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Impact of the Hester Davis Fall Risk Scale on Inpatient Falls

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Abstract

Problem: During a three month period in 2018, a rural acute care facility experienced a fall rate of 3.4 falls per 1,000 patient days. The aim of this clinical scholarship project was to implement the Hester Davis Fall Risk Scale (HDFRS) for adult inpatients in a rural acute care facility.

Methods: Utilizing the Find, Organize, Clarify, Understand, Select- Plan, Do, Study, Act (FOCUS-PDSA) model, the HDFRS was implemented and evaluated using a pre and post design to determine its impact on falls per 1,000 patient days and falls with injury per 1,000 patient days. The method of evaluation was a retrospective database review to compare pre implementation fall data from September, October, November 2018 with post implementation fall data from September, October, November 2019.

Results: A two tailed *t*-test was performed to determine impact; HDFRS did not have a statistically significant impact on falls per 1,000 patient days or falls with injury per 1,000 patient days or change any factors that placed the patients at risk of fall. The cumulative compliance rate of the HDRFS was 99.15% of admissions.

Implications for practice: Fall risk identification is an important first step to a fall reduction program, but alone did not impact inpatient fall rates. This is clinically significant because proper identification and selection of patient risk factor specific interventions allows for personalized fall prevention strategy.

Keywords: Hester Davis Fall Risk Scale, inpatient falls

Impact of Hester Davis Fall Risk Scale on inpatient falls

Falls are one of the most commonly reported hospital acquired conditions, contributing to increased length of stay and cost of care compared to peers who have not experienced a fall (Aryee, James, Hunt, & Ryder, 2017; Bouldin et al., , 2013; Hester, Pao-Feng, Rettiganti, & Mitchell, 2016). During a three month period in 2018, a rural acute care facility experienced a fall rate of 3.4 falls per 1,000 patient days; of those falls, 16% resulted in some degree of injury.

While fall prevention is multifaceted and includes environmental and patient specific measures, risk factor identification and assessment provide a foundation for prevention. The rural acute care facility utilizes a system-wide, customized fall risk scale including fall risk factors of age, medications, mobility, date of last fall, mental status, volume electrolyte status, toileting, communication/sensory status, gender, and behavior with the option to choose one response per risk category. A score of eight or higher is considered high fall risk, but the facility's scale lacks scientific validation as a scoring tool (Hester et al., 2016). This scale does not directly correlate patient specific risks with the nursing care plan in the Electronic Health Record (EHR), resulting in standard fall prevention for all patients identified as high fall risk.

The Hester Davis Fall Risk Scale (HDFRS) includes factors of age, date of last known fall, mobility, medications, mental status, toileting needs, volume/electrolyte status, communication/sensory, and behavior with the option to choose multiple options per risk category; a score of seven to ten indicates low fall risk, eleven to fourteen indicates moderate fall risk, and greater than fifteen indicates high fall risk and has been validated for sensitivity and specificity in scoring fall risk (Hester & Davis, 2013). When applied in the EHR, a patient's specific risk factor will populate on the care plan for nurses to select fall prevention interventions matched to the patient's risk factor. This is the primary difference between the HDFRS and facility-developed fall risk scale.

The purpose of this project was to determine the impact of the HDFRS on falls per 1,000 patient days and the impact of the HDFRS on falls with injury per 1,000 patient days in adult patients, 18 years of age and older admitted to a rural acute care facility. The aim was to decrease the number of falls and the number of falls with injury per 1,000 patient days by 10% in the first three months of implementation. The primary outcome measures were falls per 1,000 patient days and falls with injury per 1,000 patient days. The secondary outcome was the number of fall risk assessments completed on adult inpatients aged 18 years and older. The questions asked in this project were: In hospitalized adult patients, aged 18 years and older,

1. how does fall risk assessment using HDFRS compared to fall risk assessment using a facility customized scale affect the fall rate per 1,000 patient days over a three month period?
2. how does fall risk assessment using HDFRS compared to fall risk assessment using a facility customized scale affect the fall with injury rate per 1,000 patient days over a three month period?

