7-19-2024

The Impact of Hourly Safety Rounding on Pediatric Fall Rates

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A Dissertation Submitted to the Graduate School at University of Missouri-St. Louis in partial fulfillment of the requirements for the degree of Doctor of Nursing Practice with an emphasis in Pediatric Nurse Practitioner

August 2024

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Abstract

Problem: Falls are a common adverse event in the inpatient pediatric setting and are a significant risk to patient safety. Environmental factors, such as unclear pathways, bed rails down, beds in high position, and call lights out of reach, are considered avoidable causes of patient falls. The site's fall data in a 12-month period from January 2023 to January 2024 showed (*n*=9) patient falls occurred with (*n*=5, 55.6%) due to environmental factors. The purpose of this Quality Improvement (QI) pilot project was to assess the impact of hourly safety rounding on pediatric fall rates. The study question was: In pediatric inpatients aged 8-14 years on a renal/endocrine floor, how does implementation of hourly safety rounding compared to no intervention implementation affect fall rates over 12 weeks?

Methods: The QI pilot project's design was a descriptive cohort study with a pre-and post-intervention comparison. A retrospective data review was performed and the post-intervention period was completed over a 12-week timeframe. This project utilized a convenience sampling. Participants were inpatients on the renal/endocrine floor aged 8-14 years. The exclusion criteria was patients who were not in the 8–14-year age range and not on the renal/endocrine floor.

Results: There were (*N*=107) patients who met criteria for this project. The number of patients in the pre-implementation phase from July through September of 2023 was (*n*=71) with (*n*=2) patient falls occurring and (*n*=1) caused by environmental factors. In the post-implementation phase from February through April 2024, there were (*n*=36) patients, with zero patient falls occurring (FET *p*= .549). Hourly safety rounding was

completed on (*n*=24, 66.7%) patients and interventions were completed during rounds on (*n*=20, 83.3%) patients.

Implications for Practice: The implementation of hourly safety rounding with interventions completed within a fall prevention bundle could be a vital step to decreasing the rate of falls caused by avoidable environmental factors which has an impact on healthcare costs and patient safety.

The Impact of Hourly Safety Rounding on Pediatric Fall Rates

Patient falls are a significant and consistent problem in healthcare around the globe. Falls are the most commonly reported events in the inpatient setting with 70,000 to 1,000,000 falls occurring annually in the United States (LeLaurin & Shorr, 2019). Approximately 35.0% of all falls result in harm or injury to the patient and on average, roughly 56.0% of inpatient falls are due to environmental factors such as unclear pathways, bed rails down, beds in high position, and call lights out of reach resulting in patients attempting to ambulate on their own (Mikos et al., 2021). In the pediatric setting, 24.0% of reported safety incidents are patient falls (Kim et al., 2021). Falls are a considerable threat to patient safety and the problem must be addressed to improve quality care and patient outcomes. One opportunity to improve quality care and patient outcomes is implementation of evidence-based interventions that focus on falls such as family and staff education, hourly safety rounding, and assistive devices (Strini et al., 2021).

There are a variety of explanations for patient falls in the pediatric inpatient setting (Benning & Webb, 2019; Dykes et al., 2020; Kim et al., 2021; Parker et al., 2020). Bed rails and height are considerable factors for the pediatric population as most falls occur from inpatient beds (Kim et al., 2021). Falls may also be related to pediatric development, specific diagnoses, and physiological factors including dehydration, low blood pressure, and hypoglycemia (Benning & Webb, 2019; Parker et al., 2020). Patient falls are considered the most common preventable cause of injury in pediatric hospitals, particularly due to the fact that most pediatric falls occur due to avoidable environmental factors and in the presence of caregivers (Dykes et al., 2020; Kim et al., 2021).

Fall prevention bundles with evidence-based interventions specifically tailored to individualized fall risk scores have been linked to a decrease in fall rates in multiple studies (Dykes et al., 2020; Morris et al., 2022). Many healthcare institutions have implemented the use of fall risk assessment tools and prevention bundles to decrease the incidence of falls and injuries related to falls, such as the Humpty Dumpty Fall Scale for pediatric patients (Sarik et al., 2022). Fall prevention bundles with interventions and risk assessments could be a step in the right direction for a reduction in pediatric patient falls. The ultimate goal should be elimination of all falls. However, many hospitals continue to struggle with staff compliance and support of a universal bundle available for all patients (Strini et al., 2021).

