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Feasibility of An Emergency Department Fall Screening Tool and Intervention Bundle Checklist on Nursing Fall Prevention Documentation: A Quality Improvement Project.

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Feasibility of An Emergency Department Fall Screening Tool and Intervention Bundle Checklist on Nursing Fall Prevention Documentation: A Quality Improvement Project

by

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Paper submitted in partial fulfillment of the
requirements for the degree of

Doctor of Nursing Practice

School of Nursing, University of Louisville

July 20th, 2022

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Abstract

Background: The World Health Organization (2018) and The Joint Commission (2015) define falling as a sudden, unplanned involuntarily advancement toward the ground, that may or may not result in injury. Fall rates are directly related to a facility's mortality and morbidity rates, delayed patient care, additional diagnostic testing, and increased length-of-stay. Evaluating the practices of a local emergency department (ED), it was noted that ED nurses are not documenting their acknowledgment of a patient's risk for falls, and also failed to chart interventions aimed at preventing falls. Failing to implement these practices into regular patient care can lead to negative patient outcomes.

Environment: A rural 18 bed ED in North-Central Kentucky that averages 80-110 patients daily.

Purpose: The purpose of this quality improvement (QI) project was to evaluate the implementation of an ED-specific fall risk screening tool (KINDER-1) and Preventative Intervention Bundle Checklist (PIBC) during a two-month (eight-week) span. The intervention goal was to increase the rate of nurse documentation of fall risk and prevention interventions compared to documentation without the use of an ED-specific fall risk screening tool and fall PIBC.

Intervention: Nurses received education regarding the KINDER-1 Tool and the PIBC and were taught a new screening protocol for all patients entering the ED. Following the fall risk assessment, nurses documented corresponding preventative interventions for high-risk individuals.

Method: Randomized retrospective chart audits pre- and post-intervention compared differences in nursing documentation rates. Preintervention freestyle nursing notes, the "patient teach" icon, and utilization of an inpatient screening tool were evaluated. Postintervention audits evaluated compliance to the KINDER-1 and PIBC. Quantitative descriptive statistics demonstrated that the interventions were clinically and statistically significant in bringing about a positive clinical change.

*Keywords**:** Fall Prevention; Emergency Nursing; Emergency Room; Screening Tool; Accidental Falls*

Feasibility of An Emergency Department Fall Screening Tool and Intervention Bundle Checklist on Nursing Fall Prevention Documentation: A Quality Improvement Project

A considerable volume of research exists concerning screening and preventative interventions for geriatric, inpatient, and outpatient falls, but very little research exists related to fall risk in emergency departments (ED). This gap in literature was further evidenced to have affected ED clinical practices and policies when conducting a needs assessment of a rural ED in North-Central Kentucky concerning fall identification and prevention. Prevention of falls in the ED is crucial. Emergency Department fall rates could range anywhere from 0.031 falls/ 1,000 visits to 2.89 falls/ 1,000 visits (McErlean & Hughes, 2016). Guthrie & Hochman (2018) estimate that falls in the ED account for 6% of national hospital-wide falls. Compared to falls elsewhere, falls in the ED are more likely to result in injury or death. This can be attributed to the busy atmosphere of the department, the many cords and wires present in patient rooms, and the health status of individuals in the ED who tend to be more unstable than those in inpatient care (Guthrie & Hochman, 2018). It is important to prevent falls, as fall rates are directly related to a facility's mortality and morbidity rates, delayed patient care, additional diagnostic testing, increased length-of-stay, potential need for admission, and increased utilization of narcotic pain medications (Guthrie & Hochman, 2018). This Quality Improvement (QI) project seeks to best identify how falls in EDs can be detected and prevented to ensure patient safety and best possible outcomes in a small rural Kentucky hospital.

Internal Evidence and Needs Assessment

The patient population of an 18-bed ED in North-Eastern Kentucky (QI Setting) consisted of a high ratio of individuals noncompliant with their medical regimen, many geriatrics with a diagnosis of Alzheimer's or dementia, and a plethora of patients under the influence of drugs and alcohol. This particular patient population was at serious risk for injuries secondary to falls. However, the current policies and procedures aimed to address individual fall risks was fragmented. As a result of fragmented policies, nursing documentation concerning fall risk was lacking. Current policies and procedures did not require a fall risk assessment to be completed for each patient visiting the ED. Instead, two fall-related assessment questions were asked during the patient's triage. These questions ask if the patient had

experienced a fall within the past three months, or if they had noticed any recent weakness or decreased mobility.

An inpatient fall risk screening tool was accessible by ED nurses, but the tool was not deemed as mandatory ED nurse documentation, and often went overlooked by ED nurses. When conducting a needs assessment regarding fall risk identification in the ED, nurses were asked if there was a fall risk screening tool available to help identify high risk patients. Of twenty nurses asked, only one nurse identified the presence of the inpatient screening tool. However, this same nurse reported not using the tool herself. The inpatient tool available can be viewed in Appendix A.

Without the use of standardized fall risk screening methods, many high-risk patients went unidentified as evidenced by a lack of fall risk or preventative documentation in retrospective chart audits. Failing to acknowledge and address a patient's fall risk placed the patients at risk for negative health outcomes (Guthrie & Hochman, 2018). Therefore, a problem had been identified in current practices. The lack of a standardized ED fall risk screening tool contributed to decreased ED nurse detection (and documentation) of patient fall risks and fall risk reduction interventions. A literature review (Appendices B & C) was then conducted to determine what interventions would best aid ED nurses in detecting, preventing, and documenting fall risks. Though the former research done in this area is relatively sparce, the clear consensus is that increased detection (documentation) inevitably leads to better patient outcomes (Cook et al., 2020, McFadden et al., 2019, Pop et al., 2020).

Research Methods

Common terms, or keywords, used to conduct a search pertinent to this topic included: fall prevention, accidental fall, patient fall, screening tool, emergency room, and ED. MeSH terms from PubMed were utilized to make the search concise and computable in various databases. After developing a compiled list of common terms and MeSH terms, a final Boolean string was determined. The Boolean string was reconstructed multiple times in order to create a broad search. Making the search too narrow with certain MeSH terms yielded articles that did not address the topic. Ample resources addressed the incidence of falls that occurred within a community setting and were treated in the emergency room.

However, there was a lack of literature addressing falls that occurred in the emergency room itself. The final Boolean string that broadened the search and yielded articles pertinent to the topic on four different databases was as followed:

("Accidental Falls"[Mesh]) OR ("fall prevention")) OR ("accidental falls")) OR ("patient falls")) AND ("Emergency Nursing"[Mesh]) OR ("Emergency Service, Hospital"[Mesh])) OR ("emergency medicine")) OR ("emergency room")) OR ("emergency department")) OR ("emergency nursing")) OR ("emergency service"))) AND (screening) OR (intervention)) OR ("screening tool") OR ("nurse-led intervention") OR ("Mass Screening"[Mesh])

This string was searched on PubMed, CINHAL, COCHRANE, and PsycInfo. Exclusion criteria for all databases included articles published before 2015, as well as articles written in any language other than English. From there each database had its own limitations based on the limits each individual site offered. PubMed initially yielded 1,516 articles. The article types on this database were limited to clinical trials, meta-analysis, RCT reviews, and systematic reviews. CINHAL initially yielded 197 articles and 117 articles remained after limiting the search to include exclusively certain article types (i.e., academic journals, continuing education programs, and dissertations). COCHRANE initially suggested 113 articles, but once limited by article type (including interventions and excluding diagnostics and overviews), 53 articles remained. Overall, 1,860 articles were initially found amongst the four databases. Once limitations were implemented in each database, only 233 articles were left. Of the 233 remaining, the search was further limited by examining the article titles to ensure that each article addressed the topic of interest in the title alone. This left 69 articles, 19 of which were eliminated because they were duplicates found amongst the databases. Therefore, 50 articles remain to be graded for quality and careful evaluation. The abstract, discussion, result, and conclusion segments of each of the remaining articles was closely examined. Of the 50, eight articles pertained to the topic, were evaluated in an annotative table, and synthesized to determine which intervention was best supported by the literature. The PRISMA search model is presented in Appendix D.

Literature Synthesis

Multifactorial Approach

Figure and Table 1 demonstrate a comprehensive list of findings from the articles chosen for synthetization. The literature suggests three main evidence-based practice components that should be incorporated into patient care to best guide nurse detection and prevention of falls (Figure 1). Findings from the synthesized articles are also available in Appendices B & C.

Figure 1

Three Main Components of a Multifactorial Fall Prevention Bundle

The literature review revealed three main components needed in multifactorial fall prevention bundles to best predict and prevent falls in the ED:
1. ED-Specific fall assessment tool 2. Multifactorial interventions (e.g., call light, nonslip socks, signs) 3. Promoting leadership and culture changes through effective means of communication by establishing fall champions, and promoting staff education

Institutions that initiate and document multifactorial fall risk bundles are more effective at identifying and reducing patient falls than institutions that initiate or document stand-alone fall risk prevention interventions (Cook et al., 2020; Pop et al., 2020; Goldberg et al., 2019; Stoeckle et al., 2019; McEwan, 2018). ED nurses should be educated that it is necessary to utilize and document multiple interventions simultaneously to best identify and prevent falls. Multiple preventative interventions are needed in patient care to optimize safety and best patient outcomes.

Table 1

Components of Multifactorial Fall Prevention Bundles Supported by Specific EBP Articles

Article	ED-specific fall screening tool	Multifactorial interventions	Leadership & culture promotion		
			Fall Champions	Clear Communication	Staff Education
Cook et al., 2020	X	X		X	
Goldberg et al., 2019		X			
McCarty et al., 2019		X			
McEwan et al., 2018				X	X
McFadden et al., 2019	X				
Pop et al., 2020	X	X		X	X
Scott et al., 2018		X			X
Stoeckle et al., 2019		X	X	X	X

Note. The "X" in the table above denotes the component of the multifactorial fall prevention bundle that each article gives evidence to support.

Identifying Fall Risk

The literature review revealed that nurses are more likely to identify and document a patient's risk for falls when structured screening tools are in place. Documentation of fall rates can be expected to increase from 57% to 69% post implementation of a screening tool (McCarty et al., 2019). Of the eight articles chosen for synthesis, three articles compare specific screening methods used within EDs to detect fall risks. Cook et al., (2020) compared two screening tools that are utilized in ED multifactorial fall prevention bundles; the MORSE fall risk screening tool (non-ED specific) compared to the KINDER-1 (ED-specific) screening tool. Cook et al. (2020) demonstrates the benefit of the KINDER-1 screening tool by reporting that there was a 27% decrease in falls as well as a 66% decrease in falls associated with injuries post implementation of this ED-specific tool. Even with a 3% increase in ED volume, the study

reports there were still 27 less falls, and ten less falls with injuries. Although the reduction in falls alone does not prove to be statistically significant with the KINDER-1 (Cook et al., 2020) ($p=0.18$), there are other measurements that demonstrate the benefit of the reduced fall rate (e.g., decreased mortality and morbidity, decreased adverse healthcare costs, improved patient outcomes).

Scott et al. (2018) states that when implemented in a fall prevention bundle, the MEDFRAT scale demonstrates a 48% decrease in ED fall rates with a $p<0.001$, which makes the change statistically significant. However, McCarty et al. (2019) demonstrates that in the 12-month follow-up evaluation period post MEDFRAT implementation, there was a nonsignificant increase in the absolute number of falls using this screening tool ($p=0.4999$). The severity of falls increased as well ($p=0.007$) as the percent of falls resulting in no harm decreased from 85% pre-implementation to 59% post-implementation.

McFadden et al. (2019) took a different approach entirely in a quality improvement (QI) project related to fall risk assessment and fall prevention in the ED. The project compares a two-question triage system ("Is this visit related to a fall?" and "Have you fallen in the last month?") with a later identification of the patient's chief complaint. The effectiveness of the two processes together as a screening protocol is demonstrated below in Table 2.

The findings of these previously mentioned articles are summarized in Table 2 and Table 3. Inpatient screening tools only identify 37.5% of patients who fall in EDs, while ED-specific screening tools are able to identify 84% as fall risks before the fall (Alexander et al., 2013). Therefore, overall literature findings support the use of an ED-specific screening tool (KINDER-1). ED-specific screening tools are even more effective when used in combination with determining a patient's chief complaint, and asking specific fall-related history questions (McFadden et al., 2019). Utilizing these three methods together produces an effective multifactorial approach for identifying ED patients at risk for falls.

