Developing a Multifaceted Fall Prevention Strategy in the Emergency Department

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Abstract

Despite systemwide efforts to reduce patient falls, this problem continues to be a significant patient safety concern in the emergency department. The ED is a high acuity, fast-paced, crowded and unpredictable environment making fall prevention a challenging task (Stoeckle et.al., 2019). This unique healthcare environment requires interventions tailored to meet the specific needs of an ED (Townsend et.al., 2016). The goal of this quality improvement project was to determine if a multifactorial fall prevention program tailored to the unique emergency department environment will decrease the total number of adult patient falls. The primary outcome of this quality improvement project was to reduce the total number of patient falls.

After performing retrospective root cause analysis and data review, a multifaceted fall prevention strategy was created and implemented in a large, tertiary emergency department. Initial results did not reveal an overall decrease in the total number of falls or fall rate in the emergency department. However, vital information was gained about significant barriers and gaps to fall prevention. This has been a catalyst to unit and system wide changes in fall prevention measures.

Keywords: falls, prevention, risk, emergency department, quality improvement

Developing a Multifaceted Fall Prevention Strategy in the Emergency Department

Despite systemwide efforts to reduce patient falls, they continue to be a significant patient safety concern in the emergency department (ED). The ED is a high acuity, fast-paced, crowded and unpredictable environment making fall prevention a challenging task (Stoeckle et.al., 2019). This unique healthcare environment requires interventions tailored to meet the specific needs of an ED (Townsend et.al., 2016).

A patient fall is a sudden, unintentional descent, with or without injury to the patient, that results in the patient coming to rest on the floor, on or against some other surface, on another person, or on an object (NDNQI, 2020). Patient falls represent a leading cause of preventable injury in hospitals and are frequently reported serious adverse events (Ganz et.al., 2013). Falls can be physiologically and psychologically devastating to the patient and financially devastating to the healthcare system (Ganz et.a.l, 2013). Every year, between 700,000 and 1,000,000 patients in the United States fall in the hospital setting (Currie, 2008; Oliver et al., 2010). Between 30% and 50% of in-facility falls are associated with reports of injuries (Shekelle et al., 2013). The average cost of a fall with injury is around $14,000. Patients who fall average an increase length of stay by 6.3 days (Shekelle et al., 2013). In 2008, the Centers for Medicare and Medicaid Services (CMS) labeled falls in the hospital setting as hospital-acquired condition (HAC) and quit reimbursing hospitals for subsequent fall expenses. CMS also identified patient falls with serious injury as a “never event”, meaning that falls with serious injuries are clearly identifiable, preventable, and serious in their consequences for patients.

Falls vary considerably by unit type (Bouldin et al., 2012). Evidence-based fall prevention strategies are useful when used in the appropriate environment. Not all prevention strategies are practical for every unit. Successful interventions to prevent falls should be tailored to meet unit-level and patient-level needs (Ganz et.al., 2013). Healthcare systems should identify fall prevention as a systemwide effort while appreciating that each unit needs an individual fall prevention program. To improve patient safety with a reduction of falls in the ED, a unit-level fall prevention process must be initiated.

Theoretical Framework

Havelock's Theory of Change was used to guide this quality improvement project. Havelock's theory consists of six phases: (1) build a relationship with the client system, (2) diagnose the problem and make a systematic attempt to understand it, (3) identify and acquire relevant information and resources to help reach change, (4) choose a pathway to accomplish the change, (5) establish and accept change, (6) stabilize the change and separation (Havelock, 1973). Havelock's theory expands on Lewin's change theory, incorporating knowledge building and creating a change theory that responds more effectively to real-life situations. This theory was selected because it focuses on the need to understand that change should be based on an accurate understanding of the existing conditions in the system being served (Havelock, 1973). The change process includes more than just offering a solution but appreciates that knowing when and how to offer the solution to a problem determines if the change process will be successful or not (Havelock, 1973). This QIP recognizes that an adequate understanding of unit-level operations and characteristics by use of aggregate root cause analysis and retrospective chart review is an imperative step in this change process for the ED.