Literature Review

Databases included in the literature search were Cumulative Index of Nursing and Allied Health Literature (CINAHL), Medline, and Cochrane Database for Systematic Reviews. Inclusion criteria were articles published in the last 10 years, peer reviewed, and full text availability. The search strategy used keywords and phrases including "falls"

OR “falls per” OR “fall rate” OR “fall incidence” OR “fall prevention” OR “prevent falls” OR “fall reduction” OR “fall scale” AND “hospital” OR “hospitals” OR “acute care.” The original Hester and Davis reference (2013) was obtained by the librarian at the facility’s corporate office, and is important for validating specificity and sensitivity of the HDFRS. This reference is peer reviewed and published within the last 10 years but was unavailable in full text in the aforementioned databases. Current literature includes one Cochrane systematic review inclusive of 119 studies, one systematic review inclusive of 54 studies, one quasi-experimental study, one case review, one retrospective correlational study, one analyses and one exploratory cross-sectional study of reported data, one feasibility study, and one case control study. Nine total references were identified in the literature review for use in this project with themes of identifying prevalence rates, fall scales, and efficacy of interventions.

Falls are the most reported incident in the acute care setting and estimates range from 1.4 to 18.2 falls per 1,000 patient days, with the most frequent estimates of 3 to 5 falls per 1,000 patient days (Bouldin et al., 2013; Cameron et al., 2018). Fall rates and falls with injury are associated with patient specific factors. Analysis of data from de-identified medical records for 10 patient factors identified age, sex, fall history, use of cardiovascular medications, use of central nervous system (CNS) medications, cognitive impairment, specific medical diagnosis, abnormal laboratory findings, body mass index (BMI), and mobility deficits. A retrospective case-control study comparing admitted patients who sustained an injurious fall in an academic tertiary care center with patients who had not sustained a fall between April, 2011 and April, 2014 found no significant differences in falls for age, BMI, admission source, or orthopedic conditions (Aryee et al., 2017). Falls occur more frequently in medical than surgical departments and often during activities related to toileting (Rheaume & Fruh, 2015). Patient factors are utilized in fall risk scales predict anticipated physiologic falls.

Risk factors for falls and falls with injury are both modifiable and nonmodifiable. Fall risk factors include age, medications, mobility, date of last fall, mental status, volume electrolyte status, toileting, communication/sensory status, gender, and impulsive behavior (Hempel et al., 2013). In fall literature, 37 fall risk assessment scales were identified. Of the 37 scales, 33 were validated with adult patients and 26 were validated in an acute care setting. Validity testing of sensitivity and specificity was completed for 25 of the 26 fall risk scales identified for adult patients in an acute care setting. Inter-rater reliability testing was completed for 14 of the 25 scales. Of the 14 scales that met criteria of reliability and validity testing for adult inpatients in an acute care setting, Morse Fall Risk Scale, St. Thomas's Risk Assessment Tool in Falling Elderly Inpatients (STRATIFY), and HDFRS were compared for scale content, sensitivity and specificity, and inter-rater agreement to select a new scale for implementation.

Morse fall risk scale has been validated in an acute care setting and utilized for sensitivity and specificity comparison to other scales and studies validating novel fall risk scales. Predictive validity for the Morse scale has a sensitivity of 0.73 to 0.96 with specificity of 0.54 to 0.74 and inter-rater agreement of 0.96 to 0.98 (Hempel et al., 2013). The Morse fall scale includes assessment of fall prevention factors, specifically history of falling, secondary diagnosis, ambulatory aid use, peripheral intravenous catheter placement, gait and transferring ability, and mental status including orientation to patient's own ability. Each category is scored based on the patient's response with a score greater than 50 indicating a high risk for falls.

