

Implementation of Post-Fall Nursing Peer Reviews to Improve Patient Safety Culture

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She has no known conflicts of interest to disclose.

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Abstract

Falls in hospitalized patients are a widespread occurrence in the United States, resulting in unfavorable outcomes amongst patients, healthcare providers, and hospital organizations. Current fall prevention efforts have failed to adequately reduce patient fall rates. Nursing peer review (NPR) seeks to refine the quality and safety of patient care, making its use applicable in post-fall reviews. This evidenced-based quality improvement project implements a post-fall NPR program to examine patient falls in an inpatient setting, in addition to the facilitation of patient safety culture education. The Hospital Survey on Patient Safety Culture was used to assess nurses' perceptions of their units' patient safety culture. The pre- and post-survey results were analyzed using a two-tailed Mann-Whitney U test, determining significant differences in *event* ($U=2033, z=-2.81, p=.005$) and *learning* ($U=1196, z=-2.52, p=.012$). No significant differences were noted in *support* ($U=1587, z=-0.05, p=.959$), *prevent* ($U=1369, z=-0.70, p=.485$), and *rate* ($U=1355.5, z=-0.34, p=.737$). Post-fall NPR participation survey results were analyzed using descriptive statistics, showing that it improved patient safety culture (n=10, 91%), reduced "blame & shame" culture (n=9, 82%), and was a non-punitive learning method (n=10, 91%). Reviewing falls through NPR and educating nurses on patient safety culture can create a positive environment to learn from falls. Additional research is needed to determine the impact on patient fall rates.

Keywords: patient fall, fall prevention, inpatient, nurse, peer review, patient safety culture, Just Culture

Implementation of Post-Fall Nursing Peer Reviews to Improve Patient Safety Culture

As patient care in today's healthcare system becomes more complex, the overarching goal remains to provide high-quality, safe patient care. Despite this aim, adverse events continue to plague hospitals, creating undue harm to patients. One adverse event in particular, patient falls, occurs at prevalent rates in hospitals. Falls create detrimental consequences to both patients and hospitals, supporting the need to conduct a thorough literature review, to gather evidenced-based knowledge emphasizing patient falls.

Problem Statement

It is imperative to understand the definition of a patient fall, creating a clear perception of what classifies a fall in the hospital setting. Press Ganey (2020), the National Database of Nursing Quality Indicators' program director, defines a patient fall as:

A sudden, unintentional descent, with or without injury to the patient, that results in a patient coming to rest on the floor, on or against some other surface (e.g., a counter), on another person, or on an object (e.g., a trash can). (p. 2)

The Agency for Healthcare Research and Quality (AHRQ, 2018) reports that 700,000 to 1,000,000 hospitalized patients fall per year in the United States. The Joint Commission (2015) reports that 30-50% of patient falls result in injury. Most recently, a retrospective chart analysis of 2,299 inpatient falls over a five-year period discovered that 46.9% of falls resulted in patient injury (Trinh et al., 2020). Consequently, falls increase the length of hospital stays and create additional healthcare expenditures. The Joint Commission (2015) estimates that falls lengthen hospital stays by 6.3 days and cost \$14,000 per fall with injury.

Purpose and Rationale

Given the prevalence of patient falls, this evidenced-based practice synthesis seeks to understand current fall prevention interventions and post-fall review protocols that are implemented in the hospital setting. More precisely, it seeks to better understand interventions that are tailored to nursing staff, assessing their effectiveness in reducing patient falls. Additionally, literature regarding patient safety culture will be obtained, to determine its impact on patient outcomes. Ultimately, evidenced-based knowledge will be identified that seeks to prevent future patient falls.

Background and Significance

Adult Inpatient Units

The Joint Commission (2021) lists falls as a preeminent sentinel event reported to their organization. A fall is considered a sentinel event if it results in:

Any fracture; surgery, casting, or traction; required consult/management or comfort care for a neurological (e.g., skull fracture, subdural or intracranial hemorrhage) or internal (e.g., rib fracture, small liver laceration) injury; a patient with coagulopathy who receives blood products as a result of the fall; or death or permanent harm as a result of injuries sustained from the fall (not from physiologic events causing the fall). (Joint Commission, 2021, p. 4)

The mean age of patients falling in the hospital is 52.9 to 61.5 years old (Kobayashi et al., 2017; Najafpour et al., 2019; O'Neil et al., 2018). Risk factors associated with falling in the hospital include cognitive impairment, gait difficulties, incontinence, and lengthy hospital stays (Najafpour et al., 2019; O'Neil et al., 2018). Additionally, certain medications can increase patients' risk for falling. These medication classes include benzodiazepines, antipsychotics,

antidepressants, antihypertensives, and diuretics (de Vries et al., 2018; Najafpour et al., 2019; O'Neil et al., 2018).

Nursing Peer Review

As patient falls will inevitably occur, it is imperative for hospitals to engage in a process to examine the fall and to determine methods for successful fall prevention. The Joint Commission (2015) and AHRQ (2018) recommend the use of post-fall reviews to reduce patient falls. Debriefing after patient falls allows those involved to learn from the incident, therefore generating knowledge that can be spread to others to prevent future falls from reoccurring. Clinical peer review is a presiding method used to analyze such events, aiming to improve the quality and safety of patient care, as noted in Edwards' (2018a) 8-year longitudinal study of its use in United States hospitals. As this evidenced-based synthesis targets nursing staff specifically, a post-fall nursing peer review method will be examined.

Nursing peer review (NPR) was initially created by the American Nurses Association (ANA, 1988) to enhance the quality of nursing care. The guiding principles of NPR include that it: must occur between nurses of the same rank; is practice-focused; occurs in a timely and frequent manner; promotes a learning culture that is dedicated to patient safety and evidenced-based practice; is not anonymous; takes into consideration nurses' current developmental stages (ANA, 1988). George and Haag-Heitman (2015) further refined NPR based on the ANA's recommendations, creating an accountability-focused nursing framework to guide the process. Essential components include a responsive and safe learning environment, management support, shared leadership practices, and nurse empowerment (George & Haag-Heitman, 2015).

NPR enhances professional growth and development amongst nursing, strengthening the care that they provide to their patients (Bowen et al., 2019; Herrington & Hand, 2019).

Currently, limited research exists on the use of NPR to improve specific patient outcomes. Its intent is to improve patient care through adverse event review, making it applicable to patient falls, a widely prevalent adverse event in hospitals. Roberts and Cronin's (2017) descriptive study assessed NPR programs in 66 hospitals in the United States, concluding that further research is needed to determine the impact of NPR on specific measurable outcomes, supporting this objective to understand its effect on patient safety culture and inpatient fall rates.

Fall Prevention and Post-Fall Review

Turner and colleagues (2020) conducted a cross-sectional descriptive study to discern the current fall prevention interventions that are implemented in 60 hospitals across the United States. Although 90% of these hospitals are located in urban population centers, the hospitals' bed-capacities varied, increasing heterogeneity in the study sample. Additionally, 53% of the hospitals were certified. Each hospital in the study had a method for setting fall expectations, whether it be through fall policies (98%), reporting falls in annual hospital reports (95%), or rewards for top-performing units (40%). Fall prevention committees were utilized in 83% of the hospitals, providing resources and education within their organizations to decrease patient falls. Lastly, every hospital provided fall prevention education during new-staff orientation, although it was not always provided on an annual basis (Turner et al., 2020).

The AHRQ (2018) details safety huddles in their fall prevention toolkit. A safety huddle is defined as a, "short, informal meeting to cover issues related to patient safety" (AHRQ, 2018, p. 44). When a patient fall occurs, a post-fall huddle can be completed immediately, to identify potential causes of the fall and methods to prevent future falls (AHRQ, 2018). Jones and colleagues (2019) conducted a longitudinal study in 16 hospitals to analyze the influence of post-fall huddles on fall rates and safety culture. Results showed that post-fall huddles may decrease

repeat fall rates, as well as create more positive impressions of their hospitals' safety culture (Jones et al., 2019).

