper implementation of the project. The care structures will include the materials, equipment, and technology available in the facility (Cary et al., 2018). Structural measures give consumers a sense of a health provider's capacity, processes, and systems necessary to provide care (AHRQ, 2015). For example, structural measures can evaluate whether a health organization uses electronic medical records or medication entry systems (AHRQ, 2015). Structures also include the number and qualifications of the personnel on duty (Kourtis &

Burns, 2019). Structures also pertain to the organizational structures, including staff peer review and how the medical staff is overseen (Kourtis & Burns, 2019).

The project focuses on staff education and enough personnel must be in place to receive the training (Cary et al., 2018). In addition, the facility's available technology must be considered for proper integration of the STEADI protocol into workflows (Cary et al., 2018). Fall prevention strategies for older adults include environmental modification; the facility's equipment and structural layout will factor into the successful implementation of the change (Cary et al., 2018). This may include assessing and removing potential fall hazards in the facility (Clemson et al., 2019). Additional fall prevention strategies include providing assistive devices for high fall risk older adult (Clemson et al., 2019). Clearing pathways, fastening carpets, and placing non-strips on step edges will aid in fall prevention (Clemson et al., 2019).

Processes

The processes metric of the Donabedian model denotes every aspect of how care is provided (Kourtis & Burns, 2019). Processes indicate what a provider does to maintain and improve health for healthy people or people with health care conditions (AHRQ, 2015). Process measures typically reflect generally accepted clinical care guidelines and can inform the consumer about the medical care they may expect for a given disease (AHRQ, 2015). Per AHRQ (2015), process measures reflect most health care quality measures used for public reporting. Mormer et al. (2019) describes the process as inclusive of both interpersonal and technical aspects of care. Interpersonal processes are the social and cultural factors that influence patient interactions with the health system and health worker interaction with each other (Mormer et al., 2019). Technical processes are the capability to diagnose, treat, educate, and prevent a disorder competently (Mormer et al., 2019).

Processes are described as the fall prevention strategies used in the SNF to promote functional recovery and improve patient safety (Cary et al., 2018). Strategies represent direct care interventions such as the STEADI fall prevention protocol recommendations (CDC, 2021). Direct care interventions include SNF staff performing gait, strength, and balance evaluations on the identified high fall risk older adults (Moncada & Mire, 2017). Also, other interventions include performing multifactorial fall risk assessments consisting of an evaluation and a physical examination of the high fall risk older adults (Moncada & Mire, 2017). According to Moncada and Mire (2017), the assessments would include evaluation of the patient's frequency of falls, associated symptoms, and injuries. Additional evaluation should include exploring other relevant acute and chronic medical problems and reviewing over the counter and prescription medications (Moncada & Mire, 2017). The physical examination will involve assessing muscle strength, cognition, cardiovascular examination, and visual acuity (Moncada & Mire, 2017). The multifactorial fall risk assessment will be followed with a corresponding individualized multifactorial intervention involving a combination of components such as exercise, balance training, and medication management (Moncada & Mire, 2017).

Outcomes

Outcome measures represent the gold standard in measuring quality in health care (AHRQ, 2015). They define the product of care process implementation in the Donabedian model (Cary et al., 2018). Also, they take a broad view that includes changes in a patient's health status, behavior, and quality of life (Cary et al., 2018). Outcomes also denote the metrics that define the patient's health status and the care they received (Kourtis & Burns, 2019). For example, the patient's satisfaction with care and improvement in the patient's knowledge (Kourtis & Burns, 2019). According to Ameh et al. (2017), outcomes can include care's physical

and functional aspects of care. The outcome could be a disease reduction or absence of complications (Ameh et al., 2017).

Outcomes are classified as clinical or nonclinical (Cary et al.,2018). The clinical outcomes align with one of the project's main objectives: reducing the number of falls in high fall risk older adults. The nonclinical effect would be the successful implementation of the STEADI fall prevention protocol by the project host site. STEADI includes three core elements: patient screening to identify fall risk, assessing patients for modifiable fall risk factors, and intervening to reduce fall risk using effective clinical and community-based strategies (Lee, 2017). These elements substantially impact clinical outcomes, reduce falls, improve health outcomes, and lower health care expenditures (Lee, 2017).

Project Setting

The project setting is a corporately owned 65-bed skilled nursing facility that provides long-term care services such as rehabilitation services, nutrition, social services, hospice and palliative services, and mental health services (nursinghomes.com, 2021). The average annual census of the facility is 55 patients. Skilled nursing facilities (SNFs) provide skilled nursing care and rehabilitation services (Gu et al., 2019). Rehabilitation services include physical and occupational therapy and speech-language pathology services for patients following a stay in an acute-care hospital (Gu et al., 2019).

Three common conditions in older adults in the US result in the high usage of a SNF. They include patients with lower extremity joint replacement (LEJR), hip fracture, or stroke (Gu et al., 2019). Patients are typically discharged to SNFs from hospital admissions because they require support with activities of daily living and have increased co-morbidities (Britton et al., 2017). Co-morbidities include cognitive impairments and other conditions that require use of

numerous medications and specialized medical equipment (Britton et al., 2017). In addition, residents of a SNF can be admitted to treat and address their psychosocial issues such as substance abuse, homelessness, behavioral issues, and poor social support (Britton et al., 2017).

The project site facility is located in the city of Berkeley, CA. Berkeley is home to about 120,000 residents and 14% of these residents are adults 65 or older (Datausa, 2021). Approximately 87.8% of Berkeley residents are U.S citizens and as of 2019, 21.1% of the residents were born outside of the country (Datausa, 2021). The city consists of about 64.8 thousand white non-Hispanic residents, 25.3 thousand Asian, and 9.32 thousand Black residents (Datausa, 2021).

The project facility includes two primary nurses' stations and six administrative offices. The facility has 33 rooms with an average of three patients per room. There are 61 staff members hired at the facility. Staffing includes 16 certified nursing assistants (CNAs), 5 registered nurses (RNs) and 10 licensed vocational nurses (LVNs), three physical therapists, three occupational therapists, and one speech therapist. In addition, there are four physicians, three nurse practitioners, one clinical care coordinator, one administrator, one social service consultant, and administrative staff. The facility utilizes the electronic health record (EHR) system PointClickCare to document patient admissions, screenings, care assessments, and nursing interventions. The EHR system will be modified to include interventions related to the project. Integrating the fall prevention tools into the EHR system and facility workflow will help make fall prevention a routine part of clinical practice (Eckstrom et al., 2017).

Population of Interest

Fall prevention in older adults is most effective with a comprehensive, team-based

strategy (Eckstrom, et al., 2016). The direct population of interest in the project is the staff to be educated on the STEADI Protocol. The inclusion criteria for staff participation in the project are staff who conduct patient screening, assessments, and direct care interventions. Direct care staff include providers such as physicians and nurse practitioners, the rehabilitation team, the physical, occupational therapists, speech therapists, and the licensed and unlicensed nursing staff (Casey et al., 2017). Staff included in the project must be employed on a full-time or part-time basis. The exclusion criteria for the project are as follows: staff who do not conduct patient screening, assessments, care interventions are excluded from the training mandate. Staff also employed on a per-diem basis will be excluded. However, excluded staff may choose to participate for knowledge purposes.

The indirect population of interest is older adults 65 years and older residing at the SNF at the time of project implementation. All older adults will be screened to identify those that are the high fall risk. The inclusion criteria for the project are older adults identified through screening as high fall risk. The exclusion criteria are older adults who are not identified as high fall-risk after screening. Older adults are admitted to the facility because they need assistance with personal care, medication management, mobility, and rehabilitation. Falls are one of the biggest threats to the health and independence of older adults (Sarmiento & Lee, 2017). Falls can cause injuries that result in reduced mobility, fewer social interactions, decreased physical fitness, and a negative impact on overall health (Sarmiento & Lee, 2017).

Stakeholders

The stakeholders for the project include the leadership team, the direct care staff, and the patients at the project site. The leadership team consists of the site administrator, the clinical service coordinator, and the director of staff development (DSD). The leadership team

provided verbal permission to implement the STEADI protocol at the site. There were no requirements for an affiliation agreement to establish the STEADI protocol. The administrator provided the project leader EHR access for chart review and observations required to implement the protocol.

The clinical service director is a significant stakeholder as they can modify flowsheets in the EHR system; the STEADI protocol will require some integration with the facility's EHR system (Stevens et al., 2017). The clinical service director will use evaluation results from the STEADI implementation to create facility policies (CDC, 2021). The facility also has a director of staff development (DSD) that provides staff training on skills and other health care topics. The DSD is a crucial stakeholder as they will continue to offer the STEADI training to the staff after the project has concluded. The DSD is also important in coordinating the team to be present for the initial launch of the STEADI initiative. The leadership team is in full support of the project because the project enhances the quality measures of the facility.

The licensed registered nurses and vocational nurses are stakeholders for this project. Their role is to screen all older adults in the facility for fall risk (CDC, 2021). They are also responsible for assessing gait, strength, and balance in the older adults (CDC, 2021). The assessment and screening data conducted by the licensed nurses are essential in identifying the patients that need the STEADI tool (CDC, 2021). The physicians and nurse practitioners are also stakeholders for the project. The physicians implement interventions based on screening and assessments (CDC, 2021). For example, the physicians assess and manage fall risk factors such as medications that increase fall risk (CDC, 2021). Managing fall risk factors will reduce the number of falls in the older adults (CDC, 2021). The physical therapists are stakeholders for this project because they work with the older adults to improve gait, strength, and balance. Lastly, the

older adult patients are stakeholders as they are the providers of the clinical data, and they benefit from implementing the protocol (Lübbeke et al., 2019).

Interventions

The STEADI protocol project implementation will consist of staff training, electronic health record tools, and a modification of the facility workflow for fall prevention (Eckstrom et al., 2017). The STEADI protocol education will be completed in a 1-hour training session conducted by the project lead. The training will involve using a PowerPoint presentation to educate the health care providers on using the STEADI initiative to prevent falls. A pretest will be administered to participants prior to the presentation to assess knowledge and a post-test will be administered after the presentation to assess knowledge gained.

The overview of the PowerPoint training will include information on the burden of falls, risk factors for falls, and fall prevention strategies (CDC, 2021). The training will also explore the STEADI fall prevention algorithm and tools. It will include information on screening for fall risks, assessing risk factors, and practical strategies to reduce fall risk (CDC, 2021). The skills learned in training will include a systematic screening of older adults for fall risks, assessments of patients for modifiable risk factors, and treatment for the identified risk factors using evidence-based interventions (Eckstrom et al., 2017). The training also presents three realistic clinical scenarios in a case study format. The clinical scenarios teach healthcare workers to initiate conversations with older adults about falls (Lee & Sarmiento, 2017). Active learning activities will be explored using the clinical scenarios to engage participants during the presentation. Participants will have the opportunity to demonstrate practical applications of implementing the STEADI protocol during the training.

The first step in the STEADI fall prevention protocol is fall risk screening (Eckstrom et al., 2017). This step is critical as it identifies the older adults who will receive additional assessments and follow-up care (Eckstrom et al., 2017). The licensed nurses will be educated on conducting fall screenings and follow-up assessments. There will be a particular focus training for the Minimum Data Set (MDS) coordinator nurse. They are responsible for assessing functional ability, coordinating the interdisciplinary assessment, and care planning for all residents of the SNF (Bjarnadottir et al., 2015). MDS assessments are completed upon patient admission, quarterly, annually, and when a patient shows a significant change in status (Bjarnadottir et al., 2015). The MDS coordinator and other licensed nurses will be trained on using the STEADI screening tools during these assessment schedules.