Review of Literature

The patient that falls and fall prevention strategies in the inpatient hospital setting are well studied and described (McErlean & Hughes, 2017). Research focusing on falls in the ED is limited (Stoeckle et.al., 2019). Fall prevention strategies in the ED are routinely designed to mirror inpatient fall prevention efforts. However, the risks and characteristics of falls in the ED are different than the inpatient setting (McErlean & Hughes, 2017). Inpatient fall risk assessments fail to appropriately assess fall risk for patients in the ED setting (Alexander et.al., 2013; Terrell et.al., 2009). A retrospective review of 57 falls that occurred in a single emergency department during a two-year period revealed a relatively low sensitivity of 37.5% for an inpatient fall-risk identification tool to reliably identify patients at high risk for falling (Terrell et.al., 2009). Two fall risk assessment tools specific to the ED are the Memorial Emergency Department Fall-Risk Assessment Tool (MEDFRAT) and KINDER1 (Alexander et.al., 2013) A pilot study of the KINDER1 fall assessment tool revealed that following the implementation of the KINDER1 assessment tool, 74% of falls were identified as high fall risk, an improvement from the

detection rate of 55% using the previous inpatient fall risk assessment tool (Alexander et.al., 2013). The MEDFRAT tool has had similar results (McCarty et.al., 2018).

Fall prevention is a two-step process: accurate assessment of fall risk and use of effective prevention strategies (Alexander et.al., 2013). Completing a fall risk assessment alone is not supported in literature to reduce fall rates (Alexander et.al., 2013). Intervention strategies must be implemented according to assigned risk level to reduce the risk of falls (Alexander et.al., 2013). Interventions successfully implemented in the inpatient hospital setting are not always successful in the ED setting (Hatamabadi et al., 2016). However, strategies used in the inpatient setting can be used in the ED setting but need to be tailored to fit the specific ED environment (Pop et.al., 2020). Evidence-based inpatient interventions can be modified for use in the ED according to ED specific measures and needs (Pop et.al., 2020).

Diverse patient populations and varying ED environments make generalized ED patient fall risk factors and interventions difficult. Characteristics of falls vary from ED to ED (Terrell et.al., 2009). Interventions tailored to meet the needs of each individual ED are successful in decreasing the number of patient falls (Pop et. Al., 2020). Using evidence-based solutions to prevent falls in the emergency department setting should consist of evaluating unit-specific fall characteristics and adapting the solutions to meet the practical needs of the department (Pop et.al., 2020). Retrospective review of fall data and root cause analysis have been useful in identifying common factors and trends related to falls unique to departments. Through root cause analysis and evaluating characteristics of previous falls, a large tertiary trauma center identified several trends about falls in the ED and subsequently made changes to their fall prevention strategies (Alexander et.al., 2013). None of the patients who had fallen in the ED had prevention strategies in place prior to the fall, altered mental status and alcohol intoxication were found to be the most prevalent risks for falls in their ED (Alexander et.al., 2013). In response to these findings, the fall prevention team designed interventions that addressed the gaps in patient safety and were able to decrease the total number of falls and falls with injuries in the ED (Alexander et.al., 2013).

Multifactorial fall prevention strategies over a single intervention in the ED are well supported in literature (Cook et.al., 2020; Stoeckle et.al., 2019; Southerland et.al., 2016). Combining multiple interventions for fall prevention addresses the diverse patient population and fast-paced, acute environment in the ED that contributes to falls (Stoeckle et.al., 2019).

Retrospective data analysis of intrinsic and extrinsic causes of falls in combination with multifactorial interventions can decrease the rate of falls (Cook et.al., 2020; Stoeckle et.al., 2019; Pop et.al., 2020). Data analysis in research has consisted of retrospective chart audits and root cause analyses. Cook et.al., utilized retrospective data analysis as an intervention in their quality improvement project to identify common factors and trends related to falls and formulate changes based on identified factors. This led to a 25% decrease in falls and 66% decrease in falls with injuries. Understanding the underlying trends and patient safety gaps were identified as being crucial initial steps in the success of the quality improvement process (Cook et.al., 2020). Stoeckle et.al. 2019, performed a root cause analysis and retrospective chart review to create and implement multifactorial fall prevention interventions. Despite the interventions, fall rates remained high post-implementation. However, this study recognized that additional problem areas identified in the root cause analysis should be addressed to have a stronger impact on falls (Stoeckle et.al., 2019).

