IMPLEMENTATION OF A FALL RISK ASSESSMENT TOOL IN PRIMARY PRACTICE MAY DECREASE FALL FREQUENCY IN THE AGING POPULATION

A Scholarly Project

Submitted to the

Faculty of Liberty University

In fulfillment of

The requirements of the degree

Of Doctor of Nursing Practice

By

Regina M. White

Liberty University

Lynchburg, VA

December 2020

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Scholarly Chair Approval:

Dr. Lynne' Sanders, EdD, MSN, RN, CNE Date

ABSTRACT

The purpose of this evidence-based project was to illustrate the benefits of utilizing a fall risk assessment tool during office visits for the aging population of a Midwestern U.S. primary care practice. Utilization of this tool helped minimize fall frequency, thus improved quality of health. The reduction in falls helped minimize unnecessary healthcare expenses. This manuscript identified a rationale for the project, specific tool utilization, outcome measures before and after implementation, limitations, and future application for practice. Provider compliance with tool utilization and frequency were measured. Multiple potential causes of falls and recommendations to minimize falls were identified with the intent of strengthening the importance of tool use. A reduction in fall frequency resulted in the adoption of policy change across the organization. All adult primary care providers within the organization were required to implement the fall risk tool during all annual office visits and as needed.

Keywords: Fall, frequency, aging, expenses, reimbursement, causes, intervention, quality metric, guideline

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List of Abbreviations

Centers for Disease Control and Prevention (CDC)

Center for Medicare and Medicaid Services (CMS)

Collaborative Institutional Training Initiative (CITI)

Institutional Review Board (IRB)

Merit-based Incentive Payment System (MIPS)

National Council on Aging (NCOA)

Office of Disease Prevention and Health Promotion (ODPHP)

Statistical Package for Software Sciences (SPSS)

Stop Elderly Accidents, Deaths, and Injuries (STEADI)

Strategies to Reduce Injuries and Develop Confidence in Elders (STRIDE)

CHAPTER ONE: INTRODUCTION

One quality measure for Healthy People 2020 is the assessment of disability and activity for patients age 65 and above. Falls are a leading cause of mortality and debility for the aging population (Burns & Kakara, 2018). Because falls in the aging population account for multiple emergent and acute care visits and exorbitant health care expenses annually (Lee & Kim, 2017), it is crucial that primary care providers share some degree of accountability regarding fall frequency in the aging population. One third of all elderly adults fall every year (NCQA, 2020); therefore, fall frequency is a focal point in healthcare. The National Committee for Quality Assurance (2020) now advises providers to utilize evidence-based research to evaluate patients for fall risk on an annual basis. Implementation of the STEADI algorithm at primary office visits may decrease fall frequency for this population, thus decreasing anxiety, health care costs, debility, and mortality. Primary providers must evaluate the cause and frequency of falls and develop interventions to minimize the risks, probability, and frequency.

The purpose of this project was to measure fall frequency after the utilization of phase I of the STEADI fall risk algorithm. The project consisted of a two-month pilot for a subset of seven medical clinicians in a moderately sized primary care clinic in the Midwestern United States. The phase I algorithm, consisting of three questions, was completed during visits. Data extracted for the pilot were compared with the previous year's fall frequency over the same calendar months. The organization in which this project occurred lacks an existing protocol to assess fall risk. Updated quality metrics, the need for improved patient outcomes, and alignment with organizational mission, vision, and strategy prompted the need for the project. Not only did tool utilization help minimize health care costs for the patient and health care organization, but it should also improve patient outcomes while increasing reimbursement to health care

organizations that participate in reimbursement programs. The compilation of data utilized to support this project offered prevention techniques, the STEADI algorithm in its entirety, study comparisons for independent and group facilities, post-discharge guidance, quality indicators, and a comparison of interventions.

Background

In 2014, nearly 2.8 million emergency department visits were associated with falls (Bergen et al., 2016). There are nearly 800,000 admissions per year (Galet et al., 2018), and mortality associated with falls increased by 30% between 2007 and 2016 (Burns & Kakara, 2018; White, 2020). The associated costs for falls exceed $34 billion dollars per year (Eckstrom et al., 2016). The significance of assessing for fall risk should begin in primary practice, not only because it has become a quality measure for the Healthy People 2020 campaign, but also to reduce frequency, debility, admission and readmission rates, and related expenses.

While fall risk assessments have become part of a standard screening process in hospitals, there are little data to support the utilization of a fall risk assessment tool in primary practice. Phelan et al. (2016) noted that fewer than 33% of charts have documentation to support assessment for fall risk. Translating data regarding fall prevention, assessment, and intervention falls short of adequate care (Phelan et al., 2016). Studies have shown that patients above the age of 65 have a 33% increased chance of falling every year (Chang & Do, 2015), and patients being discharged from the hospital have a 40% increased chance of being readmitted due to a post-discharge fall (Naseri et al., 2018). These data alone warrant the utilization of a fall prevention program.

As patients mature, the fear of falling becomes as debilitating as the fall itself (Payette et al., 2016). As muscles deteriorate and bone density diminishes throughout the aging process, gait

becomes unsteady. One's visual acuity diminishes, and disequilibrium can be very common. Increased comorbidities often lead to polypharmacy and hemodynamic instability. All of these scenarios impact the willingness to engage in routine activities, which then decreases overall health. Patients often avoid discussing fall frequency with the primary care provider out of fear of losing independence (Reuben et al., 2018). Multiple assessment tools have been developed, such as STEADI, Timed Up and Go, and even trunk accelerometry to assist with stability and gait characteristic identification (Van Schooten et al., 2015).

Falls are often preventable and should be addressed at annual appointments, medication review appointments, and every time the individual sustains a fall (Abujudeh et al., 2014). Guirguis-Blake et al (2018) advise primary care providers to consider lifestyle and medication modification, in addition to nutritional supplementation. Evaluating potential risk for falls may help the clinician develop appropriate interventions to emphasize prevention or develop a treatment plan to minimize recurrence. This should allow for greater independence for the patient over a longer period, thus improving overall patient health.

As noted above, the mortality and population health measures for Healthy People 2020 emphasize life expectancy, activity limitations, and disability (ODPHP, 2020). Due to the elevated expense related to falls, the MIPS requires that patients above the age of 65 be assessed for falls annually in non-acute settings ("2020 MIPS measure #154," 2020). This is to say that assessment must be conducted in primary care clinics. MIPS Quality Indicator #154 outlines guidelines under the domain of patient safety when billing for reimbursement (CMS, 2018). While the provision of health care services has changed from a productivity to a value-based model, health care systems should be seeking new avenues to ensure top-quality care while achieving benchmark success and improving patient outcomes (Gruessner, 2016). Clinicians

emphasize prevention and health promotion through education regarding diabetes, cholesterol, hypertension, social behaviors, and sexual behaviors, just to name a few. Determining fall risk for this population is no less important and should be viewed as another necessary preventive measure.

Specific to the organization in which this project occurred, nearly 200 patient falls were documented in the emergency, primary, or acute care settings within the past year. This is not inclusive of the falls that occur, and the individual seeks healthcare treatment outside of an affiliate location. The lack of fall risk identifiers in primary care may have contributed to this volume. The frequency of falls, associated costs, urgency for assessment emphasized by the Center for Medicare and Medicaid Services for reimbursement, and the need for improved outcomes are additional rationale for this project.

For this pilot, the first three questions of the STEADI algorithm are implemented through collaboration with multiple departments within a primary practice in the Midwestern United States. The template for these questions has been completed at scheduled annual visits and acute care appointments. The physician, advanced practice registered nurse, or medical office staff member completes the template at the time of the visit. The current COVID-19 pandemic has negatively impacted routine office visits; therefore, the fall-risk screening process has also been completed through telephonic and audiovisual telehealth visits.

Problem Statement

Patient falls contribute to alterations in daily living, mobility, and mental health for the aging population. The exorbitant cost of health care and mortality associated with falls and the fear of falling are anxiety-provoking for patients. This lends to disability and deconditioning. Fear of losing independence may prevent patients from discussing fall frequency with providers.

Annual assessment for fall risk and patient education must begin in the primary setting, and this must become part of the routine visits. A trusting, respectful relationship between provider and patient may elicit a collaboration that will enhance outcomes while minimizing risk. Including the patient and family in fall risk identification and care plan development allows the patient to become more accountable as well. This mutual contribution opens dialogue and should minimize the fear of discussing falls and the frequency of falls. An automated utilization of the fall risk tool eliminates any awkwardness in discussion once this understanding is obtained.

Purpose of the Project

The purpose of this project was to determine whether the implementation of the first phase of the STEADI algorithm decreases the frequency of falls for patients age 65 and above for a primary care clinic in the Midwestern United States. This pilot project addresses an identifiable care gap in the selected organization. The first three questions of the STEADI fall risk algorithm, developed by the Centers for Disease Control and Prevention, were utilized to assess fall risk based upon quality measures outlined by MIPS.