There is a lack of research studies with an in-depth assessment of the individual evidence-based interventions, particularly related to the pediatric population (Strini et al., 2021). Moreover, there is a shortage of research assessing the effects of specific interventions within fall prevention bundles. Particularly, a focus on the intervention of hourly safety rounding is perceived as valuable as the literature suggests a significant percentage of pediatric falls are related to environmental factors and falls from the inpatient beds (Kim et al., 2021; Mikos et al., 2021). The success of decreasing pediatric inpatient falls can be significantly improved by implementing compliance of fall risk assessments and prevention bundles, including interventions such as hourly safety rounding (Benning & Webb, 2019; Dykes et al., 2020; Sun et al., 2019). Staff should be held accountable for implementing evidence-based interventions to prevent falls and understand that success is dependent on a team-based approach to patient safety (Benning & Webb, 2019). Nursing staff, including patient care technicians, should visualize the

patient and room surroundings at least once an hour to assess for potential hazards capable of causing a fall (Sun et al., 2019).

The purpose of this QI pilot project was to assess the impact of hourly safety rounding on the rate of falls. The aim was to evaluate the effectiveness of hourly safety rounding as an intervention over 12 weeks. The primary outcome measure was the rate of falls and the secondary outcome measure was staff compliance of hourly safety rounding. The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care served as a framework for this project. The question for this QI pilot project was: In pediatric inpatients aged 8-14 years on a renal/endocrine floor, how does implementation of hourly safety rounding compared to no intervention implementation affect fall rates over 12 weeks?

Review of Literature

A literature search was completed for current research articles regarding the impact of hourly safety rounding on patient falls. CINAHL, MEDLINE, Cochrane Library, APA PsychInfo, and PubMed were the search engines utilized. Key search terms and phrases with Boolean operators included were fall(s) AND hourly AND rounding AND safety OR pediatric OR bundle AND compliance AND risk assessment AND prevention AND intervention OR implementation. There were 25,967 initial publications generated from the five search engines.

A refined search was completed next with inclusion and exclusion criteria. The inclusion criteria included articles published in the English language, publications from the last five years, free full text, abstract included, data from the inpatient setting, pediatric populations, and peer-reviewed articles. The exclusion criteria included articles

published in languages other than English, no free full text and/or abstract, outpatient settings, and articles without peer reviews. In the refined search, 142 publications were generated. After review for significance to this project and deletion of duplicate publications, 14 articles were used in the literature review. The level of evidence was analyzed for each article chosen, there were three systematic reviews or meta-analyses of randomized controlled trials, five non-randomized controlled trials, two systematic reviews of descriptive or qualitative studies, and four single descriptive or qualitative studies.

Parker et al. (2019) conducted a retrospective analysis which highlighted how environmental factors influence the rate of pediatric falls and were most common in the acute care setting and emergency department. Another study by Mikos et al. (2021) specifically focused on floors within the acute care setting, determining that general medicine and rehabilitation floors had the highest occurrence of falls. The study found that 56.71% of the 89,693 participants had falls that occurred in the late evening or night (Mikos et al., 2021). A descriptive study found similar results with falls occurring more frequently throughout the night (Sun et al., 2020). Researchers assert that more data is needed to assess the cause of increased falls at night, including higher nurse to staff ratios preventing proper compliance of hourly safety rounding (Mikos et al., 2021; Sun et al., 2020).

Mikos et al. (2021) and Parker et al. (2020) found that environmental factors are considered the most common cause of pediatric inpatient falls and describe many of these events as “bed falls”. The term “bed fall” comes from falls due to hospital beds not set in the lowest position, side rails left down, and patients attempting to get out of bed without

assistance (Mikos et al., 2021, Parker et al., 2020). Other environmental factors associated with increased fall risk include unclear pathways, multiple devices (i.e., intravenous therapy equipment, heart monitors) being attached to the patient, and call lights out of the patient's reach (Dykes et al., 2020; Mikos et al., 2021; Parker et al., 2020). A non-randomized controlled trial by Stubbs and Sikes (2016) found 67.0% of pediatric falls occurred in the presence of a caregiver, in part due to the lack of family education and awareness of environmental hazards and fall risks. There are also less predictable causes for falls. For example, 46.8% of the 385 reported fall events were of children aged 0-2 years (Parker et al., 2019). These falls are commonly referred to as developmental falls and are related to the child learning balance and coordination (Benning & Webb, 2019; Parker et al., 2019). A fall prevention bundle with a risk assessment tool could be used to determine potential risk of falling based on environmental (i.e., bed rails down, unclear pathways), developmental, and physiological factors.