Upon identification of a high fall risk patient, the licensed nurse will be trained to notify the provider and use the EHR tool to trigger the display of a fall assessment care plan. The care plan will require staff caring for the patient to perform a follow-up assessment, including gait and balance evaluation, visual acuity tests, and orthostatic vital signs measurements (Eckstrom et al., 2017). In addition, providers will be notified to review the assessment results in the EHR. If an impairment is noted, the provider is trained to recommend interventions such as physical therapy referrals, ophthalmologist referrals, blood pressure medication adjustments, vitamin D supplements, and improved hydration (Eckstrom et al., 2017). The provider will also intervene for patients on high-risk medications by eliminating the drug, tapering the dose, or substituting with a safer alternative (Eckstrom et al., 2017). Patient charts will be audited quarterly to assess reduction in number of falls and to also assess staff compliancy with implementing the STEADI protocol. The STEADI training seminar will be part of the new hire orientation and the required

annual fall training for all staff. The new hire orientation and annual fall training will be conducted by the facility's director of staff development.

Tools

STEADI Algorithm

The STEADI algorithm (Appendix B) is the primary tool implemented in the fall prevention quality initiative. The Centers for Disease Control (CDC) developed the Stopping Elderly Accidents, Deaths, and Injuries (STEADI) protocol to facilitate identification of fall risk and fall management in health care (Eckstrom et al., 2017). The CDC does not require organizations to seek permission to use the tool. The CDC makes STEADI readily available on their website, which is comprised of resources for providers and guidelines for implementation (Lohman et al., 2017). The STEADI toolkit includes an evidence-based algorithm for fall risk screening with suggested appropriate interventions for each identified risk (Lohman et al., 2017).

A surveyed study was conducted to operationalize the STEADI fall risk algorithm using data from an existing nationally representative cohort of 7392 older adults in the US (Lohman et al., 2017). The authors evaluated the predictive validity of STEADI, estimating the association between STEADI fall risk classification and experience of falls and mortality (Lohman et al., 2017). Results of the study established the validity of STEADI protocol in fall prevention (Lohman et al., 2017). The STEADI algorithm involves fall risk screening, assessment, and intervention (CDC, 2021). Patients are screened to identify their fall risks, assessed for modifiable fall risk factors, and implemented interventions to reduce fall risk factors using effective clinical strategies (Lee, 2017).

The STEADI algorithm also requires using other tools such as the stay independent brochure (SIB) questionnaire, which is a 12-question screening tool used to assess fall risk as

part of the STEADI fall prevention protocol (CDC, 2021) (Appendix C). Also, tests such as the timed up & go (TUG) test (Appendix D), 30-second chair stand test (Appendix E), and 4-stage balance test (Appendix F) are available to assess mobility, leg strength, and endurance, and balance, respectively (CDC, 2021). The measuring orthostatic blood pressure (Appendix G) tool is also available as a fall prevention assessment guide (CDC, 2021).

Stay Independent Brochure

The Stay Independent Brochure (SIB) (Appendix H) is a scientifically validated instrument developed by Rubinstein and colleagues (Stevens, 2013). SIB validity was determined when geriatricians compared the test against the clinical evaluation of fall risk (Loonlawong et al., 2019). Development of the SIB tool incorporated input from older adults (Stevens, 2013). SIB contains 12 items to which older adults will answer "yes" or "no." The statements focus on risk factors for falls, and the 12 statements from the SIB are as follows:

1. I have fallen in the past year.
2. I use or have been advised to use a cane or walker to get around safely.
3. Sometimes I feel unsteady when I am walking.
4. I steady myself by holding onto furniture when walking at home.
5. I am worried about falling.
6. I need to push with my hands to stand up from a chair.
7. I have some trouble stepping up onto a curb.
8. I often have to rush to the toilet
9. I have lost some feeling in my feet
10. I take medicine that sometimes makes me feel light-headed or more tired than usual.
11. I take medicine to help me sleep or improve my mood.

12. I often feel sad or depressed

A positive answer on the SIB is worth one or two points for each question on the questionnaire, and a score of at least four or higher indicates a higher risk of falls (Stevens, 2013).

Educational PowerPoint Presentation

The education power-point presentation (Appendix I) used in implementing the STEADI initiative is a 54-slide document that can be covered in a 60-minute timeframe. The PowerPoint is a validated tool developed by the centers for disease control and it is a document titled 60-STEADI: Older Adult Fall Prevention (Lee & Sarmiento, 2017). The PowerPoint used in training highlights the STEADI algorithm, TUG administration, other tools, and a written description of resources included in the STEADI toolkit (Urban et al., 2020). According to CDC (2021) Presentation overview of the slides include the following:

1. The burden of falls
2. Risk factors for falls
3. How we can prevent falls
4. Tips for implementing a fall prevention program
5. Screening for fall risk
6. Assessment of fall risk factors
7. Practical strategies to reduce fall risk
8. Follow-up with patients
9. Available tools and resources

The PowerPoint materials are available at no cost and can be downloaded online on the CDC website (CDC,2021).

Pre/Post Knowledge Test

The pretest and posttest (Appendix J) is a tool developed by me, the project leader. It includes ten questions that assess knowledge on the STEADI algorithm. The test will be administered before the STEADI training to assess staff knowledge on the STEADI protocol. The test will be administered again after the training to assess post-presentation knowledge. Pretest and posttest scores will be compared to determine the effectiveness of the STEADI training.

Fall Reduction and STEADI Compliancy Chart Audit

The project leader created a fall reduction and STEADI compliance chart audit checklist tool (Appendix K) to document staff compliance with implementing the STEADI protocol. The tool requires the auditor to document and verify from the chart that the STEADI algorithm of screening, assessment, and interventions is being implemented. In addition, it requires documentation of the number of falls by the patient to see if there is a reduction in falls each month from implementing the STEADI protocol.

SPSS Software

Statistical Package for Social Sciences (SPSS) is statistical software used to analyze data from implementing a STEADI initiative. A study aimed to review the trend of statistical software usage and their associated study designs demonstrated that the SPSS software is the most widely used tool and best used for observational health science experiments (Masuadi et al., 2021). Permission to use the SPSS software requires purchasing and installing a licensed version from the manufacturer (Bruland & Dugal, 2017).

Data Collection/Study of Interventions

Data collection aligns with project aims and objectives as it will include data on fall reduction, the effectiveness of the STEADI training seminar on staff knowledge on fall prevention, and evidence of staff compliance in implementing the STEADI protocol.

Fall Reduction

Pre-intervention data regarding the number of falls in the facility in one month was provided by the facility's director of nursing (DON). Fall data was also noted in the facility's electronic record tracking of monthly falls. Fall data will be collected four weeks prior to and four weeks after implementing the STEADI protocol. The facility's DON will be contacted to obtain data regarding the number of falls. Patient confidentiality is maintained since the facility staff only provides the numeric data in aggregate, meaning the total number of falls, not individual cases. The fall data obtained will be verified via chart audits. All charts will be audited every week for four weeks. Documentation on chart audits will exclude patient names for confidentiality purposes. Patients will be identified by initials, age, and room number.

Effectiveness of STEADI Training Seminar on Staff Knowledge

Staff will be given copies of both a pretest and posttest with a designated participant number at the beginning of the training seminar. Staff will place their pretest answers in a designated envelope at the beginning of the training and place their posttest answers at the end of the training. Participant confidentiality will be maintained because staff names will not be on the tests. The project leader will collect the pretest and posttest scores in aggregate for data analysis. Total pre-test scores will be compared against total post-test scores.

Staff Compliance with Implementing the STEADI Protocol

Data collected will include chart audits of all older adults above the age of 65 in the project site to document the occurrences of fall risk screenings, assessments, and interventions in the high fall risk older adults. Only new patient charts will be audited every week for the four weeks after project implementation. The audit tool will maintain patient confidentiality as it will only include patient initials, age, gender, and room numbers. The data will be kept in a password-protected computer, and it will be stored for 2 years after the conclusion of the project.

Ethics/Human Subjects Protection

Per Touro University Nevada guidelines, the STEADI fall prevention project will not require approval by the institutional review board (IRB) because it is a quality improvement (QI) project. The project also does not require IRB committee oversight at the project site . Approval from review boards is generally not needed to implement QI projects (Hall et al., 2020). Ethical considerations guide the implementation of the QI regarding patient benefits, confidentiality, and participant consent (Hall et al., 2020). The project's goal, fall prevention, directly correlates with the ethical principles of beneficence and non-maleficence, protecting patients from harm and providing safe, efficient care (Hall et al., 2020). Confidentiality of participants is maintained in all data collection aspects of project implementation.

The STEADI protocol initiative will be routinely adopted into the facility's care practice; therefore, patients' consent to facility treatments implies consent to the intervention and inclusion in the QI project (Hall et al., 2020). Recruitment strategies include posting flyers about the training seminar. It will be mandatory training enforced by facility leadership. The QI project will be conducted as part of activities expected in routine practice and job description (Hall et al., 2020). Training will be provided during scheduled mandatory staff meetings to improve

compliance with attendance. Benefits to participants will be the ability to obtain continuing education training after completing the training seminar. Participants will be compensated with continuing education units issued by the facility. There is minimal risk to participants participating in the project; they may feel overwhelmed from learning new information, new tasks, and new skills.

Statistical Analysis

A statistician was consulted to review appropriate statistical tests for the STEADI protocol data analysis. The statistician reviewed and verified the appropriateness of the statistical tests to be used on the statistical worksheet (Appendix L). Data collected from patient charts will be entered into an excel spreadsheet and transferred to the SPSS statistics software for analysis. The SPSS software will run a paired t-test to determine a statistically significant reduction in falls after implementing STEADI. Paired t-tests are helpful before and after observations of the same subjects (Xu et al., 2017). The SPSS software will also run a paired t-test to compare test scores before and after the STEADI training seminar. The paired t-test will determine a statistically significant improvement in knowledge and decide if the education seminar effectively improved staff knowledge. When using the t-tests, there is an assumption of normality of data, homogeneity of variance, and random sample (Mishra et al., 2019). Also, the alpha significance level will be set to 0.05 (5%).

In addition, the descriptive statistics of frequency will be run on the SPSS software to evaluate a reduction in falls and staff compliance with the STEADI protocol. Descriptive statistics assumes the normality of continuous data (Mishra et al., 2019). Descriptive statistics of frequency analyze how often a variable occurs so it can be used to analyze the number of falls before and after the STEADI protocol (Cooksey, 2020). Descriptive statistics will be used for

staff compliance because the STEADI tool was not utilized before the intervention. After project implementation, descriptive statistics can analyze STEADI protocol compliance by documentation of fall risk screenings, assessments, and interventions on all high fall risk older adults.

Data Analysis

After implementing the STEADI protocol at the project site, data was collected and analyzed to determine if the project aim, and objectives were met. The project goal was to answer the following question: Does implementing a staff education program for an evidence-based fall prevention initiative (STEADI), at a skilled nursing facility, increase staff knowledge and compliance with implementing the STEADI protocol, therefore reducing the number of falls in high fall risk older adults in one month? Data was collected and analyzed to determine if, as a result of the project, there was:

1. Increased staff knowledge of the STEADI fall prevention protocol.
2. Increased staff compliance with implementing the STEADI protocol.
3. A reduction in the number of falls in the project site in one month.

Evaluating Staff Knowledge

The project leader conducted the training seminar on the STEADI protocol for the direct care staff at the facility. Fourteen staff members participated (n=14) and took the pre-test and post-test administered during the training. A two-tailed paired samples *t*-test was conducted to examine whether the mean difference between pre-test and post-test scores was significantly different from zero. Essentially, the two-tailed paired samples t-test was performed to determine if there was a statistically significant improvement in staff knowledge of the STEADI protocol after the training. With the paired t-test, there was an assumption of normality of data,

homogeneity of variance, and random sample (Mishra et al., 2019). In addition, the alpha level was set to 0.05 (5%).