Although the intent of these interventions is to reduce patient falls, there is the potential for them to create negative consequences. One qualitative descriptive study sought to understand their influence on nurses and the care that they provide to fall-risk patients (King et al., 2016). The intense pressure to prevent falls created a culture of blame and shame, causing nurses to be fearful of falls. This fear led to the overidentification of fall risk patients and the overuse of alarms, which unnecessarily restricted patient movement and worsened patient outcomes (King et al., 2016). Bed alarms are used too frequently, are often ineffective, and create a false sense of security amongst nurses and patients (LeLaurin & Shorr, 2019; Staggs et al., 2020)

Patient Safety Culture

NPRs should be objective and nonjudgmental, enhancing nurses' accountability and responsibility (Herrington & Hand, 2019). Through appropriate NPR implementation, its use has been shown to improve the quality of patient care and reinforce a culture of patient safety (Herrington & Hand, 2019; Korkis et al., 2019). Just Culture concepts are relevant to topic of patient safety culture. According to the ANA (2015), Just Culture is:

An organizational environment that holds individuals accountable for performing duties of avoiding harm, producing outcomes and following policies, procedures or guidelines that: recognizes individuals choose and need to manage human error, at-risk behaviors and reckless behaviors; recognizes individuals make mistakes and systems fail; learns from mistakes, treat individuals fairly; coaches to avoid risky behaviors; and disciplines reckless or knowingly dangerous behaviors. (pp. 43-44)

To facilitate a Just Culture within an organization, it requires strong leadership that encourages open, honest, and teamwork-centered communication (Barkell & Snyder, 2021; O'Donovan et al., 2019). While it is imperative to hold individuals accountable for adverse events such as a patient fall, a culture of blame should be avoided. A Just Culture represents a nonpunitive environment, in which individuals can feel safe to report errors (Barkell & Snyder 2021; Edwards, 2018b; O'Donovan et al., 2019; White & Delacroix, 2020). Furthermore, it supports a positive response to errors that do occur, allowing individuals to learn from the incident (White & Delacroix, 2020). Application of NPRs can be an integral component of this safety culture, allowing nurses to safely identify what could be improved in patients' care. Ideally, their implementation will improve patient safety culture and lead to a reduction in patient fall rates.

Patient falls remain an extensive issue in today's healthcare system, creating unfavorable outcomes for patients and hospital organizations. Post-fall reviews are recommended, seeking to identify factors that contribute to patient falls and to disseminate those findings to prevent future falls. NPR is an applicable approach to guiding post-fall reviews, as its aim is to improve patient care. Currently, hospital organizations provide extensive education to nurses regarding patient falls, which can conversely cause nurses to be fearful of falls and negatively impact their patient care. NPR can improve this education process, by providing relevant and nonpunitive feedback, in order promote a safety culture that is committed to decreasing patient falls.

Internal Evidence

A 268-bed adult inpatient hospital, located in metropolitan Arizona, has identified patient falls as a top safety risk. Extensive fall prevention strategies have been employed throughout the organization. Despite their efforts, inpatient falls continue to occur at high rates. The

organization reports 567 inpatient falls from 2017 to 2020, with 159 (28%) of the falls resulting in injury to the patient. Of most importance is the harm to patients, although the financial consequences to the organization are relevant as well. The Centers for Medicare and Medicaid Services (CMS, 2020) categorizes falls as hospital-acquired conditions, in which they do not accept financial responsibility for fall-related costs, creating potentially avoidable expenditures to the hospital organization. Using the Joint Commission's (2015) estimate that each fall with injury costs \$14,000, using the 159 inpatient falls that resulted in injury at this project site, hypothetically it would have created 2.23 million in costs that were not reimbursed if these falls occurred in patients receiving CMS benefits.

Through support of the organization, current evidence was gathered to determine effective fall prevention interventions. This literature review has led to the clinically relevant PICOT question, "In adult inpatient nurses (P), how do post-fall nursing peer reviews (I), compared to current post-fall review protocols (C), affect their perception of patient safety culture (O) within 16 weeks (T)?"

Search Strategy

A thorough review of the literature was conducted utilizing the PICOT question to guide the scholarly search process. The databases used included Academic Search Premier, CINAHL, and PubMed. Relevant keywords were chosen to accurately reflect the PICOT and to strengthen the search results. Inclusion criteria limited search results to English language, research articles, and publication between 2015-2021. Exclusion criteria included publications prior to 2015, those not available in English language, and non-healthcare related research. Additionally, a grey literature search was performed, deriving regulatory data, government publications, and policy

statements. Applicable research articles obtained from the search underwent rapid critical appraisal, leading to the extensive evaluation of 10 studies to be used for this project.

Academic Search Premier

The keywords *nurse*, *peer review*, and *patient fall* were searched, yielding no results. The keywords *peer feedback*, *peer evaluation*, *hospital*, *inpatient*, *adverse event*, and *incident* were added and combined with Boolean connectors to yield 218 results. Adding the keywords *root cause analysis*, *after-action review*, and *adverse event review* then produced 42 results for in-depth review. Additionally, keywords *Just Culture*, *patient outcome*, *adverse event*, *incident*, and *patient safety* were searched, deriving 29 results to be reviewed.

CINAHL

The keywords *nurse*, *peer review*, and *patient fall* were searched, yielding no results. The keywords *peer feedback*, *peer evaluation*, *peer-to-peer*, and *after-action review* were added, resulting in 2,216 results. To further refine the search, keywords *hospital*, *inpatient*, *adverse event*, and *incident*, were added and combined with Boolean connectors to yield 218 results. Keywords *sentinel event* and *patient outcome* were included, producing 52 results for in-depth review. Lastly, a search with *Just Culture*, *patient outcome*, *adverse event*, *incident*, and *patient safety* keywords was conducted, yielding 45 results to be reviewed.

PubMed

The keywords *nurse*, *peer review*, and *patient fall* were searched, yielding 3 results. The keywords *peer feedback*, *peer evaluation*, *peer-to-peer*, *after-action review*, *hospital*, *inpatient*, *adverse event*, *sentinel event*, *incident*, and *outcome* were added and combined with Boolean connectors to yield 278 results. Additional keywords, *root cause analysis*, *adverse event review*, and *quality of care*, resulting in 89 results for in-depth review. A supplemental search was

conducted, utilizing *Just Culture*, *patient outcome*, *adverse event*, *incident*, and *patient safety* as key words, providing 49 results to be reviewed.

Critical Appraisal and Synthesis of Evidence

Rapid critical appraisal (RCA) of the literature was conducted, utilizing Melnyk and Fineout-Overholt's (2019) RCA process. Although NPR is recommended by the ANA, its use has not been heavily studied. Of the relevant literature, a combination of qualitative (see Appendix A, Table A1) and quantitative (see Appendix A, Table A2) were obtained, and further evaluated in a synthesis table (see Appendix A, Table A3). These studies do in fact represent low levels of evidence, yet their outcomes and themes effectively describe the benefits of NPR phenomena, making them applicable to this literature review.

Each study was conducted in an inpatient setting, with 90% occurring in United States hospitals. Further heterogeneity was displayed in the hospitals' variable bed capacities. The number of study participants were generally low, although this is to be expected given the low levels of evidence and limited research in this field. Three studies provided a detailed understanding of current fall prevention measures utilized in hospitals, concluding that more research is needed to discover methods to reduce patient falls. Additionally, three studies thoroughly described qualitative themes, including NPR's facilitation, barriers, lessons learned, and benefits, to better understand NPR integration. Furthermore, improved nurse satisfaction scores were shown in three NPR studies. Although not NPR-specific, two studies reported enhanced Just Culture adaption and refined quality improvement scores using clinical peer review.

Influence of Evidence

Despite the abundance of fall prevention efforts employed by hospital organizations, alarmingly high rates of patient falls continue to occur. The successful implementation of post-fall reviews is critical to learn from these adverse events and to prevent more falls from occurring in the future. A standardized approach for this process does not exist, calling for additional research to generate new evidence-based knowledge regarding post-fall reviews. NPR proves to be effective in improving patient care by empowering and educating nurses, yet more needs to be known regarding its ability to affect specific patient outcomes. Its use in post-fall reviews is intriguing, with the feasible potential to create a patient safety culture environment that prevents future patient falls.