Clinical Question

The clinical question to be answered was: “Will the utilization of the first three questions (phase I) of the STEADI fall risk algorithm decrease the frequency of falls for patients age 65 and above, at a primary practice clinic in the Midwestern United States?” For patients of a primary care clinic in the Midwestern United States who are age 65 and above (P), does the utilization of phase I of the STEADI fall risk algorithm (I) reduce the future number of falls (O) when compared with no tool utilization (C)?

CHAPTER TWO: LITERATURE REVIEW

Search Strategy

Databases used to synthesize information were CINAHL, MEDLINE, JAMA, SAGEPUB, COCHRANE, AND EBSCO Information Systems. Being familiar with guideline recommendations prompted a review of specific URLs such as CMS.gov, CDC.gov, the National Committee for Quality Assurance, and the National Institute of Health. Various nursing and medical journals were searched, as well. Eighty-two articles have been reviewed, posting dates within the previous six years. Duplicate articles, articles pertaining to children, and articles pertaining to falls sustained during hospital admission were omitted from the synthesis. Thirty-one sources were used to support this project. Search terms were *falls, aging, intervention, expenses, reimbursement, intervention,* and *frequency,* but were also expanded to include *quality metric* and *guidelines.*

Critical Appraisal

The strength of each source utilized for this literature review was measured using the Melnyk Level of Evidence matrix (Appendix A). Qualitative, quantitative, meta-analysis, and expert opinion were all referenced to establish strength for this proposal. Of the 30 sources listed, 7 emphasized fall prevention, while 5 sources offered plausible causes for falls. Most commonly, weakness and lack of bone density served as the primary focus for intervention and treatment (Kojima, 2015). A review of medication history showed that some cardiovascular and psychotropic medications caused an increased number of falls, so medications should be reviewed and considered when addressing the aging population (Seppala et al., 2018). Five sources offered expert opinions ranging from guideline recommendations to billing. Seven articles offered already proven algorithms, such as STEADI (Johnston et al., 2019), to support

prevention and intervention for falls. The remaining articles emphasized the importance of post-hospital discharge planning to include fall risk assessment due to increased weakness and likelihood of readmission (Naseri et al., 2018).

Bergen et al. (2016) noted that falls are a leading cause of mortality for the aging population. Literature review noted that nearly 25% of the aging population falls every year (Burns & Kakara, 2018). Of the articles resourced, several authors noted the importance of having a multifactorial approach for risk prevention and management. Utilization of interprofessional teams, both in an acute and outpatient environment, allows patients and families to engage and interact with experts from multiple disciplines in the recognition of fall risk, modification of factors, and development of treatment plans (Eckstrom et al., 2016; Johansson et al., 2018). Some strengths noted throughout the review pertained to large sample size, benefits of utilization of existing, proven algorithms such as the STEADI algorithm, and comparison of various interventions. Some limitations noted throughout the review were for specific populations such as those living in community dwellings, occasional small sample size, conflict in recommendations for interventions, and data extracted from patients without a history of falls. While meta-analysis was utilized for multiple synthesis, some sources were expert opinion only, and others were controlled studies.

Various sources were referenced to support the need for this project, and all sources provided valuable information proving the significance of the adoption of a fall risk plan. The Melnyk Level of Evidence used to identify levels of strength of each contribution is attached as Appendix A. Expert opinions were appreciated because of the contribution through guideline recommendations made by the Centers for Disease Control and Prevention for tool development suggestions, the Centers for Medicare and Medicaid Services to support appropriate charting,

coding, and billing practice, and various journals that provide possible causes and interventions to assist with decreased fall frequency and improved patient outcomes. A limitation noted within the existing research strategy was the lack of data available for tool use in a primary care setting.

Synthesis

There is a common theme when determining fall risk and emphasizing prevention; exercise, nutrition, dietary supplementation, and medication modification (Shier et al., 2016). Consideration is also provided when discussing the socio-demographic environment to assess the level and type of involvement of family members (Kaminska et al., 2017). Evaluation of the STRIDE process, funded by the Patient-Centered Outcomes Research Institute and the National Institute on Aging, offered advice from a multifactorial level when considering potential causes, a collaboration between patient and provider, and potential interventions (Reuben et al., 2018). The recommendations were very similar to those provided by the Centers for Disease Control and Prevention. Expert opinions from the American Medical Association and Centers for Medicare and Medicaid Services were referenced for quality indicators. Utilization of the STEADI algorithm allowed providers to assess risk through the utilization of three basic questions. Patient response determined further investigation into gait and balance through the use of the Timed Up and Go Test, the 30-second chair stand, or a 4-stage balance test (Centers for Disease Control and Prevention, 2019).

Evidence has shown many potential causes of falls ranging from psychological factors, medications, and recent admissions, to vision assessment and frailty (Tricco et al., 2017). The consideration of various plausible causes combined with the various assessment capabilities offered through the STEADI algorithm assisted with better assessment capabilities for the clinician. Special consideration was made for those living in community dwellings and those

being discharged from the hospital. Performing a fall risk assessment at annual visits and as needed eliminated the need for patients to voluntarily disclose unsteady gate or fall frequency. The high mortality rate and high medical costs associated with falls warrant further emphasis on prevention in primary practice.

Conceptual Framework

The conceptual model for this project was the Iowa model of evidence-based practice (Cullen et al, 2018). Approval to utilize framework is listed as Appendix B. Triggers for this project pilot were mortality, exorbitant health care costs, associated debility (Bergen et al., 2016; Burns & Kakara, 2018; Casey et al., 2017; Chang & Do, 2015), and a lack of an existing assessment tool. As health care costs and fall-related mortality increase, Medicare has made the utilization of a fall risk tool a requirement for annual visits and new memberships (NCOA, n.d.), which reinforced the importance of this project.

The Physician Quality Reporting System requires this population to be evaluated annually and to have a treatment plan developed if the individual is found to be at risk for falls to receive incentive compensation (NCOA, n.d.). As noted above, the Centers for Medicare and Medicaid Services and Healthy People 2020 noted that fall prevention is a quality metric measured for reimbursement purposes. The STEADI algorithm not only assesses risk but also categorizes the fall risk. The primary care setting in which this project occurred has a large senior population, hence the professional obligation and financial feasibility for project implementation. Implementation generates reimbursement revenue from Medicare for providers who meet metric expectations.

The team assisting with this project implementation consists of members of the Population Health department, Decision Sciences, and Ambulatory Informatics. Colleagues in

the Population Health department assisted with data research and synthesis, supporting appropriate tool utilization. Colleagues from the Ambulatory Informatics team assisted with automation and integration of the tool template to be completed by the office staff or medical provider at the time of the visit. The Decision Science department formatted a data extraction program from the electronic health records of all existing patients age 65 and above who visited the emergency department, acute care clinic, or the office with complaints of falls, dizziness, fracture, laceration, or hypotension. Recurrent falls were also included. The data were delivered to the project manager on a weekly basis on a spreadsheet through an encrypted email. Provider compliance with tool use was also emailed to the project manager.

Anticipation of outcomes was a reduction in fall frequency for patients after implementing the algorithm and at least a 25% utilization of the assessment tool. Evidence of success prompted the adoption of the algorithm into standard practice for all primary care clinics within the organization by January 1, 2021.

The pilot measures two separate outcomes. The first measurable outcome demonstrates a reduction in the number of falls for patients age 65 and above for small primary care practice. The minimum acceptable threshold to determine success was a reduction of falls by 3%, and the maximum threshold was a reduction by 5%. The second measurable outcome demonstrated provider compliance with tool utilization at primary office visits. The minimum acceptable threshold for compliance was 25%. A maximum threshold was compliance with tool utilization of 75% by the end of the pilot. Data were extracted weekly regarding both outcome measures and were delivered to the project manager through email notification.

These data were identified through descriptive statistics and presented to the stakeholders. Dissemination of data and approval from the Medical Review Board facilitated

practice change. Data will be monitored annually by the quality improvement team to ensure compliance and continued reduction in fall frequency.

Summary

The information researched and used to support the need for this project clearly identified various causes for falls, the rationale for a fall risk assessment tool, prevention methods, guideline recommendations, preventable, unnecessary health care costs, lost revenue, and high mortality rates. Value-based medicine emphasizes prevention and improved outcomes. It is the primary care provider's responsibility to screen for fall risk and work with the patient and family to develop a plan that minimizes fall frequency while contributing to overall health. Phase I of the STEADI algorithm can be implemented during routine office visits, through telehealth audiovisual visits, or through the utilization of care coordinators at pre-visit appointments.