Assumptions

Normality. A Shapiro-Wilk test was conducted to determine whether the differences in pre-test scores and post-test scores could have been produced by a normal distribution (Razali & Wah, 2011). The results of the Shapiro-Wilk test were not significant based on an alpha value of .05, W = 0.89, p = .087. This result of the Shapiro-Wilk test suggests the possibility that the differences in pre-test scores and post-test scores were produced by a normal distribution cannot be ruled out, indicating the normality assumption is met.

Homogeneity of Variance. Levene's test was conducted to assess whether the variances of pre-test scores and post-test scores were significantly different. The result of Levene's test was not significant based on an alpha value of .05, $F(1, 26) = 0.02$, $p = .886$. The Levene's test result suggests it is possible that pre-test scores and post-test scores were produced by distributions with equal variances, indicating the assumption of homogeneity of variance was met.

Results

The result of the two-tailed paired samples t-test was not significant based on an alpha value of .05, t(13) = -1.71, p = .110, indicating the null hypothesis that the pre-test scores is not significantly different from the post-test scores, cannot be rejected. This finding suggests the difference in the mean of the pre-test scores and the mean of the post-test scores was not significantly different from zero. The results are presented in Table 1. A bar plot of the means is presented in Figure 1.

Table 1

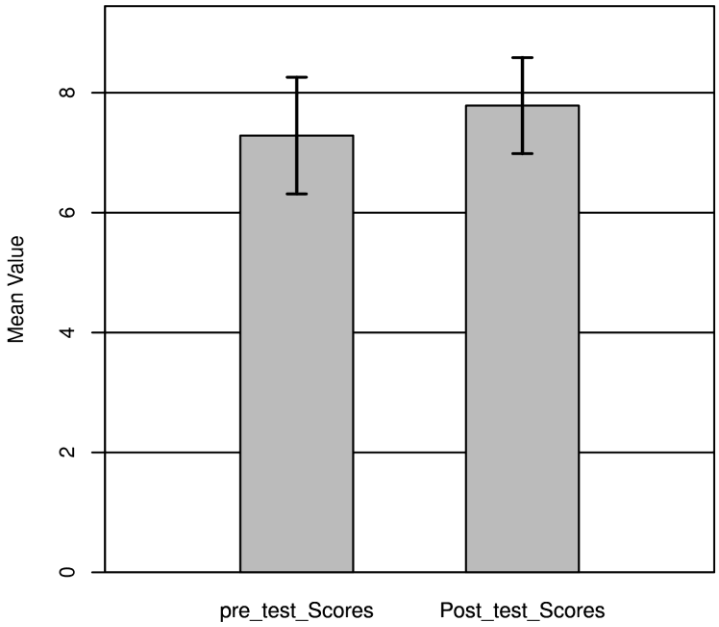
Two-Tailed Paired Samples t-Test for the Difference Between Pre-test Scores and Post-test Scores

Pre-test Scores		Post-test Scores				
M	*SD*	*M*	*SD*	*t*	*p*	*d*
7.29	1.86	7.79	1.53	-1.71	.110	0.46

Note. N = 14. Degrees of Freedom for the *t*-statistic = 13. *d* represents Cohen's *d*.

Figure 1

The Means of Pre-test Scores and Post-test Scores with 95.00% CI Error Bars



Evaluating Staff Compliance

In the four weeks after project implementation, data was collected from five (n=5) new patient admission charts to evaluate staff compliance with implementing the STEADI protocol. Compliance was determined by documentation in new admission patient charts of screening, assessments, and interventions per the STEADI protocol. Chart review demonstrated that the

STEADI protocol was being implemented. Descriptive statistics was performed on the SPSS software to analyze staff compliance with implementing the STEADI protocol.

Frequencies and percentages were calculated for screening, assessment, and intervention. The most frequently observed category of screening was performed (*n* = 5, 100.00%). All five patient charts had documentation of fall risk screening. The assessment category was not applicable for four patients (*n* = 4, 80.00%). The intervention category was not applicable for four patients (*n* = 4, 80.00%). Of the five patients, one patient was identified as a high fall risk and initially did not have follow-up documentation regarding further assessments and interventions to address the risk. A plan for further evaluation was documented in the patient chart as a follow-up. Frequencies and percentages are presented in Table 2.

Table 2

Frequency Table for Nominal Variables

Variable	*n*	*%*
Screening		
Performed	5	100.00
Missing	0	0.00
Assessment		
Not Applicable	4	80.00
Performed	1	20.00
Missing	0	0.00
Intervention		
Not Applicable	4	80.00
Performed	1	20.00
Missing	0	0.00

Evaluating Fall Reduction

Before implementing the STEADI project, the project leader collected data from the facility's Director of Nursing (DON) regarding the number of patient falls that occurred during the prior four weeks. The DON reported three patient falls which were verified by chart audit. In the four weeks after implementing the STEADI project, data collected from facility DON and chart verification demonstrated one fall incident. A fall reduction number from three to one indicates a 66% decrease in the number of falls. Fall rates were also calculated using the number of patient falls x 1,000 divided by the number of patient days. Fall rate calculations demonstrated a reduction in the fall rates from 1.9 to 0.6 after implementing the STEADI protocol. Fall rate calculations are presented in Table 3.

Table 3

Fall rate calculation

Fall rates (per 1000 occupied bed days) prior to project implementation	*Fall rates (per 1000 occupied bed days) after project implementation*
3 falls x 1000/ 1620 bed days = 1.9 falls	1 fall x 1000/ 1629 = 0.6 falls

Descriptive statistics of frequency conducted on the SPSS software evaluated the reduction in falls. The pre-project falls (n = 3, 5.56%) were more than post-project falls (n = 1, 1.85%). Frequencies and percentages are presented in Table 4. A two-tailed paired samples t-test was also conducted to examine whether the mean difference of pre-project fall numbers and post-project fall numbers was significantly different from zero.

Table 4

Frequency Table for Nominal Variables

Variable	*n*	*%*
Pre-project Falls		
Fall Occurred	3	5.56
No Fall	51	94.44
Missing	0	0.00
Post-Project Falls		
Fall Occurred	1	1.85
No Fall	53	98.15
Missing	0	0.00

Assumptions of the t-test

Normality. A Shapiro-Wilk test was conducted to determine whether the differences in pre-project fall numbers and post-project fall numbers could have been produced by a normal distribution (Razali & Wah, 2011). The results of the Shapiro-Wilk test were significant based on an alpha value of .05, $W = 0.19$, $p < .001$. This result suggests the differences in pre-project fall numbers and post-project fall numbers are unlikely to have been produced by a normal distribution, indicating the normality assumption is violated.

Homogeneity of Variance. Levene's test was conducted to assess whether the variances of pre-project fall numbers and post-project fall numbers were significantly different. The result of Levene's test was not significant based on an alpha value of .05, $F(1, 106) = 1.03$, $p = .313$. This result suggests it is possible that pre-project fall numbers and post-project fall numbers were produced by distributions with equal variances, indicating the assumption of homogeneity of variance was met.

Results

The result of the two-tailed paired samples t-test was not significant based on an alpha value of .05, t(53) = 1.43, p = .159. This finding suggests the difference in the mean of pre-project fall numbers and the mean of post-project fall numbers was not significantly different from zero. The results are presented in Table 5. A bar plot of the means is presented in Figure 2.

Table 5

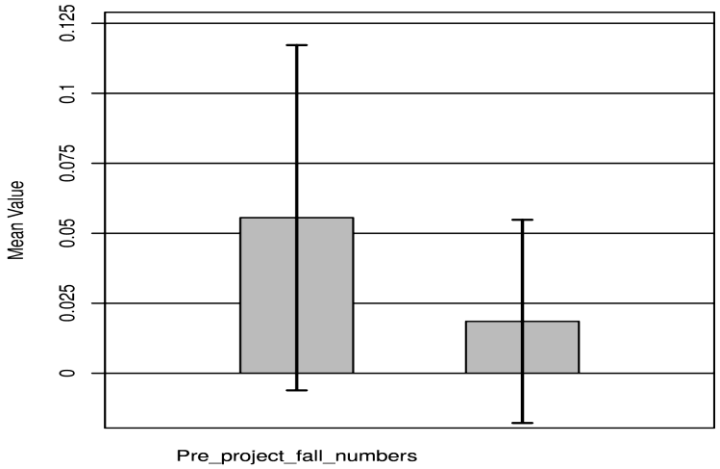
Two-Tailed Paired Samples t-Test for the Difference Between Pre-project fall numbers and Post-project fall numbers

Pre-project fall numbers		Post-project fall numbers				
M	*SD*	*M*	*SD*	*t*	*p*	*D*
0.06	0.23	0.02	0.14	1.43	.159	0.19

Note. N = 54. Degrees of Freedom for the *t*-statistic = 53. *d* represents Cohen's *d*.

Figure 2

The means of Pre-project fall numbers and Post-project fall numbers with 95.00% CI Error Bars



Discussion

The results of all data analyzed will be discussed and reviewed. The review will include evaluating the t-test analysis of the pre-test and post-test scores and assessing the frequency of staff compliance with the STEADI protocol. Also, to be discussed are the fall rates, fall frequency, and the t-test analysis results of falls before and after the project.

Pre-test and Post-test Scores

T-test analysis of pre-test and post-test score data showed no significant difference between the pre-test and post-test scores. T-tests showed alpha value of .05, $t(13) = -1.71$, $p = .110$ which means the results stayed about the same. The results provide no sufficient evidence that the STEADI training seminar is adequate to increase the project site's staff knowledge of the STEADI protocol. A similar outcome was found in a prospective, mixed-method, controlled before-and-after study that reviewed the effect of STEADI education on staff knowledge (Urban et al., 2020). The study occurred in a primary care clinic staffed with 29 medical care providers who received training on the STEADI protocol (Urban et al., 2020). The fall prevention initiative at the primary care clinic had similar objectives to the SNF project of improving staff knowledge of the STEADI protocol. The study also found a non-significant difference in the pre-education and post-education mean scores after implementing a STEADI education seminar for the staff (Urban et al., 2020).

Implementing a STEADI training seminar is beneficial in creating awareness of the STEADI protocol. However, other training modalities may be more effective in evaluating increased staff knowledge (Urban et al., 2020). For example, assessing improvement in staff knowledge can include successful return demonstration of STEADI skills such as gait

assessments. Return demonstration of skills would need to be an ongoing evaluation process by facility education staff.

Although there were no statistically significant differences in the pre-test and post-test scores of participants in the STEADI training (alpha .05, $t(13) = -1.71$, $p = .110$), the post-test average scores (M= 7.79) were higher than the average pre-test scores (M= 7.29). The higher post-test average scores show improvement in knowledge from the training given. Also, the pre-test scores on average were above 70%, which is higher than expected, considering the STEADI protocol is a new initiative at the facility. Prior knowledge of fall prevention likely contributed to the higher pre-test scores. The high scores can be attributed to the fact that the facility provides periodic and annual fall-prevention program staff training; STEADI has some similar information to the standard fall prevention programs.

Frequency of Staff Compliance

Staff compliance data results; screening (n= 5, 100.00%), assessment ($n = 4$, 80.00%), intervention($n = 4$, 80.00%) demonstrated that the staff was compliant with implementing the STEADI protocol. All five new patient admission charts showed that the components of the STEADI protocol (screening, assessment, and intervention) were being implemented. All five charts had documented screenings. No assessments were required for four patients because they screened negative for fall risk. One patient was identified as a high fall risk and initially did not have follow-up documentation regarding further assessments and interventions to address the risk, but this was promptly modified with coaching by the project leader. The project leader met with the facility MDS coordinator to discuss strategies for integrating a routine assessment and intervention plan for identified high-risk patients. A plan for further evaluation was documented in the patient chart as a follow-up.