Table 2

Comparing Screening Tools Identified in the Literature

Screening Tool	Specificity	Sensitivity	ED-Specific
MORSE	91%	23%	NO
KINDER-1	68%	68%-73%	YES
MEDFRAT	----	52%	YES

Cook et al., 2020; Pop et al., 2020

Table 3

Comparing Effectiveness of Current Practices for Fall Risk Assessment

Components of Current Practice	Specificity	Sensitivity
2-question method	0.77	0.7
Chief complaint	0.98	0.52
Both components together	0.75	0.87

McFadden et al., 2019

Leadership and Culture Promotion Amongst Staff

Compliance, staff buy-in, leadership support, and establishing a fall prevention culture are crucial factors in sustaining long-term fall risk documentation changes (Stoeckle et al., 2019; Pop et al., 2020; Cook et al., 2020; McEwan et al., 2018). Leadership interaction directly promotes communication, education, confidence, staff buy-in, and is of great importance in establishing a culture change (Pop et al.,

2020). The engagement, excitement, knowledge, and commitment of all levels of leadership and staff members is required. Cook et al., (2020) and Stoeckle et al., (2019) suggest that this can be achieved when staff has a fall champion available and when staff are educated pre-intervention implementation. Fall champions are key agents in promoting change as they are excited and informed about the change at hand. Theses champions are individuals selected to be knowledge experts in the agents of change. They know the benefits, evidence-based practices, barriers, and other components associated with the change and are committed to implementing the change successfully in practice. Fall champions promote and encourage staff buy-in by answering questions, serving as resources to make the change go smoothly, and offer continuing education concerning the interventions at hand. These individuals are essential to the success of the implementation as peer-to-peer interactions promote communication, education, and staff buy-in (Pop et al., 2020).

Barriers in Literature

The literature review disclosed both common themes as well as diverse ones. Articles from levels 1-6 on the Melnyk Levels of Evidence scale (Melnyk & Fineout-Overholt, 2011) are included in this synthesis as literature related to this topic is sparce. Most literature speaks to inpatient interventions and then states that these interventions are not applicable or generalizable to an ED setting. Many of the studies conducted so far in ED-specific environments are QI projects or descriptive studies. Inclusion criteria, setting, and sample data differed greatly among the articles as well, and could very much contribute to the differing outcomes. These are serious limitations in the information provided in current literature, which demonstrates the need for more research to be conducted concerning this particular issue as well as the need for controlling certain confounding variables.

Project Description

Purpose, Objective, Goal, and Target Population

The literature findings above support implementation of an ED-specific fall risk screening tool into current policies and procedures (at the QI setting) in order to improve patient outcomes, ensure safety, and improve nursing documentation in regards to fall risk. In all the previous research findings,

implementation of such a tool was best conducted via a Quality Improvement (QI) project. QI projects allow evidence-based practice findings to be simply implemented into clinical settings in a quick manner. The overall aim of the QI project was to evaluate the implementation of an ED-specific fall risk screening tool (KINDER-1) (Appendix E) and a Preventative Intervention Bundle Checklist (PIBC) (Appendix F) during a two-month (eight-week) span. Short term, intermediate, and long-term objectives of the project are outlined in Appendices G & H. The target population for this QI project was all ED nurses (documentation) in the rural community hospital of interest.

This project sought to educate all of the nurses (part-time, per-diem, full time, and travelers) in this particular ED (100%) pre-intervention to ensure best possible outcomes. The intervention was then implemented with the goal of increasing the rate of ED nurse documentation of fall risk and prevention interventions compared to documentation without the use of an ED-specific fall risk screening tool and PIBC. This project was considered a QI project as it did not seek to prove or disprove previous knowledge. The project instead focused on the effect the tools had on nursing documentation. Implementation of these tools created a regimen for nurses to identify patients at high-risk for falls and provided a platform for nurses to document interventions in order to increase nursing documentation concerning patient safety.

Instruments

KINDER-1 Screening Tool

As demonstrated in the Literature Synthesis section, the KINDER-1 Screening tool is superior to other published screening tools for identifying falls in the ED setting (Cook et al., 2020; Pop et al., 2020). The KINDER-1 evaluates patient risk for falls based on five categories: chief complaint, age, altered mental status, impaired mobility, and nursing judgment. The goal was that each patient seen in the ED would have a KINDER-1 Fall Risk Screening Tool (Alexander et al., 2013) (Appendix E) completed for them as standard of care. Such documentation improves safety measures and patient outcomes through proper nurse identification and documentation. If patients were considered at risk for falls based on any of

the five risk categories, then the patient was considered a "high fall risk". Patients were screened with the screening tool on admission to the department.

The original KINDER-1 classified anyone over the age of 70 as a high fall risk. A literature review conducted by Alexander et al., (2013) demonstrated that more than one-half of ED patients that fall are typically over the age of 65. Based on these findings, it is unclear why the age of 70 was chosen as a limit for the original KINDER-1 scale. Permission to use the KINDER-1 scale and to modify the scale for the sake of this QI project was permitted by a developer of the tool (Appendix O). The modified KINDER-1 utilized in this QI project will classify anyone over the age of 65 as a fall risk (from this point on in the manuscript, when the KINDER-1 tool is referenced, it is referring to this modified version of the tool).

Preventative Intervention Bundle Checklist (PIBC)

A PIBC was developed by the conductor of the QI project to accompany the KINDER-1 screening tool. Nurses implemented the checklist into a patient's plan of care after determining the patient's risk for falls. The fall interventions included on the PIBC were approved by the hospital's corporate office for inpatient preventative documentation prior to conduction of the QI project. These previously approved interventions were the only interventions included on the PIBC to ensure compliance with corporate standards. For each category of the KINDER-1 risk screening tool, coinciding interventions were listed on the PIBC that decreased the likelihood of a patient fall. For each category of the KINDER-1 that the patient was considered at risk for falls, nurses should have selected the same category (chief complaint, age, altered mental status, impaired mobility, or nursing judgment) on the PIBC to show they acknowledged a patient's risk for falls. Putting a check mark next to coinciding categories on the PIBC showed that nurses implemented the suggested preventative interventions into patient care to prevent the patient from falling.

If the patient did not score high-risk in any of the categories of the KINDER-1, the PIBC included an option for the implementation of a "General Education Bundle". The "General Education Bundle" was intended to be implemented and documented for all admissions to the ED, despite a patient's low fall risk,

as the interventions in this category are baseline care measures that promote overall patient safety and prevent all falls in the department.

If a patient was a positive risk in multiple categories of the KINDER-1 and at a severe risk for falls, the PIBC allowed for the addition of higher-level interventions to be implemented into care. These interventions included: a physical or virtual safety attendant, chair alarm, or bed alarm. The PIBC was utilized by selecting yes or no. Simply checking yes or no next to the categories that were implemented into patient care was a quick and easy way to document interventions without disrupting workflow.

Methods & Design

Implementing the QI project within the boundaries of a conceptual framework allowed for the intervention (KINDER-1 and PIBC) to be implemented effectively and easily while ensuring a level of adherence from the participants before implementing the change into a permanent practice (policy change). The project did not seek to have any direct influence on patients, but sought to indirectly increase patient safety through increased nurse documentation of patient fall risks and preventative interventions incorporated into care.

Conceptual Framework: Model for Improvement

Establishing an Intervention Team

Utilization of the Model for Improvement (MFI), an effective and easy-to-use guide for the implementation of QI projects, ensured the potential for success in adopting new interventions into clinical practice (Langley et al., 2009). Establishing a process improvement or intervention team was a major component of the MFI framework. This team of individuals was important to establish prior to intervention implementation so as to enhance the implementation and acceptance of the KINDER-1 screening tool and PIBC. Below is a list of high-level influencers and members of the intervention team that helped to bring the QI project to life by promoting leadership and staff buy-in (as suggested by the literature).

- CNO: CNO support was critical in obtaining department nursing leadership support. This individual was considered the clinical leader in the QI project. During the planning stages of this project, the CNO was consulted during a sit-down meeting consisting of the ED managers, research committee head, magnet status coordinator, ED educator, and various other individuals. In this meeting, these leaders were informed of the project intervention, specific goals, and desired outcomes. The CNO, at the completion of the meeting, gave verbal and written consent (Appendix O) for this particular QI project to be completed within this facility.
- ED Director & Assistant Director: As the director and assistant, these individuals are responsible for the function of the ED. They were active supporters of this project as they always strive to ensure patient safety, listen to staff feedback, and are supportive in making sure staff has the resources they need to do their jobs well. These two individuals were educated on why changes in fall risk screening and prevention intervention documentation were needed. It was demonstrated to them how the changes would decrease adverse effects and long-term treatments needed within the facility. Explaining how the KINDER-1 and PIBC aided staff in providing better patient care and ensured patient safety was vital in gaining the managers' support of adopting the change into practice.
- Charge nurses (fall champions): Each charge nurse has a group of ED staff members that they are responsible for overseeing and updating on new policies and procedures. Charge nurses are responsible for obtaining information from administration, making sure bedside staff are aware of the information, and that these individuals are then equipped to make changes as needed. Charge nurses served as fall champions on the unit for the duration of the QI project.
- Bedside nurses: Bedside nurses were responsible for completing the required education pre-implementation, and for actual documentation of the KINDER-1 and PIBC. Their participation and cooperation were indispensable to the project's success.
- DNP student: The DNP student conducting the project was in charge of educating the administrators, clinical leaders, charge nurses, and bedside staff about the need for this QI project.

The student was also responsible for providing the materials necessary to conduct this project, as well as completing the weekly chart audits that monitored the progression of the project. If compliance dropped, the DNP student stepped in to re-educate staff of the need, make the necessary changes required, and provided motivation to staff. At the conclusion of the project, the DNP student collected analytical data to determine whether the intervention was clinically and/or statistically significant in bringing about a positive change in nursing documentation.

SMART Objectives and Outcome Measurements

The MFI framework formulated a process improvement team that sought to answer the following three major questions related to SMART objectives and desired outcome measurements (Langley et al., 2009):

1. What are we trying to accomplish? What is the AIM of this improvement effort?
    a. The aim of this improvement project is to increase ED nursing documentation, concerning patient fall risks (assessment of risk and interventions put into place to decrease risk)
2. How will we know that a change is an improvement? What metrics will be used to measure the outcomes of change to demonstrate the improvement of practice?
    a. Retrospective chart audits demonstrate pre- and post-implementation differences of fall risk documentation. Fall risk documentation was expected to increase post-implementation, which would demonstrate the change brought about improvement.
3. What change can we make that will result in improvement of clinical practice, and will accomplish the desired aims?
    a. Implementing an ED-specific fall risk screening tool (KINDER-1) and Preventative Intervention Bundle Checklist (PIBC) will improve the rate of ED nurse documentation of fall risk and prevention interventions.

Procedure and Processes (PDSA Cycle)

Plan, Do, Study, Act Cycle

The MFI model expands on these three questions through the Plan-Do- Study- Act (PDSA) implementation cycle (Appendix I) (Langley et al., 2009). With this cycle, the agents of change (interventions) are implemented, tested, altered, and refined on a small scale before large-scale implementation (permanent policy change). This enhances success of the QI project during implementation in the clinical setting by exposing potential obstacles or design flaws before large-scale adoption. This increases the project's feasibility and compliance (Langley et al., 2009). The PDSA cycle is broken down further in the following sections.

Planning and Education

In this stage of the cycle, specific aims and measurable outcomes were identified, which included conceiving a plan for data collection and formulating a timeline of change (Appendix J). Charge nurses were identified as the best potential ED fall champions. The DNP student educated these individuals and designated them as fall champions concerning the project aims and objectives before the information was introduced to the unit at large. Charge nurses were given the opportunity to ask questions, identify barriers, and voice recommendations or concerns prior to implementation. The fall champions were educated about how to correctly utilize the KINDER-1 and PIBC. The tools were meant to be implemented in a way that was most convenient for staff, creating no extra burden on work flow. At the conclusion of the education, the fall champions signed an attendance sheet (Appendix K) saying they completed the education regarding the new tools. Fall champions served as resources to other staff members during the duration of the project to answer questions and clarify misunderstandings. The DNP student then attempted to educate bedside nurses during a monthly staff meeting prior to intervention implementation. Staff meetings, however, continued to be cancelled due to poor attendance rates, and staff were educated independently on a 1:1 basis during their scheduled shifts. All nurses not taught on

shift were sent a GroupMe notification with educational materials attached for their viewing. Staff then "liked" the educational message, showing the online education had been completed. The aim was that all nurses on the unit were educated about the QI project, and 100% would sign the education completion form (either paper form or electronic) (Appendix K). Forty out of a total of forty-eight employees were educated prior to implementation (83.33%). Thirty-one individuals were educated in-person, while nine were educated via the GroupMe app. The remaining eight employees were not present for in-person education and did not respond to the electronic form of education.

Do: Intervention

The intervention was implemented over a two-month (eight week) time span as a pilot trial for electronic charting. Forms that had the KINDER-1 and PIBC were printed off (front and back) and given to greeters and unit clerks at the ED front desk. The forms were printed on neon yellow papers in effort to reduce the number of forms that would be lost or misplaced. Greeters were responsible for receipting patients into the system upon arrival, then escorting patients to their rooms where they were triaged by a nurse. When escorting a patient to their room, greeters left a KINDER-1 and PIBC at the computer in the room. Nurses then completed the KINDER-1 to determine the patient's risk for falls. The PIBC was also completed, as appropriate to the patient's fall risk status. Patients who were treated in the triage area had forms complete by a triage nurse. Extra forms were kept with unit clerks in the main ED for individuals arriving via ambulance. Unit clerks also had extra forms for patients whose forms may have been lost in the process of moving from the lobby to a room. Having extra forms was meant to increase compliance as paper forms were likely to be misplaced from time-to-time.