CHAPTER THREE: METHODOLOGY

Design

This was an evidence-based project utilizing the Iowa model for evidence-based practice to reflect comparison data regarding fall frequency prior to and after the implementation of phase I of the STEADI fall risk algorithm, developed by the Centers for Disease Control and Prevention. This was a non-experimental design, and data collected reflect fall frequency and provider compliance with tool use. Patients under the age of 65 and patients who were not existing patients of the organization's primary care practices were omitted from the pilot. For the pilot, the tool was completed during all office visits for patients age 65 and above. The pilot was conducted by seven medical providers within a moderately sized primary care practice in the Midwestern United States for a period of two months.

Data were extracted for the designated population, who have visited an affiliate acute care clinic, emergency department, or office during the two-month pilot. Electronic health records were reviewed by the Decision Sciences department to determine the cause of injury. Only visits pertaining to a fall, dizziness, hypotension, fracture, or laceration were included in the fall frequency data set. The total number of falls and the total number of completed assessment tools were documented and presented to the project manager on a weekly basis. The IBM SPSS was utilized to demonstrate descriptive statistics. During this pilot process, the data collected demonstrated decreased falls because of implementing the screening tool in primary care offices.

Measurable Outcomes

Fall Frequency

Fall frequency for the patients of a primary care clinic in the Midwestern United States who meet the inclusion criteria was measured for comparison before and after implementing the assessment tool. Patient age was considered, but only as a variable, as the data were specific to age 65 and above. As noted above, the minimum threshold for a decrease in fall frequency was 3%, and the maximum threshold was 5%. Data were entered into the SPSS software and reflected in the form of a bar graph (Appendix I). A decrease in fall frequency greater than 5% was considered successful.

Compliance with Tool Utilization

Compliance with tool use was also measured. An expected minimum threshold for utilization of the algorithm was 25% of applicable patients. Each of the seven providers was audited for a summation of tool use during the pilot period. Tool use over 25% of the total number of visits for this age population was considered successful. These data were also presented in the SPSS software. Results were reflected through a pie chart, as data were presented as percentages (Appendix H).

Setting

This project pilot occurred with seven medical clinicians who were part of a moderately sized primary care practice in the Midwestern United States. The organization's strategic goals included improvement in the quality of care by utilizing evidence-based guidelines, which enhance reimbursement from Medicare for the organization. The population for this project included male, female, and multiple ethnicities. Socioeconomic status consisted of the uninsured,

those receiving coverage through state and federal plans, and third-party payors. Approval for this project was provided by the organization (see Appendix C).

Population

The patient population consisted of those who were existing patients of this primary practice setting and who were at least 65 years of age. Gender and ethnicity were omitted from the data set, as the purpose of the project was to compare fall frequency before and after tool implementation. Injuries sustained without relationship to a fall were omitted from the data collection. Unattached patients and patients under the age of 65 were also omitted. Compliance use for the seven participating clinicians was also included. Data were extracted with the Decision Sciences department's assistance and provided to the project manager on a weekly basis. Data were entered into the SPSS system throughout the duration of the pilot.

Ethical Considerations

Research ethics training was completed by the student through the CITI. Certification is filed under Appendix E. The organization in which this project occurred did not have an IRB; however, authorization for project support is provided in Appendix C. Authorization from the Liberty University IRB is included as Appendix D.

Patient information is protected under the Health Insurance and Portability and Accountability Act of 1996. Personal patient information was not provided to the student, as fall frequency and provider compliance were the two measurable outcomes noted for this project. The electronic health records were reviewed by employees of the organization, and data were presented to the student in the form of a spreadsheet. There was no specific consent required for patients to complete this assessment tool, as this was part of routine office visits. Medical consent is obtained on an annual basis at the time of the appointment. The student did not

directly interact with any patient for the purpose of this project. Patients had the right to refuse to complete the assessment tool at any time.

Data Collection

Members of the Population Health department and the Decision Sciences department assisted with data collection and deployment of phase I of the STEADI algorithm. Members from the Ambulatory Informatics department developed a temporary template to be used in the Allscripts platform. Medical office staff and providers completed the template during the pilot phase. As a result of the recent COVID-19 pandemic, the organization in which this pilot occurred began offering non-traditional office visits through the use of a synchronous audiovisual telehealth platform. Despite some visits not being conducted in person, patients engaging in telehealth appointments were also screened for fall risk and were included in the results. Pilot completion, data dissemination, and medical board approval allowed for the development of a permanent template and integration into the electronic health record. The timeline for completion of this project was two months and is listed in Appendix F.

Tools

Phase I of the STEADI fall risk algorithm (included as Appendix G) was utilized for the purpose of this project. The algorithm was originally intended for community dwellings; however, it applies to all elderly patients over 65 (Centers for Disease Control and Prevention, 2019). The algorithm utilizes a series of 12 questions to assess the ability of the individual to live independently; however, due to changes in practice schedules to meet the needs of the community during the COVID-19 pandemic, the organization in which this pilot occurred elected to simplify the questionnaire for the purpose of this pilot. The fall risk assessment tool, in its entirety, will be more inclusive with phase II; however, only phase I was utilized for this pilot.

Patients were asked three questions: Has there been a fall within the previous 12 months, do you have a fear of falling, and do you feel steady when standing or walking? These are the only questions that were asked of the patients for the purpose of this pilot. Phase II, which will be deployed after pilot completion, will consist of addressing those questions with the answer of yes. If the patient answered no to all questions on the questionnaire, there was a low probability for falls; however, prevention, nutritional supplementation, exercise, and annual reassessments were advised. Individuals identified as high risk were evaluated for medications, gate, strength, hazards within the home, laboratory data, hemodynamics, visual acuity, and comorbidities (Centers for Disease Control and Prevention, 2019).

Utilization of the STEADI algorithm enabled the provider to develop a more specific care plan for the individual, thus reducing fall frequency and improving outcomes. Physical therapy, medication modification, exercise encouragement, dietary supplementation, the need for durable medical equipment, and modifications of home hazards helped minimize fall risk. Data were extracted using the in-house created software program, PHeNOM, comparing fall frequency before and after the tool utilization. This allowed the project leader and team members to identify inclusion and exclusion criteria before extracting data for the purpose of this project. The SPSS system was used to disseminate statistics.

Intervention

After careful consideration and discussion with the administrator of the Population Health Department within this organization, it was decided that phase I of the STEADI tool was the most feasible for this pilot project. Noting multiple falls within this organization for the preceding year and the lack of any fall risk protocol warranted this project. The desire to minimize fall frequency and enhance the quality of health aligned with the organizational

mission and value. Approval for project completion was immediately granted by the organization. Project implementation and completion required interprofessional collaboration between the project leader, Ambulatory Informatics, Decision Sciences, and Population Health, as well as a willingness to see the value in this project through the perspective of the clinicians and patients.

Clinicians and medical staff were trained to use the tool and template, as created by the Ambulatory Informatics department. Template utilization allowed for more accurate mining of fall frequency and clinician compliance. Data for fall frequency were stored in the PHeNOM software system, which was an in-house developed platform. Data were extracted and provided to the project manager on a weekly basis. The results were entered by the project manager into the SPSS software. The pilot consisted of a two-month period. Successful completion of the pilot resulted in the adoption of phase I of the STEADI algorithm into routine practice for the primary practice clinic, with further anticipated inclusion of more detailed evaluation and intervention in the future.

Timeline

The timeline for pilot completion was two months. Discussion was held between the student and preceptor to develop a feasible and time-efficient workflow for pilot training and deployment. Because of the impact of the current COVID-19 pandemic, only phase I of the STEADI fall risk assessment algorithm was implemented during this project. A detailed timeline for the project is included as Appendix F. Education consisted of one-on-one training between the project manager and medical office staff, and the medical clinicians. Follow up reminder emails were also utilized to assist with tool utilization.

Feasibility Analysis

Successful implementation for this project required multi-departmental collaboration. This included assistance from Population Health, Decision Sciences, Ambulatory Informatics, medical staff, and clinicians. Utilization of the PHeNOM software provided an easily minable data capability, and the SPSS software was utilized for the dissemination of results.

Data Analysis

Measurable Outcome One: Fall Frequency

The total number of falls was calculated for the designated population. A comparison was made for the same calendar months of the previous year. Comparison reflected fall rate before and after implementation of the fall risk tool. All visits pertaining to falls, hypotension, dizziness, laceration, or fractures were considered for data analysis of fall frequency; however, all injuries unrelated to falls were omitted from the data set. Data were presented to the project manager through encrypted email, from the Decision Science department, as an Excel spreadsheet, on a weekly basis. These data were then entered into the SPSS software. Collectively, results are presented through a bar graph in Appendix I, as the data are discontinuous.