Purpose

This quality improvement project served to construct a new standard of care to prevent falls in a tertiary emergency department by creating and implementing a multifactorial fall risk prevention strategy created to meet the unique and specific needs of the emergency department environment. The primary outcome of this project was to reduce the total number of adult patient falls.

Methods

This project was a single-unit, four-week quality improvement intervention project that compared postintervention monthly unit-level data to preintervention monthly fall rates on the same unit. It was conducted in a large, tertiary emergency department located in the fourth largest city in North Carolina. With 921 inpatient beds, it is the largest hospital in its associated healthcare system and the fifth largest

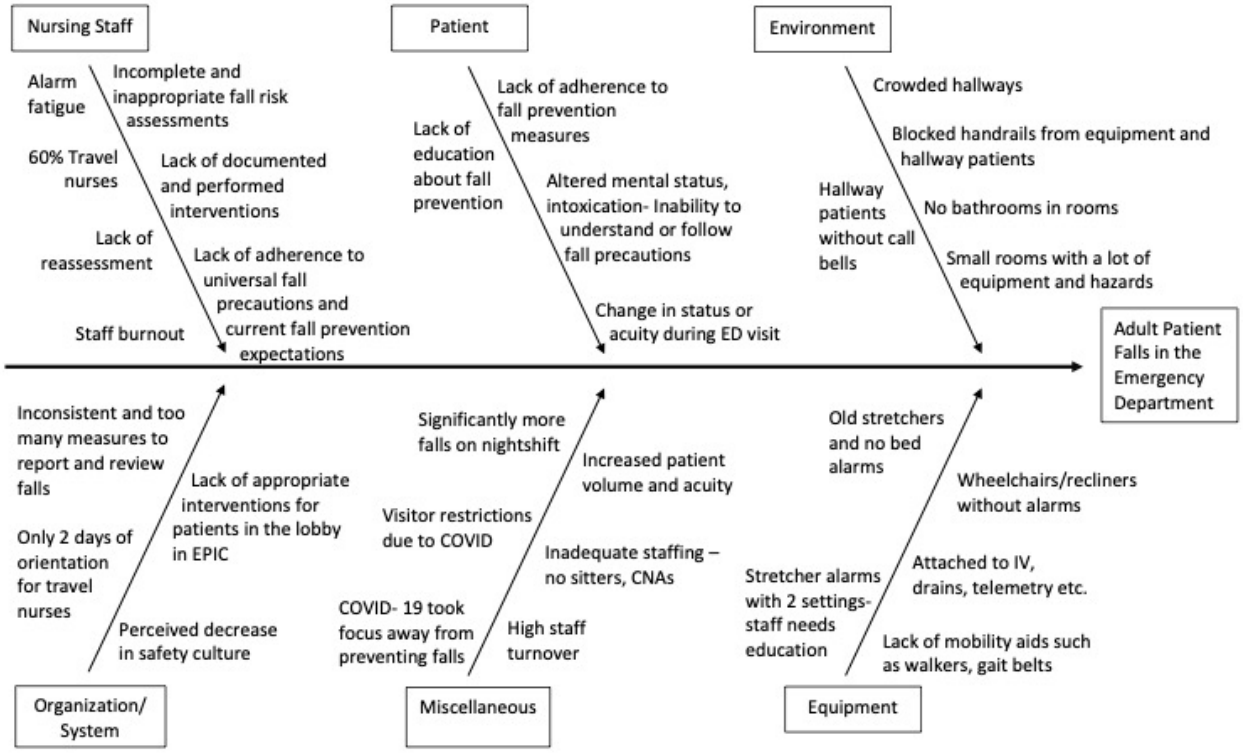
hospital in the state. This emergency department has 72 patient beds and is one of the busiest in the state, seeing over 80,000 patients annually. This study was approved by the Institutional Review Board at Novant Health and Lenoir-Rhyne University. This project was considered a quality improvement project and was exempt from Institutional Board Review. There is no harm to nursing staff or patients during this study. Signed consent was not required.