After completing the form, nurses placed a patient label at the top of the form and placed the document in a wire box at the unit clerk's desk. The coordinator of the project (i.e. doctoral nursing student completing the chart audits) collected the papers weekly for data analysis. The patient identification was kept confidential in a file provided by the manager and was only accessed by the doctoral student completing the chart audits. All HIPPA measures were observed and practiced for the

duration of the project. Now that the project has been completed, the paper forms have been shredded and all patient identification destroyed.

Retrospective chart audits were completed for all patients within a 24-hour period on randomly selected days (five days per month pre-intervention and two days per week during 8-week intervention period) (Appendix L & M) to determine success of the education process and compliance to the new interventions. The pre-intervention chart audits evaluated platforms available for nurses to chart fall risk and preventative interventions before the intervention implementation (freestyle nursing notes, the freestyle teach icon, and the inpatient fall screening tab). In the post-intervention audit process, audits were evaluated to determine whether nurses documented KINDER-1 and PIBC for all patients. The random days selected for auditing were determined by a Random Numbers Generator (Random Number Generator, n.d.). Randomizing the days audited each week ensured that variables such as weekends vs weekdays, mode of arrival, night-shift vs day-shift, and patient volume did not significantly influence the project outcomes. These variables were tracked via descriptive statistics as they had the ability to impact nurse documentation rates; possible confounding variables that needed to be examined.

Study: Analyzing Process Measures

Data from the chart audits were analyzed to determine if the change produced the desired outcomes (Appendix G & H). Process measures were then scrutinized to determine if the preemptive plan formulated was adequate in predicting a positive change in favor of the desired outcomes. One process measure that was necessary to track closely was nurse compliance. During and post implementation of the intervention, it was important to determine how project feasibility and sustainability affected nurse compliance. Staff feedback was encouraged to improve compliance and reduce barriers throughout the duration of the QI project. Conducting two chart audits per week during the 8-week intervention implementation period quickly identified any decreased rate of documentation and allowed the issue of compliance to be quickly identified and addressed so that outcomes were not greatly influenced. If

compliance was noted to decrease at any point during the project, or the short term or intermediate goals were not being met, additional education and motivation were delivered to ensure best outcomes.

Completeness, accuracy, and consistency of data collection was ensured throughout the project as one person conducted the chart audits for the duration of the project (DNP student) while utilizing the same chart audit tool for each evaluation. Only one chart was evaluated at a time in a secluded area without distraction. The data collected from the charts was kept on an Excel sheet that only the DNP student had access to, and the computer where the data was stored was passcode protected. Hospital HIPPA mandates were acknowledged, and all patient information was kept confidential.

Act: Long-term Goal for Policy Change

When influential outcomes are obtained, and the project outcomes either support (increase nurse documentation) or reject (decrease nurse documentation) the desired outcomes of the QI project. At the conclusion of the QI project, the process improvement team gathered to discuss what things went well and what obstacles or challenges were present. The team members were in favor of incorporating this QI project into a permanent policy change as they saw the benefit in the increased documentation rates. The intervention team determined that improving nursing documentation of fall risk and prevention interventions is of great importance not only because of the many factors already mentioned, but because such documentation communicates to an entire healthcare team a patient's fall risk status. As the ED is a high-traffic, hectic area, it may often be difficult to communicate effectively amongst staff members which patients are high fall risks. Incorporating this paper charting into an electronic format compatible with Meditech Expanse EMAR would serve as an effective means of communication to caregivers (in all departments). Such documentation takes the burden off ED nurses for this means of communication while still promoting safe continuity of care. The patient's risk for falls is acknowledged and further prompts anyone looking in the patient's chart to implement fall prevention interventions to reduce adverse effects during the patient's stay. Feasibility of incorporating this pilot study into a standard policy change and electronic formatting was supported by staff cooperation, positive feedback, and increased nursing

documentation rates. However, the policy change is now being reviewed by corporate administration officers and is pending approval or denial at this time.

Costs and Potential Revenue

This QI framework evaluated important concepts such as cost, side effects, social impact, and other components of change that were helpful to minimize resistance and barriers during the change implementation process. Although there was a monetary cost (Appendix N) to the organization for the implementation of a KINDER-1 and PIBC, the benefit of the project objective was multifold. Preventing falls and their corresponding complications would ultimately lower healthcare costs as extra diagnostics and medical interventions would become unnecessary (Guthrie & Hochman, 2018). This small investment in prevention saves time, money, and promotes the well-being of patients. Patient length-of-stay would be expected to decrease as adverse health outcomes are successfully prevented. Morbidity and mortality rates would decline as fall risk levels decline since falls are one factor directly linked to these statistics (Guthrie & Hochman, 2018). The facility would have higher staff satisfaction rates as nurses are able to better identify fall risks, implement interventions early, and are better equipped to provide holistic care to patients in the ED despite working in a busy environment.

Data Analysis

The data analysis aimed to answer the question: was there a difference in nursing documentation pre and post intervention? Comparing pre and post chart audit percentages determined if the interventions were clinically and/ or statistically significant in bringing about a positive clinical change. Statistical significance was tested by computing a Wilcoxon Signed Rank Test to determine if $p<0.05$. Confounding variables and their effect on the project outcome were also considered and recorded via descriptive statistics.

Ethical Considerations

This QI project proposal was submitted to the University of Louisville International Research Board (IRB) for approval prior to implementation. The IRB requirements for data stewardship measures were closely adhered to. Approvals from the site CNO and ED nurse managers were obtained prior to implementation, as well as approval to utilize the KINDER-1 tool (Appendix O). The name of the hospital was not identified in any manuscript.

Project Limitations

The ED of this small rural hospital has a limited number of staff and resources. High staff turnover rates during the duration of this QI project resulted in the use of multiple float pool nurses, techs, and unit clerks as well as travel nurses who were unaware of the QI project being conducted during this time. Use of these personnel caused significant change in staffing over short amounts of time, creating a barrier to change as interventions were hard to maintain long-term without providing constant education for new employees. Night shifts particularly were affected as core staff levels for this shift remained poor throughout the project implementation period and negatively affected adherence rates.

Decreased staffing levels during this time created high nurse to patient ratios. As this project was conducted in 2022, the aftermath effects of COVID-19 were still poignantly prevalent. The pandemic left staff feeling overwhelmed and exhausted as nursing shortages were at an all-time high. Nurse fatigue and the overcrowded nature of healthcare during this time negatively affected compliance with this QI project, and must be considered as this project relied heavily on nurse participation. There were also scheduled "downtimes" during the duration of the project where all computer databases were down for maintenance and upgrades, which reduced the staff's ability to access patient charts to print off patient identification stickers. During downtimes, project adherence decreased as stickers were not available to be printed to put on paper documents. Another barrier to adherence occurred when patients arrived via EMS. If the unit clerk was not at the desk, EMS personnel bypassed the clerk and went straight to the room the patient had been assigned, and did not get a KINDER-1 and PIBC form for the primary nurse to fill out. This caused

a lower adherence for patients brought in by this arrival method when compared to walk-ins coming in from the main lobby and checking in with an initial greeter.

Many patients waited in the triage area for numerous hours, and a majority of those individuals were discharged from the lobby never receiving a bed. This ED did not previously have a triage system in effect prior to the implementation of this QI project. The QI project and new triage system were implemented at the same time. This negatively influenced the outcome of the project as a primary nurse was not assigned to patients discharged from the triage area, therefore no particular nurse was held responsible for completing documentation for patients in the lobby. There was much confusion concerning patient flow and patient documentation during this time. Paper forms of the KINDER-1 and PIBC were often lost in the shuffle when patients that waited in the lobby for many hours were finally taken to a room.

Staff education was difficult to complete as in-person staff meetings pre-implementation were cancelled numerous times because of poor attendance secondary to low staffing levels. Education could not be done as a collective group; therefore, staff did not have the opportunity to ask questions and learn from one another. Education was completed either via an online form of communication (staff GroupMe app, texting) or hurriedly in-person while staff was on shift. Staff had limited time in-between patients to learn about the project, ask questions, or complete teach-back method to ensure education was understood.

Overcoming Obstacles

Many strengths within this particular rural community hospital assisted in successfully changing the ED process for fall risk screening and implementation of fall preventions interventions. The nursing services department practiced a shared governance structure, which empowered patient-centered care nurses to be innovative and autonomous. QI projects headed by bedside nurses are highly encouraged and advanced education is also valued by the organization. Both staff pursuit and involvement in improvement projects and research studies was/is encouraged and rewarded. The organization's strategic goals include providing patients and staff a safe environment through the utilization of best evidence-

based practice, and this project supported that strategic initiative. Administrator buy-in and support was easily won.

Although education had to be delivered in a “less than ideal” format to accommodate the settings of the work environment, the need for change and the proper process of the implementation of interventions to assess and prevent falls in the ED was communicated in a clear and simple manner. This was pivotal in gaining the support mentioned above. If the change was not presented in a well-organized, understandable, and easily adaptable manner that fit into current workflow conditions, staff would have been resistant to support and adopt the changes suggested. The coordinator of the QI project (DNP student) utilized all methods available to meet individually with every staff member in order to explain the project and it’s aims as thoroughly as possible prior to implementation.

Staff were taught the importance of establishing a fall prevention culture so that the change mentioned above would not only be implemented but would be long-lasting. The concept of a fall prevention culture was intended so that all nurses within the department would be involved in the change, from leadership to the bedside. Teaching staff how to establish this inclusive culture and making them aware of the potential long-term benefits was essential in influencing their readiness to adapt to accept change. Making sure all staff were educated and Fall Champions were established to assist in ongoing education throughout the duration of the intervention was essential to the success of implementing this change as the outcomes depended greatly on nursing participation.

Results

Quantitative data retrieved from audits performed pre-intervention and post-intervention are recorded below utilizing descriptive and analytical statistics (Wilcoxon Signed Rank Test). These descriptive statistics demonstrate the clinical significance the KINDER-1 and PIBC had upon ED nurse documentation rates. Overall, the implementation of these interventions positively influenced ED nurse documentation as influenced by a 33.88 percentage point increase (i.e. 2.46-fold increase) in documentation rates. Statistical significance was also evident as a Wilcoxon Signed Rank Test computed $p<0.001$, statistically significant when $p<0.05$.

Pre-Intervention and Post- Intervention Audits

For the pre-intervention process of this project, all charts for ED patients seen for five randomly selected 24-hour periods (Jan 5th, 19th, 21st, 24th, 29th) were audited to determine rates of nursing documentation prior to the KINDER-1 and PIBC. Of the 424 total audits completed pre-intervention, 52 of the charts had nursing documentation that acknowledged either the patient's fall risk or fall prevention status (12.26% documentation rate pre-intervention). Three different locations in the patient's chart (demonstrated below) were audited to obtain this information.

Table 4

Pre-Intervention Audit Breakdown

Documentation	Inpatient Screening Tool	Freestyle Nursing Note	Patient Teaching Icon
Risk	10	2	0
Interventions	1	2	47

Post-intervention chart audits were completed to determine intervention adherence over the course of 8-weeks by auditing two random 24-hour patient care periods per week. 4,725 total patients were seen during the time of intervention implementation, yet 3,147 forms were returned to the auditing basket for review. 1,578 forms were not returned to the wire basket (lost and not located) and therefore not audited. Central logs were utilized to audit whether each patient had a KINDER-1 AND PIBC documented for their visit. Out of all the patients 2,180 patients had BOTH the Kinder-1 and Intervention Checklist documented by ED nurses (46.14% documentation rate). There was a 33.88 percentage point increase (2.46-fold increase) in ED nurse documentation rates post intervention. The demographic and descriptive findings of the pre- and post-intervention audits are summarized in the figures and tables below.