Theory Application

George and Haag-Heitmann's (2015) accountability-focused theoretical framework fosters a culture that enhances the quality and safety of patient care. The framework's four concepts previously mentioned; a responsive environment, management, shared leadership development, and personal empowerment, are all essential to the facilitation of successful fall prevention. More specifically, NPR is a subcomponent of personal empowerment, ultimately enabling nurses to feel equipped to provide safe patient care. When combined with the framework's other concepts, ample behavioral change will be achieved to allow for improved nurse autonomy and accountability, inherently leading to an improvement in the quality and safety of patient care (George & Haag-Heitmann, 2015).

The structure of this project was created with this theoretical framework in mind. Through implementation of post-fall NPR, nurses will be held accountable for their care and will become more knowledgeable regarding fall prevention. Post-fall NPR incorporates shared leadership concepts through the facilitation of teamwork-centered communication. Additionally,

encouraging honest and open-ended discussions regarding patient falls enhances personal empowerment amongst nurses. A commitment to post-fall NPR creates a safe learning environment, in which patient safety becomes a priority. Lastly, this intervention has support from management, an essential component to improve their units' patient safety cultures.

Implementation Framework

The project site's evidenced-based practice model was utilized throughout the creation and implementation of this project. This model is the cornerstone process used to guide nursing evidenced-based practice projects at the selected organization. It includes seven steps; formulate a question, search for evidence, appraise the evidence, compare and contrast, decision options, evaluate, and disseminate. The organization identified patient falls as a top safety risk, lending itself to a relevant PICOT question, literature review, and critical appraisal, discerning the applicability of NPR in post-fall reviews.

According to stakeholders within the organization, post-fall NPR is a process that is currently being facilitated on two inpatient units. The organization has expressed interest in incorporating this practice on two additional inpatient units to gain more knowledge on its effect on patient safety culture and inpatient fall rates. Through extensive collaboration with the key stakeholders, an intervention was created. Outcome measures were further agreed upon, lending support to conduct this evidence-based quality improvement project. At the completion of the project, the results were disseminated across the organization.

Methods

Intervention

This evidence-based quality improvement project was conducted on two inpatient units, an intermediate care unit and a cardiovascular progressive care unit. These units represent similar

high-acuity patient populations, with a large prevalence of inpatient falls. The intervention targets inpatient nursing staff, whom are at the forefront of patient care and are most frequently involved in patient falls. Their perceptions of their units' patient safety culture were assessed, in addition to receiving education regarding post-fall NPR, patient safety culture, and inpatient fall prevention.

The intervention was piloted over 16 weeks, which included two weeks of gathering pre-survey data, 12 weeks of education and post-fall NPR implementation, and two weeks of gathering post-survey data. Falls create physical, emotional, and financial consequences to patients, healthcare providers, and healthcare organizations. This intervention seeks to improve the patient safety culture on each pilot unit, creating an environment where falls are freely discussed and learned from, with the future potential to determine its long-term impact on inpatient fall rates within this healthcare organization.

Fall Committee Education

Each pilot unit had a fall committee in place, consisting of a total of 24 nurses. These groups expressed the interest in incorporating post-fall NPR into their practice. Before the implementation of post-fall NPRs could begin, fall committee members needed to be educated on the process and its potential to impact the patient safety culture on their units. Three educational opportunities were provided to the fall committee members, in the form of a one-hour Zoom meeting. If a nurse was unable to attend one of these sessions, the educational material was sent to their workplace email. Educational tools utilized during this meeting included a PowerPoint presentation discussing internal fall data, post-fall NPR, and patient safety culture. Additionally, fall chart auditing was explained, utilizing the organization's electronic

medical record training environment. This training environment allowed fall committee members to familiarize themselves with chart auditing, without the use of protected health information.

Post-Fall NPRs

The post-fall NPRs were facilitated during monthly fall committee meetings. These one-hour meetings occurred over Zoom and were scheduled in advance for the third Monday of each month, to increase convenience for fall committee members. Both pilot units' fall committees were in attendance. Nurses involved in patient falls were also invited to participate by the project's Co-Investigator. If these nurses worked on the unit during these meetings, nursing management from each pilot unit agreed to provide patient coverage to allow the nurses to participate.

As patient falls occurred on each pilot unit, nursing management would promptly send the fall documents to the fall committee chairs. Two to three fall committee members per patient fall were assigned a post-fall NPR and were provided with the applicable fall documents. These documents were used to complete a chart audit, providing reviewers with relevant information to complete the post-fall NPR form. This form was created by the project site, assessing patients' fall risk factors, vital sign trends, and fall precaution measures that were in place prior to the fall. This protected health information was de-identified by peer reviewers prior to the fall committee meeting and was not visible to the project's Primary Investigator and Co-Investigator.

The format of the fall committee meetings was centered around the completed post-fall NPRs. To begin, peer reviewers shared their completed post-fall NPR forms. If the nurse involved in the fall was present, they were given the opportunity to discuss the event. This allowed for open, informal, and non-punitive dialogue amongst those in attendance. Information generated during this discussion was used to complete the falls peer review group summary and

recommendation form. Each fall took approximately 10 to 15 minutes to review. For any additional meeting time remaining, fall committee members collaboratively discussed current fall prevention methods on their units and brainstormed future fall prevention strategies.

Pilot Unit Education

Throughout the 12-week post-fall NPR implementation, education was provided to inpatient nurses on each pilot unit, which consists of approximately 250 nurses. These educational sessions occurred during four, in-person professional development day meetings, as well as two, Zoom unit-based team meetings. These meetings are a mandatory job requirement for inpatient nurses on each pilot unit, allowing this project's education to be integrated into these pre-scheduled meetings, therefore reflecting it not to be an additional requirement for participants. Closely matching the education provided to the fall committees, a brief PowerPoint presentation was given to discuss internal fall data, post-fall NPR, and patient safety culture.

Ethical Considerations

Prior to this project's implementation, project site approval was obtained. Furthermore, approval was received from the Arizona State University Institutional Review Board on July 29th, 2021 (see Appendix B). To maintain participant privacy, no personal identifying information was obtained, in which survey responses could not be directly linked to project participants. Survey data was safeguarded through the project site's secure server and a password encrypted computer. This data will be stored for a year after the project's completion date, at which it will then be permanently deleted. Access to these files will be limited to the project's Primary Investigator and Co-Investigator. Lastly, as mentioned above, protected health information that was used to complete the post-fall NPRs were deidentified prior to fall

committee meetings and were not available to the project's Primary Investigator and Co-Investigator.

Participants

The participants in this evidence-based quality improvement project include inpatient nurses on two pilot units. Approval from project site leadership was obtained to include this sample as participants in the project. Recruitment emails were sent by the project's Co-Investigator to the participants' workplaces emails, prior to survey distribution and as an invitation to attend the post-fall NPR if involved in a patient fall. A total of 24 inpatient nurses were members of the fall committees that completed the post-fall NPRs. The pilot unit education, as well as the pre- and post- surveys, were given to approximately 250 inpatient nurses. Exclusion criteria included nursing supervisors and managers. This sample did not include special populations: minors under the age of 18, adults who are unable to consent, prisoners, and economically or educationally disadvantaged individuals.

Instruments

Hospital Survey on Patient Safety

The AHRQ's (2019a) Hospital Survey on Patient Safety was used as a pre- and post-survey in this project (see Appendix C, Figure C1). This 40-item Likert-scale survey is free and available for public use. It was measured for validity using pilot test data from 25 hospitals and 4,345 hospital staff members across the United States (AHRQ, 2019b). The survey's items are grouped into 10 composite measures, all confirmed for reliability using Cronbach's alpha, with a domain range of 0.67 to 0.89 (AHRQ, 2019b). A high mean response to a survey item indicates that more nurses agree with the statement, while a low mean response indicates that more nurses disagree with the statement. Assessing nurses' perceptions of their units' patient safety culture

aligns with the project's theoretical framework, as this environment can improve the quality and safety of patient care, potentially impacting future inpatient fall rates.

Post-Fall Nursing Peer Review Survey

An additional post-fall NPR participation survey (see Appendix C, Figure C2) was created by the project's Co-Investigator. This survey was administered to fall committee members and nurses involved in patient falls who participated in the post-fall NPRs. Given that its validity and reliability could not be confirmed, it was reviewed by the project's Primary Investigator for its content and face validity. This six-item Likert-scale survey assessed participants' perceptions of post-fall NPRs' impact on nurse autonomy, accountability, and job satisfaction, as well as its influence on a patient safety culture versus a blame and shame culture. Participants' beliefs on whether post-fall NPR is a non-punitive response to error were also assessed. An additional open-ended question was included at the end of the survey to determine how post-fall NPRs could be improved, to refine the process and to assist the project site to potentially implement this intervention hospital-wide in the future.