St. Thomas's Risk Assessment Tool in Falling Elderly Inpatients (STRATIFY) has been validated in acute care and geriatric rehabilitation settings. STRATIFY has a predictive validity with sensitivity ranging from 0.66 to 0.93 with specificity that ranged from 0.47 to 0.88; the inter-rater agreement was 0.74 to 0.78 (Hempel et al., 2013). STRATIFY includes assessment of fall history including a patient presenting to the hospital with a fall or who has fallen since admission, patient agitation, visual impairment, frequent toileting, and transfer and mobility. Each item is assigned one point for yes or zero points for no; a patient with a score of two or higher is considered high risk.

HDFRS was studied in an acute care setting with adult patients, 18 years of age and older. HDFRS includes factors of age, date of last known fall, mobility, medications, mental status, toileting needs, volume/electrolyte status, communication/sensory, and behavior with the option to choose multiple options per risk category. A score of seven to ten indicates low fall risk, eleven to fourteen indicates moderate fall risk, and greater than fifteen indicates high fall risk. HDFRS was validated with 1,904 adult patients 18 years of age contributing 7,836 patient days in an evaluation of fall events over a 10-year period. For each fall, the HDFRS score was completed by the researcher and entered into an Excel database. Any fall that was not an anticipated physiological fall and falls that occurred multiple times to the same patient were eliminated. The most recent HDFRS score before the fall was taken and the remainder of the patients were analyzed using their admitting HDFRS score. Inter-rater reliability was measured using a Cohen's kappa and chi-squared analysis was performed to test validity of the tool. HDFRS has a predictive validity with a sensitivity of 0.91 and specificity of 0.47, and inter-rater reliability of 0.90 (Hester & Davis, 2013).

Hempel et al. (2013) summarize an extensive list of fall interventions in their systematic review of 59 studies from 1986 to 2011. These interventions include various forms of patient education, bed exit alarms, fall risk signage at the door or bedside, tailoring interventions in care planning, and other assessment related to potential fall risk factors such as mobility. In a Cochrane systematic review of fall prevention interventions in 119 studies from 1994 to 2018, 24 applied to acute care facilities while 95 applied to long term care facilities (Cameron et al., 2018). Physiotherapy, multifactorial interventions, and bed and chair exit alarms showed a low level of evidence for efficacy. Bed exit alarms were cited most often, but uncertainty exists in their efficacy at lowering fall rates. Detection of fall motion increases surveillance in an acute care setting with virtual monitoring by Microsoft® Kinect™ allows for patient monitoring while maintaining privacy and provides clinicians an opportunity to review fall events for quality improvement (Rantz, et al., 2014). Evidence for fall reduction interventions and impact shows the complexity of falls and necessity for a multifaceted approach.

The framework for the project was the Find, Organize, Clarify, Understand, Select- Plan, Do, Study, Act (FOCUS-PDSA). FOCUS-PDSA is a rapid cycle approach to quality improvement projects (Gouty, Bonomi, Messer-Rehak, & Garcia, 2009). The opportunity for improvement, *Find*, was fall risk identification for fall reduction. *Organize* was the phase to bring together a team, a foundation for prework of a quality improvement project (Gouty et al., 2009). *Clarify* processes and problems were performed with administration alongside the Ministry Patient Safety team and the interdisciplinary team. *Understanding* the process was performed with the interdisciplinary team and presented to senior leadership to develop target readiness and build a communication plan. The *Selected* intervention used was to modify the EHR to add HDFRS as decided by the corporate wide fall prevention committee.

During the *Plan* phase, target readiness, education, and a communication and feedback plan were developed by the implementation team. The *Do* phase was implementation of the plan and collection of project specific data capturing problems and observations by the team (Gouty et al., 2009). During the *Study* phase, results from defined from *Do* phase process and outcome measures were reviewed for action determination in the *Act* phase. PDSA cycles assist in prioritizing actions to study the impact of actions taken and *Act* upon the results. This pattern is cyclical and continued throughout implementation of the project.