There is significant evidence showing the positive impact of fall prevention bundles with risk assessment tools (Benning & Webb, 2019; Dykes et al., 2020; Morris et al., 2022, Stubbs & Sikes, 2016). In a non-randomized controlled trial by Benning and Webb (2019), zero falls occurred in five out of the six months after a fall prevention bundle with evidence-based interventions was implemented. Similarly, another study conducted by Dykes et al. (2020) found a 15.0% reduction in falls (p=.001, 2.06-3.00 per 1000 patient days) when interventions such as the Morse Fall Scale risk assessment, a laminated beside safety checklist, patient and family education, and hourly safety rounding were implemented. In a systematic review and meta-analysis, it was found that

when patient and family education was added to a fall prevention bundle, the rate of falls ratio decreased by 0.70 (p=0.03) (Morris et al., 2022). Similarly, when Stubbs and Sikes (2016) implemented the Red Light Green Light Fall Prevention Program with a special focus on family education, pediatric falls in the presence of a caregiver decreased by 50.0% (p=.012).

Strini et al. (2021) completed a systematic review and found 38 different fall risk assessment tools within the 115 articles reviewed. A secondary data analysis was conducted to determine if modifications were needed to improve the accuracy of the pediatric Humpty Dumpty Fall Scale. The study by Sarik et al. (2022) determined gender and medication use were not found to have significant association with fall risk, indicating the other components of the fall scale, including environmental factors, hold more significance.

Morris et al. (2022) posits evidence showing a fall prevention bundle starting with an accurate fall risk assessment and implementation of hourly safety rounding significantly affects fall rates. Hourly safety rounding could be a potential solution to preventing pediatric falls related to environmental factors. Additionally, Gliner et al. (2022) conducted a non-randomized controlled trial assessing the effects of hourly safety rounding on falls rates and found that there was a 21.0% reduction (p<.01, incidence rate ration: 0.79) in falls after implementation. Walsh et al. (2018) also found similar results with the fall rate decreasing from 3.07 to 2.22 and the injury rate from falls decreasing from 0.77 to 0.65 per 1000 patient days after compliance of implementation of hourly safety rounding.

Turner et al. (2022) completed a cross-sectional descriptive study to assess the consistency and compliance to specific interventions within a fall prevention bundle. A significant component to the success of fall prevention interventions, such as hourly safety rounding, is staff compliance. The study showed that 73.0% of staff reported "strongly agree" on the Likert scale in the study's survey for consistently putting the bed to the lowest setting as an intervention during rounding (Turner et al., 2022). Furthermore, Benning and Webb's (2019) non-randomized controlled trial reported zero falls occurring when fall prevention bundle compliance increased from 27.0% to 88.0% . Although the study by Benning and Webb (2019) was limited to a stand-alone hospital, the study by Turner et al. (2022) showing similar results had increased generalizability with a sample from sixty different hospitals, including pediatric facilities. These studies indicate the necessity for staff compliance to ensure interventions are accurately implemented and assessed to determine the impact on falls (Benning & Webb, 2019; Turner et al., 2022). To ensure compliance, teamwork and communication are essential for success in implementing a fall prevention plan. Poor nurse communication and safety rounding less frequent than every hour have been linked to an 8.6 increase in the rate of falls (Gliner et al., 2022).

The review of literature revealed that when falls continue to occur, they serve as a safety risk for the patient. There is a significant gap in the literature specifically addressing the impact of hourly safety rounding on pediatric patient fall rates. There is also a lack of diversity in study designs and methods for this specific topic, with many of the articles being non-randomized controlled trials or descriptive systematic reviews.