Measurable outcome Two: Clinician compliance

Use of phase I of the STEADI fall risk algorithm should impact fall frequency; therefore, compliance with tool use was required. Again, data were extracted with the assistance of the Decision Sciences department. A spreadsheet was presented to the project leader in the form of an Excel spreadsheet through a non-encrypted email. These data identified all seven clinicians and the percentage of compliance with tool use. This information was entered into the SPSS software, and results were reflected through the use of a pie chart in Appendix H.

CHAPTER FOUR: RESULTS

Upon initiation of this project, the project leader hoped to find a strong relationship between tool use and fall frequency; however, completion of the project revealed no definitive conclusion. For the months of September and October of 2019, the total number of patients who met the inclusion criteria for the entire larger practice was 24. Of that number, only four were part of the clinician panel who participated in the pilot. In 2020, the total number of falls increased to 83, but only 5 were patients of participating clinicians. While the clinicians who engaged in the pilot project had a low population of patient falls, it was evident that other partners within the group needed to evaluate fall frequency. Multiple patients sustained multiple falls within the two-month period and were included in the total fall volume.

The total number of visits among 5 of the 7 clinicians during the pilot period was 1,562. Two of the providers did not participate in the pilot. Of the 1,562 visits, the tool was completed 260 times. The greatest rate of use by a single provider was 48.77%. Of the clinicians who participated, the lowest rate of completion was 2.65%. Neither of these providers had a patient who sustained a fall during the pilot or the previous year.

Descriptive Statistics

Descriptive statistics are listed below, reflecting the frequency of tool use and fall frequency. Data were identified through the utilization of the SPSS software.

Measurable Outcome One: Fall Frequency

The number of fall encounters for the entire primary clinic between September 1, 2019 and November 1, 2019 was 23. There were 83 patient fall encounters for the entire primary care clinic between September 1, 2020 and November 1, 2020. This number nearly quadrupled the fall frequency from the previous year. In comparing both years, only one patient sustained falls

both years. Of the 23 falls in 2019, only 4 patients belonged to the panels of the participating 7 clinicians. Five of the 83 patients listed for the 2020 pilot were patients of the 7-clinician pilot group. These values are identified in Table 1. The extreme increase in fall frequency should raise questions within the organization. One could logically deduce that there is an obvious problem with fall frequency among the entire primary care clinic and not specific to the participating clinicians. While the increased fall frequency is not directly related to tool utilization, as the majority of these falls belong to clinicians who did not participate in the pilot, it is apparent that patients must be evaluated for fall risk, interventions must be explored, and plan development is needed in this clinic.

Table 1

Measurable Outcome One: Fall Frequency Comparison

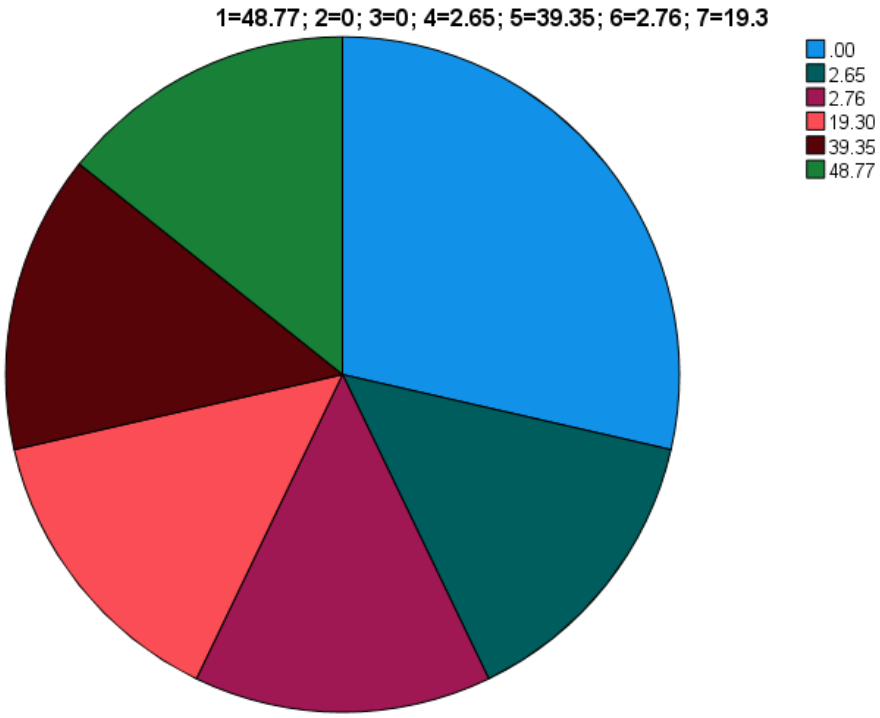
Week	2019 (Clinician Patient)	2020 (Clinician Patient)
1	5 (0)	23 (1)
2	1 (0)	20 (2)
3	2 (1)	16 (3)
4	2 (0)	9 (0)
5	1 (0)	5 (0)
6	3 (0)	6 (1)
7	3 (0)	0
8	6 (3)	4 (0)

Measurable Outcome Two: Clinician Compliance

The participating seven clinicians for this project pilot were a subset of a moderately sized primary care practice in the Midwestern United States. While the intent of this project was to link provider compliance with tool utilization to fall frequency, not all clinicians participated. Only five of the seven requested clinicians engaged in the pilot. The remaining two clinicians elected not to participate for various reasons. The two clinicians who chose not to participate also lacked any patients who had fallen during this pilot phase. Of the remaining 5 clinicians, the

greatest percentage of compliance with tool use was 48.77%. Despite high tool use, this clinician also lacked patients who had fallen during 2019 and the 2020 pilot phase. The lowest percentage of compliance was 2.65%, and this provider also lacked patients who had fallen during the pilot. Success was determined to be 25% use of the tool. Only 2 of the clinicians met these minimal criteria on an individual basis, at 48.77% and 39.35%. The average participation of all 7 clinicians was 16.74%, which did not support a successful implementation by all participating clinicians. Compliance use is identified below and listed as Appendix H.

Figure 1. Individual provider percentage of fall risk tool use.



Summary

As indicated above, the frequency of falls for the entire primary care clinic increased substantially over the previous year. The first question the organization should ask is why. Why were there so many more falls for patients of the larger clinic between 2019 and 2020? Data would suggest that the five participating clinicians had a low population of patients who fell, so

utilization of the fall risk tool may not have made a significant impact on those patient panels. While two clinicians elected not to participate in the pilot, lack of cooperation did not negatively impact the results, as no patients who sustained a fall were part of that clinician-patient panel.

However, noting the increase in fall frequency by patients of other providers within the organization who did not participate in the pilot would suggest the need for a fall risk tool. The entire premise for the tool use was to initiate the assessment process, which could further open dialogue between the clinician, patient, and family. Tool use allowed the clinician to recommend interventions and develop a plan for the patient to minimize falls.

CHAPTER FIVE: DISCUSSION

Implication for Practice

Falls place a significant financial burden on the health system. Medicare and merit-based incentive programs mandate utilization of a fall risk assessment tool annually for healthcare organizations to receive financial incentives. To sustain viability, healthcare institutions should seek additional revenue sources, but the overall health of patients should be a top priority. The aging population suffers from mental and physical disability resulting from falls. This pilot revealed the need for a fall risk assessment to be conducted in all primary care offices that see patients within this age group, as evident by the increase in the number of falls between 2019 and 2020.

A review of data and pilot implementation would reveal that a more beneficial pilot would have consisted of pilot clinicians with the highest population of patient falls. Several limitations were identified throughout this pilot, as well. The first limitation was the brief pilot period. Changes placed on the primary care offices as a result of the recent COVID-19 pandemic forced a much shorter pilot period with fewer clinicians. Several clinicians were redeployed into respiratory clinics to assist with COVID triage, testing, and assessment. This translated into a smaller population sample. A second limitation was only implementing phase I of the STEADI algorithm. Team members believed the timing to implement the full STEADI algorithm was not appropriate during the pandemic and schedule changes. A third limitation consisted of the low volume of patient falls for the patient panels of the seven clinicians who participated in the pilot. The low number of falls for each clinician before tool utilization did not offer support for change after tool implementation. The fourth limitation was a decreased desire to complete the pilot

without a plan in place. Only implementing phase I of the STEADI algorithm did not offer intervention or care plan capabilities. This led to low provider compliance.

Despite pilot outcomes lacking evidence to support a direct relationship between tool application and fall frequency, strong evidence supports the need to assess fall risk for this age population. A positive lesson learned from this pilot was the identification of fall frequency among other clinicians within the same practice setting. The increased number of falls also supports the need for tool utilization and an extension to include intervention and plan development.