Procedures

This project was implemented in two intervention phases. The first intervention was performing an aggregate root cause analysis (RCA) and retrospective data review to identify unit specific deficiencies and barriers to fall prevention as well as unit specific characteristics of adult patient falls. The aggregate RCA tool is used to examine multiple cases simultaneously in a single review to identify trends and systems vulnerabilities, thereby supporting process and systems improvements. Aggregate RCA has proven to be an effective intervention for patient safety and fall prevention as it provides valuable information on unit specific falls that allows units to create specific action plans (Lee et al., 2012; Mills et al., 2005). Retrospective chart audits were performed to gain additional intrinsic and extrinsic factors surrounding patient falls that were not evident on the individual-level root cause analysis. An aggregate RCA was performed utilizing all available RCAs performed after every fall in the emergency department. A total of 23 individual RCAs and charts were retrospectively reviewed. The findings from the aggregate RCA and retrospective chart review were placed into a fishbone diagram (Figure 1). Patients fall demographics were organized into a Microsoft Excel spreadsheet. To gain additional information and insight, the project team gathered informal input about falls from nursing staff in the department. This information was also added to the fishbone diagram in Figure 1.

Figure 1

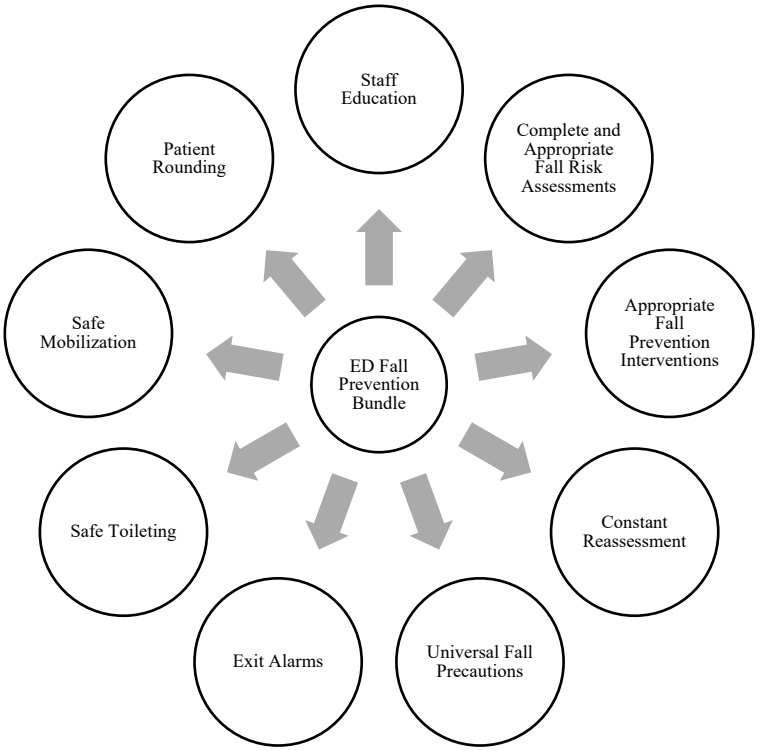
Phase 1 Fishbone Diagram



The second intervention phase of this project consisted of planning and implementing multiple evidence-based fall prevention strategies and interventions that addressed the findings from the aggregate RCA and data review. These strategies were placed into a fall prevention bundle (Figure 2). The fall prevention bundle focused on nine barriers and gaps to fall prevention identified in the department. This bundle was fully implemented in the department after development.