This QI pilot project focused on the specific intervention of hourly safety rounding on fall rates while also considering staff compliance rates. The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care was the framework used to guide this project. This evidence-based model was chosen because it directs healthcare professionals in making decisions about clinical practice that affect healthcare outcomes (Melnyk & Fineout-Overholt, 2023). This model started with identifying the triggering issue/opportunity which was patient falls and patient safety was determined as a priority for the healthcare organization (Melnyk & Fineout-Overholt, 2023). A team was formed and a systematic search was conducted that appraised and synthesized the body of evidence. There was sufficient evidence to implement the QI pilot project for practice change. Following the design and pilot, the team decided to adopt the intervention into practice and disseminate the results.

Methods

Design

The design of this QI pilot project was a descriptive cohort study with a pre-implementation (July-September 2023) and post-implementation (February-April 2024) comparison. A retrospective and prospective data review was completed to analyze the fall rates and staff compliance. This study was conducted over 12 weeks from February through April of 2024.

Setting

The setting was a 16-bed renal/endocrine floor at a large, urban pediatric hospital. The pediatric hospital is a teaching facility and advocates for research efforts to improve

patient care. The setting included staff of nurses, patient care technicians, educators, management, nurse practitioners, and physicians.

Sample

This QI pilot project utilized convenience sampling. Participants were inpatients on the renal/endocrine floor aged 8-14 years. No recruitment strategies were used. The exclusion criteria for the sample was inpatients outside of the 8–14-year age range and not on the renal/endocrine floor. The desired sample size was 75 patients.

Interventions/Procedures

The pediatric renal/endocrine floor has a current fall bundle in place. The stakeholders recognized the lack of intervention compliance and impact on the rate of falls. Meetings were conducted with the primary researcher, 3rd committee member, and staff educator to discuss causes and effects of falls on the renal/endocrine floor. The floor's fall rate was reviewed with (n=9) from January 2023 to January 2024 and it was determined environmental factors are a common cause of falls (n=5, 55.6%). The stakeholders wanted to assess the impact of hourly safety rounding on fall rates on the pediatric renal/endocrine floor. The intervention for this QI pilot project was hourly safety rounding. The staff, including bedside nurses and patient care technicians, were to round on each patient every hour to assess for potential environmental hazards for falls including bed rails down, beds in high position, call lights out of reach, and unclear pathways. The staff implementing the hourly safety rounding were asked to document every hour the intervention was completed within EPIC and on an in-room checklist to track compliance (see Appendix A). Included in the documentation were any changes made to the environment during the hourly safety rounds.

Data Collection/Analysis

The data was de-identified, coded, and protected. Data excluded patient identifiers such as name and date of birth. The information necessary for this project's analysis was age, sex at birth, date of fall, and reported cause of fall. The site's adverse events reporting program was used for data collection. The data collected from the adverse event reporting program included the number of falls, age, sex at birth, date of fall, and reported cause of the fall. This data was pulled from the renal/endocrine floor's nurse manager and third committee member of this project. The IBM SPSS Statistics 29 software was then used for data analysis.

Retrospective data was collected from the previous year's data (January 2023 to January 2024) on fall rates and causes. Prospective data was collected (February through April 2024) during the post-implementation phase. For descriptive data, mean, mode, and range of patient age were calculated. The dependent variable was falls and the independent variables were hourly safety rounding and staff compliance. Categorial and continuous variable types were included in this project. The categorial variable was if the patient was male or female. The continuous variable was age. The normality for the continuous variables was nonparametric due to the small sample size. Tests performed included Fisher's Exact tests.

Approval Processes

Formal and written approvals obtained to conduct this QI pilot project included those from the organization, site IRB, doctoral committee, and the IRB of the University. There were limited risks to the patient with confidentiality secured. The benefit of

assessing the effectiveness of hourly safety rounding to decrease fall rates considerably outweighed the limited risks.

Results

This QI pilot project had (*N*=107) patients. The number of patients in the pre-implementation phase was (*n*= 71) from July through September of 2023, with (*n*=38, 53.5%) males and (*n*=33, 46.5%) females and (M=11.03) for age, with a mode of 12. In the post-implementation phase from February through April 2024, there were (*n*=36) patients, with (*n*=18, 50.0%) males and (*n*=18, 50.0%) females and (M=11.81) for age, with a mode of 14 (see Appendix B). In the pre-implementation phase, (*n*=2) patient falls occurred with (*n*=1) due to environmental factors. During the post-implementation phase, zero patient falls occurred and a Fisher's Exact test was performed due to the project's small numbers to examine fall rates for the primary outcome measure (FET *p*= .549) (see Appendix C).