Sustainability

The mission of the organization was to improve the health and quality of life for the community served. Utilizing a fall risk assessment tool would assist clinicians with risk recognition, intervention, and plan development, which would improve the quality of life for these patients. This aligned directly with organizational values. In light of the financial impact made as a result of the COVID-19 pandemic, capturing additional revenue would also benefit the financial stability of the organization. Last, assisting patients to live to the highest quality of life possible is a pillar of healthcare.

Dissemination Plan

Results were presented to the administrator of Population Health and to the administrative board. A combination of a short two-month pilot and a low fall frequency population of the participating clinicians did not prove that tool implementation would reduce fall frequency. Despite this finding, identification of fall frequency among other clinicians within the health care system proved to be alarming. The increase in fall frequency and the lack of an existing fall risk tool prompted immediate adoption of the STEADI algorithm for immediate

deployment in January 2021. As this project was specific to the organization in which it occurred, and data did not support a relationship between the two variables, these data were not published. Full implementation of the algorithm for the entire clinician population for a period of one year would be reason for comparison and dissemination of findings through publication.

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Appendix A: Melnyk Level of Evidence

Article	Study Purpose	Sample	Methods	Results	Level of Evidence	Limitations	Useful to support change
Abujudeh, H. H., Aran, S., Besheli, L., D., Miguel, K. Halpern, E., & Thrall, J. H. (2014). Outpatient falls prevention program outcome: An increase, a plateau, and a decrease in incident reports. *American Journal of Roentgenology*, *203*, 620-626. doi:10.2214/AJR13.11982. Retrieved from https://www.ajronline.org/doi/10.2214/AJR.13.11982	To evaluate the impact of fall guidelines in relation to the number of falls in an outpatient environment	327 falls out of 5,080,512 radiology visits between 4/06 and 9/13.	Retrospective study	Implementing fall guidelines with patient interaction decreased the number of falls in the outpatient setting	3-controlled	Small sample size Included all ages, not just ages 65 and above Specific to one environment	Yes-this study re-iterates the importance of developing a fall risk plan and educating patients
2020 MIPS measure #154. (2020). Retrieved from https://healthmonix.com/mips_quality_measure/2020-mips-measure-154-falls-risk-assessment/	No study-guideline purpose only	n/a	n/a	Guidelines for billing purposes	7	Not a meta-analysis	Yes-reinforces need for project
Bergen, S., Stevens, M. R., & Burns, E. R. (2016). *Morbidity and Mortality Weekly Report*. Centers for Disease Control and Prevention. Retrieved from https://www.cdc.gov/mmwr/volumes/65/wr/mm6537a2.htm	To identify implications for fall risk tool in primary practice	147,319	Randomized control study using paired t-test	Women and older population were at greater risk for falls	2	Data is self-reported; exclusion of residence in extended care facilities; broad definition of fall; response rate	Yes-providers can support fall prevention through multifactorial approach
Burns, E., & Kakara, R. (2018). *Morbidity and Mortality Weekly Report*. Centers for Disease Control and Prevention. Retrieved from https://www.cdc.gov/mmwr/volumes/67/wr/mm6718a1.htm#suggestedcitation	Identify benefits of PT/OT for strengthening	n/a	No methodology	PT and OT have shown to increase strength and stability in the aging population	7-expert opinion only	Not a study, more of a reference	Yes-contributes to need for tool
Casey, C. M., Parker, E. M., Winkler, G., Liu, X., Lambert, G. H., & Eckstrom, E. (2017). Lessons learned from implementing CDC's STEADI falls-prevention algorithm in primary care. *The Gerontologist*, *47*(4), 787-796. Retrieved from https://doi-org.ezproxy.liberty.edu/10.1093/geront/gnw074	To evaluate success of implementing STEADI algorithm into primary care	416	Implementation of Practice Change Model i.e. PDSA, SEIPS, and RE-AIM. Through retrospective chart review	Time consuming to implement the STEADI protocol and should be afforded additional time at appointments	3-Synthesis of information provided	Small sample size	Yes- this study does offer opportunity to implement STEADI protocol in pre-visit planning
Centers for Medicare and Medicaid Services. (2018). Falls: Risk Assessment-National quality strategy domain: Patient safety ID #154. Retrieved from https://qpp.coms.gov/docs/QPP_quality_measures_specifications/Claims-Registry-Measures/2018_Measure_154_Claims.pdf	Explanation of Medicare billing requirement for tool use	na	No methodology	na	7-expert opinion	No study	Yes-importance of assessment and criteria for reimbursement

Chang, V. C., & Do, M. T. (2015). Risk factors for falls among seniors: Implications of gender. *American Journal of Epidemiology, 181*(7), 521-531. Retrieved from https://academic.oup.com/aje/article-abstract/181/7/521/150122	To assess the relationship between gender and falls	14,881	Cross-sectional study using logistic regression model and multistage stratified sampling design	Women are at greater risk of falls than men with strongest association with Alzheimer's disease and Parkinson's Disease	3-Critically appraised	Limited to Canadian population only; Does not consider geographical possibilities	Yes- various possible causes for falls may be specific to gender
Cullen, L., Hanrahan, K., Farrington, M., DeBerg, J., Tucker, S., & Kleiber, C. (2018). *Evidence-based practice in action: Comprehensive strategies, tools, and tips from the University of Iowa Hospitals and Clinics.* Sigma Theta Tau International.	Use of Iowa Model	na	na	na	na	na	Yes-requirement
Eckstrom, E, Neal, M. B., Cotrell, V., Casey, C. M., McKenzie, G., & Lasater, K. (2016). An interprofessional approach to reducing the risk of falls through enhanced collaborative practice. *Journal of the American Geriatrics Society, 64*, 8. doi:10.1111/jgs.14178. Retrieved from https://onlinelibrary-wiley-com/ezproxy.liberty.edu/doi/full/10.1111/jgs14178	Encouraged use of Evidence-based strategies to reduce fall risk	25 clinical teams	Quantitative and Qualitive data extraction over 1-year, longitudinal study	Exercise proved beneficial; no positive correlation with fall risk and vitamin D consumption	3	Volunteer-based; strategies were not documented in patient charts; limited ability to pair with PT	Yes-also sets up for future state plans to expand assessment of risk
Galet, C., Zhou, Y., Eyck, P. T., & Romanowski, K. S. (2018). Fall injuries, associated deaths, and a 30-day readmission for subsequent falls are increasing in the elderly US population: A query of the WHO mortality database and National Readmission Database from f2010 to 2014. *Clinical Epidemiology, 10*, 1627-1637. doi:10.2147/CLEP.S181138. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6233862/	To assess if fall-related deaths, admissions, and readmissions are increasing over time	No identifiable sample noted; referenced "member states" from WHO mortality database	Meta-analysis	There is a higher percentage of the aging population dying from fall-related incidence; also worthy of note is that the aging population is growing significantly and is projected to double between 2012 and 2060.	2 Meta-analysis	NO sample size evident	Yes-information extracted from databases is informative
Gruessner, V. (2016). How quality metrics affect value-based care reimbursement. *Healthpayer **Intelligence***. **Retrieved from** https://healthpayerintelligence.com/news/how-quality-metrics-affect-value-based-care-reimbursement	Guidelines for appropriate billing criteria	No sample	No methodology	Guideline requirements for reimbursement	7	Not a study	Yes-inclusion criteria for reimbursement