Figure 2

Phase 2 Fall Prevention Bundle



The first intervention in the bundle was nursing staff education. While not a novel idea, we felt that the nursing staff in the emergency department required significant education about fall prevention. RCA revealed that nursing staff were not adhering to the evidence-based practices and policies already in place by the healthcare system to prevent patient falls. We decided that prior to introducing only new interventions, we needed to reinforce current policies. Nursing administration also felt that patient falls have increased since the onboarding of travel nurses. Nearly 60% of registered nurses in the emergency department are travel nurses. Travel nurses only receive two, 12-hour shifts, for orientation. It was postulated that a short orientation does not allow for adequate time to provide education about specific fall prevention strategies used in the emergency department. Education was presented to the department in the form of the fall prevention bundle. This education included information about current practices and

expectations as well as information about the new interventions. An educational binder about fall prevention was created and disseminated throughout the department. All registered nurses, safety attendants, paramedics and certified nursing assistants were required to review and sign the binder. A PowerPoint was also created and played on the breakroom television leading up to implementation and during the entire intervention phase. In addition, this education was and will continue to be provided to all new nursing staff members.

A new expectation introduced as an intervention for this project was reassessing fall risk level and documenting appropriate interventions when a patient arrived from triage or the lobby to a room, change of shift and change of primary nurse. During our root cause analysis, we found that patients who had fallen did not have appropriate fall risk levels assigned. Additionally, patients did not have appropriate or adequate fall prevention interventions documented. Fall risk level can change during a patient's stay based on medications given, change in patient acuity and condition. Patients were expected to constantly be reassessed for a change in fall risk level.

The next intervention in the bundle was exit alarm technology. Bed alarms or stretcher alarms have not been routinely used in the emergency department. Prior to the implementation of this project emergency department management purchased over 60 new Stryker stretchers with exit alarm capabilities. Consensus from nursing staff about exit alarms was positive, reporting that exit alarms helped nursing staff quickly identify and intervene when a patient was trying to get out of the bed especially when the department was busy, and staffing was short. While evidence for the use of exit alarms as a fall prevention strategy is mixed, we decided that exit alarms were beneficial in preventing patient falls. We introduced portable exit alarms that could be placed in wheelchairs, recliners, and stretchers that did not have built in exit alarms. We provided additional education on the use of the stretcher alarms, as most of staff had never received formal education on proper use of the stretcher alarms.

Universal fall precautions are well studied and have proven to reduce patient falls in all settings (Ganz et.al., 2013). Universal fall precautions constitute the basics of patient safety and revolve around

the concept that keeping a patient's environment safe and comfortable will reduce patient falls. While universal fall precautions are implied in the emergency department, formal implementation has not occurred. We implemented the expectation that every patient, regardless of fall risk level had universal fall precautions in place. These precautions included keeping the call bell in reach, maintaining the bed in a locked and in low position, utilizing nonslip, comfortable, well-fitting footwear on the patient and keeping the patient's personal possessions within patient safe reach.

Hourly rounding was not documented on any of the falls reviewed during the data review. Hourly rounding is a current expectation within the healthcare system but has not been routinely enforced in the emergency department. As a part of the fall prevention bundle, hourly rounding was made mandatory for all high fall risk patients.

The last intervention addressed safe mobilization. The aggregate RCA identified two serious patient safety events where patients fell while ambulating to the lobby during discharge and sustained significant injuries. Nursing staff were instructed to use wheelchairs with all patient discharges. If a patient refused a wheelchair, the nursing staff were instructed watch the patient ambulate in the hallway prior to discharge to assure the patient's gait was steady.

Measures

Number of Falls

Data on total number of falls were collected retrospectively prior to the project start and concurrently after implementation of the quality improvement project.

Monthly Fall Rate

Monthly fall rates per 1,000 patient encounters were calculated retrospectively prior to the project start and concurrently after implementation of the quality improvement project.

Data Analysis

To evaluate the effectiveness of the fall prevention strategy, pre- and post-intervention monthly fall data was collected. Fall data was described monthly with the total number of falls and falls per 1,000 patient encounters. Data on the total number of falls were obtained by monthly reports via online risk

reports completed by staff following a fall. Total patient encounter data were collected via online monthly department performance scorecards calculated and distributed to the department by the healthcare system. Fall rates per 1,000 encounters were calculated using the formula: (Total Number of Falls/Total Number of Patient Encounters) x 1000.