Favorable staff compliance rates correlate with outcomes from other sites that have implemented fall prevention programs (Dykes et al., 2020). A non-randomized controlled trial evaluated the efficacy of a fall prevention program implemented in three inpatient medical centers in Boston and New York City (Dykes et al., 2020). The trial demonstrated high staff compliance rates after the fall prevention program was implemented at the sites (Dykes et al., 2020). Site 1 had a mean compliance rate of 86%, and sites 2 and 3 had mean compliance rates greater than 95% in implementing the fall prevention program. Compliance rates were measured twenty-one weeks after project implementation (Dykes et al., 2020). Staff compliance will need to be monitored and evaluated quarterly to ensure long-term compliance with the STEADI protocol.

Falls

Comparing the number of falls and fall rate calculations from the four weeks before project implementation to 4 weeks after project implementation showed a reduction in falls. Initially, when the project leader first evaluated fall numbers in the SNF, the fall numbers were about 5-6 falls per month. Those numbers have reduced consistently as the timeframe for project implementation got closer. Staff awareness of the pending fall-prevention project may have impacted staff and leadership vigilance and prevention of falls, resulting in reduced falls.

After implementing the STEADI training at the SNF, there was a reduction in falls from 3 to 1, and the fall rates reduced from 1.9 to 0.6. However, a paired t-test analysis of the number of falls showed no significant difference ($p = .159$) between the number of falls before and after project implementation.

Data was evaluated from another fall prevention project that involved training twenty-five healthcare provider teams on implementing the STEADI fall prevention protocol in their

long-term care settings (Eckstrom et al., 2016). Data collected from the study demonstrated a decrease in falls (12.9% vs. 12.2%, p=0.615), although not statistically significant during the three-month post-intervention data collection period compared to the three-month pre-intervention period (Eckstrom et al., 2016).

Another comparative study evaluated results from a system-based fall-prevention program in an inpatient unit and obtained statistically significant fall reduction rates after collecting data for over a year (Lohse et al., 2012). In the facility, the pre-intervention period had fall rates of 1.17, total fall rates were 4.24 per 1000 patient days, and the post-intervention study rates were 2.53 per 1000 patient days a year later (Lohse et al., 2012). The reduction in the fall rates (p = 0.036) and total falls (p = 0.024) were significant (Lohse et al., 2012). A recommendation for the project site would be to collect more data for additional months after the project to determine if the low fall rates are sustained.

Significance to Nursing

Data collected from the STEADI fall prevention program at the SNF demonstrated improved staff knowledge of fall prevention, improved staff compliance with implementing fall prevention interventions, and reduced patient falls. This data represents positive implications and significance to the nursing profession.

Staff knowledge

Nursing care staff at the SNF acquired knowledge regarding fall prevention in older adults, as evidenced by the test scores collected from the seminar (pre-test scores (M = 7.29), post-test scores (M = 7.79)). Staff acquisition of STEADI fall prevention knowledge is significant to the nursing profession because nurses, as professionals and leaders, require adequate education to manage patient safety issues such as falls (Montejano-Lozoya et al., 2020).

Nurses are accountable for admission assessments, identifying fall risk patients, and implementing fall prevention strategies (Montejano-Lozoya et al., 2020). Proper education and training of nurses improve nurse competency and lead to positive patient outcomes (Montejano-Lozoya et al., 2020).

Staff compliance

Nursing care staff at the SNF were compliant with implementing the STEADI protocol, as evidenced by documented screenings (n = 5, 100.00%), assessments (n = 4, 80.00%), interventions (n = 4, 80.00%) in the data collected. Staff compliance with STEADI is significant to nursing because quality-of-care improvement depends on nurses adhering to patient safety principles (Vaismoradi et al., 2020). Nurses play a crucial role in preserving patient safety and preventing harm when providing care in settings such as the skilled nursing facility (Vaismoradi et al., 2020). Nurses demonstrate compliance with organizational strategies through assessments, surveillance activities, and care planning (Vaismoradi et al., 2020). Data reflecting nurse compliance shows that the nursing discipline is working to achieve a sustainable and safer healthcare system for older adults by taking measures to reduce falls (Vaismoradi et al., 2020).

Fall reduction

Data collected from implementing the STEADI fall prevention protocol demonstrates a trend for fall reduction in the SNF. There was a reduction in falls from 3 to 1, and the fall rates reduced from 1.9 to 0.6. A reduced number of falls in a facility is significant to the nursing profession because it aligns with the role the nursing profession plays in health promotion, improving patients' health, and providing quality care (Tsai, 2020). Falls in older adults represent a significant public health concern for older adults, nurses, and the health care system (King et al., 2018). Falls result in bodily injuries, longstanding pain, functional impairment, hospital

admissions, and mortality for older adults (King et al., 2018). Falls lead to increased costs for the health care system costing approximately 1.9–10% of the annual income of the facility (Montejano-Lozoya et al., 2020).

Falls also negatively affect nurses. Staff nurses have the most significant impact on reducing patient falls due to their 24-hr presence during patient care and continual monitoring of patients (King et al., 2018). Therefore, when a fall occurs, nurses often may feel responsible and express increased stress, anxiety, guilt, concern for liability, and self-doubt about the quality of care (King et al., 2018). Falls and related injuries are consistently associated with the quality of nursing care in the care setting (Currie, 2008). Falls and fall-related injuries are nursing-quality indicators monitored by the American Nurses Association, the National Database of Nursing Quality Indicators (ANA–NDNQI), and the National Quality Forum (Currie, 2008). Overall, fall reduction represents reduced adverse outcomes for the older adults, the facility, and the nursing staff (King et al., 2018).

Limitations

In evaluating the project's outcomes, limitations were noted concerning the design, data recruitment and collection methods, and data analysis.

Project Design

The project as a Quality Improvement (QI) project has limitations because, in general, QI studies are less rigorous than other research study designs (LeLaurin & Shorr, 2019). For example, controlled trials represent a much more robust study design because there is more clarity regarding the population, interventions, outcomes of the control group, and other external factors that can impact the project outcomes (LeLaurin & Shorr, 2019). The project took place at a single site without a control site. Other SNF sites without the STEADI protocol can be used as

a comparative control to account for this limitation. Generally, SNFs tend to have similar risk factors for falls, similar concerns with older adult falls, and similar patient and staff populations. Therefore, the project results can still be compared to results from another skilled nursing facility (SNF) site without the STEADI.

Although randomized controlled studies yield the highest level of evidence, some universally applied interventions, such as fall prevention protocols, cannot be studied in a controlled manner (LeLaurin & Shorr, 2019). However, helpful evidence can still be derived from significant, credible parallel or before-and-after studies (LeLaurin & Shorr, 2019). A systematic review of studies utilizing the STEADI protocol fall prevention evidence-based strategies has shown that the STEADI protocol is an effective fall prevention program (Sarmiento & Lee, 2017).

Data Recruitment

The COVID-19 pandemic created a challenge during the project because it caused staffing shortages. The project leader was limited to providing training only during the administered seminar because there was not enough staff to cover the floor for multiple training sessions. The staffing shortages reduced staff who could have participated in the training. Fourteen healthcare participants attended the STEADI training seminar. Approximately eight other workers were on-site but unable to participate in the training due to their work shifts and lack of coverage. Implementation of STEADI will be more effective if all or majority of staff are trained on the protocol. The project leader has trained the facility director to administer additional STEADI training seminars to additional employees who need the training.

COVID-19 also impacted the workflow at the facility. Another limitation of the project was the inability to directly observe the implementation of the STEADI protocol on the floor. Social distancing and other COVID-19 prevention measures were the facility's focus, so it was not easy to observe the STEADI protocol directly on the floor with staff. The project leader was still able to verify that the STEADI protocol was being implemented by evaluating documentation of STEADI guidelines in the patient charts.

Collection Methods

The entire project was four weeks from implementation time to evaluation of results. The 4-week time frame project design was a limitation because it did not provide adequate time to collect data to establish statistically significant effects. Also, the project implementation involved administering a 1-hour training seminar which provided enough time to review the project content but did not allow enough time to provide in-depth training that involved skills and return demonstrations. The facility director will provide additional education and evaluations to staff on the floor and provide training as needed for skills involving the STEADI Protocol

The project leader was able to access data regarding patient falls from patient charts; however, the project leader had to validate the data by verifying it with the facility director's information. Data revealed that the number of falls was low before and after implementation, leaving little room for analysis and comparisons. Analyzing data on staff compliance was also limited due to the small sample size of patient admissions. The facility only had five new admissions during the project time frame; therefore, only five charts were evaluated during the project implementation phase. Small samples can undermine internal and external validity (Faber & Fonseca, 2014). Too small a sample may prevent extrapolating the findings (Faber & Fonseca, 2014). Although the sample sizes were small, the project leader recognizes that the STEADI

protocol is a new intervention at the site, so any application of the protocol by the site is considered progress and a pathway to improve patient outcomes.

Data Analysis

Paired t-tests were used to determine a statistically significant reduction in falls after implementing the STEADI protocol. T-tests assume normality of data, homogeneity of variance, and random sample (Mishra et al., 2019). A Shapiro-Wilk test was conducted to check for the normal distribution of data (Razali & Wah, 2011). The results of the Shapiro-Wilk test alpha value of .05, $W = 0.19$, $p < .001$ suggested the differences in pre-project fall numbers and post-project fall numbers were unlikely to have been produced by a normal distribution, indicating the normality assumption was violated. The paired t-test may have been misused since the data did not obey the normal distribution (Liang et al., 2019). It would have been better to perform *a t*-test after an appropriate variable transformation (Liang et al., 2019).

Also, performing a non-parametric test method instead of the paired t-test may have been a better alternative (Liang et al., 2019). Non-parametric tests are most often used when there is evidence of non-normality. Also, the non-parametric test is appropriate because the data for the pre-project and post-project falls consisted of a small sample size. As alternatives to t-tests, non-parametric tests are most valuable when a small sample size (Fagerland, 2012).

Dissemination

DNP nurses are expected to successfully disseminate and translate research regarding data designed to improve patient outcomes (Curtis et al., 2017). Project results will be communicated to all project key stakeholders, such as the project mentor, the facility administrator, and other care staff at the project site. The results will be presented at a staff leadership meeting in June. Also, on June 16, 2022, there will be a formal Zoom presentation of

the project overview and results presented to the faculty and students of the DNP program at Touro University, Nevada. The DNP project proposal will also be submitted to the Doctor of Nursing Practice Repository. The project lead plans to disseminate the project overview and results to three other local skilled nursing facilities sister facilities to the project site. The project will be available in a poster presentation format for display at the facilities. The project lead also plans to submit a project poster presentation to the next available Doctor of Nursing Practice Conference.

Sustainability

The sustainability of the STEADI fall prevention program looks promising with the favorable staff compliance rates in implementing the STEADI protocol. Sustainability will require the facility's director to play a crucial role in enforcing the protocol. The facility director would need to identify other staff members to assist with continuous staff training on fall prevention. The facility director would also need to establish the STEADI training as part of the new staff orientation. The facility director would need to incorporate the STEADI training as part of their routine staff training for the project to be sustainable. Teams with high levels of administrative support and participation in the intervention are likely to continue implementing new patient care strategies (Eckstrom et al., 2016). Discussions are still in progress to establish written policies on incorporating STEADI training as part of the facility's staff annual training and new-hire training, which will help sustain the STEADI protocol.