Guirguis-Blake, J. M., Michael, Y. L., Perdue, L. A., Coppola, E. L., & Beil, T. L. (2018). Interventions to prevent falls in older adults. Updated evidence report and systematic review for the U.S. Preventive Services Task Force. *JAMA, 319*(16), 1705-1716. doi:10.1001/jama2017.21962. Retrieved from https://jamanetwork.com	To evaluate efficacy of various interventions related to frequency of falls	30,334	Retrospective analysis	Exercise program had the greatest impact of decreased number of falls	1- systematic review of multiple sources i.e. MEDLINE and PubMed	Sample was limited to specific community-dwelling; Some subjects with specific medical history were omitted from the study	Yes- valuable information regarding exercise, Vitamin D, and multifactorial interventions impact fall risk
Johansson, E., Jonsson, H., Dahlberg, R., & Patomella, A. H. (2018). The efficacy of a multifactorial falls-prevention programme, implemented in primary health care. *British Journal of Occupational Therapy, 81*(8), 474-481. doi:10.1177/0308022618756303. Retrieved from https://journals.sagepub.com/home/bjot	To evaluate difference between regular fall prevention strategies and a multifactorial fall program in a primary care setting	131	Randomized Control Study	Multifactorial interventions had greater outcome than primary intervention alone	2-the study based upon randomization of the participants	Small sample size of 131; no identification of those who declined the study; gender disparity; limited factors included	Yes, supports need for protocol development, implementation, and patient education; also need to consider multiple factors for patients prior to development
Johnston, Y. A., Bergen, G., Bauer, M., Parker, E. M., Wentoworth, L., . . . Garnett, M. (2019). Implementation of the Stopping Elderly Accidents, Deaths, and Injuries Initiative in primary care: An outcome evaluation. *The Gerontological Society of America, 59*(6), 1182-1191. doi:10.1093/geront/gny101. Retrieved from https://academic.oup.com/gerontologist/article-abstract/59/6/1182/5103473	To determine impact of STEADI program	12,346	Cohort Study using RE-AIM framework	Older adults without a Fall Plan of Care were more likely to sustain falls	4	No randomization; manual record review; plan of care varied; only falls within the health system were included in the study	Yes-implementation of the STEADI looks to be beneficial for patients
Kaminska, M. S., Brodowski, J., & Karakiewicz, B. (2017). The influence of socio-demographic and environmental factors on the fall rate in geriatric patients in primary health care. *Family Medicine & Primary Care Review, 19*(2): 139-143. doi:10.5114. Retrieved from https://doi.org/10.5114/fmpcr.2017.67869	To identify various risk factors contributing to falls in the elderly	304	Survey	Age, family structure and family ability to assist impacted frequency of falls	4- controlled study	Small sample; convenience sampling	Yes, despite level 6 and small sample size; identification of various factors will assist with the development of fall risk assessment tool
Kojima, G. (2015). Frailty as a predictor of future falls among community-dwelling older people: A systematic review and meta-analysis. *JAMDA.* 1027-1033. doi:10.1016/j.jamda.2015.06.18. Retrieved from http://dx.doi.org/10.1016/j.jamda/2015.6.18	To determine if frailty contributes to prevalence of falls	Eleven articles consisting of 68,723 individuals	Meta-analysis with systematic review of multiple databases i.e. MEDLINE, CINAHL Plus, PsycINFO, and Cochrane Library	Frailty is a significant indicator of fall risk	1- Systematic review of multiple articles	No adjusted Odds Ratio presented, publication bias for studies favorable for outcome	Yes- evidence for correlation between frailty and fall risk

Lee, S. H., & Kim, H. S. (2017). Exercise interventions for preventing falls among older people in care facilities: A meta-analysis. *Worldviews on Evidence-Based Nursing. Sigma Theta Tau International.* Vol. 14(1): 74-80. Retrieved from	To evaluate the effectiveness of exercise on frequency of falls	21 studies consisting of 5,540 participants	Meta-analysis	Positive correlation between exercise, especially gate training and decreased frequency of falls	1-meta-analysis	Specific characteristics omitted from results; limited access to patient data to evaluate effect of exercise	Yes-exercise decreases chances of falls
Naseri, C., Haines, T. P., Etherton-Beer, C., McPhail, S., Morris, M. E., . . . Hill, A. M. (2018). Reducing falls in older adults recently discharged from hospital: A systematic review and meta-analysis. *Age and Ageing, 47*, 512-519. doi:10.1093/ageing/afy043. Retrieved from https://academic.oup.com/ageing/article-abstract/47/4/512/4951828	To synthesis the evidence for fall prevention education provided to patients discharged from the hospital	3,290	Review of six databases consisting of quantitative studies	Home hazard modifications and proper nutrition reduced fall frequency	1-systematic review	Grouping of interventions; omission of participant characteristics; data did not include search terms i.e. Elderly and seniors	Yes-confirmation of lifestyle changes reduces fall risk
Naseri, C., McPhail, S. M., Netto, J., Haines, T. P., Morris, M. E., . . . Hill, A. M. (2018). Impact of tailored falls-prevention education for older adults at hospital discharge on engagement in falls-prevention strategies post-discharge: Protocol for a process evaluation. *BMJ Open Access.* 8:e020726. doi:10.1136/bmjopen-2017-020726. Retrieved from search-proquest-com.ezproxy.liberty.edu/docview/2099466994/fulltextPDF/304793F873744D13PQ/1?accountid=12085	Evaluate impact of specifically made fall prevention education at time of discharge	390	Prospective observational cohort study	No results yet at time of publication	4	Study has not been documented as completed	Yes, however, results would be beneficial
NCOA-National Council on Aging. (n.d.). *State PolicyToolkit for Advancing Fall Prevention Select Resources.* Retrieved from ncoa.org/wp-content/uploads/State-Policy-Toolkit-for-Advancing-Fall-Prevention-Select-Resources.pdf.	To educate clinicians regarding Medicare requirements and reimbursement based upon fall risks	No sample	Education only	Information provided per Medicare policy	7-professional opinion only	Not a study	Yes- professional advice only
NCQA. *National Committee for Quality Assurance.* Fall risk management. (2020). Retrieved from https://www.ncqa.org/hedis/measures/fall-risk-management	Emphasized importance of using EBR to support need for fall prevention	No sample	Education only	Information reinforced by NCQA	7	Not a study; guidelines only	Yes-reiteration

ODPHP. Office of Disease Prevention and Health Promotion. (2020). Foundation health measures. Retrieved from https://www.healthypeople.gov/2020/About-Healthy-People/Foundation-Health-Measures	Identify quality metric for Healthy People 2020, as falls are a major health concern for aging population	No sample	Education	Supports importance of health concern	7	Not a study, but supports significance	Yes-supports significance for fall risk assessment
Payette, M. C., Belanger, C., Leveille, V., & Grenier, S. (2016). Fall-related psychological concerns and anxiety among community-dwelling older adults: Systematic review and meta-analysis. *PlosOne, 11*(4). e0152848. doi:10.1371/journal.pone.0152848. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4820267/	Determine to relationship between anxiety and fall-related psychological concerns	20 articles consisting of 4738 applicable participants	Systematic review of multiple articles using the PRISMA guidelines	There is a strong relationship between increased anxiety and the risk of falling in the aging population	1-data extracted from multiple sources i.e. MEDLINE, Cinahl, EBSCO, XML, Scopus, PubMed and PsycINFO	Omission of some inclusion data; anxiety should be compared to actual risk of fall and not just presumed risk of fall; first study of its kind	Yes, the aging population is not an ideal candidate for anxiety controlling medications; however, there is documentation of high levels of anxiety regarding concern for falls
Phelan, E. A., Aerts, S., Dowler, D., Eckstrom, E., & Casey, C. M. (2016). Adoption of Evidence-based fall prevention practices in primary care for older adults with a history of falls. *Frontiers in Public Health, 4,* 190. doi:10.3389/fpubh.2016.00190. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5014854/	To assess the relationship between falls and multifactorial risk assessments and interventions	116	Retrospective chart review	Benefits of implementing fall risk assessments in primary care settings	6-case controlled in isolated clinic with 1 researcher extracting data	Small convenience sample size: sample limited to specific clinic; medical records used; generalized data	Yes-to support multiple other research sources, but not as a stand alone
Reuben, D. B., Gazarian, P., Alexander, N., Araujo, K., Baker, D., . . . McMahon, S. (2018). The STRIDE Intervention: Falls risk factor assessment and management, patient engagement, and nurse co-management. *Journal of American Geriatric Society*, *65*(12): 2733-2739. doi:10.1111/jgs.15121. Retrieved from https://wwwncbi.nlm.nih.gov/pmc/articles/PMC5729112/	To evaluate if using the STRIDE program with assistance of an RN Manager improves patient outcomes	5491	Multi-site cluster RCT	Utilization of an RN for patient engagement improves outcomes	2-Synthesis of evidence of STRIDE program	More need for implementation	Yes-assists with development ideas into practice utilizing care team