Method

Design

This quality improvement project used a pre and post implementation design to evaluate use of a standardized scale comparing patient fall data from September, October, November, 2018 with September, October, November, 2019. The method for data collection was a retrospective database review of the implementation of the HDFRS.

In the *Plan* stage, champions were identified from nursing, therapy services, UAPs, Epic, and clinical education through participation in the Fall Committee. The multidisciplinary team developed the appearance and functionality of HDFRS in the EHR. This was accomplished through weekly meetings to review elements of the scale and test functionality in the EHR ‘playground’ environment. An audio-visual style online education module that covered of the scale elements was developed by the interdisciplinary team. All inpatient registered nurses were required to pass a multiple-choice assessment with a score of 80% or better at the end of the module. A feedback tool was also made available on the facility’s intranet site for staff to utilize to communicate with the implementation team about issues and opportunities.

Setting

The setting was a rural, 142-bed acute care facility in a county in the Midwest area of the United States with a population of about 100,000 persons. The facility provides inpatient care in medical, medical/surgical, cardiac telemetry, intensive care, step down, and maternal childcare/labor and delivery departments for 1,900 patient days per month.

Sample

The sample was a convenience sample that included data from all inpatient adults, 18 years of age and older, aggregated as total patient days. Patient days from patients younger than 18 years of age, emergency department visits, and surgery center visits were excluded.

Approval Process

After approval by the student’s committee, details of the study were submitted by application to the facility’s Institutional Review Board (IRB) for a Determination of Research. The IRB reviewed the application and protocol, acknowledged the project, and determined it was not human subjects research. The project was then submitted to the University of Missouri - St. Louis (UMSL) IRB for expedited approval, and determined not to be human subjects research. Benefits of this project included enhancement to the identification and care planning of patients at risk for inpatient falls. There was minimal risk to patients as all data were de-identified.

Data Collection

The event reporting system, Safety, Accountability, and Feedback for Everyone (SAFE), a secure database, was utilized by bedside coworkers to report falls with standardized details surrounding the fall; de-identified reports from SAFE were accessed to review falls. Data for each fall event collected included date, time, department, patient age, patient sex, if there was harm, what level of harm, type of injury, if fall risk assessment was performed prior to fall, if the patient was determined to be at risk for a fall, pre-fall risk score, post-fall risk score, if the decent was assisted, if staffing was to matrix, and patient activity prior to fall. These data were filled out by the bedside coworker reporting the event and did not require chart review to obtain information.

Fall data from the SAFE and Insight were used to determine falls per 1,000 patient days for outcome measures. Data were collected and stored in a password-protected spreadsheet and on a password-protected facility computer on the facility's secure server. Data were then aggregated to falls and falls with injury per 1,000 patient days by month and department then shared to the lead investigator's personal computer via a secure file transfer system for data analysis.

To collect data on secondary outcomes, an Insight report to capture utilization rates for HDFRS for inpatient admissions was generated and shared with the CNO and nurse managers to reinforce assessment with bedside nurses with a goal of 100% adherence with assessment of inpatient admissions.

Procedures

Transition from the facility developed falls scale to HDFRS was a quality improvement project selected by the corporate level falls prevention committee after review of the current scale. The small interdisciplinary subcommittee was selected by the organization Fall Committee and led by the Doctor of Nursing Practice (DNP) candidate. The subcommittee met once a week to create the scale and work on implementation while the wider committee received a progress report once a month during the regular meeting. The proposal for the quality improvement project was submitted and approved by the DNP candidate's committee in December of 2019 and IRB approval, both the facility and UMSL, was completed March 2019.

Data collection was initiated April 1, 2020. Pre and post implementation data were analyzed using an independent t-test by uploading both data sets into Statistical Package for the Social Sciences (SPSS). Results were summarized and shared with the Fall committee in June 2020.