A descriptive statistical analysis was calculated on hourly safety rounding completed in the post-implementation phase on (*n*=24, 66.7%) patients using data from the in-room checklist (see Appendix A). There were (*n*=20, 83.3%) interventions performed during hourly safety rounding. Interventions included adjusting the bed height (*n*=2, 10.0%), correcting the number of bed rails up (*n*=2, 10.0%), placing the call light within the patient's reach (*n*=9, 45.0%), and clearing pathways or clutter (*n*=7, 35.0%) (see Appendix D).

Discussion

Hourly safety rounding was completed at a rate of 66.7% in the post-implementation phase which included interventions correcting environmental fall risks.

The completed hourly safety rounding and interventions showed that when environmental risk factors are corrected, the number of falls decreases. Correcting the environmental factors capable of causing a fall occurred at a rate of 83.3%, with the most common interventions performed being placing the call light within the patient's reach and clearing pathways or clutter, which led to a zero percent fall rate. The pre-implementation phase (July through September 2023) had almost double the participants within the 8-14 year age range. A note of importance was during the post-implementation phase (February through April 2024), the floor's population had more infants and toddlers, which could not be included in this project's data collection. The rise in admissions of infants and toddlers could have been due to seasonal factors, such as viral season, or the hospital's overall census at time of implementation.

Limitations for this QI pilot project included a restricted timeline for intervention implementation of 12 weeks and the difference in the time of year between the pre-and post-implementation phases. Another limitation was staff not utilizing the in-room checklist. The age range of 8-14 years limited the data able to be collected, and patients, even those of younger age commonly known to fall due to development, could experience a fall caused from avoidable, environmental factors.

Recommendations for further study include widening the age range for the sample to include pediatric patients of all ages. Another recommendation is to improve strategies for staff compliance of the intervention, including staff education and communication. Furthermore, research into staff compliance on day shift versus night shift with a specific focus on staffing is recommended to assess how staffing ratios affect compliance.

Conclusion

Falls caused by environmental factors pose as a threat to patient safety and are often considered unpredictable, but avoidable adverse events. Compliance of hourly safety rounding as part of a fall prevention bundle could decrease the incidence of patient falls occurring due to environmental factors. In the post-implementation phase including a bundle with a risk assessment tool and hourly safety rounding, zero patient falls occurred. The use of the Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care as a framework allowing further improvement of clinical practice by implementing a fall prevention bundle with hourly safety rounding could be a vital step to decreasing the rate of falls caused by avoidable environmental factors which has an impact on healthcare costs and patient safety.

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Appendix A

Please sign your initials and role (RN, PCT) in the box for each hourly safety rounding completed. If interventions are performed within the hour, include the number corresponding with the intervention key. If no intervention is performed, place N/A in the intervention box.

Intervention Key:

1 Adjusted bed height **2** Adjusted bed side rails **3** Placed call light within reach
4 Cleared pathways/removed clutter **5** Other

*At the end of the week, place completed sheet in the back of the folder and begin new document.