Seppala, L. J., Van de Glind, E. M. M., Daams, J. G., Ploegmakers, K. J., De Vries, M., . . . Van der Velde, N. (2018). Fall-risk increasing drugs: A systematic review and meta-analysis: III. Others. *Journal of American Medical Directors Association, 19*(4), 372.e1-372.e8. doi:10.1016/j.jamda.2017.12.099. Retrieved from https://www.sciencedirectcom/science/article/pii/S1525861017307855	To evaluate the association between fall risk and specific medication classes	281 studies from 8927 articles reviewed	Meta-analysis with systematic review of multiple databases i.e. Medline, Embase, and PsychINFO	Opioids and anti-epileptic medications contribute heavily to fall risk	1-Systematic review of multiple articles	Study should include more medication classes i.e. cardiac medications	Yes- medication to be considered when developing fall risk assessment
Shier, V., Trieu, E., & Ganz, D. A. (2016). Implementing exercise programs to prevent falls: A systematic descriptive review. *Injury Epidemiology, 3*(1), 16. doi:10.1186/s40621-016-0081-8. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4932138/	To assess how exercise-based programs to help reduce fall risks are implemented in a primary care setting	29 Studies	Qualitative literature review	Primary care providers must have buy-in, in order to encourage patients to participate	2-Evidence synthesis of qualitative research	none	Yes-identification of impact clinicians have on patient decisions
Tricco, A. C., Thomas, S. M., Veroniki, A. A., Hamid, J. S., Cogo, E., . . . Straus, S. E. (2017). Comparisons of interventions for preventing falls in older adults. A systematic review and meta-analysis. *The Journal of American Medical Association, 318*(17), 1687-1699. doi:10.1001/jama.2017.15006. Retrieved from https://jamanetwork.com	To assess effectiveness of various interventions to prevent falls	283 RCTs consisting of 159,910 participants	Systematic review of RCTs	Multiple interventions improve patient fall risks	1-Data review of RCTs from MEDLINE, Embase, Cochrane Central Register of Controlled Trials, and Ageline	none	Yes- various and multiple interventions positively impact fall risk
Van Schooten, K. S., Pijnappels, M., Rispens, S. M, Elders, P. J. J., Lips, P., & Van Dieen, J. H. (2015). Ambulatory fall-risk assessment: Amount and quality of daily-life gait predict falls in older adults. *The Journals of Gerontology. Series A., 70*(5), 608-615. doi:10.1093/Gerona/glu225. Retrieved from https://academic.oup.com/biomedgerontology/article/70/5/608/647437	To determine if the use of technology will assist with fall risk determination	169	Comparison study	Technology can be used to determine risk for falls	6-controlled study	Small sample size and convenience sampling	Yes-however, utilization of advanced technological devices can be costly
Van Voast, Moncada, L. and Mire, L. G. (2017). Preventing falls in older persons. *American Family Physician, 96*(4), 240-247. Retrieved from https://www.aafp.org/afp/2017.0815/p240.html.	To educate clinicians regarding algorithm to help minimize fall risk	No sample	Research of guideline recommendations	Recommendations, interventions, and workflow provided	7-professional opinion only	Not a study	Yes- professional advice only, but applicable to fall risk assessment tool

Appendix B: Approval for use of Iowa Model of Evidence-Based Practice

Kimberly Jordan - University of Iowa Hospitals and Clinics <noreply@qemailserver.com>
Sat 2/15/2020 8:47 PM

To:

- White, Regina

You have permission, as requested today, to review and/or reproduce *The Iowa Model of Evidence-Based Practice to Promote Quality Care (Revised 1998).* Click the link below to open.

The Iowa Model of Evidence-Based Practice to Promote Quality Care (Revised 1998)

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Citation: Titler, M. G., Kleiber, C., Steelman, V. J., Rakel, B.A., Budreau, G., Everett, L. Q., . . . Goode, C. J. (2001). The Iowa model of evidence-based practice to promote quality care. *Critical Care Nursing Clinics of North America, 13*(4), 497-509.

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Please contact UIHCNursingResearchandEBP@uiowa.edu or 319-384-9098 with questions.

Appendix C: Organizational Letter of Support for DNP Project

Memorial Physician Services

DNP Scholarly Project

Letter of Support

Liberty University, Inc.
1971 University Blvd.
Lynchburg, VA 24593

Re: IRB Letter of Support for Regina White, APRN, FNP-BC

Dear Institutional Review Board Chair and Members:

I am writing this letter of support for one of our colleagues, Regina White. It is our intention to support Regina's DNP scholarly project in the utilization of a fall risk assessment tool in primary practice, to be part of routine annual exams.

Scholarly Project Overview:

Project Summary: The purpose of this project is to implement use of the STEADI algorithm to assess fall risk for patients, age 65 and above in a Midwestern primary care practice. Regina will be working with the departments of Decision Sciences and Population Health to gather data and develop a workflow process for appropriate utilization of this tool. The desire of this project is to minimize falls for patients age 65 and above. Data will be collected before and after the 4-month pilot for tool utilization. Providers and care coordinators will be educated regarding use of the tool.

Objectives: The objective of this project is to decrease fall frequency for patients, age 65 and above, with implementation of this tool. Quality metrics, exuberant associated medical expense, MIPS reimbursement requirement, and lack of existing protocol prompts need for this project.

Background and Rationale: Falls are a leading cause of death and disability in this age population. The mission and vision of this organization is to improve the quality of care and health of the community. Implementation of the STEADI algorithm will align with the mission and values of the organization. The project will utilize the Iowa Model of Evidence-based.

Practice for Quality Improvement: The IBM SPSS software will be utilized to disseminate data to reflect patient age, fall frequency, and provider compliance with use of the tool. Regina has written permission from Memorial Physician Services to extract data from medical records for the purpose of this project. She will be working with the Decision Sciences and Population Health Departments to synthesize data and to develop a workflow process for tool implementation for the pilot, with anticipation of this becoming a permanent protocol change.

Sincerely,

Henry Hurwitz, MHA
System Administrator, Population Health

Memorial Health System, Ambulatory Networks

Appendix D: Liberty University Institutional Review Board Approval Letter

September 1, 2020

Regina White
Lynne Sanders

Re: IRB Application - IRB-FY20-21-106 Implementation of a fall risk assessment tool in primary practice to decrease fall frequency in the aging population

Dear Regina White, Lynne Sanders:

The Liberty University Institutional Review Board (IRB) has reviewed your application in accordance with the Office for Human Research Protections (OHRP) and Food and Drug Administration (FDA) regulations and finds your study does not classify as human subjects research. This means you may begin your research with the data safeguarding methods mentioned in your IRB application.

Decision: No Human Subjects Research

Explanation: Your study does not classify as human subjects research because:

(2) evidence-based practice projects are considered quality improvement activities, which are not considered “research” according to 45 CFR 46.102(d).

Please note that this decision only applies to your current research application, and any modifications to your protocol must be reported to the Liberty University IRB for verification of continued non-human subjects research status. You may report these changes by completing a modification submission through your Cayuse IRB account.

If you have any questions about this determination or need assistance in determining whether possible modifications to your protocol would change your application's status, please email us at irb@liberty.edu.

Sincerely,

G. Michele Baker, MA, CIP
Administrative Chair of Institutional Research
Research Ethics Office

Appendix E: CITI Certification

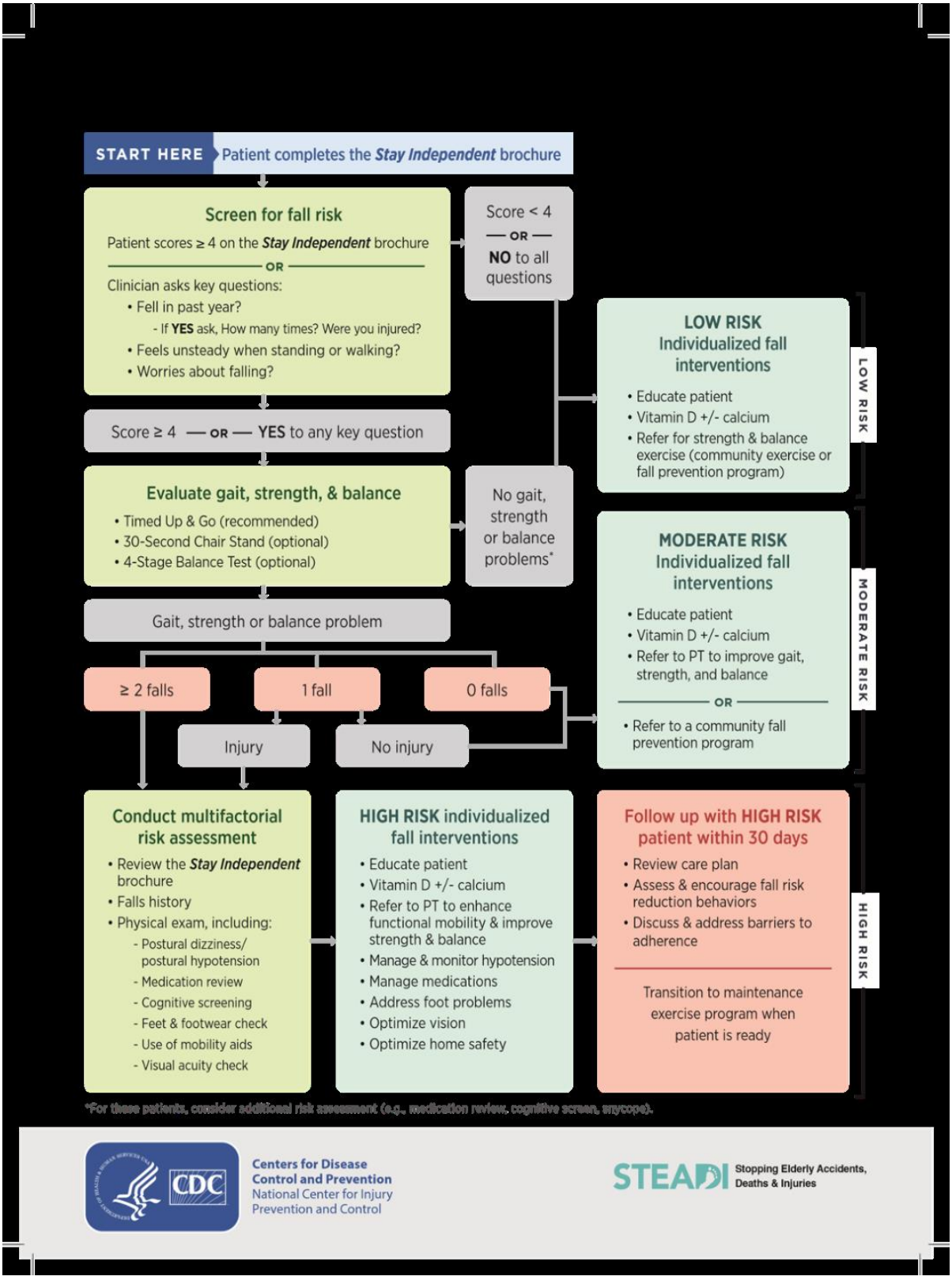
Appendix F: Timeline for Project Completion