Results

A two-tailed paired samples *t*-test was conducted to examine whether the mean difference of the cumulative inpatient fall rates and cumulative inpatient fall rates with injury was significantly different from zero. The two-tailed paired samples *t*-test was selected because the fall rates were normalized to falls per 1,000 patient days and were measured in the same inpatient departments pre and post implementation of the HDFRS.

A Shapiro-Wilk test was conducted to determine whether the differences in cumulative inpatient fall rates pre implementation and cumulative inpatient fall rates post implementation and cumulative inpatient fall rates with injury pre implementation and cumulative inpatient fall rates with injury post implementation could have been produced by normal distribution (Razali & Wah, 2011). The results of the Shapiro-Wilk test for cumulative fall inpatient rates pre implementation and cumulative inpatient fall rates post implementation were not significant based on an alpha value of 0.05, W=0.88, p=0.287. The results of the Shapiro-Wilk test for cumulative inpatient fall rates with injury pre implementation and cumulative inpatient fall rates with injury post implementation were not significant based on an alpha value of 0.05, W=0.90, p=0.395. The results for both measures suggest the possibility the results being produced by a normal distribution cannot be ruled out, indicating the normality assumption is met.

Levene's test was conducted to assess whether the variances of cumulative inpatient fall rates pre implementation and cumulative inpatient fall rates post implementation and cumulative inpatient fall rates with injury pre implementation and cumulative inpatient fall rates with injury post implementation were significantly different. The result of Levene's test for cumulative fall inpatient rates pre implementation and cumulative inpatient fall rates post implementation was not significant based on an alpha value of 0.05, $F(1, 10) = 0.87$, $p = .372$. The result of Levene's test for cumulative inpatient fall rates with injury pre implementation and cumulative inpatient fall rates with injury post implementation was not significant based on an alpha value of 0.05, $F(1, 10) = 3.44$, $p = .093$. These results suggest it is possible that both measures were produced by distributions with equal variances, indicating the assumption of homogeneity of variance was met.

The result of the two-tailed paired samples t-test for cumulative inpatient fall rates pre implementation and cumulative inpatient fall rates post implementation was not significant based on an alpha value of 0.05, $t(5) = -2.08$, $p = .092$, indicating the null hypothesis cannot be rejected. This finding suggests the difference in the means of the pre and post implementation results was not significantly different from zero. The results are presented in Appendix A.

The result of the two-tailed paired samples *t*-test for cumulative inpatient fall rates with injury pre implementation and cumulative inpatient fall rates with injury post implementation was not significant based on an alpha value of 0.05, $t(5) = -1.48$, $p = 0.199$, indicating the null hypothesis cannot be rejected. This finding suggests the difference in the means of the pre and post implementation results was not significantly different from zero. The results are presented in Appendix A.

The Cardiac Telemetry unit had the highest fall rates pre implementation and post implementation periods with rates of 6.7 and 8.6 falls per 1,000 patient days respectfully while the Intensive Care Unit had the lowest fall rate of 0 falls per 1,000 patient days in both the pre implementation and both implementation periods. Results are displayed in Appendix B. The mean age of the pre implementation group was 70.52 while the mean of the post implementation group was 72.24. The patient who fell was a male 59% of the time in the pre implementation group and 57% of the time in the post implementation group. In both the pre implementation and post implementation groups, the greatest proportion of fall events occurred after toileting related activities in 52% and 47% of the events respectfully. The second most common activity prior to fall in the pre implementation and post implementation groups was ambulating without assistance in 18% and 22% of events respectfully. Cumulative compliance for completion of the HDFRS on inpatient admissions was 99.15% of admissions.

Discussion

The facility and organization spent significant time and attention to accurately identify patients at increased risk for fall. While HDFRS is validated for sensitivity and specificity, identification alone of patients at high risk for falls did not result in a statistically significant decrease of falls or falls with injury in the adult inpatient population. This is clinically significant because risk factor identification and assessment should provide a foundation for prevention, but the facility will need to tailor interventions to patient-specific risk factors.