Conclusion

The DNP project aimed to prevent falls in older adults residing in the SNF by educating staff on implementing the STEADI fall prevention protocol. The project was guided by the Donabedian model and involved staff training through a seminar on the STEADI protocol. Staff

received education on the STEADI algorithm, which involved training on fall risk screening, assessment, and interventions (CDC, 2021). Data was collected on fall reduction, the effectiveness of the STEADI training seminar on staff knowledge of fall prevention, and evidence of staff compliance in implementing the STEADI protocol. Results from the project indicated improved staff knowledge of fall prevention protocol, increased staff compliance in implementing fall prevention interventions, and an overall reduction in the number of falls.

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Appendix A

Figure 1

Donabedian Model

(Tossaint-Schoenmakers et al., 2021).

Appendix B

(CDC, 2021)

Appendix C

Stay Independent Brochure Questionnaire

Check Your Risk for Falling

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 furniture when walking at home.	This is also a sign of poor balance.
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 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 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 for falling. Discuss this brochure with your doctor.	

This checklist was developed by the Greater Los Angeles VA Geriatric Research Education Clinical Center and affiliates and is a validated fall risk self-assessment tool (Rubenstein et al. J Safety Res. 2011; 42(6):493-499). Adapted with permission of the authors.

(CDC, 2021)

Appendix D

ASSESSMENT

Timed Up & Go (TUG)

Patient

Date

Time ☐ AM ☐ PM

Purpose: To assess mobility

Equipment: A stopwatch

Directions: Patients wear their regular footwear and can use a walking aid, if needed. Begin by having the patient sit back in a standard arm chair and identify a line 3 meters, or 10 feet away, on the floor.

NOTE: Always stay by the patient for safety.

① **Instruct the patient:**

When I say "Go," I want you to:

1. Stand up from the chair.
2. Walk to the line on the floor at your normal pace.
3. Turn.
4. Walk back to the chair at your normal pace.
5. Sit down again.

② **On the word "Go," begin timing.**

③ **Stop timing after patient sits back down.**

④ **Record time.**

Time in Seconds: _____

An older adult who takes ≥12 seconds to complete the TUG is at risk for falling.

OBSERVATIONS

Observe the patient's postural stability, gait, stride length, and sway.

Check all that apply:

- ☐ Slow tentative pace
- ☐ Loss of balance
- ☐ Short strides
- ☐ Little or no arm swing
- ☐ Steadying self on walls
- ☐ Shuffling
- ☐ En bloc turning
- ☐ Not using assistive device properly

These changes may signify neurological problems that require further evaluation.

CDC's STEADI tools and resources can help you screen, assess, and intervene to reduce your patient's fall risk. For more information, visit www.cdc.gov/steadi

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

2017

STEADI Stopping Elderly Accidents, Deaths & Injuries

(CDC, 2021)

Appendix E

ASSESSMENT CONTINUED

The 4-Stage Balance Test

Patient _____

Date _____

Time _____ ☐ AM ☐ PM

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.**"

	① Stand with your feet side-by-side.	Time: _____ seconds
	② Place the instep of one foot so it is touching the big toe of the other foot.	Time: _____ seconds
	③ Tandem stand: Place one foot in front of the other, heel touching toe.	Time: _____ seconds
	④ Stand on one foot.	Time: _____ seconds

Notes:

CDC's STEADI tools and resources can help you screen, assess, and intervene to reduce your patient's fall risk.
For more information, visit www.cdc.gov/steadi.

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

2017

STEADI Stopping Elderly Accidents, Deaths & Injuries

(CDC, 2021)

Appendix F

ASSESSMENT

30-Second Chair Stand

Purpose: To test leg strength and endurance

Equipment: A chair with a straight back without arm rests (seat 17" high), and a stopwatch.

NOTE: Stand next to the patient for safety.

① Instruct the patient:

1. Sit in the middle of the chair.
2. Place your hands on the opposite shoulder crossed, at the wrists.
3. Keep your feet flat on the floor.
4. Keep your back straight, and keep your arms against your chest.
5. On **"Go,"** rise to a full standing position, then sit back down again.
6. Repeat this for 30 seconds.

② On the word "Go," begin timing.

If the patient must use his/her arms to stand, stop the test. Record "0" for the number and score.

③ Count the number of times the patient comes to a full standing position in 30 seconds.

If the patient is over halfway to a standing position when 30 seconds have elapsed, count it as a stand.

④ Record the number of times the patient stands in 30 seconds.

Number: _____ Score: _____

Patient _____

Date _____

Time _____ ☐ AM ☐ PM

SCORING

Chair Stand
Below Average Scores

AGE	MEN	WOMEN
60-64	< 14	< 12
65-69	< 12	< 11
70-74	< 12	< 10
75-79	< 11	< 10
80-84	< 10	< 9
85-89	< 8	< 8
90-94	< 7	< 4

A below average score indicates a risk for falls.

CDC's STEADI tools and resources can help you screen, assess, and intervene to reduce your patient's fall risk. For more information, visit www.cdc.gov/steadi

CDC Centers for Disease Control and Prevention
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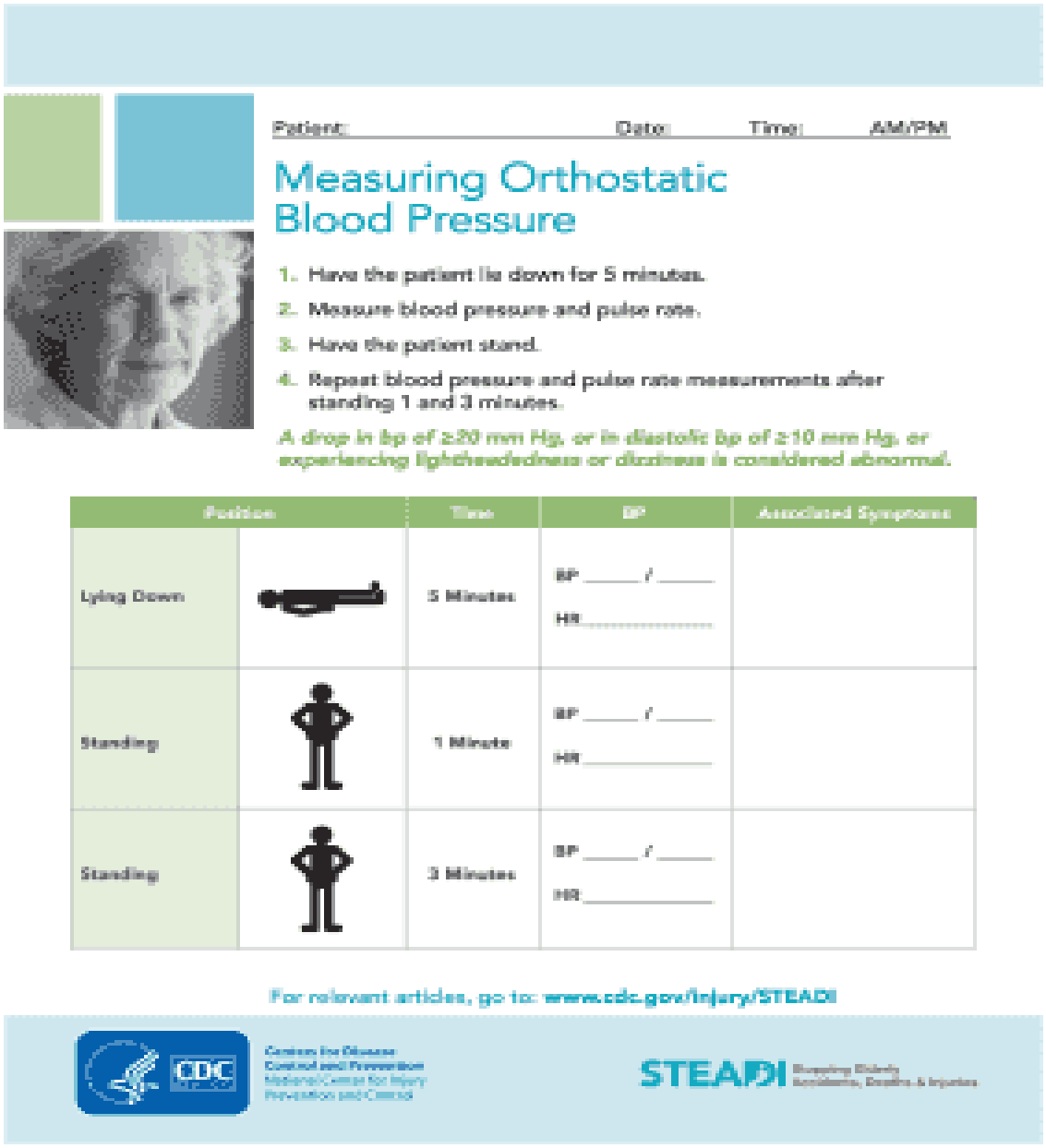
STEADI Stopping Elderly Accidents, Deaths & Injuries

2017

(CDC, 2021)

Appendix G



Patient: Date: Time: AM/PM

Measuring Orthostatic Blood Pressure

1. Have the patient lie down for 5 minutes.
2. Measure blood pressure and pulse rate.
3. Have the patient stand.
4. Repeat blood pressure and pulse rate measurements after standing 1 and 3 minutes.

A drop in bp of ≥20 mm Hg, or in diastolic bp of ≥10 mm Hg, or experiencing lightheadedness or dizziness is considered abnormal.

Position		Time	BP	Associated Symptoms
Lying Down		5 Minutes	BP ____ / ____ HR ____	
Standing		1 Minute	BP ____ / ____ HR ____	
Standing		3 Minutes	BP ____ / ____ HR ____	

For relevant articles, go to: www.cdc.gov/injury/STEADI

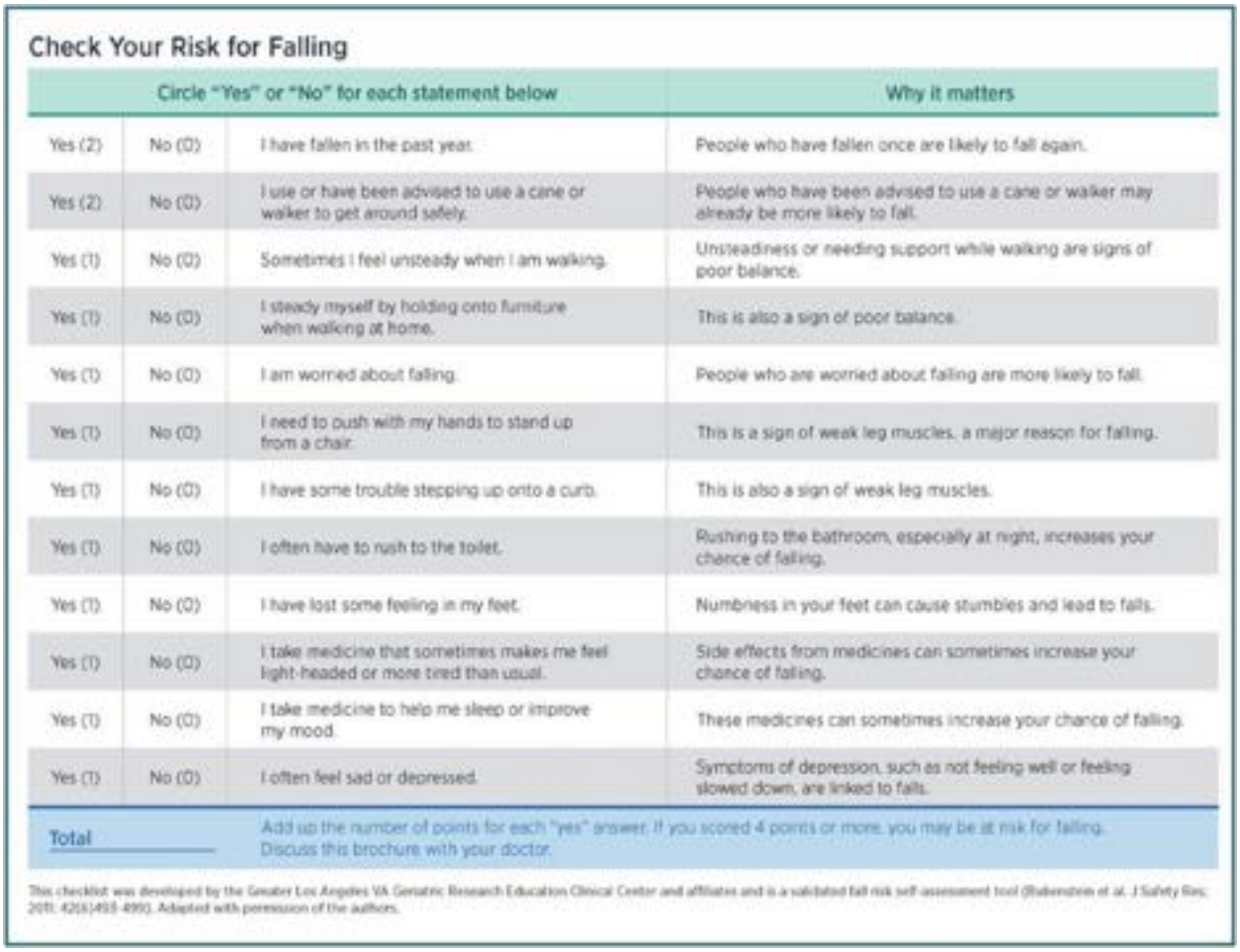
CDC Centers for Disease Control and Prevention National Center for Injury Prevention and Control