Table 5

Comparing Patient Volume Pre and Post Intervention

Patient Volume	PRE-Intervention	POST-Intervention
Min	73	57
Max	104	105
Mean	86.32	85.93
Standard Deviation	11.688	12.235

Table 6

Week Days Audited Per Randomization

Day of the Week	PRE-Intervention Frequency	Percent	POST-Intervention Frequency	Percent
Sunday	----	----	57	4.2%
Monday	89	21.0%	269	20.0%
Tuesday	----	----	356	26.5%
Wednesday	177	41.7%	168	12.5%
Thursday	----	----	98	7.3%
Friday	84	19.8%	328	24.4%
Saturday	74	17.5%	66	4.9%
Total	424	100.0%	1,342	100.0%

Table 7

Mode of Arrival Effect on Charting

Mode of Arrival	Pre-Intervention Volume/ Frequency	Percentage Fall Risk Assessed	Post-Intervention Volume/ Frequency	Percentage Fall Risk Assessed
EMS	114 (17)	14.91%	311 (138)	44.37%
Walk In	310 (35)	11.29%	1022 (553)	54.11%
Helicopter	----	----	2 (0)	0%
Police	----	----	7 (5)	71.42%

Table 8

Percentages of Audits Based on Shift

Shift	Pre-Intervention Volume/ Frequency	Percentage Fall Risk Assessed	Post-Intervention Volume/ Frequency	Percentage Fall Risk Assessed
Day Shift	305 (32)	10.49%	868 (485)	55.88%
Night Shift	118 (20)	16.95%	474 (211)	44.51%

Table 9

Post-intervention OVERALL Frequency Findings (Course of 8-weeks)

Measurement	Frequency	% of total
Total patients seen in 8-week period:	4725	------
Forms returned:	3147	66.6%
Forms returned blank:	784	24.91%
Forms returned w/ ONLY KINDER-1 completed:	89	2.83%
Forms returned w/ ONLY the PIBC completed	84	2.67%
Of forms returned w/ BOTH KINDER-1 & PIBC:	2180	69.27%

Table 10

SPECIFIC Two Day Per Week 24-hour Chart Audits During Time of Implementation

Date	Patient Volume (PV)	Forms Returned	Blank Forms	Filled Out KINDER-1 Only	Filled Out PIBC Only	Both KINDER-1 & PIBC	% of Both Per PV
8-Mar	89	63	13	3	0	47	52.8%
9-Mar	78	60	12	10	0	38	78.72%
14-Mar	96	78	29	8	0	41	42.7%
15-Mar	77	62	12	4	0	46	59.74%
24-Mar	98	40	15	0	0	25	25.5%
25-Mar	81	59	11	0	0	48	59.26%
28-Mar	88	67	7	0	0	60	68.1%
29-Mar	85	69	17	0	0	52	61.17%
8-Apr	84	67	27	0	0	40	47.62%
9-Apr	66	41	20	0	1	20	30.30%
12-Apr	105	80	11	0	0	69	65.71%
15-Apr	63	45	21	0	0	24	38.1%
17-Apr	57	18	7	0	0	11	19.30%
22-Apr	100	86	36	0	0	50	50%
25-Apr	85	49	0	0	0	49	57.65%
27-Apr	90	72	8	0	0	64	71.11%
TOTAL	1,342	956	246	25	1	684	-----
%		71.2% returned	18.33%	1.86%	0.07%	50.97%	-----

Table 11

Nursing Findings Based on Documentation of SPECIFIC chart audits (2 audits/ week for 8 weeks)

High risk for falls based on:	Yes	No
Chief complain	84	1258
Age	148	1194
Altered Mental Status	42	1300
Impaired mobility	92	1250
Nursing Judgement	81	1261

Table 12

Comparing Nurse Documentation Rates Pre- and Post- Intervention

Nurse Audited	Pre-Intervention Documentation Rate	Post-Intervention Documentation Rate
Nurse 1	0%	53%
Nurse 2	0%	47%
Nurse 3	0%	73%
Nurse 4	0%	50%
Nurse 5	0%	63%
Nurse 6	0%	80%
Nurse 7	0%	39%
Nurse 8	50%	47%
Nurse 9	40%	75%
Nurse 10	24%	66%
Nurse 11	0%	62%
Nurse 12	0%	29%
Nurse 13	0%	39%
Nurse 14	0%	54%
Nurse 15	0%	55%
Nurse 16	0%	58%
Nurse 17	0%	41%
Nurse 18	0%	67%
Nurse 19	0%	56%
Nurse 20	0%	53%
Nurse 21	0%	54%

Discussion

Summary

Comparing pre and post chart audit percentages determined that the intervention was clinically and statistically significant in bringing about a positive clinical change. The KINDER-1 and PIBC increased ED nurse fall assessment and prevention documentation from 12.26% to 46.14% (33.88 percentage point increase; 2.46-fold increase), thus fulfilling the purpose and overall aim of the QI project. There was a significant increase in documentation rates per a Wilcoxon Signed Rank Test (Z= -3.964, p <0.001). As indicated in Table 12, all but one nurse had increased documentation rates post-implementation. The short term and intermediate goals were partially achieved as 83.33% of employees were educated prior to implementation (rather than 100%), and 46.14% of patients were screened for falls and had preventative interventions documented for the 8-week QI duration (rather than 100%).

Interpretation

The findings of this QI project support the statement from McCarty et al. (2019) that nurses are more likely to identify and document fall risks when structured screening tools are in place and when they are educated about how to utilize such tools. However, not just any screening tool. Of the 424 total charts audited pre-intervention, 40 of these patients were considered high risk for falls based on the hospital's current inpatient criteria, while 309 of the 424 were considered high risk for falls based on KINDER-1 standards. Literature findings are further substantiated by this project as these statistics demonstrate that inpatient screening tools are not as sensitive as ED-specific screening tools in detecting falls risks in this particular environment (Cook et al., 2020; McFadden et al., 2019; Pop et al., 2020). The KINDER-1 would be an appropriate tool to adopt into long-term clinical practices as the tool is ED-specific and has reliable sensitivity and specificity (Table 2) (Alexander et al., 2013; Cook et al., 2020; Pop et al., 2020). McFadden et al. (2019) demonstrates that ED specific screening tools are more effective when used in combination with considering a patient's chief complaint (which the KINDER-1 tool includes), and asking fall-related history questions. Therefore, adding the KINDER-1 long-term to current practices

would be a simple addition that would establish a multifactorial approach to falls and improve patient identification and nursing documentation of patient fall risk through minimal change.

Staff buy-in is crucial for compliance. Staff buy-in is ensured when all staff are educated how adopting new interventions will increase patient outcomes, improve patient care, and lower overall healthcare costs and adverse events (Stoeckle et al., 2019; Pop et al., 2020; Cook et al., 2020; McEwan et al., 2018). Creating this fall prevention culture through proper education is essential to sustain improved long-term fall risk documentation changes with utilization of the KINDER-1 and PIBC. These sources of literature suggest that as education rates increase, compliance rates increase. Therefore, educating all staff members prior to long-term policy change and permanent intervention adoption would be most efficient for bringing about increases in ED nurse documentation rates. Compliance and accuracy rates are inspected to increase as education rates increase (Stoeckle et al., 2019; Pop et al., 2020; Cook et al., 2020; McEwan et al., 2018), further insinuating that the educate rate of this QI project (83.33%) limited the extent of the positive influence the intervention could have had on documentation rates had all nurses been properly educated prior. Educating staff in a relaxed environment, giving them ample opportunities to ask questions, and covering examples of how to use the tools with fictional patients would greatly benefit staff prior to implementation and increase the accuracy of ED nurse documentation rates. Demonstrating how to interpret the KINDER-1 in light of complicated and differing patient presentations would have further eliminated discrepancies in the misidentification of high-risk patients.

Prior to implementation, patient volume was suspected to be a confounding variable that would affect outcomes as the project was implemented during the COVID-19 pandemic and patient volume seemed to be steadily increasing. However, Table 5 demonstrates that the findings could be closely compared because the average patient volume pre and post intervention were very similar. Other confounding variables (such as differing days of the week, different nurses completing the documentation, differing shifts) were controlled through audit randomization and by auditing all patients for the duration of implementation.

Limitations

Several limitations to the overall implementation of the intervention are mentioned above in "Project Limitations". There were two unexpected weakness in the design of the Modified KINDER-1 tool that was utilized as the intervention. The "Age" category deemed any patients over the age of 65 to be at risk for falls, but did not address patients the age of 65 particularly. Upon documentation, nurses were confused as to whether patients that were 65 years old qualified as high risk for falls under this category, or if they wouldn't qualify until the age of 66. In the future, the tool should be clearer in this area and should read "Age ≥ 65" rather than "Age > 65".

Another unexpected finding or barrier was that the intervention implemented (KINDER-1 and intervention checklist) did not address specific guidelines for pediatric patients. Nurses were unsure how to screen pediatric patients under the age of 2 if the chief complaint was nonurgent, yet the patient was an unsteady cruiser or not yet walking. Many nurses utilized the categories of "Impaired Mobility" or "Nursing Judgement" on the KINDER-1, but how to address pediatric patients was not clearly defined on the intervention tools and was not taught in the pre-intervention education.

As mentioned before, there is limited published data regarding the KINDER-1, therefore data concerning validity, sensitivity, and specificity are significantly absent. However, to ensure validity and reliability of the project as much as possible, the intervention tool was not changed throughout the duration of the implementation period despite the concerns of the geriatric and pediatric patients mentioned above. The tools remained the same, and these concerns are identified barriers in the QI project that led to many geriatric and pediatric patients not being captured accurately as fall risks. When completing chart audits pre and post intervention, anyone 65 years and older was determined as a high risk, and all pediatric patients two years of age or younger were considered high risk for falls. The reliability of findings and reported statistics was ensured as one person completed all the audits utilizing the same method for each audit. The auditor was well versed in the patient charting system as well as the KINDER-1 tool and was efficient in determining if nurses completed the tool accurately by comparing the differing charting mechanism (paper vs electronic). This also ensured validity, although there is no

statistical measurement to be reported for such. The specificity and sensitivity of the Kinder-1 demonstrated, as when the tool is utilized properly, the KINDER-1 is able to identify a larger percent of patients at risk for falls than the inpatient tool. Reliability of the KINDER-1 tool would improve once changes to include the specific geriatric and pediatric patients mentioned above are made. The findings of this QI project could easily be applied to other small community ED's, but may be limited in generalizability if applied in larger teaching facilities.

Conclusions

Falls in the ED continue to be a concern for hospitals nationally as these sentinel events increase overall healthcare costs as well as patient morbidity and mortality rates. The clinical and statistical significance of this QI project supports the adoption of a framework and long-term policy to establish ED-specific fall risk detection (KINDER-1) and prevention tools (PIBC) into standardized practice for all ED patients. The PDSA cycle is a sufficient framework for the implementation and refining of this change process. The project goal to increase the rate of nurse documentation of fall risk and prevention interventions with the use of an ED-specific fall risk screening tool (KINDER-1) and PIBC was achieved. Improvement for future implications for practice would include (1) utilizing pediatric guidelines on the Kinder-1 screening tool, and (2) modifying the age category to include all patient ages 65 and older.

The findings of this QI project contribute to current nursing knowledge regarding ED nurse documentation, fall risk detection, and prevention by demonstrating that structured screening tools aid ED nurses in identifying patients at risk for falls, and therefore better prepares nurses to identify patients needing preventative interventions implemented to ensure safety and reduce morbidity and mortality. The tool should be utilized in electronic formatting rather than paper format to increase compliance and should be modified to include geriatric and pediatric specifics.

Implication for Further Studies

Additional research should be conducted on how to reduce documentation omission and inaccuracy so as to increase overall frequency and efficiency of KINDER-1 documentation in clinical practice. The DNP student collected subset data utilizing the Random Numbers Generator (Random

Number Generator, n.d.) to measure nurse compliance over the 8-week span. The purpose was to select twenty-five charts per day of project implementation (20 charts with KINDER-1 completed; 5 charts that had been returned blank) to determine whether nurses were utilizing the KINDER-1 tool accurately. The DNP student was able to visualize nurse compliance to the intervention more accurately as well as monitor the efficiency of the preintervention education (possible confounding variables) through the subset data. Auditing five charts each day where nurses were noncompliant to fill out the KINDER-1 helped determine if at-risk patients were not being captured due to nurses' failed completion of the intervention. (One exception to the subset audits was April 17th; on this date only 18 forms were returned total. Therefore only 18 audits were completed for this date). Charts were considered "correct" if nurses selected every category of the KINDER-1 that placed patient at risk for falls per auditor's chart audit. 1,398 charts were audited total. 601 of these charts had accurate documentation, while the rest (797 charts) were missing at least one (or more) high-risk categories. Further research should be directed at how to reduce the number of charts missing one or more high-risk categories by modifying the tool to make the categories more specific or by determining more effective means of preintervention education. Table 14 summarizes the findings of the subset chart audits. These audits serve as a good means for comparison if further research were to be conducted after making the improvements suggested above (pediatric and geriatric additions).

Table 14

Subset Audits Measuring KINDER-1 Accuracy and Compliance

KINDER-1 Category	BLANK (5 forms/ day)	FILLED OUT (20 forms/ day)	TOTALS
Total audits	285 total	1,113 total	1,398 total
Audits CORRECT	99 blank forms where patient was not at risk for falls	502 correct	601 accurate
Missed Chief Complaint	119 charts	353 charts	472 charts
Missed Age	78 charts	56 charts	134 charts
Missed Altered Mental Status	20 charts	17 charts	37 charts
Missed Impaired Mobility	33 charts	51 charts	84 charts
Missed Nursing Judgement	125 charts	419 charts	544 charts

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Appendix A

In-patient Screening Tool

Able to comprehend and follow directions?	YES	NO
Is patient at high risk for falls?	If no to above question, your patient is a high fall risk:	
	YES	NO
Falls interventions in use	Bed exit alarm Chair alarm Diversion technique Family presence Pad on floor	Placed in crib Safety attendant-physical Safety attendant-virtual Supervised, assisted ambulation
Fall precautions observed	YES	NO

Appendix A: Inpatient screening tool available to ED staff that often goes unutilized

Appendix B

Annotative Table and Evidence Level

Table B1

Citation: Cook, N. S., Komansky, B. J., & Urton, M. S. (2020). Do no harm: A multifactorial Approach to preventing emergency department falls- a quality improvement project. *Journal of Emergency Nursing*, 46(5), 666-674.