Results

During the implementation month of March 2022, there were 11 total adult patient falls in the department. A fall rate of 1.83 falls per 1000 patient encounters was calculated during the same month. In the 17 months of data reviewed, March had the third highest fall rate per 1000 patient encounters. A summary of fall data is shown in Table 1. A comparison of pre-intervention data and post-intervention outcomes are shown in Figure 2.

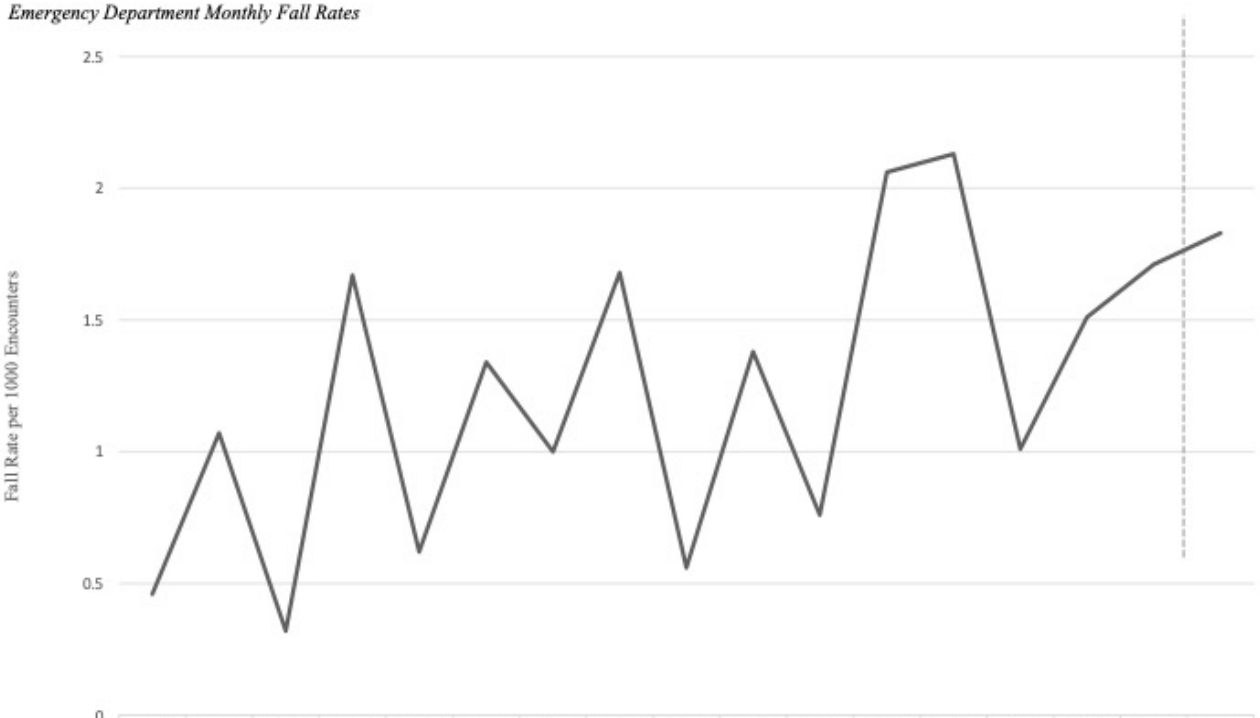
Table 1

Number of Emergency Department Falls by Month

Month	Total Patient Encounters	Total Number of Falls	Fall Rate per 1000 Encounters
Nov-2020	6475	3	0.46
Dec-2020	6534	7	1.07
Jan-2021	6170	2	0.32
Feb-2021	5388	9	1.67
Mar-2021	6472	4	0.62
Apr-2021	6698	9	1.34
May-2021	6972	7	1.00
Jun-2021	6548	11	1.68
Jul-2021	7083	4	0.56
Aug-2021	7222	10	1.38
Sep-2021	6592	5	0.76
Oct-2021	6325	13	2.06
Nov-2021	6102	13	2.13
Dec-2021	6943	7	1.01
Jan-2022	6623	10	1.51
Feb-2022	5276	9	1.71
Mar-2022	5997	11	1.83

Figure 2

Emergency Department Monthly Fall Rates



	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-21
Fall Rate	0.46	1.07	0.32	1.67	0.62	1.34	1	1.68	0.56	1.38	0.76	2.06	2.13	1.01	1.51	1.71	1.83

Note: This figure represents a comparison of fall data pre-and post-intervention.