Projected Completion Date	Planning	Pre-implementation	Implementation	Evaluation
6/22/2020	Submit updated pre-proposal to Dr. Sanders for feedback	Modification required due to project change	Done	
7/15/2020	Modify proposal based upon Dr. Sander's feedback	5/24/20 submission to Dr. Sanders	Done	
7/20/2020	Improve strength of literature review for project purpose	1/20; Project topic change, collecting sources with higher Melnyk Level of Evidence	Done	
8/10/2020	Complete IRB checklist	Cumulative 5/12/20-6/1/20	Done	
8/10/2020	Submit for IRB approval	Pending approval from Dr. Sanders	Done	
9/1/2020	Format Cost Analysis	Research cost/benefit analysis for organization and affected population; to be done 9/20	Not done/Pandemic forced re-allocation of team members/preceptor	
7/2/2020	Submit Project Approval Letter to Memorial Physician Services	Draft complete 5/20; resubmitted for approval after tool identification	Done	
9/1/2020	Implement use of STEADI fall risk algorithm	IRB approval obtained 9/1/20	Done	
7/2/2020	Acquire approval to utilize tool from appropriate board members	To be approved by Population Health Administrator	Done	
8/10/2020	Workflow process initiated for utilization of algorithm	Collaboration with Administrator of Population Health Department-presented 7/20	Done	

8/15/2020	Assemble team members who will assist with data collection	Collaboration with Decision Science team for data collection to provide evidence for project need – 7/20	Done	
8/15/2020	Assemble team members who will assist with deployment of tool	Collaboration with Population Health, Care Coordinators, and Quality Improvement Teams - 7/20	Done	
8/20/2020	Meet with Decision Science team for integration into EHR	Requires IRB, MPS approval, tool utilization, and Pilot approval	Done	
8/27/2020	Educate providers regarding pilot and use of tool	Per email and direct training, throughout month of June	Done	
9/1/2020	Implement two-month pilot	Educate providers	Done	
9/1/2020	Perform on-going data collection, weekly	To be done every Monday through automated data collection	Done	
9/8/2020	Utilize SPSS for descriptive analysis of data	Weekly data added to SPSS software	Done at end of pilot, not weekly	
11/4/2020	Prepare for dissemination utilizing final project check list	Weekly goals for completion in timely fashion	Done and presented to Chair for review on 11/18/20	
12/08/2020	Present final project	Pending approval from Faculty at Liberty University	Done	

(Roush, 2019)

Appendix G: STEADI Algorithm



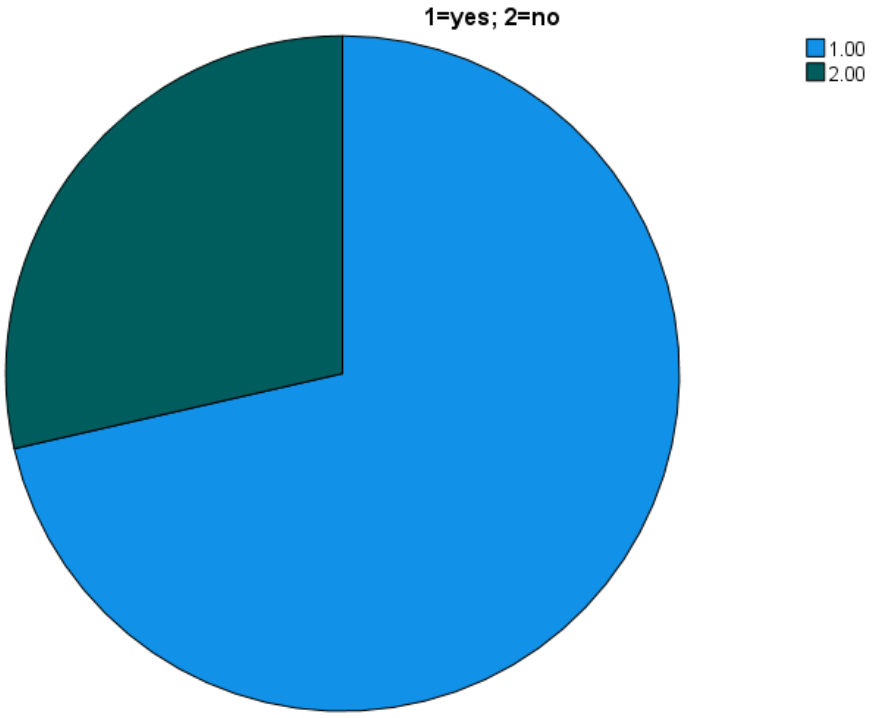
Appendix H: Provider Compliance with Tool Use

Descriptive Statistics: Percentage of Tool Use

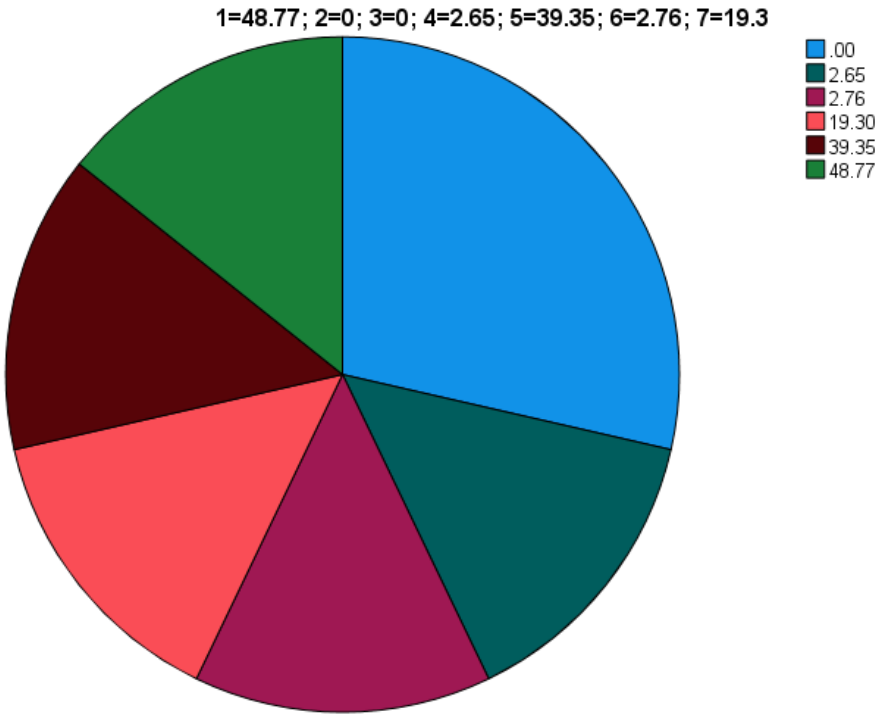
	N	Minimum	Maximum	Sum	Mean	Std. Deviation
1=48.77; 2=0; 3=0; 4=2.65; 5=39.35; 6=2.76; 7=19.3	7	.00	48.77	112.83	16.1186	20.39366
1=yes; 2=no	7	1.00	2.00	9.00	1.2857	.48795
Valid N (listwise)	7					

Number of Providers who utilized fall risk tool (1=yes; 2=no)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.00	5	71.4	71.4	71.4
	2.00	2	28.6	28.6	100.0
	Total	7	100.0	100.0	



Individual Provider Percentage of Fall Risk Tool Use



Appendix I: Fall Frequency by Week

Statistics

Number of falls per week

N	Valid	8
	Missing	0
Mean		10.3750
Median		7.5000
Mode		.00[a]
Sum		83.00

a. Multiple modes exist. The smallest value is shown