These surveys were created using REDCap, the preferred web application for administering online surveys at the project site. The project's Co-Investigator was responsible for emailing each survey to inpatient nurses' workplace emails, to be completed by participants during their paid work shifts. A consent statement was included at the beginning of each survey. By responding "yes" to this statement, consent to participate was obtained, directing the participants to complete the survey. Demographics collected in each of these surveys included the nurses' age range, number of years as a nurse, number of years at the project site organization, highest level of education, and nurse certification status.

Data and Budget

Survey data was inputted into Intellectus Statistics statistical software. In accordance with recommendations from Intellectus statisticians, this data was further analyzed using descriptive statistics and a two-tailed Mann-Whitney *U* test, to describe the participant sample and to determine meaningful outcome variables from each survey. No grants or financial aid were attained for this project. All associated costs for project development and implementation were incurred by the project site and the project's Co-Investigator (see Appendix D).

Results

Demographic Data

Descriptive statistics were used to describe the surveys' samples. Eighty-one participants completed the Hospital Survey on Patient Safety pre-survey. The most frequently observed age range was 20 to 29 years old (n=35, 43%), years as a nurse was 1 to 4 years (n=30, 37%), years at the organization was 1 to 4 years (n=47, 58%), and highest level of education was a Bachelor degree (n=61, 75%). Thirty-nine participants completed the Hospital Survey on Patient Safety post-survey. The most frequently observed age range was 20 to 29 years old (n=18, 46%), years as a nurse was 1 to 4 years (n=15, 38%), years at the organization was 1 to 4 years (n=20, 51%), and highest level of education was a Bachelor degree (n=27, 69%). Eleven participants completed the post-fall NPR survey. The most frequently observed age range was 50 years or older (n=4, 36%), years as a nurse was 5 to 9 years (n=3, 27%) 10 to 14 years (n=3, 27%), or 15 years or more (n=3, 27%), years at the organization was 5 to 9 years (n=8, 73%), and highest level of education was a Master or doctorate degree (n=6, 55%).

Outcomes

Hospital Survey on Patient Safety

Pre-survey (n=81) and post-survey (n=39) data were analyzed using a two-tailed Mann-Whitney U test, to determine if there were statistically significant differences in survey responses from the two independent groups, based on an alpha of .05. The results of the two-tailed Mann-Whitney U test was significant for *event* ($U=2033$, $z=-2.81$, $p=.005$). The mean rank for the pre-survey was 66.10 and the mean rank for the post-survey was 48.87. The lower mean rank score suggests that the intervention significantly decreased nurses' beliefs that a reported event feels like the person is being written up, not the problem. Additionally, the results were significant for *learning* ($U=1196$, $z=-2.52$, $p=.012$). The mean rank for the pre-survey was 55.77 and the mean rank for the post-survey was 70.3. The higher mean rank score suggests that the intervention significantly increased nurses' beliefs that their unit focuses on learning rather than blaming individuals. The results were not significant for *support* ($U=1587$, $z=-0.05$, $p=.959$), *prevent* ($U=1369$, $z=-0.70$, $p=.485$), and *rate* ($U=1355.5$, $z=-0.34$, $p=.737$). Given that there were no statistically significant changes in mean rank scores, it suggests that the intervention had no impact on nurses' beliefs regarding the support for staff involved in patient safety errors, preventative discussions after errors occur, and their units' patient safety ratings.

Post-Fall Nursing Peer Review Survey

Seven inpatient falls underwent a post-fall NPR during project implementation. Participation survey (n=11) data was analyzed using descriptive statistics, to examine and summarize nurses' experiences in post-fall NPR participation. Post-fall NPR improved patient safety culture (n=10, 91%), reduced blame and shame culture (n=9, 82%), and was a non-punitive learning method (n=10, 91%). Regarding its impact on nurses, it improved their autonomy (n=9, 82%), accountability (n=11, 100%), and job satisfaction (n=6, 55%).

Clinical Significance

Given the statistically significant improvements in nurses' beliefs that a reported event concentrates on the problem itself and that their units focus on learning rather than blaming individuals, a vast number of positive clinical outcomes may be seen. In alignment with this project's goals, a reduction in patient falls would ideally occur. Enhancing the units' patient safety culture, as shown in the results from the post-fall NPR participation survey, may create a culture that safely discusses all adverse events (ie: medication errors, hospital-acquired conditions, etc.). As adverse events cannot be entirely avoided in healthcare, a positive response to these events is integral to prevent them from occurring in the future.

Project Impact

Enhancing patient safety culture using post-fall NPR creates a unit committed to inpatient fall prevention. It promotes a non-punitive learning environment, allowing for falls to be freely discussed and learned from. Reducing nurses' feelings of blame and shame after a fall can facilitate a safe environment, producing meaningful fall prevention discussions. Ultimately, this environment may lead to a reduction in patient falls, improving outcomes for patients, healthcare providers, and hospital organizations.

Sustainability

This evidence-based quality improvement project was created with sustainability in mind. Previously, the project site had implemented post-fall NPR on two inpatient units, with a goal to implement it hospital-wide. This project provides additional knowledge on the benefits of post-fall NPR, as well as opportunities for improvement, to enhance the process and to encourage nurse participation in the future. The project site is committed to creating a patient safety culture that discusses adverse events in a non-punitive manner. Given the intervention's potential to

reduce patient falls and the associated financial consequences, it is likely cost-effective to continue the post-fall NPR program.

Discussion

Summary

This evidence-based quality improvement project determined that post-fall NPR enhanced patient safety culture, while reducing a blame and shame environment. Additionally, participants agreed that it was a non-punitive learning method. These findings are in accordance with the current evidence-based literature (Barkell & Snyder, 2021; Edwards, 2018b; Herrington & Hand, 2019; Korkis et al., 2019; O'Donovan et al., 2019; White & Delacroix, 2020).

Additional knowledge garnered from this project include an improvement in nurses' beliefs that their units focus on learning from adverse events after they occur, rather than blaming the individuals involved in the incident.

Strengths and Limitations

The creation and implementation of this evidence-based quality improvement project were strengthened by the project site's stakeholder support. This organization is Magnet[®] recognized, in which this project's goals to improve patient safety culture directly align with Magnet's nursing excellence values. Each unit had fall committees in place, consisting of nurses committed to patient safety and fall prevention. This allowed for seamless integration of the post-fall NPR and educational interventions. Additionally, these interventions could be facilitated through Zoom, increasing the convenience for the project's participants. Furthermore, a large sample size was obtained, allowing for meaningful conclusions to be drawn.

Limitations include that the project's outcomes were dependent on real-time falls occurring. The project's short 16-week time frame was a hindrance, in that the project was near

completion as the participants expressed more comfortableness with the post-fall NPR process. It was also determined that the chart audits needed to complete the post-fall NPR form were time consuming. When reviewing the post-fall NPRs at fall committee meetings, limited participation from the nurses involved in the falls were noted. This hesitation may be attributed to a fear to participate, potentially due to inadequate post-fall NPR and patient safety culture education. Lastly, this project was implemented during the COVID-19 pandemic, in which the project site's resources were heavily allocated towards relief efforts.

Recommendations

This evidence-based quality improvement project determined that a post-fall NPR program enhanced patient safety culture on two inpatient units, therefore reducing a blame and shame environment. Post-fall NPRs were viewed as a non-punitive method to learn from patient falls, creating relevant recommendations and encouraging fall prevention discussions. This project did not assess patient falls rates, given its short time frame. To determine its impact on inpatient falls, a longitudinal study is recommended to analyze trends in fall rates.

To improve the post-fall NPR process, an integration of the applicable incident forms and fall documentation into a single location within the electronic medical record is recommended. The chart audits were deemed as time consuming, creating challenges in promptly and thoroughly completing the post-fall NPR forms. Additionally, more education must be facilitated to inpatient nurses, reducing their potential fear to participate. To best learn from a patient fall, the input from the nurse involved is invaluable. Creating an environment where nurses feel safe to freely discuss and learn from falls is instrumental, ultimately improving outcomes for patients, healthcare providers, and hospital organizations.