Discussion

The purpose of this study was to prevent falls in the emergency department by implementing a multifactorial fall risk prevention strategy created to meet the unique and specific needs of the emergency department environment. A multifaceted fall prevention strategy was created and implemented using unit-level specific data obtained during chart reviews and aggregate root cause analysis. Despite efforts to decrease adult patient falls in the emergency department, the total number of falls and rate of falls remained high, with 11 total falls and a rate of 1.83 falls per 1,000 patient encounters during the month of March. However, understanding the underlying trends and patient safety gaps found in the fall events was a crucial initial step in this project. The aggregate root cause analysis and retrospective data review revealed several gaps and barriers to fall prevention in the emergency department.

We were able to address nine barriers and gaps identified during retrospective data review. To continue creating a new standard of care in the emergency department that prevents adult patient falls, additional measures must be taken to address all vulnerabilities identified during the retrospective data review. The unit and healthcare system have used this quality improvement project as a catalyst to address the vulnerabilities identified during this project, but immediate implementation of interventions was not achievable during the implementation of this project. For example, we recognized that assistive devices and mobility aids such as walkers and canes are not available to patients unless they bring their personal aids from home. However, evidence-based practice recognizes that having assistive devices and mobility aids readily available for any patient with impaired mobility decreases the potential for falls (Ganz et.al., 2013). Acquiring mobility aids for the emergency department was not obtainable for this project however, the unit has identified this as an imperative need and is actively working with the healthcare system to acquire resources and training.

Data on total number of falls were collected and reviewed. However, data on specific interventions could not be collected. Additional research is needed to measure how each intervention implemented in the fall prevention bundle is contributing to fall prevention and patient safety in the department.

Limitations

There were limitations to this project that could restrict generalizability and replication in other organizations. The aggregate root cause analysis relied on the integrity and completeness of individual-level root cause analysis and EHR documentation and may not represent all pertinent fall related data. There is a potential for unreported or unobserved falls and the misclassification of falls which may affect data reliability. A larger number of individual root cause analysis and chart reviews could have provided additional information regarding barriers and gaps to preventing falls. Obtaining consensus on fall prevention strategies following the aggregate root cause analysis was limited to the principal researcher and stakeholder. The creation of an ED fall prevention team was initially discussed but with the significant clinical staff turnover, it was determined that creating a reliable team was unobtainable at this

time. Interventions were created to meet the needs of a department with a large proportion of travel or temporary nursing staff. This may be a limiting factor in the generalizability of this project to units with permanent staff.

Conclusions

The ED is a high acuity, fast-paced, crowded and unpredictable environment making fall prevention a challenging task (Stoeckle et.al., 2019). This unique healthcare environment requires interventions tailored to meet the specific needs of an ED (Townsend et.al., 2016). Using evidence-based solutions to prevent falls in the emergency department setting should consist of evaluating unit-specific fall characteristics and adapting the solutions to meet the practical needs of the department (Pop et.al., 2020). Multifactorial fall prevention strategies over a single intervention in the ED are well supported in literature (Cook et.al., 2020; Stoeckle et.al., 2019; Southerland et.al., 2016). Aggregate root cause analysis has been noted in research to be an initial intervention in fall prevention and patient safety (Mills et.al., 2005). While not immediately successful in reducing fall rates in the department, the aggregate root cause analysis and data review revealed significant barriers and gaps to patient safety and fall prevention in the emergency department. This project has served as a catalyst to address numerous unit and system vulnerabilities.

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