Admit Date, Rm #	Sunday D	N	Monday D	N	Tuesday D	N	Wednesday D	N	Thursday D	N	Friday D	N	Saturday D	N
0700/1900														
Intervention														
0800/2000														
Intervention														
0900/2100														
Intervention														
1000/2200														
Intervention														
1100/2300														
Intervention														
1200/0000														
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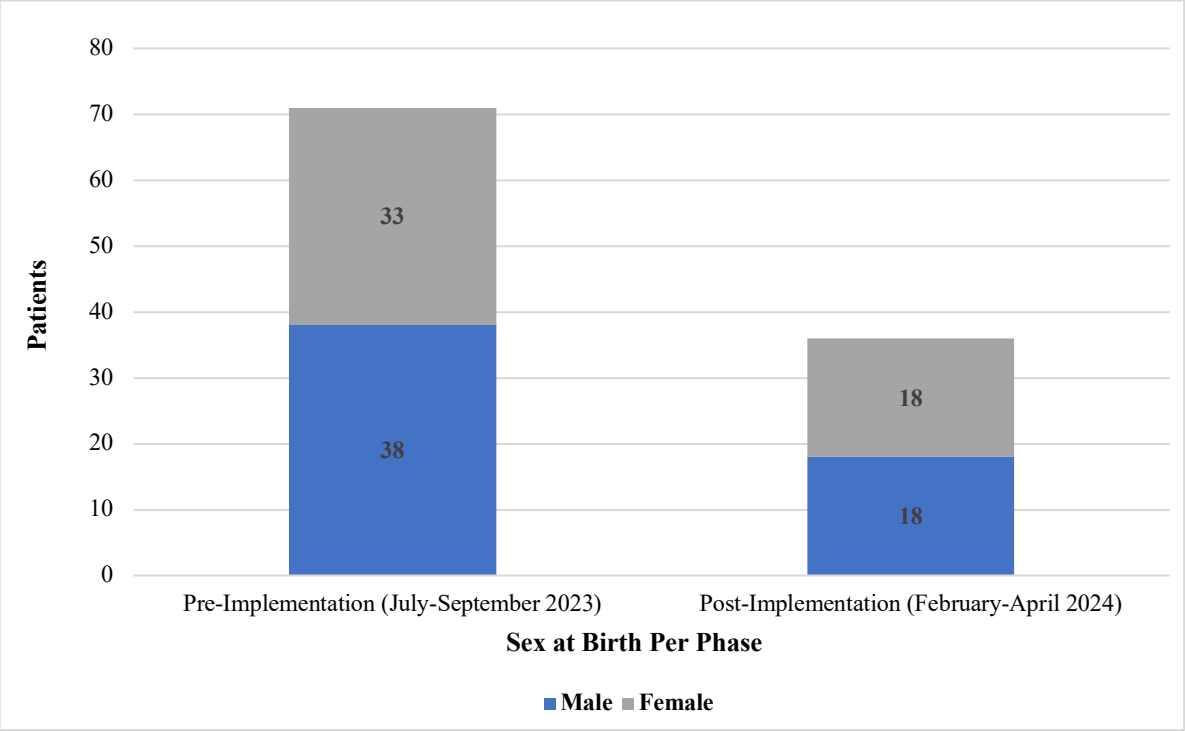
Intervention														
1500/0300														
Intervention														
1600/0400														
Intervention														
1700/0500														
Intervention														
1800/0600														
Intervention														