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Appendix A

Evaluation and Synthesis Tables

Table A1

Evaluation Table Qualitative Studies

Citation	Theory/Conceptual Framework	Design/Method/Sampling	Sample/Setting	Major Themes Studied/Definitions	Measurement/Instrumentation	Data Analysis	Findings/Themes	Level/Quality of Evidence/Decision for Practice/Application to Practice
<p>Bowen-Brady et al., (2019). Asking for feedback: Clinical nurses' perceptions of a peer review program in a community hospital.</p> <p>Country: US</p> <p>Funding: None</p> <p>Bias: None listed</p>	<p>Not stated, inferred phenomenology framework</p>	<p>Design: Descriptive qualitative with focus groups and interviews</p> <p>Purpose: Understand nurses' perceptions of an annual peer review process</p>	<p>N = 11</p> <p>Demographics:</p> <ul style="list-style-type: none"> -Nurses -25-59 years old (72.2%) -Caucasian (81.82%) -Bachelor's (81.82%) ->20 years experience (54.55%) <p>Setting: 162-bed community hospital</p> <p>Exclusion:</p> <ul style="list-style-type: none"> -Employment < 6 months -No previous participation in hospital's NPR process <p>Attrition: 0</p>	<p>Research Questions:</p> <ol style="list-style-type: none"> 1. What is NPR 2. How are facilitators part of the NPR process? 3. What are barriers to NPR? 4. What can be learned from NPR? <p>Definitions: NPR – process by which nurses assess, monitor, & make judgements about the quality of nursing care provided by peers</p>	<p>Focus groups</p> <p>Open-ended questionnaires</p> <p>Digital voice recorders</p> <p>Professional transcription service</p>	<p>Calaizzi's analysis</p>	<p>Themes:</p> <ol style="list-style-type: none"> 1. What is NPR? -It's professional, not personal -Personal growth & development 2. Facilitating the NPR process -Peer facilitators: an essential role -Education is key 3. Barriers to NPR -Dedicated time/space/privacy/leadership support -Clinical nurse engagement -Difficult conversations 4. Lessons learned -1st year vs. 2nd year meaningful experience 	<p>Level of Evidence: VI</p> <p>Strengths: strong qualitative design; incorporating the American Nurses Associations' (ANA) peer review guidelines into clinical practice</p> <p>Weaknesses: small N; conducted in small community hospital (limits generalizability); low level of evidence</p> <p>Application: NPR plays an essential role in improving that quality & safety of nursing care; repeated participation enhances nurses' understanding of peer review; supports use</p>

Key: **AE** – adverse event; **ANOVA** – analysis of variance; **DS** – databases searched; **DV** – dependent variable; **EHR** – electronic health record; **IQR** – interquartile range; **IV** – independent variable; **M** – median; **N** – number of participants; **NDQNI** – National Database of Nursing Quality Indicators; **No.** – number; **NPR** – nursing peer review; **PR** – peer review; **PRISMA** – Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **QI** – quality improvement; *d* – Cohen's *d*; *p* – p value; ΔI – pretest to posttest change

Citation	Theory/Conceptual Framework	Design/Method/Sampling	Sample/Setting	Major Themes Studied/Definitions	Measurement/Instrumentation	Data Analysis	Findings/Themes	Level/Quality of Evidence/Decision for Practice/Application to Practice
							-Modeling lifelong learning -A request for on-going peer review to hold one another accountable	of ANA Guidelines and Contemporary Principles of Peer Review Process
<p>King et al., (2018). Impact of fall prevention on nurses and care of fall risk patients.</p> <p>Country: US</p> <p>Funding: Clinical and Translation Science Award program through NIH National Center for Advancing Translation Sciences</p> <p>Bias: None</p>	Grounded Theory	<p>Design: Qualitative with focus groups and interviews</p> <p>Purpose: Explore nurses' experiences with fall prevention in hospital settings & the impact of these experiences on how nurses provide care to fall risk patients</p>	<p>N = 27</p> <p>Demographics: -34.3% patient bed days (site A) & 54.4% (site B) are occupied by patients 65 years old and older</p> <p>Setting: -530-bed hospital (site A) & 81-bed teaching hospital (site B) -4:1 nurse to patient ratio</p> <p>Exclusion: -Nurses not in formal leadership roles -Not employed on medical, surgical, or medical/surgical unit with patients 65 years and older</p> <p>Attrition: 0</p>	<p>Research Questions:</p> <p>1. What are inpatient nurses' experiences with fall prevention?</p> <p>2. How do these experiences impact how nurses provide care to fall risk patients?</p>	<p>Focus group</p> <p>1:1 interviews</p> <p>Audio recorders</p> <p>Transcription</p>	Grounded dimensional analysis; open, axial & selective coding	<p>Themes:</p> <p>1. Fall Message: -“Zero falls” message -Identifying units as “high-fall” or “low-fall” units -Varying fall message intensity depending on how often, who sent it, and the tone of the message</p> <p>2. Intense Messaging -Fearful of falls -Culture of blame or shame</p> <p>3. Impact on Nursing Practice: -Overidentification of fall risk patients -Restricting pts' movement -Overwhelmed with fall prevention</p> <p>4. Conditions to Progress Fall Risk Patients</p>	<p>Level of Evidence: VI</p> <p>Strengths: strong qualitative design; heterogenic setting sample</p> <p>Weakness: small N; limited to medical-surgical units (limits generalizability); low level of evidence</p> <p>Application: Intense fall prevention pressure creates negative outcomes; leads to restriction of patients' movement, impeding w/ their recovery; dependency on bed/chair alarms, which creates chaos; places fear of falling in patients</p>

Key: **AE** – adverse event; **ANOVA** – analysis of variance; **DS** – databases searched; **DV** – dependent variable; **EHR** – electronic health record; **IQR** – interquartile range; **IV** – independent variable; **M** – median; **N** – number of participants; **NDQNI** – National Database of Nursing Quality Indicators; **No.** – number; **NPR** – nursing peer review; **PR** – peer review; **PRISMA** – Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **QI** – quality improvement; *d* – Cohen’s *d*; *p* – p value; ΔI – pretest to posttest change

Citation	Theory/Conceptual Framework	Design/Method/Sampling	Sample/Setting	Major Themes Studied/Definitions	Measurement/Instrumentation	Data Analysis	Findings/Themes	Level/Quality of Evidence/Decision for Practice/Application to Practice
							-Patient ambulation encouraged & rewarded -Investigating the environment & risk factors surrounding the fall, rather than the individual nurse themselves	
LeLaurin & Shorr, (2019). Preventing falls in hospitalized patients: State of the science. Country: US Funding: None Bias: None	Not stated, inferred Grounded Theory	Design: Meta-synthesis Purpose: To examine fall prevention intervention strategies in hospitals	N = 58 Inclusion: Hospital settings Exclusion: Outpatient or community dwelling settings	Themes: 1. Single Fall Prevention Interventions 2. Multifactorial Interventions	Varied based on study reviewed	Not described	1. Single Fall Prevention Interventions -Fall risk identification -Alarms -Sitters -Intentional rounding -Patient education Environmental modifications -Physical restraints -Non-slip socks 2. Multifactorial Interventions -Limited evidence	Level of Evidence: V Strengths: large N Weaknesses: few high-level studies were reviewed; did not outline search strategy or data analysis techniques Application: Most fall prevention literature includes quality improvement studies, thus higher-level research studies need to be conducted
Liukka et al., (2020). Action after adverse events in healthcare: An integrative review. Country: Finland Funding: None	Whittemore and Knafl's five stages of integrative review	Design: Systematic review Purpose: Synthesize knowledge, theory, and evidence regarding action after AEs in	N = 25 DS: Scopus; CINAHL; Cochrane; PubMed Inclusion: published 2009-2018; English	Research Question: What are key elements of action immediately after AEs in healthcare organizations? Themes: 1. First Victim	Varied based on study reviewed	Inductive content analysis; PRISMA	1. First Victim -Attention in revealing an AE -Communication after AEs -Victim support -Complete apology 2. Second Victim	Level of Evidence: V Strengths: strong study design; thorough search strategy Weaknesses: small N; few high-level studies