STEADI Stopping Elderly Accidents, Deaths & Injuries

(CDC, 2021)

Appendix H

Stay Independent Brochure



Check Your Risk for Falling

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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 furniture when walking at home.	This is also a sign of poor balance.
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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.
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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 for falling. Discuss this brochure with your doctor.	

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(CDC, 2021)

Appendix I

Education Powerpoint

STEADI Our Staff for Fall Prevention

Stacey Eletu, RN, BSN, MSN
2/8/2022

Disclaimer: Slide content developed by the Centers for Disease Control and Prevention

1

Purpose and Learning Objectives

• The purpose of the training seminar is to educate staff at a skilled nursing facility on the proper implementation of the fall prevention protocol called the STEADI. The staff will learn a straightforward, and effective practical approach for incorporating fall risk assessment and prevention into routine clinical practice

Learning Objectives

Upon successful completion of this course, the participant will be able to:

- Describe the burden of falls on older adults
- Identify the risk factors for falls in older adults
- Describe the benefits of implementing a STEADI-based fall prevention program in a facility
- Demonstrate how to implement the fall prevention steps of screening, assessing, and intervening.
- Locate additional STEADI protocol resources

2

Your Thoughts and Experiences with Falls

How have falls among older adults (age 65+) affected you?

- Have you or someone you know fallen?
- What kind of life-changing events occurred because of the fall?
- How could the fall have been prevented?

3

Leading Causes of Death

4

Falls Are Common

Data sources: National Vital Statistics System, National Electronic Injury Surveillance System–All Injury Program, and Behavioral Risk Factor Surveillance System.

5

Falls Might Not Be a Priority for Patients

Less than half of older adults who fall talk to their doctor about falls

Reasons patients do not talk to their doctor: o Belief that falls are a normal part of aging o Fear that a fall may lead to loss of independence o Not aware of common fall risk factors

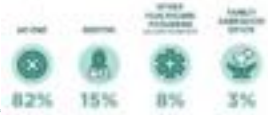
6

Falls Might Not Be a Priority for Patients

Few older adults speak to someone about medications and fall risk

Example:

In the past 12 months, who has talked to you about medications that might make you fall?*



*Percentage does not add up to 100 because participants could select more than one response option.
Source: ConsumerStyles survey 2016

7 8 9 10

Falls Might Not Be a Priority for Providers

Providers also face many barriers to addressing falls with older patients

- Competing healthcare priorities
- Lack of time during office visits
- Limited fall prevention knowledge
- Limited communication between providers from different disciplines • Limited reimbursement strategies

11

Consequences of Falls Among Older Adults

More than 95% of hip fractures are due to falls

Falls are the leading cause of traumatic brain injuries

Falls and fall injuries increase the risk of nursing home placement

Fall death rates increased about 30% between 2009 and 2018

12

Common Fall Risk Factors

Falls Are Preventable

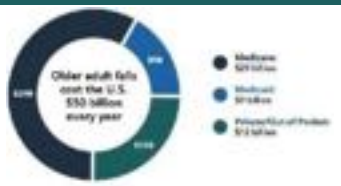
Successful Implementations

Falls Are Costly

- Average hospitalization cost due to a fall injury is $30,000 o Fall-related injuries are a leading cause of hospital readmission
- Average cost per fall injury:
  - o Emergency Department visits = $4,829 o Office-based and outpatient visits = $5,813

13

Falls Are Costly



Florence C., et al. (2018). Medical costs of fatal and nonfatal falls in older adults. Journal of the American Geriatrics Society, 66(4), 693-698.

14

Falls Are a Growing Burden

Data sources: Behavioral Risk Factor Surveillance System and United States Census Bureau

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Modifiable Risk Factors	Non-modifiable Risk Factors
• Gait, strength, and balance deficits • Medications that increase fall risk • Home hazards • Orthostatic hypotension • Vision problems • Foot issues/inappropriate footwear • Vitamin D deficiency • Comorbidities	• Age • Sex • Race/ethnicity • History of falls

Fall risk increases as the number of risk factors increases.

~~Stopping Elderly Accidents, Deaths, and Injuries (STEADI)~~

The ~~Stopping Elderly Accidents, Deaths, and Injuries (STEADI)~~ initiative was developed by the U.S. Centers for Disease Control and Prevention (CDC)

- o STEADI is based on the American and British Geriatrics Societies' Clinical Practice Guideline for Prevention of Falls in Older Persons and designed with input from healthcare providers
- o STEADI offers tools and resources to help healthcare providers Screen, Assess, and Intervene to reduce fall risk

Oregon Health & Science University, Oregon

- 64% of patients screened for fall risk
- At-risk patients with modifiable risk factors, such as gait impairment and orthostatic hypotension, received interventions

United Health Services Hospitals, New York

- 79% of patients screened for fall risk
- At-risk patients with a fall prevention care plan were 40% less likely to have a fall-related hospitalization, compared to at-risk patients without a plan

Benefits of a STEADI-based Fall Prevention Program

Use STEADI to:

- Prevent fall-related hospitalizations
- Reduce healthcare costs
- Improve the lives and independence of older patients

STEADI

STEADI Algorithm

STEADI Algorithm: Algorithm for Fall Risk Screening, Assessment, and Intervention

STEADI: Screening

- If your patient is 65 or older, screen
  - o Once a year for fall risk or
  - o If they present with an acute fall

- Two validated screening tools include
  - o The Three Key Questions o CDC's Stay Independent questionnaire

Screening Tool: The Three Key Questions

Ask your patient these questions:

- Have you fallen in the past year?
- Do you feel unsteady when standing or walking?

Do you worry about falling?

RESULTS

Screening Tool: Stay Independent Questionnaire

Screening Tool: Stay Independent Questionnaire

RESULTS

Score of 4 or more

Interpretation: Screened at fall risk

Next steps: Conduct fall risk assessment

Score less than 4 and patient fell in the past year

Interpretation: Screened at fall risk

Next steps: Conduct fall risk assessment

Score less than 4

Interpretation: Screened not at fall risk

Next steps: Recommend strategies to prevent future fall risk

Tips to Implement Fall Screening

- Integrate screening tools to fit your clinic workflow
  - Example: Add to usual patient intake forms
- Find an optimal time to ask screening questions
  - Before an office visit—by phone or online portal
  - During routine office visit—in the waiting room or the exam room
  - During Welcome to Medicare Examination or Medicare Annual Wellness Visit
- Set screening goals and monitor progress
  - Example:
    - Goal: We will screen 50% of our older adult patients in 30 days
    - Monitor: Percent of older patients screened for fall risk in the past 30 days
    - Share progress with team members

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STEADI: Assessment

To identify modifiable fall risk factors in at-risk patients:

Conduct a falls history. Example questions:

- How many times have you fallen?
- Did you have any symptoms prior to your fall?
- Where and when did you fall?

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STEADI: Assessment

To identify modifiable fall risk factors in at-risk patients:

Conduct assessments:

- Evaluate gait, strength, and balance
- Identify medications that increase fall risk
- Ask about potential home hazards
- Measure orthostatic blood pressure
- Check visual acuity
- Assess feet and footwear
- Assess vitamin D intake
- Identify comorbidities

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STEADI: Intervention

25 26 27 28 29 30

Components of STEADI: Examples

Fall Risk Factor	Assessment	Intervention
Gait, strength, and balance deficits	Conduct tests: - Timed Up and Go (TUG) - 30-second chair stand - 4-stage balance	• Physical therapy • Evidence-based fall prevention program

- Handouts: TUG, 30-second chair stand, and 4-stage balance tests
- Instructional videos: TUG, 30-second chair stand, and 4 stage balance tests

Components of STEADI: Examples

Fall Risk Factor	Assessment	Intervention
Medications that increase fall risk	Conduct a comprehensive medication review	Medication management - Stop medications when possible - Switch to safer alternatives - Reduce to lowest effective dose

Fact sheets: Medications Linked to Falls, SAFE Medication Review Framework, STEADI-Rx Pharmacist Flyer

Components of STEADI: Examples

Components of STEADI: Examples

Components of STEADI: Examples

Components of STEADI: Examples

Educational material: Check for Safety

Fall Risk Factor	Assessment	Intervention
Home hazards	Ask patients and their family members about home safety	• Refer to occupational therapy • Recommend tips to improve home safety

References (30,31)

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Components of STEADI: Examples

Fall Risk Factor	Assessment	Intervention
Orthostatic hypotension The patient has orthostatic hypotension if systolic blood pressure drops by at least 20 mm Hg or diastolic by at least 10 mm Hg	Measure orthostatic blood pressure 1. Have the patient lie down for 5 minutes 2. Check blood pressure 3. Have the patient stand 4. Check blood pressure within 3 minutes	• Treat underlying cause • Adjust medications if warranted

Handout: Measuring Orthostatic Blood Pressure

Educational material: Postural Hypotension

References (30,32)

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Components of STEADI: Examples

Fall Risk Factor	Assessment	Intervention
Vision impairment	• Ask patients about vision problems • Use Snellen eye chart to assess visual acuity • Ask if patient uses bifocal lenses when outdoors	• Refer to ophthalmology or optometry • Recommend single distance lenses for walking outside

References (30,33)

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Components of STEADI: Examples

Fall Risk Factor	Assessment	Intervention
Feet or footwear issues	• Look for foot deformities, deficits in sensation, or pain • Assess for inappropriate footwear	• Counsel on shoe fit, insoles, and heel height • Refer to podiatry

Guide: Coordinated Care Plan to Prevent Older Adult Falls

Educational materials: Family Caregivers: Protect your Loved Ones from Falling, What You Can Do to Prevent Falls

References (30,31)

Components of STEADI: Examples

Fall Risk Factor	Assessment	Intervention
Vitamin D deficiency	Ask about patient's dietary vitamin D intake, use of vitamin D supplements, and sun exposure	Consider increasing dietary vitamin D or daily vitamin D supplements if the patient has a vitamin D deficiency

References (30,32)

Components of STEADI: Examples

Fall Risk Factor	Assessment	Intervention
Comorbidities	Screen for comorbidities such as osteoporosis, depression, dementia, incontinence	Optimize treatments of identified conditions

References (30,33)

Follow-Up

Follow up with patients within 30–90 days

- Review plan of care
- Encourage adherence to recommendations
- Discuss barriers to adherence

References (30,33)

Our Fall Prevention Program

- Which fall risk factors will we focus on?
- How will our facility workflow adapt STEADI's screen, assess, and intervene steps?
- How will the electronic health record incorporate fall prevention?
- How will the facility monitor and evaluate the program?
- Describe how staff of the facility can play a role in fall prevention.