Keywords: Emergency service accidental falls; prevention and control; quality improvement; accidental falls; risk factors; risk assessment; Emergency; Fall; Multifactorial; Remote video monitoring; Safety

Study Purpose (copy exactly from study)	**Type of Study**	**Sample/ Setting**	**Major Variables Studied and their Definitions**	**Data Analysis and Findings**	**Grade**	**Appraisal: Strength of Evidence and Worth to Practice**
The purpose of this article was to provide an example of how a comprehensive, ED-based fall prevention initiative was created	Quality improvement project Compared postintervention monthly unit-level data to historic monthly	Level 1 trauma center emergency department (adult only) in an urban tertiary care teaching hospital Implementation: January	**Patient falls-** sudden, unplanned descent to the floor (or other unintended surface), with or without injury; reported as the number of events per 1,000 patient visits- **continuous**	KINDER 1 sensitivity was calculated at 68% (pre-MFS = 23%) and the specificity 68% (pre-MFS = 91%). Morse Fall Scale (MFS) had a specificity of 91% (low rate of false negatives) but only a 23% sensitivity (high fall risk score and went on to fall).	SQUIRE QI 16/18	Melnyk- Level 6 evidence A multifactorial approach to ED fall prevention (implementing the KINDER-1 fall risk assessment (ED-specific), remote video monitoring, exit alarms, creating a fall prevention culture (“Catch a Falling Star”), and ensuring good communication resulted in 27% decrease in falls and a 66% decrease in falls with injuries.

and implemented, including the following 43omponent: triage-based fall risk assessment, application of new monitoring technologies, improved post event analysis, and awareness and recognition activities.	rates on the same unit	2017 to June 2017 Postimplementation: July 2017 to June 2019	**Falls w/ injuries-** sudden, unplanned descent to the floor (or other unintended surface), WITH injury; reported as the number of events per 1,000 patient visits-**continuous** **ED-specific fall risk assessment tool:** KINDER-1-**nominal** (yes/no/ nursing judgment) **ED-nonspecific fall risk assessment tool:** Morse Fall Scale (MFS)-**ordinal**	Fall rate: decreased from 0.73 falls per 1,000 visits (pre) to 0.55 falls per 1,000 visits (post), representing a 25% decrease ($t = 1.41$, $P = 0.18$)-**2 tailed t-test** Fall w/ injury rate: decreased from 0.09 FWI per 1,000 visits (pre) to 0.03 FWI per 1,000 visits (post), which was a 66% decrease in injuries ($t = 2.29$, $P < 0.05$)- ***2 tailed t-test*** 27 fewer falls and 10 fewer injuries over the 24-month postimplementation period despite a 3% increase in adult ED volume over this time frame.		KINDER-1 promoted changes in the EMAR (flowsheets and red banners across the patient's chart alerting staff of previous falls or high fall risk) to promote better communication amongst staff Although the reduction in falls (27 less falls, $t = 1.41$, $P = 0.18$) may not be statistically significant, the impact of this program can be measured by other means: avoiding legal and financial costs, increased morbidity and mortality, & fall-related injuries which rule in favor of a multifactorial approach to ED fall prevention (suggests measuring these factors in a future study)

Table B2

Citation: Goldberg, E. M., Marks, S. J., Ilegbusi, A., Resnik, L., Strauss, D. H., & Merchant, R. C. (2019). GAPcare: The geriatric acute and post-acute fall prevention intervention in the emergency department: preliminary data. *Journal of the American Geriatrics Society*, *68*(1), 198-206.

Keywords: Emergency department; falls; injury prevention; pharmacist; physical therapy

Study Purpose (copy exactly from study)	**Type of Study**	**Sample/ Setting**	**Major Variables Studied and their Definitions**	**Data Analysis and Findings**	**Grade**	**Appraisal: Strength of Evidence and Worth to Practice**
Describe a new multidisciplinary team fall prevention intervention for older adults who seek care in the emergency department (ED) after having a fall, assess its feasibility and acceptabilit	Single-blind randomized controlled pilot study.	Two urban academic Eds in Providence, Rhode Island (The Miriam Hospital & Rhode Island Hospital) Adults 65 years old or older (n = 110) who presented to the ED within 7 days of a fall (Spanish and English	**Medication Therapy Management by Pharmacy**- open ended questioning and motivational interviewing about medication list to identify meds that could contribute to falls- **nominal** **Physical Therapy Led Fall Risk Assessment/ Plan-** assess balance, gait,	Median consult time was 20 minutes for pharmacy and 20 minutes for PT. ED length of stay was not increased in the INT arm (5.0 h vs 5.25 h; $P < .94$)- **descriptive stats** Most ED clinicians indicated they were in favor of integration of pharmacy consultation (95.8%) and PT consultation (97.6%)- **descriptive stats** 100% of participants and 97.6% of clinicians recommended the pharmacy consult, and 95% of participants and 95.8%	CASP RCT 10 of 11	Melnyk- Level 2 evidence A headline in the ED visit summary alerted the PCP that the individual was part of the GAPcare intervention and that recommendations made by the pharmacist and the PT were appended to the standard ED visit summary- reduced burden on ED clinician and allowed PCP to make recommended changes and continue to be in control of patient's care while promoting continuity of care These findings suggest that a multidisciplinary fall prevention intervention can be initiated in the ED setting. Possible to integrate this model into ED care without increasing ED clinician

y, and review lessons learned during its initiation.		speakers) who were DC and not admitted to hospital 110 participants; median participant age was 81 years old, 67% were female, 94% were white, and 16.3% had cognitive impairment 55 in Intervention group (INT) and 55 in usual care group (UC)	strength; get up and go test; independent functioning-**did not specify in article if scales used to determine these were nominal, ordinal, or continuous**	of clinicians recommended the PT consult. – **descriptive stats**		burden- allow the HER to facilitate communication w/ PCP Medicare recipients taking multiple medications have pharmacist-delivered MTM services covered by Medicare, and PTs can bill payors for their ED-based assessments

Table B3

Citation: Stoeckle, A., Iseler, J. I., Havey, R., & Aebersold, C. (2019). Catching quality before it falls: preventing falls and injuries in the adult emergency department. *Journal of Emergency Nursing, 45*(3), 257-264.

Keywords: Fall; injury; ED; adult; Fall prevention; fall risk

Study Purpose (copy exactly from study)	**Type of Study**	**Sample/ Setting**	**Major Variables Studied and their Definitions**	**Data Analysis and Findings**	**Grade**	**Appraisal: Strength of Evidence and Worth to Practice**
Identify and implement evidence-based interventions to prevent patient falls and injuries in the emergency department.	Quality Improvement Project	In 2017, at an 87-bed, level-1 trauma emergency department in a large Midwestern hospital	Staff education about universal fall precautions- toilet assistance, pain assessments, repositioning, stretchers low and locked, personal items in reach, call light usage, nonskid socks, gait belts Patient/ family education- fall risk handout review with nurse if pt is high risk Visual communication tools- socks, wristbands, signage outside door and flag on HER	The average number of falls between April and December 2017 was 5.2 falls/month→ Despite multifactorial interventions and compliance with universal fall precautions, the fall rate remained high postimplementation- **descriptive stats** Although staff adherence to fall-prevention interventions was low, universal fall precautions were consistently practiced 7-question Likert survey 3 months postimplementation to RN staff- response rate of 28%; stated that time required to initiate interventions did not interfere with the overall patient care- **descriptive stats**	SQUIRE QI 15/18	Melnyk- Level 6 Evidence Multiple change strategies and leadership support are essential to sustain changes. Fall risk assessment tool utilized was not ED-specific- could have influenced outcomes emergency nurses are front line for assessing fall risk and proactively implementing appropriate fall precautions in a vulnerable environment. Potential barriers- lack of supplies, storage space, funding, sign fatigue; resistance to change from ED staff/organization; lack of support from the leadership team and fall champions although patients were identified as high risk for falls with a yellow stop sign, this sign did not travel with patients throughout the emergency department. Therefore, considering a mobile identification system (such as a fall risk wristband, gown, and socks) may further

			Fall RN as fall champion- key agent in promoting change and ensuring staff buy-in by answering questions and being a resource Number of patient falls- **continuous** **Did not specify rate of measurement (nominal, ordinal, continuous)**	50% of respondents thought the sign and education were easy to locate and use; 39% thought the sign and education improved communication and partnership to reduce patient falls. – **descriptive stats**		increase communication and awareness of patients at high risk for falls.

Table B4

Citation: Pop, H., Lamb, K., Livesay, S., Altman, P., Sanchez, A., & Nora. M. E.(2020). Tailoring a comprehensive bundled intervention for ED fall prevention. *Journal of Emergency Nursing, 46*(2), 225-232.

Keywords: Fall risk screening; Fall prevention bundle; emergency department, patient safety

Study Purpose (copy	**Type of Study**	**Sample/ Setting**	**Major Variables Studied and their Definitions**	**Data Analysis and Findings**	**Grade**	**Appraisal: Strength of Evidence and Worth to Practice**

exactly from study)						
Tailor and implement a comprehensive fall prevention bundle in our emergency department.	Literature review/ quality appraisal Qualitative	676-bed Midwestern urban academic medical center over the course of 5 months, from August to December, 2017	Fall risk assessment- comprehensive list of ED fall risk factors was generated and agreed upon using a nominal process with the ED Fall Prevention Team, departmental, and organizational nursing leadership- **nominal & ordinal** KINDER1- ED fall risk tool; measures hx of fall, age, altered mentation, impaired mobility, nursing judgement; sensitivity= 73%- ordinal- **nominal** Memorial ED fall risk assessment tool (MEDFRAT)-ED	Multifactorial bundles are effective in reducing patient falls in the acute care setting (reduce fall risk up to 30%).- **descriptive stats** Quarterly fall rate reduced to 0.27 falls per 1,000 visits with no fall-related injuries- **descriptive stats** After implementation of fall bundle, the rates of falls decrease, as well as the rate of falls w/ injuries- **descriptive stats** Each month the fall bundle was live, 89% or more of patients screen positive as a fall risk in some manner, and therefore benefited from the fall prevention bundle – **descriptive stats**	CASP Qualitative study 8 of 10	Melnyk- Level 6 Evidence Evidence-based components of fall prevention bundles include (1) assessment of fall risk, (2) application of multifactorial interventions, and (3) embedding fall prevention into unit culture. Failure to incorporate all 3 aspects or overemphasis on 1 area of fall prevention may lead to varying results. Bundling these aspects into a fall prevention intervention provides a balanced approach, which may provide the best outcomes. Facilitate staff buy-in by highlighting that new documentation required less mouse strokes to complete, and new prevention materials are being conveniently placed around unit and don't add time to implement. Create a sense of urgency by displaying benchmark data of unsatisfactory performance to staff. ED Fall Prevention Team in was instrumental in the success of this initiative. Peer-to-peer interactions promoted education, communication, and buy-in

			fall risk tool; measures hx of falls; confused or disoriented, intoxicated or sedated, impaired gait, mobility assisted device, altered elimination; sensitivity 52%; Reliability 0.7- **ordinal** Safe ambulation- nonskid socks; gait belts; individualized staff assistance Safe toileting- bedside commodes and early warnings from bed-exit alarms Staff communication- wristbands and door signage Patient education- “call,			

			don't fall" tech-back technique ED Fall Prevention Team- compromised of 5 nurses and 4 techs; perform peer-to-peer education, implement fall prevention bundle and track progress (stats) Number of patient falls- **continuous**			

Table B5

Citation: Scott, R. A, Oman, K. S., Flarity, K., & Comer, J. L. (2018). Above, beyond, and over the side rails: Evaluating the new memorial emergency department fall risk assessment tool. *Journal of Emergency Nursing, 44*(5), 483-490.

Keywords: Patient safety; falls; assessment score

Study Purpose (copy	**Type of Study**	**Sample/ Setting**	**Major Variables Studied and their Definitions**	**Data Analysis and Findings**	**Grade**	**Appraisal: Strength of Evidence and Worth to Practice**

exactly from study)						
Evaluate the reliability and validity of the 2013 Memorial ED Fall Risk Assessment tool (MEDFRAT) specifically designed for the ED population.	Two-phase prospective qualitative descriptive study Phase one determined the interrater reliability of the MEDFRAT. Phase two assessed the validity of the MEDFRAT	Emergency department (ED) within a 600-bed academic/teaching institution; Level II trauma center Convenience sampling of 69 patients to assess for fall risk	MEDFRAT- 0–14 point scale system consisting of 6 risk-factor variables to assess an ED patient's risk of falling: history of falls in the last 3 months, confusion, intoxication or sedation, gait, use of mobility-assist devices, and altered elimination- **ordinal** Validity & Reliability- measured by Kappa (0-1); Ordinal Number of patient falls- **continuous**	Positive interrater reliability (k=0.701) and when implemented with a falls prevention strategy and staff education demonstrated a 48% decrease in ED fall rate (0.57 falls/1000 patient visits) post implementation- **kappa** The **kappa (K) statistic** was used to determine the rate of agreement between ED nurses and researchers (phase 1). Kappa is the degree to which 2 or more raters agree when categorizing data. K = 1 indicates complete agreement/reliability and K = 0 indicates agreement that is purely coincidental. This study achieved a K = 0.70, which is considered to be an acceptable level of agreement. The correlation coefficient calculated for the 2 scores (ED RN and researcher) was r = 0.918; $P < 0.001$. → clinically	CASP Qualitative 7/10	Melnyk- Level 6 evidence MEDFRAT is a valid tool for ER hospital system Reassessment of fall risk is imperative, as the patient may be treated with narcotics or sedatives, and intoxication may clear during the patient stay; also, transport team members or physicians may not replace fall prevention interventions after completing procedures bc they have not been trained in fall prevention (expresses need to educate these individuals as well) ED nurses did not interpret MEDFRAT question the same, therefore there was a difference in determining what qualified as a risk for each patient in every category (ex: vaginal bleeding as altered elimination) Highlights the need for more thoughtful education surrounding uncommon patient presentations and how to score them using the tool.

				significant change in rate of falls -**Pearson's correlation** showing validity Decreased fall rate of 48% (from 1.17 to 0.57 falls per 1,000 thousand patient days)- **descriptive**		

Table B6

Citation: McCarty, C. A., Harry, M. L., Woehrle, T. A., & Kitch, L. A. (2019). Screening and falls in community hospital emergency rooms in the 12 months following implementation of MEDFRAT. *The American Journal of Emergency Medicine*, *38*(8), 1686-1687.