Key: **AE** – adverse event; **ANOVA** – analysis of variance; **DS** – databases searched; **DV** – dependent variable; **EHR** – electronic health record; **IQR** – interquartile range; **IV** – independent variable; **M** – median; **N** – number of participants; **NDQNI** – National Database of Nursing Quality Indicators; **No.** – number; **NPR** – nursing peer review; **PR** – peer review; **PRISMA** – Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **QI** – quality improvement; **d** – Cohen’s *d*; **p** – p value; **ΔI** – pretest to posttest change

Citation	Theory/Conceptual Framework	Design/Method/Sampling	Sample/Setting	Major Themes Studied/Definitions	Measurement/Instrumentation	Data Analysis	Findings/Themes	Level/Quality of Evidence/Decision for Practice/Application to Practice
Bias: None		hospitals and primary care units	language; reported action after AE Exclusion: AE reports; not an empirical study or literature review	2. Second Victim 3. Third Victim Definitions: 1 st victim – patients and their families 2 nd victim – healthcare providers 3 rd victim – healthcare organizations			-Support type -Coping strategies -Professional changes after AEs -Learning about AE phenomenon 3. Third Victim -Action after AE strategy -Action after AE infrastructure -Open disclosure about AE -Action after AE training	were reviewed; omitted national guidelines Application: Action after AEs should take into account first, second, and third victims, in order to develop evidenced-based processes to respond to AEs

Key: **AE** – adverse event; **ANOVA** – analysis of variance; **DS** – databases searched; **DV** – dependent variable; **EHR** – electronic health record; **IQR** – interquartile range; **IV** – independent variable; **M** – median; **N** – number of participants; **NDQNI** – National Database of Nursing Quality Indicators; **No.** – number; **NPR** – nursing peer review; **PR** – peer review; **PRISMA** – Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **QI** – quality improvement; **d** – Cohen’s *d*; **p** – p value; **ΔI** – pretest to posttest change

Table A2

Evaluation Table Quantitative Studies

Citation	Theory/Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement/Instrumentation	Data Analysis	Findings/Results	Level/Quality of Evidence/Decision for Practice/Application to Practice
<p>Edwards, (2018a). In pursuit of quality and safety: An 8-year study of clinical peer reviews best practices in US hospitals.</p> <p>Country: US</p> <p>Funding: None</p> <p>Bias: None</p>	<p>None stated, inferred Social Cognitive Theory</p>	<p>Design: Longitudinal cohort with surveys</p> <p>Purpose: Assist healthcare leaders in re-designing clinical PR programs to maximize the impact on the quality and safety of patient care</p>	<p>N = 270</p> <p>Response Rate: 270/457 (59%)</p> <p>Demographics: Regions: -Northeast (N=60) -South (N=61) -Midwest (N=95) -West (N=54)</p> <p>Staffed beds: >500 (N=48) 200-499 (N=104) 50-199 (N=90) <50 (N=28)</p> <p>Council of Teaching Hospitals members (N=62)</p> <p>Setting: Acute care hospitals in US</p>	<p>IV: Clinical PR</p> <p>DV1: Annual rate of PR program change</p> <p>DV2: QI model scores</p>	<p>Online survey</p>	<p>Paired <i>t</i>-tests; Pearson chi-square; ordinal logistical regression</p>	<p>DV1: Mean 20% [11-24%]</p> <p>DV2: Mean increase 5.6 [2.9-8.3]</p>	<p>Level of Evidence: IV</p> <p>Strengths: large N; heterogenic sample; strong data analysis</p> <p>Weaknesses: convenience sampling method; data self-reported and un-audited</p> <p>Application: There is a large gap between clinical PR and best practices used to achieve high-quality and safe patient care, reinforcing the need for organizations to revisit their current programs</p>
<p>Edwards, (2018b). An assessment of the impact of Just Culture on quality</p>	<p>None stated, inferred Social Cognitive Theory</p>	<p>Design: Mixed methods with surveys</p>	<p>N = 270</p> <p>Response Rate: 270/457 (59%)</p>	<p>IV: Clinical PR</p> <p>DV1: Just Culture adoption</p>	<p>Online surveys (yes/no; 6-point Likert scale)</p>	<p>Pearson chi-square; ANOVA</p>	<p>DV1: N=211, 79%</p> <p>DV2: -Strongly positive (N=33, 16%)</p>	<p>Level of Evidence: IV</p> <p>Strengths: large N; heterogenic sample; strong data analysis</p>

Key: **AE** – adverse event; **ANOVA** – analysis of variance; **DS** – databases searched; **DV** – dependent variable; **EHR** – electronic health record; **IQR** – interquartile range; **IV** – independent variable; **M** – median; **N** – number of participants; **NDQNI** – National Database of Nursing Quality Indicators; **No.** – number; **NPR** – nursing peer review; **PR** – peer review; **PRISMA** – Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **QI** – quality improvement; *d* – Cohen’s *d*; *p* – p value; ΔI – pretest to posttest change

Citation	Theory/Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement/Instrumentation	Data Analysis	Findings/Results	Level/Quality of Evidence/Decision for Practice/Application to Practice
<p>and safety in US hospitals.</p> <p>Country: US</p> <p>Funding: None</p> <p>Bias: None</p>		<p>Purpose: Assemble data relevant to hospital safety culture and clinical PR, to further assess the impact of Just Culture on quality and safety</p>	<p>Demographics: Regions: -Northeast (N=60) -South (N=61) -Midwest (N=95) -West (N=54)</p> <p>Staffed beds: >500 (N=48) 200-499 (N=104) 50-199 (N=90) <50 (N=28)</p> <p>Council of Teaching Hospitals members (N=62)</p> <p>Setting: Acute care hospitals in US</p>	<p>DV2: Perceived impact of Just Culture</p> <p>DV3: Associations with PR program and Just Culture adoption</p> <p>DV4: Associations with PR program and Just Culture impact</p>			<p>-Positive (N=77, 37%) -Somewhat positive (N=68, 33%) -No apparent effect (N=27, 13%) -Somewhat negative (N=2, 1%) -Negative (N=1, 0%) -Strongly negative (N=1, 0%) -No response (N=1, 0%)</p> <p>DV3: -Organizational leadership (p=.005) -Primary goal to improve quality and safety (p <.001) -Monitoring counts/patterns of system or process of care improvement opportunities identified (p=.005) -Documenting cases in which excellent clinical performance was recognized (N=.001)</p> <p>DV4: -Organizational leadership (p <.001)</p>	<p>Weaknesses: self-reported data; variation in the interpretation of Just Culture; convenience sampling</p> <p>Application: More research is needed regarding the efficacy of Just Culture on the quality and safety of patient care</p>

Key: **AE** – adverse event; **ANOVA** – analysis of variance; **DS** – databases searched; **DV** – dependent variable; **EHR** – electronic health record; **IQR** – interquartile range; **IV** – independent variable; **M** – median; **N** – number of participants; **NDQNI** – National Database of Nursing Quality Indicators; **No.** – number; **NPR** – nursing peer review; **PR** – peer review; **PRISMA** – Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **QI** – quality improvement; **d** – Cohen’s *d*; **p** – p value; **ΔI** – pretest to posttest change

Citation	Theory/Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement/Instrumentation	Data Analysis	Findings/Results	Level/Quality of Evidence/Decision for Practice/Application to Practice
							-Likelihood of self-reporting cases for PR (p=.003) -Quality of case review (p<.001) -Level of reviewer participation in PR process (p<.001) -Perceived PR impact on quality and safety (p<.001) -Medical staff perceptions of the PR program (p<.001)	
Herrington & Hand, (2019). Impact of nurse peer review on a culture of safety. Country: US Funding: None Bias: None	None stated, inferred Social Cognitive Theory	Design: Descriptive with surveys Purpose: Develop, implement, and evaluate an NPR program	N = 26 Demographics: Nurses with experience: <1 year (N=3) 1-5 years (N=6) 6-8 years (N=8) 11-15 years (N=3) 16-20 years (N=4) >20 years (N=2) Setting: 355-bed acute care hospital in Midwestern US; Magnet; participates in NDQNI Inclusion: nurses on pediatric, neonatal intensive care,	IV: NPR program DV1: Mistakes lead to positive change DV2: Staff will freely speak up	Pre and post assessments using the Agency for Healthcare Research and Quality Hospital Survey	Paired sample <i>t</i> -tests; Cohen's <i>d</i>	DV1: $p < .001, d = 1.31$ DV2: $p = .002, d = 0.67$	Level of Evidence: VI Strengths: heterogenic sample; strong data analysis Weaknesses: small N; low level of evidence; focus on one geographical area Application: NPR is a valuable tool for case view that allows nurses to speak up, receive valuable feedback, and create an environment the supports a safety of patient culture