Guides: Coordinated Care Plan to Prevent Older Adult Falls, STEADI: Evaluation Guide for Older Adult Clinical Fall Prevention Programs

References (31,33)

Team and Roles

Every member can play an important role in fall prevention

Our team will include o Front office staff o Office manager o Care coordinator o Nurses o Nurses Aides o Physician, physician assistants, or nurse practitioners o Pharmacists o Physical therapists o Occupational therapists

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Let's Do Our Part to Prevent Falls

- Learn about older adult fall prevention and STEADI resources
  - Available at www.cdc.gov/steadi
- Earn continuing education with an online training on fall prevention
  - STEADI: Empowering Healthcare Providers to Reduce Fall Risk Available at www.cdc.gov/steadi/training.html
- Hear from other healthcare providers on their STEADI experience
  - Available at www.cdc.gov/steadi/about/success-stories.html

Appendix: Resource Gallery

STEADI Guides

Coordinated Care Plan to Prevent Older Adult Falls

Evaluation Guide for Older Adult Clinical Fall Prevention Programs

Appendix: Resource Gallery

STEADI Assessment Handouts

Timed Up & Go (TUG)

4-Stage Balance

30-Second Chair Stand

Measuring Orthostatic Blood Pressure

Appendix: Resource Gallery

STEADI Fact Sheets

Medications Linked to Falls

SAFE Medication Review Framework

STEADI-Rx Pharmacist Flyer

Talking about Fall Prevention with Your Patients

Appendix: Resource Gallery

STEADI Educational Materials

Appendix: Resource Gallery

Wall Chart and Algorithm

Practice Fall Prevention Wall Chart

Algorithm for Fall Risk Screening, Assessment, and Intervention (front page)

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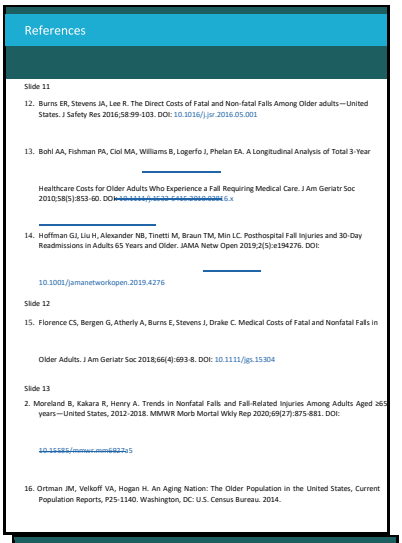

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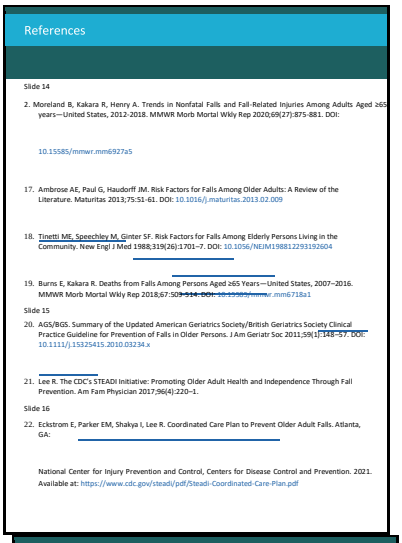

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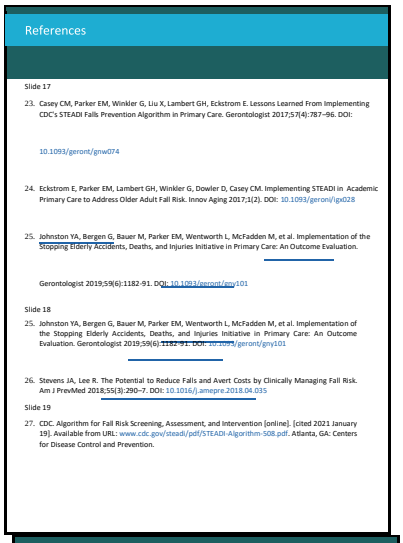

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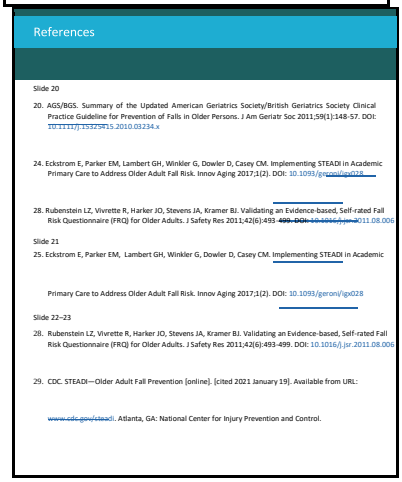

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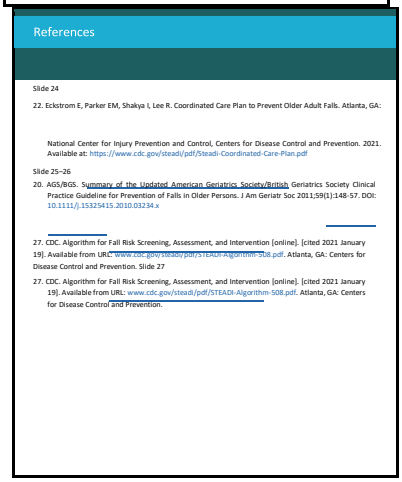

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(CDC, 2021)

Appendix J

General Directions for the Test

Directions: Read each question carefully, and then SELECT THE ANSWER that best fits the question.

STEADI FALL PREVENTION PROGRAM

Pre/Post Knowledge Test

1. The benefits of a STEADI-based Fall Prevention Program include which of the following?

a) Prevent fall-related hospitalizations

b) Reduce healthcare costs

c) Improve the lives and independence of older patients

d) All of the above*

Answer: D Analysis: Benefits of implementing a STEADI-based fall prevention program in a facility
Rationale: The STEADI protocol has a substantial impact on fall reduction, improving health outcomes and reducing health care expenditures (Lee, 2017).

2. The first component of the STEADI algorithm is

a) Assessment

b) Screening

c) Medication prevention

d) Intervening

Answer: B Knowledge: Fall prevention steps of screening, assessing, and intervening.
Rationale: The first step in a multifactorial clinical fall prevention approach is fall risk screening to identify older adults at increased risk of falling (Eckstrom et al., 2017). The initial screening step is critical because it determines who will receive additional assessments and follow-up care (Eckstrom et al., 2017).

3. STEADI fall prevention program includes which of the two validated screening tools?

a) TUG test and sit to stand test
b) RACE and PASS test
c) The Three Key Questions and CDC's Stay Independent questionnaire
d) The Morse Fall risk scale and Braden risk scale

Answer: C Knowledge: Fall prevention steps of screening, assessing, and intervening.
Rationale: The Stay Independent questionnaire is a widely used fall-risk self-assessment tool, part of the Stopping Elderly Accident, Deaths & Injuries (STEADI) program (Loonlawong et al., 2019). The STEADI initiative includes two screening options (Eckstrom et al., 2017). STEADI fall prevention strategies include a simple three-question screening approach: Have you fallen in the past year? Do you feel unsteady when standing or walking? Do you worry about falling? (Lee, 2017).

4. A patient scores 4 or more on the Stay Independent Questionnaire. This score can be interpreted as:

a) Screened at fall risk
b) Screened not at fall risk

Answer: A Application: Fall prevention steps of screening, assessing, and intervening.
Rationale: The *Stay Independent* can be used as a screening questionnaire, with a score of four or more indicating an increased risk of falling; furthermore, responses to individual questions can point to specific risk factors and clinical issues that may require additional follow-up (Eckstrom et al., 2017).

5. Which of the following conditions are co-morbidities that can put the patient at risk for falls?

a) Osteoporosis
b) Asthma
c) Sunburns
d) Tooth cavity

Answer: A Analysis: Risk factors for falls in older adults
Rationale: Fall risk assessment also includes identifying if the patient has comorbidities such as osteoporosis, depression, dementia, and incontinence (CDC, 2021). Providers can optimize treatment of the conditions present to address the patient's risk of falling (CDC, 2021).

6. Every member of the healthcare team can play an important role in fall prevention

a) True
b) False

Answer: A Comprehension: Fall prevention steps of screening, assessing, and intervening.
Rationale: All members of the healthcare team play an important role in fall prevention (CDC, 2021).

7. An intervention for the patient taking medications that cause fall risk include:

a) Stop medications when possible
b) Increase medication doses
c) Switch to another psychoactive medication
d) Continue taking the medications

Answer: A Analysis: Fall prevention steps of screening, assessing, and intervening.
Rationale: Per the STEADI protocol, health providers should conduct a comprehensive medication review to identify polypharmacy and medications that can increase fall risk such as psychoactive medications (CDC, 2021). Some interventions include stopping, switching, or reducing medication use, lowering the total number of medications, and using non-pharmacologic interventions (CDC, 2021). When making these changes, it is important to use clinical judgment (CDC, 2021).

8. Falls are the number _____ cause of unintentional injury deaths in older adults.

a) one
b) two
c) three
d) four

Answer: A Comprehension: Burden of falls on older adults
Rationale: Falls are the leading cause of injury-related deaths in older adults (Eckstrom et al., 2017). In 2015, falls accounted for nearly 3 million emergency department visits, including 925,000 hospitalizations and over 28,000 deaths in the United States (Eckstrom et al., 2017).

9. Which of the following are modifiable risk factors for falls in older adults?

a) Age
b) Vision problems
c) Race/ethnicity
d) History of falls

Answer: B Knowledge: Risk factors for falls in older adults
Rationale: Non-modifiable risk factors include age, sex, race/ethnicity, and history of falls (CDC, 2021).

10. Timed Up and Go (TUG) test, 30-second chair stand, and _____ are gait and strength balance tests in the STEADI algorithm.

a) Jump up and walk
b) Lay to sit
c) 4-stage balance
d) Touch your toe

Answer: C Knowledge: Fall prevention steps of screening, assessing, and intervening. ***Rationale:*** Recommended balance evaluations for fall risk clients in the STEADI algorithm include Timed Up-and-Go, 30-second Chair Stand, and 4-stage Balance tests (Phelan et al., 2015).

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Appendix K

Fall reduction and STEADI compliance chart audit checklist tool

Please reference STEADI algorithm below for screening tools, assessment components, and Intervention guidelines									
	Room #	Room #	Room #	Room #	Room #	Room #	Room #	Room #	Room #
Patient initials									
Today's Date									
Date of last fall									
Psychoactive/Psychotropic medications currently taking									
Number of falls 1 month ago: 2 months ago: 3 months ago:									
Fall screening conducted using STEADI screening tools and documented within 12 months and after patient fall if applicable									
Screened at risk for fall (yes or no) (if no, explain)									
If screened at risk (indicate assessment applied)									

Interventions documented in chart addressing risk factors identified (yes or no) (if no, explain)									
Follow up documented within 30 days after intervention									

Appendix L

DNP Project: Statistics Plan Worksheet

Please provide a brief description of each section. Attach supporting documents (instruments) to the end of this form as appendices.