Data from this program provide insight into activities patients were performing prior to fall. In both the pre and post implementation, toileting related activities were most frequently associated with a fall. Ongoing quality improvement projects aimed at implementing interventions for toileting related falls could have a significant impact on fall rates at this facility based on these current data.

Limitations of this evaluation include sample size. The HDFRS was implemented throughout the organization at large, not only the rural health facility used as the setting for this project. Due to the size of this facility, some departments have lower patient days and/or zero fall events not allowing for further statistical analysis. Further data analysis could be conducted across multiple hospitals to measure a greater impact of the scale on inpatient falls including comparison by service line.

HDFRS allows for selection of and supporting documentation for interventions tailored to patient specific risk factors. Literature supports patient and risk factor specific interventions for fall prevention. As a retrospective review of pre and post implementation data, an outcome measure scale reviewed was overall completion of the scale. Further study of intervention selection could be improved by evaluating selected interventions during the patient's hospitalization when presence of options such as bed alarm activated, gait belt available at bedside, or personal items within reach are observable.

Conclusion

Results of the program evaluation indicate implementing the HDFRS did not have a statistically significant impact on inpatient falls or falls with injury. In the pre and post implementation groups, there existed little variation in gender, age, or activity prior to fall; the groups are comparable with both scales in use.

While implementation of HDFRS may not have impacted fall rates, the facility now has an evidence-based scale successfully implemented and should not be reverted back to a tool that is not validated. This change can be sustained by working with the feedback received to streamline the tool and further improve the user interface of the HDFRS and maintain engagement. Identification of patients at risk for falls provides the foundation for a fall prevention program and the facility can now implement more quality improvement measures for fall prevention.

References

Aryee, E., James, S., Hunt, G., & Ryder, H. (2017). Identifying protective and risk factors for injurious falls in patients hospitalized for acute care: A retrospective case-control study. *BMC Geriatric, 17*(260). doi: 10.1186/s12877-017-0627-9

Bouldin, E., Andresen, E., Dunton, N., Simon, M., Waters, T., Liu, M. … Shorr, R. (2013). Falls among adult patients hospitalized in the United States: Prevalence and trends. *Journal for Patient Safety, 9*(1), 13-17. doi: 10.1097/PTS.0b013e3182699b64.

Cameron, I. Dyer, S., Panagoda, C., Murray, G., Hill, Cumming, G. … Kerse, N. (2018). Interventions for preventing falls in older people in care facilities and hospitals. *Cochrane Database of Systematic Reviews, 9.* doi: 10.1002/14651858

Datix (2019). Falls by department and month. Report generated October 15, 2019. St. Louis, MO: Mercy.

Gouty, C., Bonomi, J., Messer-Rehak, D., & Garcia, R. (2009). Fall reduction strategies: Using a rapid cycle FOCUS-PDSA process to reduce patient falls. *Sustained improvement in nursing quality: Hospital performance on NDNQI Indicators, 2007-2008.* Silver Spring, MD: American Nurses Association.

Hempel, S., Newberry, S., Wang, Z., Booth, M., Shanman, R., Johnsen, B. … Ganz, D. (2013). Hospital fall prevention: A systematic review of implementation, components, adherence, and effectiveness. *American Geriatrics Society, 61*(4). doi: doi: 10.1111/jgs.12169

Hester, A. & Davis, D. (2013). Validation of the Hester Davis Scale for Fall Risk Assessment in a neurosciences population. *Journal of Neuroscience Nursing, 45*(5), 298-305. doi: 10.1097/JNN.0b013e31829d8b44.

Hester, A., Pao-Feng, T., Rettiganti, M., & Mitchell, A. (2016). Predicting injurious falls in the hospital setting: Implications for practice. *American Journal of Nursing, 116*(9), 24-31. doi: 10.1097/01.

Insight (2019). Flash report. Report generated October 15, 2019. St. Louis, MO: Mercy.

Intellectus Statistics [Online computer software]. (2020). Intellectus Statistics. https://analyze.intellectusstatistics.com/.