Appendix B

Figure 1

Patient Demographics

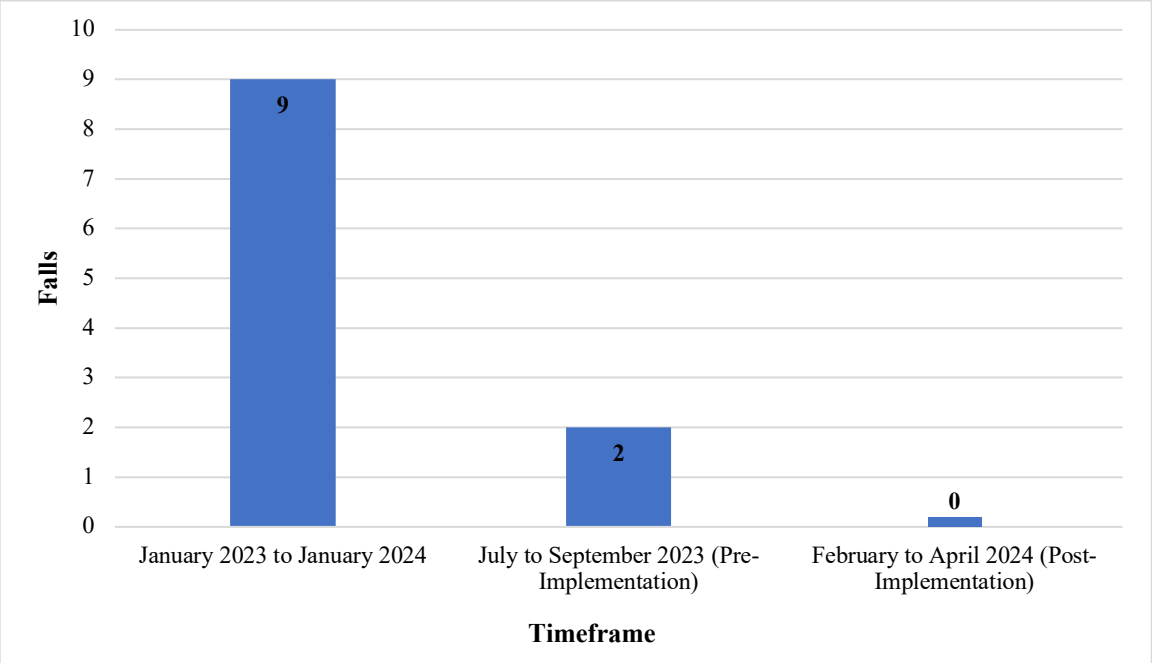


Note. Age (M=11.03) in the pre-implementation phase and (M=11.81) in the post-implementation phase.

Appendix C

Figure 2

Fall Rates

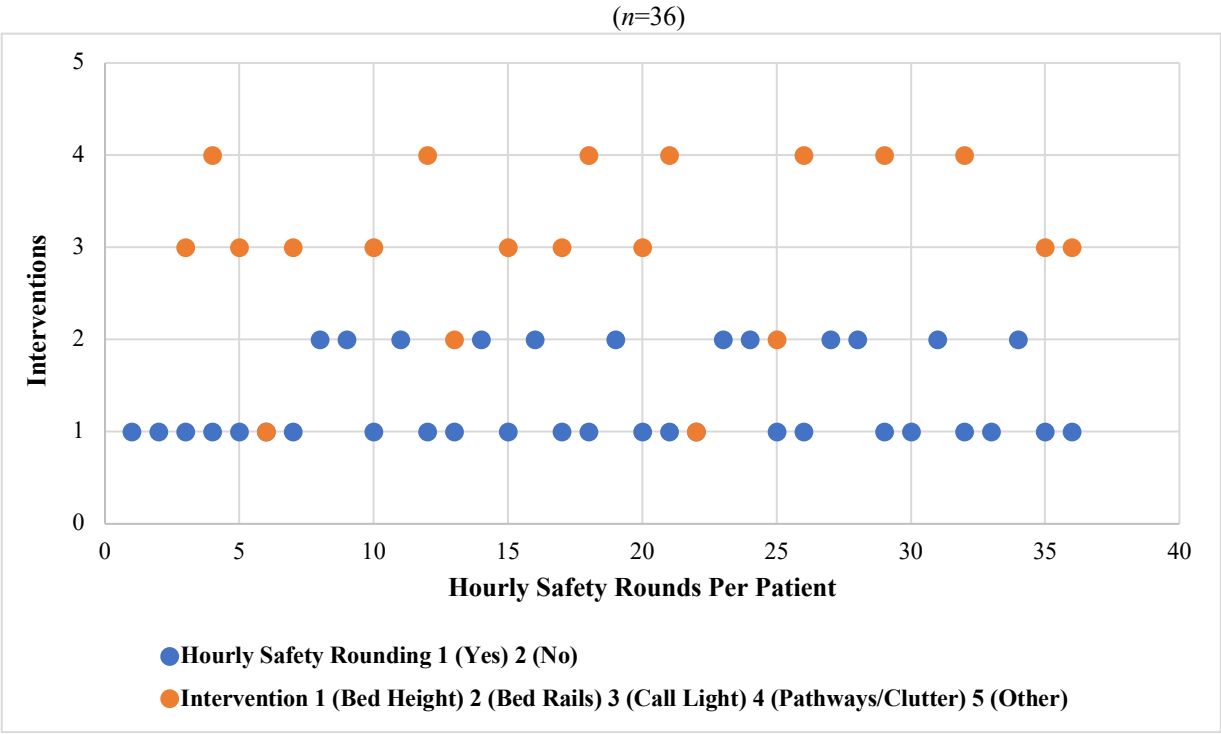


Note. When comparing pre-and post-implementation fall rates, value was found insignificant (FET, p=.549).

Appendix D

Figure 3

Post-Implementation Hourly Safety Rounding and Interventions



Note. Hourly safety rounding was completed (yes, represented by blue dot on line 1) on (*n*=24) patients, with a compliance rate of 66.7%. Hourly safety rounding was not completed (no, represented by blue dot on line 2) on (*n*=12) patients. Out of the (*n*=24) rounds completed, interventions (represented by orange dots) were performed on (*n*=20), with a rate of 83.3%.