Name: Stacey Eletu

Date: 12/20/2021

Section	Description
Project Title	Implementing a Fall Prevention Protocol for High Fall-Risk Older Adults in a Skilled Nursing Facility.
Project Purpose	The purpose of the project is to prevent falls in older adults residing in the SNF by educating staff on the proper implementation of the STEADI fall prevention protocol initiative. **Project Objectives** In the timeframe for this DNP project, the host site will IV. Implement the STEADI toolkit as a protocol for fall prevention within a 4-week time frame. V. Administer a training seminar on properly implementing the STEADI fall prevention protocol to 100% of the full-time staff. VI. Increase staff compliance in implementing the STEADI fall prevention protocol evidenced by documented fall risk screenings, assessments, and interventions on all high fall risk older adults. **VII.** Reduce the number of falls by 20% within a 4-week time frame. VIII.
Project Question	Does implementing a staff education program for an evidence-based fall prevention initiative (STEADI); at a skilled nursing

	facility; increase staff knowledge and compliance with implementing the STEADI protocol, therefore reducing the number of falls in high fall risk older adults in one month. The PICOT is broken down as such: P: (Population): Primary population is facility staff that will be educated on proper implementation of the STEADI protocol. Secondary population is the older adult in the SNF. I: (Intervention): Education of staff regarding the implementation of the STEADI initiative resources C: (Comparison): Comparing staff knowledge, protocol implementation compliance, and number of falls prior to education program implementation versus the number of falls after STEADI education implementation O: (Outcome): The primary outcome will be to increase staff knowledge in preventing patient falls, utilizing the STEADI tool, and increasing compliance with the protocol. The secondary outcome is the reduction in the number of falls T: (Time Frame) One month
Project Design (general description how treatments are assigned/observational/repeated measures of X # of people, etc.)	Implement training seminar session (s) on the STEADI protocol. Ensure competency with post-completion test score of 80% or higher. Implement documentation of fall screenings and follow up in EHR. Currently the facility uses the Morse Fall Risk scale for fall screening. This current fall risk scale will be maintained as it has some of the same key screening questions as the STEADI screening tools. All admitted older adults of the SNF receive fall screenings upon admission and quarterly. irb. Plan of care: Older adults screened at risk will receive an assessment of modifiable risk factors and fall history. This

	assessment will be identified in the patient's EHR as an assessment tool. The assessment tool will also have documentation of the intervention for each indicated positive assessment. Review of actions taken during the project will be observed/ monitored via chart review and documentation.
Population of Interest	The direct population of interest in the project is the staff to be educated on the STEADI Protocol. The inclusion criteria for staff participation in the project are staff who conduct patient screening, assessments, and direct care interventions. Direct care staff include providers such as physicians and nurse practitioners, the rehabilitation team, the physical, occupational therapists, speech therapists, and the licensed and unlicensed nursing staff (Casey et al., 2017). Staff included in the project must be employed on a full-time or part-time basis. The exclusion criteria for the project are as follows: staff who do not conduct patient screening, assessments, care interventions are excluded from the training mandate. Staff also employed on a per-diem basis will be excluded. However, excluded staff may choose to participate for knowledge purposes. The indirect population of interest is older adults 65 years and older residing at the SNF at the time of project implementation. All older adults will be screened to identify those that are the high fall risk. The inclusion criteria for the project are older adults identified through screening as high fall risk. The exclusion criteria are older adults who are not identified as high fall-risk after screening. IX.
Variables	Independent Variable(s) – Dependent Variable(s) – Relevant Constant(s)- The Independent variable is the STEADI training seminar and the STEADI protocol implementation. Dependent variables are increased staff knowledge about the STEADI protocol, increased protocol competency and the reduction in older adult falls from the staff education, which aligns with the project question. Dependent variables are staff compliance, and 33% rate reduction in the number of older adult falls

Sample Size	Patients: 35 Staff: 25
Recruitment Methods	Establish project as mandatory training required by facility leadership. Recruitment by announcing required training at staff meeting and also posting on flyer in staff breakout room
Instruments/Tools (Validity/Reliability)	STEADI tool- The Center for Disease Control (CDC) developed the validated measure: Stopping Elderly Accidents, Deaths, and Injuries (STEADI) protocol. Pre and post educational survey Educational handout/PowerPoint Stay independent Brochure (SIB)- fall screening tool Time Up and Go test (TUG) 30-Second Chair Stand 4-Stage Balance Test
Proposed Descriptive Statistics and Statistical Test(s)	Staff Pre and Post test scores comparison- Will use a paired T-test to see if the education seminar was effective. Rationale: Paired T-test are useful in before and after observations of the same subjects. Observation of the test scores prior to the STEADI training seminar will be compared with the test scores after the seminar. Reduction in falls: Descriptive statistics of frequency a t-test for comparison of reduction in fall Staff Compliance with protocol: Descriptive statistics of frequency Rationale: Descriptive statistics of frequency analyzes how often a variable occurs so it can be used to analyze the number of falls before and after STEADI protocol. It can also be used to analyze compliancy, comparing documentation occurrences before and after protocol. Compliancy is measured by documented fall risk screenings, assessments, and interventions on all high fall risk older adults.

RESOURCE

Algorithm

for Fall Risk Screening, Assessment, and Intervention

As a healthcare provider, you are already aware that falls are a serious threat to the health and well-being of your older patients.

More than one out of four people 65 and older falls each year, and over 3 million are treated in emergency departments annually for fall injuries.

The CDC's STEADI initiative offers a coordinated approach to implementing the American and British Geriatrics Societies' clinical practice guideline for fall prevention. STEADI consists of three core elements: **Screen**, **Assess**, and **Intervene** to reduce fall risk.

The **STEADI Algorithm for Fall Risk Screening, Assessment, and Intervention** outlines how to implement these three elements.

Additional tools and resources include:

- Information about falls
- Case studies
- Conversation starters
- Screening tools
- Standardized gait and balance assessment tests (with instructional videos)
- Educational materials for providers, patients, and caregivers
- Online continuing education
- Information on medications linked to falls
- Clinical decision support for electronic health record systems

CDC's STEADI tools and resources can help you screen, assess, and intervene to reduce your patient's fall risk. For more information, visit www.cdc.gov/steadi.

You play an important role in caring for older adults, and you can help reduce these devastating injuries.

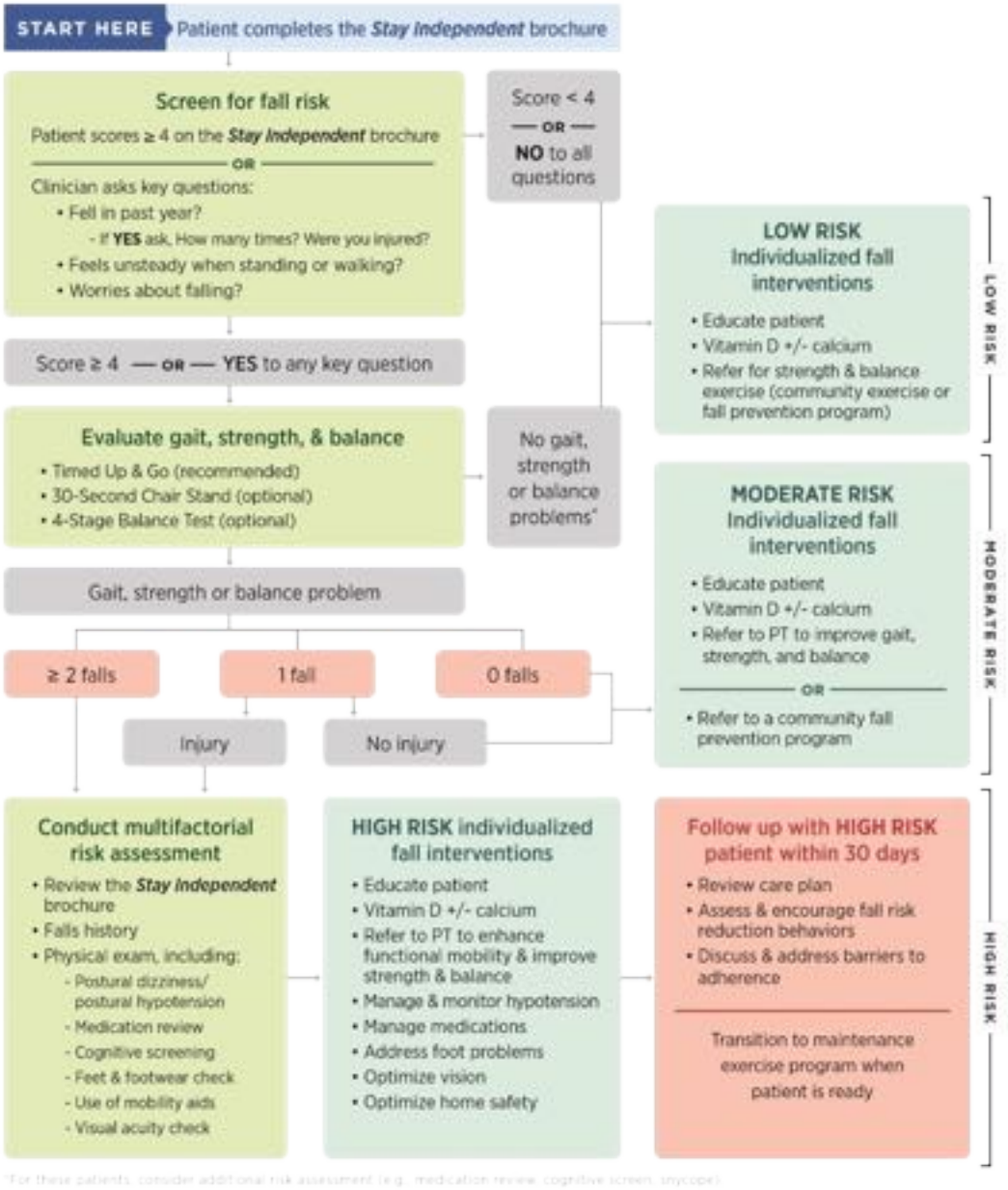
CDC

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

STEADI Stopping Elderly Accidents, Deaths & Injuries

Appendix M

Workflow Algorithm


START HERE
Patient completes the Stay Independent brochure
Screen for fall risk
Patient scores ≥ 4 on the Stay Independent brochure
OR
Clinician asks key questions:
• Fell in past year?
- If YES ask, How many times? Were you injured?
• Feels unsteady when standing or walking?
• Worries about falling?
Score < 4
OR
NO to all questions
Score ≥ 4 OR YES to any key question
Evaluate gait, strength, & balance
• Timed Up & Go (recommended)
• 30-Second Chair Stand (optional)
• 4-Stage Balance Test (optional)
No gait, strength or balance problems*
Gait, strength or balance problem
≥ 2 falls
1 fall
0 falls
Injury
No injury
LOW RISK
Individualized fall interventions
• Educate patient
• Vitamin D +/- calcium
• Refer for strength & balance exercise (community exercise or fall prevention program)
MODERATE RISK
Individualized fall interventions
• Educate patient
• Vitamin D +/- calcium
• Refer to PT to improve gait, strength, and balance
OR
• Refer to a community fall prevention program
Conduct multifactorial risk assessment
• Review the Stay Independent brochure
• Falls history
• Physical exam, including:
- Postural dizziness/ postural hypotension
- Medication review
- Cognitive screening
- Feet & footwear check
- Use of mobility aids
- Visual acuity check
HIGH RISK individualized fall interventions
• Educate patient
• Vitamin D +/- calcium
• Refer to PT to enhance functional mobility & improve strength & balance
• Manage & monitor hypotension
• Manage medications
• Address foot problems
• Optimize vision
• Optimize home safety
Follow up with HIGH RISK patient within 30 days
• Review care plan
• Assess & encourage fall risk reduction behaviors
• Discuss & address barriers to adherence
Transition to maintenance exercise program when patient is ready
LOW RISK
MODERATE RISK
HIGH RISK
CDC
Centers for Disease Control and Prevention
National Center for Injury Prevention and Control
STEADI
Stopping Elderly Accidents, Deaths & Injuries

(CDC, 2021)