Rantz, M., Banerjee, T., Cattoor, E., Scott, S., Skubic, M., & Popescu, M. (2014). Automated fall detection with quality improvement "rewind" to reduce falls in hospital rooms. *Journal of Gerontological Nursing, 40*(1), 13-17. doi: 10.3928/00989134-20131126-01

Rheaume, J, & Fruh, S. (2015). Retrospective case reviews of adult inpatient falls in the acute care setting. *MEDSURG Nursing, 24*(5), 318-324. doi: 10.2106/JBJS.J.01647

Razali, N. M., & Wah, Y. B. (2011). Power comparisons of Shapiro-Wilk, Kolmogorov-Smirnov, Lilliefors and Anderson-Darling tests. *Journal of Statistical Modeling and Analytics, 2*(1), 21-33.

Tzeng, H., Hu, H., & Yin, C. (2016). Understanding inpatient injurious fall rates using Medicare's *Hospital Compare* data. *MEDSURG Nursing, 25*(4), 255-269.

Appendix A

Table 1

Two-Tailed Paired Samples t-Test for the Difference Between Falls Rate and Fall Rate with Injury

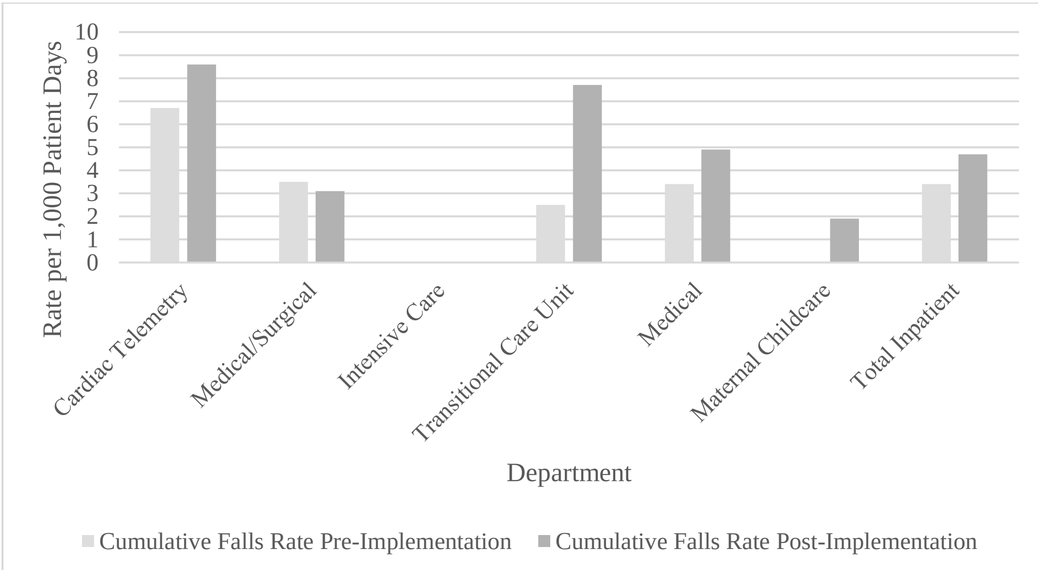
	Pre_Implementation		Post_Implementation				
	M	*SD*	*M*	*SD*	*t*	*p*	*d*
Fall Rate	2.68	2.52	4.37	3.35	-2.08	0.092	0.85
Fall Rate with Injury	0.28	0.44	1.17	1.51	-1.48	0.199	0.60

Note. N = 6. Degrees of Freedom for the *t*-statistic = 5. *d* represents Cohen's *d.* Data derived from Datix (2019), Insight (2019), and Intellectus Statistics (2020).

Appendix B

Table 2

Comparison of Fall Rates Pre and Post Implementation



Note. Pre implementation dates September, October, November, 2018 and post implementation dates September, October, November, 2019 with data from Datix (2019) and Insight (2019).