Key: **AE** – adverse event; **ANOVA** – analysis of variance; **DS** – databases searched; **DV** – dependent variable; **EHR** – electronic health record; **IQR** – interquartile range; **IV** – independent variable; **M** – median; **N** – number of participants; **NDQNI** – National Database of Nursing Quality Indicators; **No.** – number; **NPR** – nursing peer review; **PR** – peer review; **PRISMA** – Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **QI** – quality improvement; *d* – Cohen's *d*; *p* – p value; ΔI – pretest to posttest change

Citation	Theory/Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement/Instrumentation	Data Analysis	Findings/Results	Level/Quality of Evidence/Decision for Practice/Application to Practice
			postpartum, or labor and delivery units Attrition: 0					
Korkis et al., (2019). Mentoring clinical nurses toward a just culture. Country: US Funding: None Bias: None	None stated, inferred Social Cognitive Theory	Design: Descriptive-mixed methods with questionnaires Purpose: To analyze an NPR that supports QI and Just Culture principles through assigned time for facilitated, peer-to-peer, nonpunitive dialogue that focuses on clinician performance and systems improvement	N= 13 Demographics: Nurses represented from each specialty area Case type: Anesthesia; blood transfusion; diagnoses/treatments/orders; falls; tubes/intravenous lines/drains; delay in treatment; medication issues Setting: 265-bed acute care hospital on Pacific coast; unionized; Magnet; employs 1,000 nurses Attrition: 0	IV: NPR program DV1: Understanding of NPR DV2: Comfort with NPR DV3: Comfort to initiate safety conversations Research Question: What are your top-2 take away points from participating in NPR?	Pre and post questionnaires (1 open-ended narrative & 3 closed-ended items using 5-point Likert scale)	Descriptive statistics	DV1: ΔI: 1.44 DV2: ΔI: 1.31 DV3: ΔI: 0.46 Themes: -Learning experience -NPR council was thoughtful & courteous -Nonpunitive -Improved nurses' autonomy & accountability	Level of Evidence: VI Strengths: measured quantifiable outcomes; assessed a variety of case types Weaknesses: small N; low level of evidence; focus on one geographical area Application: Implementing a mentorship-based NPR program encourages nurse participation and advances Just Culture principles
Roberts & Cronin, (2017). A descriptive study of nursing peer-review	Not stated, inferred Grounded Theory	Design: Descriptive with surveys Purpose: Assess the types of NPR	N = 41 Demographics: Bed-size: 75 patients->500 patients	IV: NPR program DV1: NPR program description	Telephone or online surveys	Descriptive statistics	DV1: - Case review/root cause analysis structure (N=30, 73%)	Level of Evidence: VI Strengths: heterogenic sample - variable hospital locations, sizes

Key: **AE** – adverse event; **ANOVA** – analysis of variance; **DS** – databases searched; **DV** – dependent variable; **EHR** – electronic health record; **IQR** – interquartile range; **IV** – independent variable; **M** – median; **N** – number of participants; **NDQNI** – National Database of Nursing Quality Indicators; **No.** – number; **NPR** – nursing peer review; **PR** – peer review; **PRISMA** – Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **QI** – quality improvement; *d* – Cohen’s *d*; *p* – p value; ΔI – pretest to posttest change

Citation	Theory/Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement/Instrumentation	Data Analysis	Findings/Results	Level/Quality of Evidence/Decision for Practice/Application to Practice
<p>programs in US Magnet hospitals.</p> <p>Country: US</p> <p>Funding: None</p> <p>Bias: None</p>		<p>programs in US Magnet hospitals</p>	<p>Hospital type: General acute care; specialty; government; teaching/academic medical center</p> <p>Setting: Magnet hospitals representing 9 geographical regions throughout the US</p> <p>Attrition: 0</p>	<p>DV2: NPR outcome measurement</p> <p>DV3: NPR barriers</p>			<p>-Preemptive investigation (N=1, 2%)</p> <p>-Other (N=10, 25%)</p> <p>DV2:</p> <p>-No. of cases (N=6, 15%)</p> <p>-No. of systematic changes (N=14; 34%)</p> <p>-No. of improvements (N=2, 5%)</p> <p>-Improvement in specific outcome (N=5, 12%)</p> <p>-Improvement in nurse satisfaction (N=1, 2%)</p> <p>-Other (N=9, 22%)</p> <p>-None (N=15, 37%)</p> <p>DV3:</p> <p>-Nurses unable to distinguish or lack of agreement on practice variations (N=7, 17%)</p> <p>-Coworkers view conversations at criticism (N=13, 32%)</p> <p>-Uncomfortable approaching peers or fear retribution (N=10, 25%)</p> <p>-Worry labeled as troublemaker (N=2, 5%)</p>	<p>& types (increases generalizability; first known study to evaluate current NPR program in place</p> <p>Weaknesses: small N; low level of evidence; survey allowed for answers to be given with varying descriptions – some answers were short & some were more descriptive</p> <p>Application: There is wide variability of NPR programs in the US and many are not supported by data, more research is needed to measure the outcomes of NPR programs</p>

Key: **AE** – adverse event; **ANOVA** – analysis of variance; **DS** – databases searched; **DV** – dependent variable; **EHR** – electronic health record; **IQR** – interquartile range; **IV** – independent variable; **M** – median; **N** – number of participants; **NDQNI** – National Database of Nursing Quality Indicators; **No.** – number; **NPR** – nursing peer review; **PR** – peer review; **PRISMA** – Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **QI** – quality improvement; *d* – Cohen’s *d*; *p* – p value; ΔI – pretest to posttest change

Citation	Theory/Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement/Instrumentation	Data Analysis	Findings/Results	Level/Quality of Evidence/Decision for Practice/Application to Practice
							-Lack of support or change in practice (N=4, 10%) -Nurses feel that the primary nurse is in charge (N=0, 0%) -Time to do peer review (N=9, 22%) -Lack of cases for review or participation (N=5, 12%) -Other (N=3, 7%) -None (N=11, 27%)	
<p>Turner et al., (2020). Fall prevention implementation strategies in use at 60 United States hospitals: A descriptive study.</p> <p>Country: US</p> <p>Funding: National Institute on Aging</p> <p>Bias: None</p>	Not stated, inferred Grounded Theory	<p>Design: Descriptive cross-sectional with surveys</p> <p>Purpose: Identify and describe the prevalence of specific hospital fall prevention implementation strategies</p>	<p>N = 60</p> <p>Response Rate: 60/80 (75%)</p> <p>Demographics: Hospital ownership: -Not-for-profit (N=59, 98%) -For profit (N=1, 2%)</p> <p>Bed size: <200 beds (N=32, 53%) >200 beds (N=28, 47%)</p> <p>-Urban (N=54, 90%)</p> <p>-Magnet (N=32, 53%)</p>	<p>IV: Fall prevention strategies</p> <p>DV1: Leadership support</p> <p>DV2: Education for staff, patients, and families</p>	<p>Online Press Ganey survey</p> <p>NDNQI site coordinator</p>	<p>Descriptive statistics; complete case analysis; Reporting of Observational Studies in Epidemiology checklist</p>	<p>DV1 (N=60): 1. Setting expectations: -Used at least 1 setting expectations strategy (N=60, 100%) -Falls policies have been updated in last 3 years (N=59, 98%) -Falls included in annual board of trustees' report (N=57, 95%) -Falls reviewed quarterly by top leadership (N=56, 93%) -Safety officer or director (N=39, 65%) -Unit manager (N=24, 40%)</p>	<p>Level of Evidence: VI</p> <p>Strengths: heterogenic hospital size; first known study to examine which hospital fall prevention strategies are being used and how they are implemented</p> <p>Weaknesses: small N; low level of evidence; urban locations overrepresented; hospitals self-selected to participate</p> <p>Application: Further research is needed to examine fall prevention strategies and which are most effective in</p>