Keywords: Accidental falls, accident prevention, emergency hospital services

Study Purpose (copy exactly from study)	**Type of Study**	**Sample/ Setting**	**Major Variables Studied and their Definitions**	**Data Analysis and Findings**	**Grade**	**Appraisal: Strength of Evidence and Worth to Practice**
Evaluate our experience in the first 12 months after	Descriptive qualitative analysis	Emergency departments at Essentia Health, a large, primarily	MEDFRAT- 0–14 point scale system consisting of 6 risk-factor variables to assess an ED	Falls risks questions within the electronic health record were used for 57% of patients prior to MEDFRAT implementation, compared	CASP Qualitative 6/10	Melnyk- Level 6 Evidence **I**ncrease in the use and documentation of falls risk assessment and selection of nursing interventions to decrease falls with MEDFRAT implementation

implementation of MEDFRAT with the following specific aims: 1) document the frequency of MEDFRAT use by hospital; 2) document the fall prevention interventions used at each hospital; and 3) describe the outcomes of patients who fell.		rural health care delivery system with 12 emergency departments. Northern Minnesota, Wisconsin, and North Dakota	patient's risk of falling: history of falls in the last 3 months, confusion, intoxication or sedation, gait, use of mobility-assist devices, and altered elimination- **ordinal** Number of patient falls- **Continuous**	with 69% of patients using the MEDFRAT tool after its implementation ($p < .001$).- **Chi-square** non-significant increase in the absolute number of falls ($p = .499$)- **Chi-square** The severity of falls increased ($p = .007$), with 85% of falls in the pre-MEDFRAT time frame resulting in no harm, compared with 59% in the post-MEDFRAT time period- **Fisher's exact test**		tool includes a question related to alcohol or substance use, which has been shown to be associated with falls that occur in emergency departments. Did not result in a decrease in falls and the falls that did occur were more likely to result in patient harm.

Table B7

Citation: McEwan, H., Baker, R., & Banerjee, J. (2018). A qualitative study of the determinants of adherence to NICE falls guideline in managing older fallers attending an emergency department. *International Journal of Emergency Medicine, 11*(33).

Keywords: Accidental falls, Emergency care systems, Emergency departments, Guidelines, Geriatrics, Qualitative research

Study Purpose (copy exactly from study)	**Type of Study**	**Sample/ Setting**	**Major Variables Studied and their Definitions**	**Data Analysis and Findings**	**Grade**	**Appraisal: Strength of Evidence and Worth to Practice**
investigate how falls are managed in Eds, reasons why guideline recommendations are not always followed, and what happens instead National Institute for	**Qualitative analysis**	England, 2013 2 different emergency rooms in the same city Busy city hospital ED (A) compared to a less busy town hospital ED (B) **27 episodes of care, for patients**	NICE falls guidelines adherence in specific hospitals- **Did not specify rate of measurement (nominal, ordinal, continuous)** Number of patient falls- **Continuous** Barriers to guideline adherence- **Did**	Observations: looking for adherence to fall guidelines-**descriptive stats** Semi-structured convenience interviews: assessing potential barriers and enablers to guideline adherence- **descriptive stats** Overall adherence was 62% in hospital A and 64% in hospital B. For none of the 27 observed care episodes were all 11 multifactorial assessment guideline	CASP Qualitative study 7 of 10	Melnyk- Level 6 evidence education and proformas are unlikely to have substantial effects alone the influence of senior staff on juniors could enhance adherence. **Determinants of adherence: Communication (staff-patient; staff-staff); patient complexity (other health concerns take priority); education/ training; variation in care pathways; access to resources; influence of seniors; level of acuity; benchmarks/ targets; definition of a fall; staffing/**

Health and Care Excellence (NICE) guidelines on falls		ranging in age from 67 to 98 **Convenience sampling**	**not specify rate of measurement (nominal, ordinal, continuous)**	recommendations completed- **descriptive stats** Most frequently adhered: cardiovascular examination (27/27 occasions)- **descriptive stats** Osteoporosis risk/ urinary incontinence: completed less than a quarter of the time. – **descriptive stats** Medication review: completed least frequently (1/27 occasions) – **descriptive stats**		**consistency of care; cross-boundary care, etc.** Cross boundary care: The ED could fulfill the role of gatekeeper, in recognizing the need for falls assessments and referring patients to services with more time for managing people with falls in accordance with the guideline; used to appropriately direct aspects of care away from the department.

Table B8

Citation: McFadden, G. P., Hall, S. E., Gleason, L . J., Herrera, O., & Hogan, T. M. (2019). Identification of older adult fall occurrence by brief emergency department triage screen. *Journal of the American Geriatrics Society, 68*(2), 442-443.

Keywords: accidental falls; prevention and control; in old age; triage; health screening; emergency patients

Study Purpose (copy exactly from study)	**Type of Study**	**Sample/ Setting**	**Major Variables Studied and their Definitions**	**Data Analysis and Findings**	**Grade**	**Appraisal: Strength of Evidence and Worth to Practice**
Assess the ability of a two-question triage screen combined with documented chief complaint to effectively identify the occurrence of fall in undifferentiated ED patients aged	Quality Improvement Project	Urban, academic level 1 trauma center Inclusion: Patients aged 65 years or older visiting between November 27, 2017, and December 30, 2018 **Exclusion:** Emergency Severity Index of 1; transfer from	2 Question triage screening for falls: "Is this visit related to a fall?" and "Have you fallen in the last month"; A positive response to either question flagged the patient in the electronic health record.-**Nominal** Chief Complaint identification-determining if reason for visit is r/t fall; if yes,	**S**creen identified 20.0% of all older adult presentations as falls- **descriptive** 1329 were identified by questions and 903 were identified by chief complaint, with 612 identified by both components- **descriptive** Sensitivity and specificity: **descriptive** 1. Screening protocol: 0.87 & 0.75 2. Two-question screen: 0.7 & 0.77	SQUIRE QI 16 of 18	Melnyk- Level 6 evidence The fall screen was successfully integrated into a busy ED workflow and significantly improved both sensitivity and specificity in identifying older adult fallers. This screen identifies fallers during triage, providing maximal utility for clinical management, mitigation of in-facility falls, and efficient referral to enhance safer discharge. Limitations include a single location, reducing generalizability. While our results demonstrate enhanced sensitivity, specificity, and timeliness over existing falls identification methods, it has not been compared to a full-scale manual chart review or real-time physician identification of fallers.

65 years or older		another hospital; elopement; or left without being seen, without being treated, or against medical advice. 8534 eligible patients; 1620 screened positive for fall risk	flags patient EMR- **nominal** Combined screening protocol: utilizing 2 question screening w/ chief complaint identification- **nominal**	3. Single question: fall-related visit: 0.52 & 0.81 4. Single question: fall in the last 30 days: 0.58 & 0.87 5. Chief complaint text: 0.52 & 0.98		

Appendix C

Conceptual Synthesis Table

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Source 7
Multifactorial approach	Cook et al. (2020): video monitoring; bed alarms; fall prevention culture; effective communication (27-66% decrease in falls)	Stoeckle et al. (2019): staff education about universal fall precautions; pt/ family education; visual communication tools; Fall RN Champion	Pop et al. (2020): fall assessment tool; multifactorial interventions (safe toileting, safe ambulation, etc.); fall prevention culture and team	Scott et al. (2018): fall prevention strategies and staff education	McCarty et al. (2019): increased documentation and nursing interventions	McEwan et al. (2018): communication; education; access to resources; senior influence; patient acuity and complexity; benchmarks; staffing; etc.	McFadden et al. (2019): 2 question triage screening tool w/ chief complaint screen
Screening tools/ methods	Cook et al. (2020): KINDER-1 vs Morse Fall Scale Screening tool implementation effects: 27 fewer falls and 10 fewer injuries over the 24-month postimplementation period despite a 3% increase in adult ED volume over this time frame.	Scott et al. (2018): that when implemented in a fall prevention bundle, the MEDFRAT scale demonstrates a 48% decrease in ED fall rates with a $p<0.001$, which makes the change statistically significant for the change in rate of falls with the initial implementation	Pop et al. (2020): -After implementation of fall bundle, the rates of falls decrease, as well as the rate of falls w/ injuries -Each month the fall bundle was live, 89% or more of patients screen positive as a fall risk in some manner, and therefore	McCarty et al. (2019): in the 12-month follow-up evaluation period post MEDFRAT implementation, there was a nonsignificant increase in the absolute number of falls using this screening tool ($p=0.4999$)	McFadden et al. (2019: 2 Question triage screening for falls: "Is this visit related to a fall?" and "Have you fallen in the last month"; A positive response to either question flagged the patient in the electronic health record.		

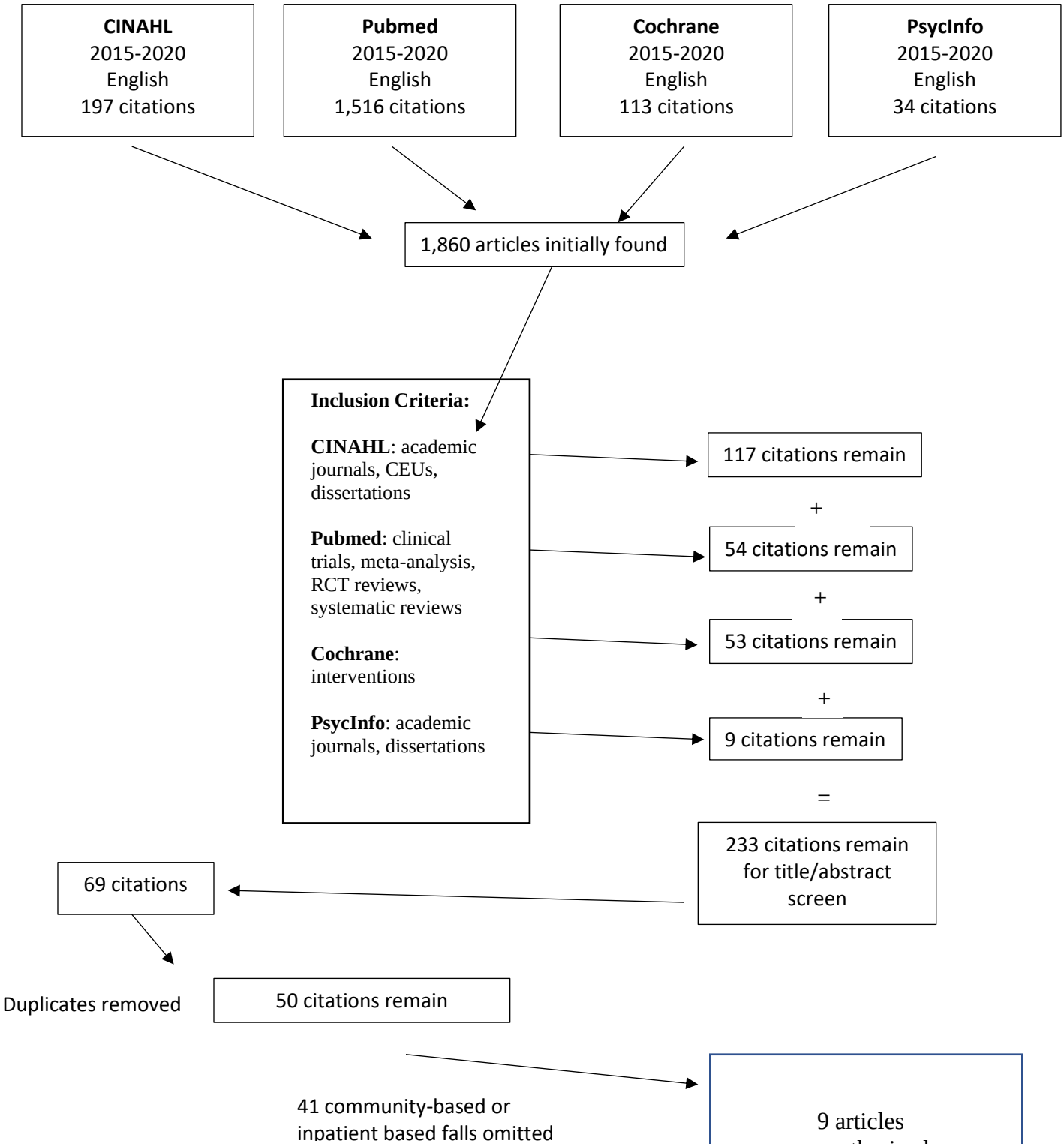
			benefited from the fall prevention bundle -KINDER-1 vs Memorial ED fall risk assessment		-Chief Complaint identification- determining if reason for visit is r/t fall; if yes, flags patient EMR -Combined screening (both techniques utilized together)		
Fall prevention interventions Common theme: clear and concise communication	Cook et al., (2020): EMAR banner warning all caregivers of fall risk	Stoeckle et al., (2019): -Patient/ family education- fall risk handout review with nurse if pt is high risk -Visual communication tools- socks, wristbands, signage outside door and flag on HER	Pop et al. (2020): Safe ambulation- nonskid socks; gait belts; individualized staff assistance; Safe toileting- bedside commodes and early warnings from bed-exit alarms; Staff communication- wristbands and door signage	McCarty et al., 2019: Fall assessments and interventions occurs much more frequently when a structured screening tool is in place (documented 57% of the time pre, versus 69% of the time post)			
Staff buy-in/ influence	Cook et al. (2020): KINDER-1 promoted changes in the EMAR (flowsheets and red	Stoeckle et al., (2019): Staff education about universal fall precautions- toilet assistance, pain	Pop et al. (2020): Facilitate staff buy-in by highlighting	McCarty et al., (2019): **I**ncrease in the use and documentation	McEwan et al;., (2018) Education and proformas are		

	banners across the patient's chart alerting staff of previous falls or high fall risk) to promote better communication amongst staff	assessments, repositioning, stretchers low and locked, personal items in reach, call light usage, nonskid socks, gait belts - Fall RN as fall champion- key agent in promoting change and ensuring staff buy-in by answering questions and being a resource - Although staff adherence to fall-prevention interventions was low, universal fall precautions were consistently practiced- Despite multifactorial interventions and compliance with universal fall precautions, the fall rate remained high postimplementation	that new documentation required less mouse strokes to complete, and new prevention materials are being conveniently placed around unit and don't add time to implement. Create a sense of urgency by displaying benchmark data of unsatisfactory performance to staff. ED Fall Prevention Team in was instrumental in the success of this initiative. Peer-to-peer interactions promoted education, communication, and buy-in	of falls risk assessment and selection of nursing interventions to decrease falls with MEDFRAT implementation	unlikely to have substantial effects alone the influence of senior staff on juniors could enhance adherence.		

Appendix C: Comparing the findings of different sources of literature in the synthesis review; evaluating commonalities and differences

Appendix D

PRISMA Chart



Appendix D: Literature search method to yield articles for synthesis

Appendix E

KINDER-1 Fall Risk Screening Tool: Modified

Each patient that comes into the Emergency Room will have a "KINDER-1 Fall Risk Screening Tool" completed for them as standard of care in order to improve safety measures and patient outcomes though proper nurse identification and documentation. If any of these risk categories are answered "yes", the patient is considered a high fall risk and should have at LEAST one fall prevention intervention documented.

Risk Assessment	Yes	No
Chief Complaint: Presented to emergency department because of falls (syncope, seizure, or loss of consciousness)		
Age: Age >65		
Altered Mental Status: Disorientation, impaired judgement, poor safety awareness, or inability to follow instructions Intoxication with alcohol or substance confusion (disorientation, impaired judgement, poor safety awareness, or inability to follow instructions)	____ ____	____ ____
Impaired Mobility: Ambulates or transfers with assistive devices or assistance Unable to transfer or ambulate	____ ____	____ ____
Nurse Judgement: Bowel or bladder incontinence Sensory deficits Leg weakness Orthostatic hypotension, dizziness, vertigo Medications such as diuretics, narcotic, sedatives	____ ____ ____ ____ ____	____ ____ ____ ____ ____

Appendix E: KINDER-1 Fall Risk Screening Tool; "Yes" to any risk category = high fall risk; Implement fall precaution interventions if high-risk (Alexander et al., 2013)

Appendix F

Fall Prevention Intervention Bundle Checklist

Interventions Based on Risk	Implemented? Yes	No
General Education Bundle (Recommended for all admissions to Emergency Room despite fall risk rating): • Fall risk and interventions • Call bell within reach • Personal items within reach • Call for assistance • Bed in lowest position and locked • Room free of clutter and well lit • Patient and family fall prevention education		
Chief Complaint: • General education bundle • Mobility assisted • Siderails up x3 • Yellow wristband and non-slip socks applied • Fall risk sign on door • Risk communicated on room white board		
Age: • General Education bundle		
Altered Mental Status: • General education bundle • Mobility assisted • Siderails up x3 • Yellow wristband and non-slip socks applied • Fall risk sign on door • Risk communicated on room white board		
Impaired Mobility: • General education bundle • Mobility assisted • Siderails up x3 • Yellow wristband and non-slip socks applied • Fall risk sign on door • Risk communicated on room white board		

Nurse Judgement: • General education bundle • Mobility assisted • Side rails up x3 • Yellow wristband and non-slip socks applied • Fall risk sign on door • Risk communicated on room white board		
***Positive Fall Risk Determined by Multiple Categories** (additional interventions)**:** • Safety attendant (physical or virtual) • Chair alarm • Bed alarm	____ ____ ____	____ ____ ____

Appendix F: Intervention Preventative Checklist; The interventions in each category are suggested for implementation to prevent patient falls if patient scored “high risk in the specific categories based on the Kinder-1 screening tool. Check “yes for interventions implemented into care. Select no if interventions not implemented into patient care

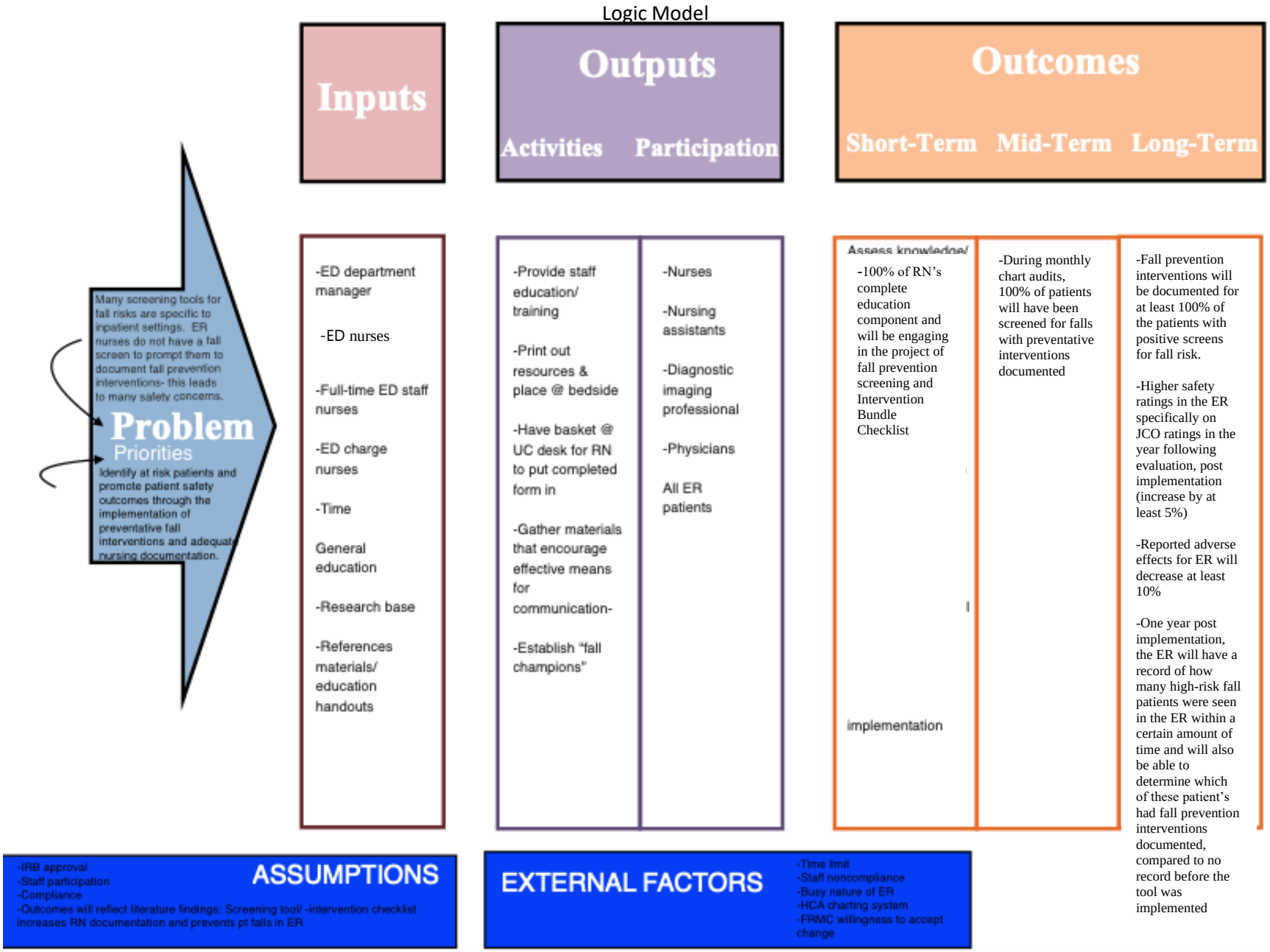
Appendix G

SMART Objectives & Outcome Measurements

Objectives	Measurements:
SHORT TERM GOALS: Assess knowledge/ resources • 100% of ED nurses complete the required education, pre-intervention implementation	• 100% of ED nurses complete the education program
INTERMEDIATE GOALS: Change behavior • During monthly chart audits, 100% of patients will have been screened for falls with preventative interventions documented	• Complete chart audit to ensure that 100% of patients audited each month have a fall screening tool and Intervention Bundle Checklist documented
LONG TERM GOALS: Patient outcomes • Fall prevention interventions will be documented for at least 100% of the patients with positive screens for fall risk. • Higher safety ratings in the ER specifically on JCO ratings in the year following evaluation, post implementation (increase by at least 5%) • Reported adverse effects for ER will decrease at least 10% • One year post implementation, the ER will have a record of how many high-risk fall patients were seen in the ER within a certain amount of time and will also be able to determine which of these patient's had fall prevention interventions documented, compared to no record before the tool was implemented	• Complete chart audit to ensure that 100% of patients that screen high-risk for falls have screening tool and Intervention Bundle Checklist documented • Compare JCO ER safety ratings pre and post implementation • Compare ER reported adverse effects (through incident reports, etc.) pre and post implementation • Staff and administration will be able to demonstrate how to determine how many patients per month were deemed as "high risk" for falls by completing chart audits to obtain such statistics