Key: **AE** – adverse event; **ANOVA** – analysis of variance; **DS** – databases searched; **DV** – dependent variable; **EHR** – electronic health record; **IQR** – interquartile range; **IV** – independent variable; **M** – median; **N** – number of participants; **NDQNI** – National Database of Nursing Quality Indicators; **No.** – number; **NPR** – nursing peer review; **PR** – peer review; **PRISMA** – Preferred Reporting Items for Systematic Reviews and Meta-Analyses; **QI** – quality improvement; *d* – Cohen’s *d*; *p* – p value; ΔI – pretest to posttest change

Citation	Theory/Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement/Instrumentation	Data Analysis	Findings/Results	Level/Quality of Evidence/Decision for Practice/Application to Practice
			<p>Setting: US hospitals participating in NDQNI</p>				<p>2. Providing rewards (for-high performing units)</p> <p>3. Providing support: -Used at least 1 support strategy for low performing units (N=37, 62%) -Quality management/safety consultation (N=30, 50%) -Interdisciplinary consultation (N=13, 22%) -Additional equipment or furniture (N=10, 17%) -Additional staffing (N=6, 10%) -Chair alarms (N=58, 97%) -Bed alarms (N=54, 90%) -Sitters (N=53, 88%) -Low beds (N=37, 62%) -Safety equipment (N=27, 45%)</p> <p>DV2 (N=58): 1. Education at staff orientation: -Overall (N=58, 100%)</p>	<p>reducing falls, guiding future fall prevention intervention development</p>

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Citation	Theory/Conceptual Framework	Design/Method	Sample/Setting	Major Variables & Definitions	Measurement/Instrumentation	Data Analysis	Findings/Results	Level/Quality of Evidence/Decision for Practice/Application to Practice
							-Nursing staff only (N=45, 78%) -All employees (N=13, 22%) 2. Annual staff training: -Overall (N=40, 69%) -Nursing staff only (N=24, 41%) -All employees (N=16, 28%) 3. Patient/families: -1-on-1 education (N=57, 98%) -Printed materials (N=49, 85%) -Fall prevention video on TV (N=16, 28%)	

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Table A3

Synthesis Table

Author/Year	Bowen-Brady et al., 2019	King et al., 2018	LeLaurin & Shorr, 2019	Liukka et al., 2020	Edwards, 2018a	Edwards, 2018b	Herrington & Hand, 2019	Korkis et al., 2019	Roberts & Cronin, 2017	Turner et al., 2020
Design/LOE	QS, VI	QS, VI	MS, V	MS, V	LC, IV	MM, IV	DS, VI	DMM, VI	DS, VI	DCS, VI
Sample										
Country	US	US	US	Finland	US	US	US	US	US	US
N	11	27	58	25	270	270	26	13	41	60
Setting										
Bed size										
>500		X			X	X			X	
200-499					X	X	X	X	X	X
<200	X	X			X	X			X	X
Inpatient	X	X	X	X	X	X	X	X	X	X
Magnet							X	X	X	X
Interventions										
AER				X						
FP		X	X							X
NPR	X						X	X	X	
PR					X	X				
Outcomes										
FP education										↑
Just Culture						↑				
Leadership support						↑				↑

Key: **AER** – adverse-event review; **DCS** – descriptive cross-sectional; **DMM** – descriptive mixed methods; **DS** – descriptive study; **FP** – fall prevention; **LC** – longitudinal cohort; **MM** – mixed-methods; **MS** – meta-synthesis; **N** – sample size; **NPR** – nursing peer review; **PR** – peer review; **QI** – quality improvement; **QS** – qualitative study

Nurse autonomy & accountability								↑		
Nurse satisfaction							↑	↑	↑	
NPR understanding								↑	↑	
QI score					↑	↑				
Themes										
FP										
<i>Interventions</i>			X							
<i>Fall message</i>		X								
<i>Nurse impact</i>		X								
<i>Victims</i>				X						
NPR										
<i>Barriers</i>	X									
<i>Definition</i>	X							X		
<i>Facilitation</i>	X									
<i>Lessons</i>	X							X		

Key: **AER** – adverse-event review; **DCS** – descriptive cross-sectional; **DMM** – descriptive mixed methods; **DS** – descriptive study; **FP** – fall prevention; **LC** – longitudinal cohort; **MM** – mixed-methods; **MS** – meta-synthesis; **N** – sample size; **NPR** – nursing peer review; **PR** – peer review; **QI** – quality improvement; **QS** – qualitative study

Appendix B

Project Approvals



APPROVAL: EXPEDITED REVIEW

[Michelle Morgan](#)
[EDSON: DNP](#)

-
 Michelle.S.Morgan@asu.edu

Dear [Michelle Morgan](#):

On 7/29/2021 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Implementation of Post-Fall Nursing Peer Reviews to Improve Patient Safety Culture
Investigator:	Michelle Morgan
IRB ID:	STUDY00014300
Category of review:	
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	<ul style="list-style-type: none"> • Clean Copy, Category: IRB Protocol; • Clean Copy of Supporting Documents, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Consent_Form1_PostFallNursingPeerReviews_Version2.pdf, Category: Consent Form; • Consent_Form2_PostFallNursingPeerReviews_Version2.pdf, Category: Consent Form; • Lindsay Blythe CITI Certificate.pdf, Category: Other; • Lindsay Blythe CV.pdf, Category: Vitaes/resumes of study team; • Michelle Morgan CITI Certificate.pdf, Category: Other; • Michelle Morgan CV.pdf, Category: Vitaes/resumes of study team; • ProjectSiteIRBWizrd.pdf, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc); • recruitment_methods_email1_27-07-2021.pdf, Category: Recruitment Materials; • recruitment_methods_email2_27-07-2021.pdf, Category: Recruitment Materials; • recruitment_methods_email3_27-07-2021.pdf, Category: Recruitment Materials;

	<ul style="list-style-type: none">• recruitment_methods_email4_27-07-2021.pdf, Category: Recruitment Materials;• SiteLetterofSupport_PostFallNursingPeerReviews.pdf, Category: Off-site authorizations (school permission, other IRB approvals, Tribal permission etc);
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The IRB approved the protocol from 7/29/2021 to 7/28/2022 inclusive. Three weeks before 7/28/2022 you are to submit a completed Continuing Review application and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 7/28/2022 approval of this protocol expires on that date. When consent is appropriate, you must use final, watermarked versions available under the "Documents" tab in ERA-IRB.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc:

Lindsay Blythe

Figure C2

Post-Fall Nursing Peer Review Survey

How much do you agree or disagree with the following statements after participation in post-fall nursing peer review (NPR)?					
	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Post-fall NPR improves nurse autonomy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Post-fall NPR improves nurse accountability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Post-fall NPR improves nurse satisfaction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Post-fall NPR improves patient safety culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Post-fall NPR reduces "blame and shame" culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Post-fall NPR is a non-punitive method to learn from patient falls	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How could the post-fall NPR process be improved?

Appendix D

Budget

DNP Project Budget			
	Activities	Cost	Total
Direct Costs			
	Travel	\$100	\$100
	Educational materials	\$50	\$50
	Intellectus Statistics consulting	\$99/month	\$99
	Thank you cards & snacks	\$50	\$50
Indirect Costs			
	Fall committee education (24 nurses, 1-hour meeting)	≈\$35/hour/nurse	\$840
	Post-fall NPRs (≈ 15 nurses, 1-hour meeting/month) x 3 months	≈\$35/hour/nurse	\$1,575
	Pilot unit education (integrated into participants' paid educational job requirements)	\$0	\$0
	Zoom access (free to project site employees)	\$0	\$0
	REDCap survey access (free to project site employees)	\$0	\$0
			\$2,714

Cost vs. Savings

The potential cost savings are unknown at this time. If the intervention successfully enhances the patient safety culture on each pilot unit, there is feasible potential to reduce future inpatient falls. Using the Joint Commission's (2015) estimate that each patient fall costs approximately \$14,000, for the five inpatient falls that occurred during this project's implementation, \$70,000 in healthcare costs could have potentially been avoided had these falls not occurred.

References

Joint Commission. (2015, September 28). Sentinel event alert 55: Preventing falls and fall-related injuries in health care facilities. https://www.jointcommission.org/-/media/tjc/documents/resources/patient-safety-topics/sentinel-event/sea_55_falls_4_26_16.pdf