Appendix G: Aims and desired outcomes of the Quality Improvement project

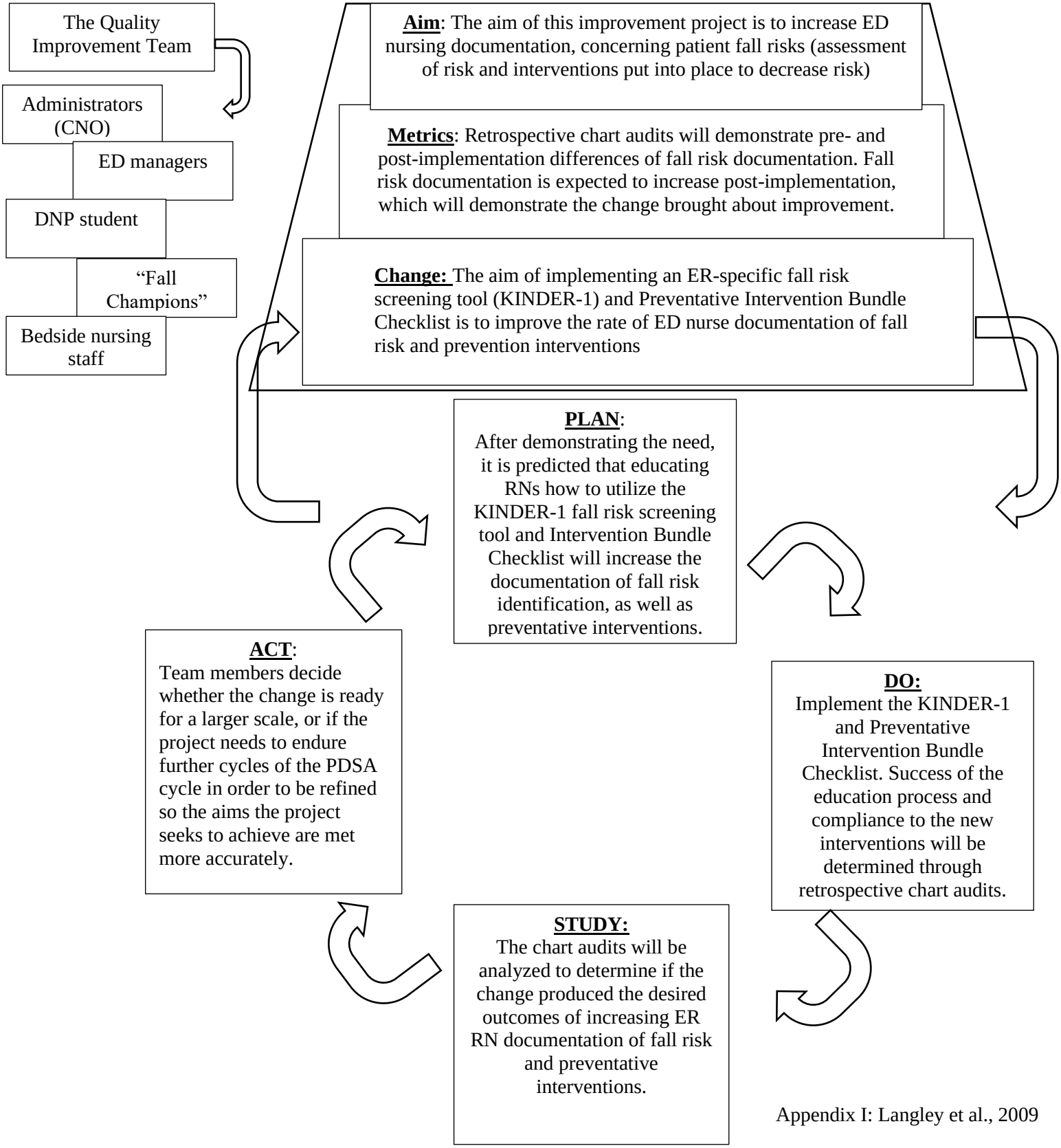
Appendix H



Appendix H: Summary of contributing factors in Quality Improvement project

Appendix I

PDSA Cycle



Appendix I: Langley et al., 2009

Appendix J

GANNT Chart

	MONTH 1 (PRE)	MONTH 2	MONTH 3	Month 4 (POST)
Approval from IRB	**x**			
Create ED staff education bundle regarding Kinder-1 and Intervention Bundle Checklist	**x**			
Provide staff education/ training	**x**	**x**		
Meet with ED manager to finalize QI project and to gain support	**x**	**x**		
Meet with administration at FRMC to inform them about QI project, and gain support	**x**	**x**		
Met with ED Educator for education approval	**x**			
Have staff complete education for screening tool and checklist	**x**	**x**		
Implement intervention: • Provide nurses Intervention Bundle Checklist for fall prevention • Obtain baseline information regarding nursing documentation (control) to compare to results post implementation via retrospective chart audits • Obtained signed consent and commitment from staff to participate in change • Assign roles and responsibilities for implementation of		**x**		

fall prevention practices • Print out paper form of KINDER-1 and interventions • Have basket @ UC desk for completed forms • Gather materials that encourage effective means for communication (equipment/ resource audit)				
Establish "fall champions"	**x**	**x**		
Implement change into practice		**x**	**x**	
Assess short-term goals		**x**		
Assess mid-term goals			**x**	
Assess long-term goals				**x**
Monitor progression of nursing documentation	**x**	**x**	**x**	**x**
Cultivate and sustain change in practice	**x**	**x**	**x**	**x**
Present project outcomes to HCA cooperate. Advocate for national HCA ER EMAR adoption of electric fall screening tool and prevention checklist				**x**

Appendix J: Timeline for project implementation

Appendix K

Education Completion Form

Date	Staff Name	Full time/ Part time/ PRN/ Traveler	Education via in-person staff meeting vs online	My signature below signifies I have completed the associated education, and agree to participate in this QI project

Appendix K: Form that staff will sign after completing pre-intervention education

Appendix L

Chart Audit Tool: Pre-Intervention

Date being audited:

Day of the week:

Auditor:

Nurse documenter initials:

Mode or arrival to ER:

Patient volume in 24-hour period:

Night vs Day shift

CHART AUDIT ***PRE-INTERVENTION***		
	YES	NO
Was inpatient screening tool completed on ED checklist?		
Were interventions documented via inpatient screening tool?		
Was patient fall risk mentioned under "teach tab"?		
Were interventions documented under "teach tab"?		
Was patient fall risk mentioned under "nurses note"?		
Were interventions documented under "nurses note"?		
Is patient considered high-risk for falls via Kinder-1?		
Is patient considered high-risk for falls via inpatient tool?		

Appendix L: Chart audits pre-intervention education and screening tool/ Intervention Bundle Checklist implementation

Appendix M

Chart Audit Tool: Post- Intervention

Date being audited:

Day of the week:

Auditor:

Nurse documenter initials:

Mode or arrival to ER:

Patient volume for 24-hour period:

Night vs day shift:

CHART AUDIT ***POST-INTERVENTION***		
	YES	NO
Kinder-1 Scale completed		
High risk based on CC		
High risk based on Age		
High risk based on altered mental status		
High risk based on impaired mobility		
High risk based on nursing judgement		
Intervention checklist completed		
Interventions implemented		

Appendix M: Chart audits post-intervention education and screening tool/ Intervention Bundle Checklist implementation

Appendix N

Proposed Budget

TOTAL ESTIMATED COST: $1,973.05

Costs	Amount/ Description	Time/ Resource	Rate	Total Cost
PERSONNEL/ LABOR:				
Initial education of charge nurses (Fall Champions that will enforce info with rest of staff nurses)	4 charge nurses	30 "non-productive" clinical minutes to educate and give opportunity to ask/ answer questions	$34.48/ hour ("Average charge nurse," 2021).	$68.96
Educating nurses/ techs during 12-hour scheduled shift	-15 Full time nurses -20 PRN nurse -4 Travel nurses	30 "non-productive" clinical minutes to educate and give opportunity to ask/ answer questions	FT Nurse: $27/hour PRN Nurse: $42/hour Travel nurse: $55/hour	FT Nurse: $202.59 PRN Nurse: $420 Travel Nurse: $110
Administrators and managers meeting to approve/ discuss project idea	10 administrators/ managers	1 hour	$41/hour ("Hourly wage for clinical nurse manager", *2021)*	$410
Developing HealthStream module to educate staff further about screening tool and Intervention Bundle Checklist	Person who develops HealthStream (ER educator)	2 hours to create	$44/ hour ("Hourly wage for clinical nurse educator", 2021)	$88
Time to present, collect, and analyze data	APRN Student (current PRN RN status)	45 hours	$36/ hour	$0- cannot be on clock for time r/t school

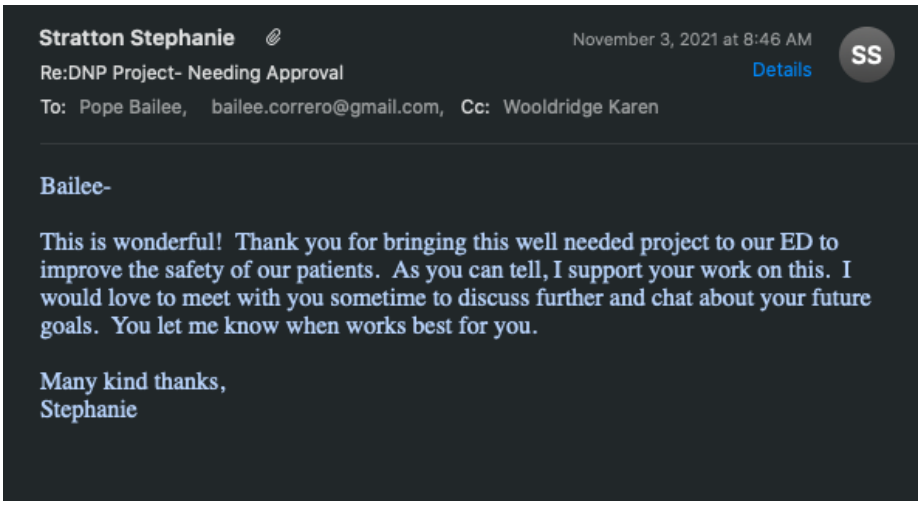
MATERIALS:				
Making education materials (handouts)	40 handouts	Paper and ink (double-sided)	$0.09/ sheet of paper and ink (Fox, n.d.)	$7.20
Printing off screening tool and Intervention Bundle Checklist for clinical use	2,000 screening tools/ Intervention Bundle Checklist	Paper and ink (double-sided)	$0.09/ sheet of paper and ink (Fox, n.d.)	$180
Collection basket to put next to unit clerk for documents to be stored in	1 basket	Black wire basket	Allot $10/ basket	$10
"Fall prevention" resources	200 socks	Fall risk bundle	$0.94/ sock (Soft sole slipper, 2021)	$188 socks
	200 wristbands		$0.06/ wristband (Medical alert, n.d.)	$12 wristbands
	200 "high risk" signs		$0.09/sheet of paper & ink (Fox, n.d.)	$18 signs
	10 bed alarms		$25.83/ bed alarm (Bed pressure pad, n.d.)	$258.30 bed alarms
INDIRECT COSTS:				
Meeting room	Facility provided	ER Manager's office	$0	$0
Emails for approval of project	Explaining project and asking for permission to conduct project in facility	Facility email system	$0	$0

Appendix N: Approximate cost for Quality Improvement Project

Appendix O

Approval Letter from Organization

Figure O1



Stratton Stephanie
November 3, 2021 at 8:46 AM
Re:DNP Project- Needing Approval
Details
SS
To: Pope Bailee, bailee.correro@gmail.com, Cc: Wooldridge Karen

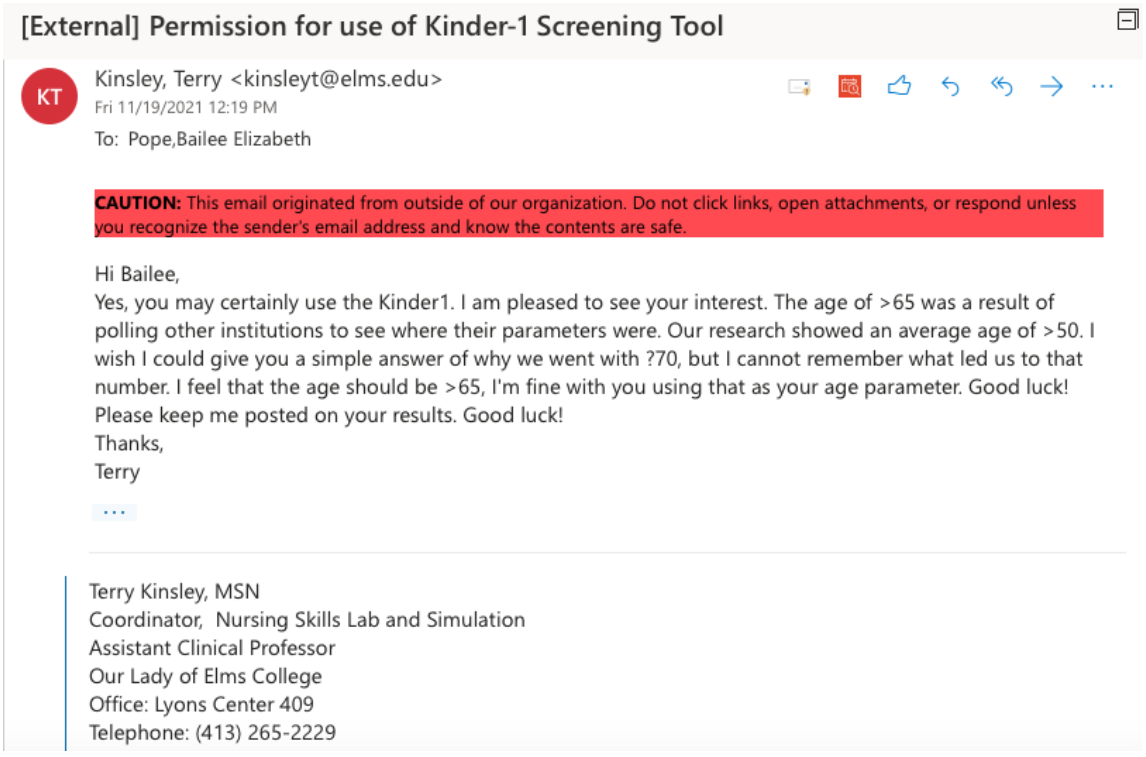
Bailee-

This is wonderful! Thank you for bringing this well needed project to our ED to improve the safety of our patients. As you can tell, I support your work on this. I would love to meet with you sometime to discuss further and chat about your future goals. You let me know when works best for you.

Many kind thanks,
Stephanie

Approval Letter for KINDER-1 Fall Risk Screening Tool

Figure O2



[External] Permission for use of Kinder-1 Screening Tool

KT
Kinsley, Terry <kinsleyt@elms.edu>
Fri 11/19/2021 12:19 PM
To: Pope,Bailee Elizabeth

CAUTION: This email originated from outside of our organization. Do not click links, open attachments, or respond unless you recognize the sender's email address and know the contents are safe.

Hi Bailee,
Yes, you may certainly use the Kinder1. I am pleased to see your interest. The age of >65 was a result of polling other institutions to see where their parameters were. Our research showed an average age of >50. I wish I could give you a simple answer of why we went with ?70, but I cannot remember what led us to that number. I feel that the age should be >65, I'm fine with you using that as your age parameter. Good luck! Please keep me posted on your results. Good luck!
Thanks,
Terry

...

Terry Kinsley, MSN
Coordinator, Nursing Skills Lab and Simulation
Assistant Clinical Professor
Our Lady of Elms College
Office: Lyons Center 409
Telephone: (413) 265-2229