IMPROVING MEDICATION ADMINISTRATION SAFETY IN CLINICAL

by

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Abstract

Work interruptions during medication administration are a serious problem negatively impact patient safety. Utilizing a medication safety vest and signage during medication administration improves situation awareness, therefore reducing the potential for interruptions.

Keywords: workplace interruptions, medication errors, situation awareness

Improving Medication Administration Safety in the Clinical Environment

Work interruption(s) (WI) create danger at the bed side particularly during medication administration (MA). Medication errors (ME) compromise patient safety (Flynn, Liang, Dickson, Xie, & Suh, 2012). A WI can be as simple as a member of the health care team, patient or family member inviting conversation while preparing medications. Additionally, technology at the bedside, telephone calls and noise cause distractions (Hester, 2010), posing yet another source for WI. Incorrect administration of medication is responsible for approximately 26% to 32% of total patient safety errors in nursing care (Anderson & Townsend, 2010, p. 23; Karavasiliadou & Athanasakis, 2014). The need to reduce interruptions and associated errors with MA is essential.

The setting for this quality improvement (QI) project was a regional medical center with 251 beds serving a western Maryland. The institution had a "no interruption zone" for MA. A no interruption zone is a designated area that is quiet, or otherwise designated area expected to decrease WI during the preparation for MA. Quiet zones and red-taped safety areas have been researched for reducing distractions with MA (Klejka, 2012). During direct observation in the facility the nurses, staff, and interdisciplinary team appeared unaware of the no interruption zone and ignored its purpose.

Literature Review

In order to examine the evidence further, a literature review was systematically conducted. The search included a variety of studies, journals, and a dissertation from 2009-2015 and resulted in 14 relevant studies. Keywords used were workplace interruptions, medication errors, medication administration, and situational awareness (SA). The data bases reviewed included: (a) The Cochran Database of Systematic Reviews, (b) Cumulative Index to Nursing

and Allied Health Literature, (c) ERIC EBSCO, (d) Health Source Nursing/Academic Ed, (e) OVID Full text, (f) Medline (PubMed), (g) ProQuest, (h) Psych INFO, (i) SOCINDEX with full text, and (j) Sciencedirect.

The ability to maintain a safe working environment with positive patient care outcomes is a challenge. Flynn et al. (2012) determined that patients are subjected to one ME per day and that a supportive practice environment can reduce WI for nurses during MA. Approximately 53% of MA errors occur at the time of preparation or administration (Tzeung, Yin, & Schneider, 2013). Being interrupted during MA is one of the many reasons for safety issues (Dilles et al., 2011). An integrative review by Hopkinson and Jennings (2013) identified that WI are still in need of further investigation in the acute care area.

Williams, King, Thompson and Champagne (2014) conducted a QI project examining causes of WI and medication safety initiatives with successful result of reduced ME. The QI project identified a decrease in WI and improved outcomes with QI interventions of a safety vest, signage, and educational responses for nurses to use during WI. The fact that WI is prominent in the workplace among nurses remains a significant issue, placing patients at increased risk for safety.

The other causes of WI during MA were related to communication interruptions. Interruptions from co-workers were a main factor with ME (Petrova, 2010). Keers, Williams, Cooke, and Ashcroft (2013) utilized a systematic review of 54 studies and found that MA causes included but were not limited to situational violations, poorly designed tools and protocols, drug knowledge and the patient. Keers et al. (2013) found that distractions and interruptions during MA were caused by ward rounds, telephone calls to the nurses, and conversations with co-workers and patients.

Improvement Needs/Group Oversight

The identified need for improvement was to create SA during MA was the initiative of the QI project described in this paper. To pilot this project, an interdisciplinary team on a 28- bed nursing unit within a regional medical center was chosen. The clinical problem was the apparent disregard and non-adherence to current MA practice on the unit of the "no interruption zone" in the medication area, during direct observation.

The purposes of the evidence-based QI project were (a) to investigate WI, and (b) to improve medication safety outcomes on the medical surgical unit in an acute care setting. The project was designed to bridge the gap in clinical practice by answering the research question: *Will SA of those nurses utilizing the medication safety vest administering medications to patients have reduced distractions as compared to the current practice of no medication safety vest?*

According to Sitterding et al. (2014), a gap in knowledge and understanding of SA exists during MA. Registered Nurses (RN) administering bed side medications need to use SA to prevent WI and reduce ME. SA is a universal term for conscious awareness that a practitioner has of a circumstance or situation (Stubbings, Chaboyer, & McMurray, 2012). Some institutions have utilized bright colored safety vests for nurses to wear to alert colleagues and patients that the nurse is not to be disturbed during medication administration (Hester, 2010). There have been many types of QI initiatives used for reducing WI during MA. According to Williams et al., (2014), safety vests, posted signs, highlighted decorative aprons and sashes have been used to reduce WI during MA.

A visual prompt of a medication safety vests with *Do Not Disturb* labeled on it was used during the QI project to reduce WI and ME as desired outcomes. The medication safety vests were donated by Riskologic LLC. for the project. The project was designed, implemented, and

evaluated by the project leader. Consent to particulate was waived by the Institutional Review Board at the university and medical center as the QI project was conducted as part of in-service for staff on the unit.

Quality Indicators

Quality indicators are helpful in determining an assessment with internal and external reporting (Smeulers, et al., 2015). The quality indicators sources of information were the Patient Safety Reporting System and the hospital's Medication Variance Reporting System (MVRS). Medical center incident reports ME were located in the MVRS.

The educational sessions were conducted on the nursing unit. All shifts were included to capture the staff involved with the project. The need to educate the individuals involved with patient care specifically during MA was to create an understanding of SA, medication safety vest and signage.

Medication safety vests were given to all RNs on the unit responsible for MA after the educational session was completed. The project leader attended staff meetings and performed several unannounced visits during the implementation of the medication safety vest timeframe, in order to observe the compliance with the QI project. The visits were conducted during the day, night, and weekend shifts. An average of two visits per week occurred over the four week period. A field log was used to keep anecdotal notes of the QI project observations. Feedback was obtained randomly from the RNs during the field visits about the project. Comments were documented without identifiers from the RNs and kept in the field log.

The method utilized for the QI project was a pretest-posttest model. The RNs were given a pretest tool on types of distractions to complete before the implementation of the medication

safety vest. The posttest was provided after the four week time frame as a way to re-evaluate a change (Harvey, 2015).

MADOS Survey Tool

The Medication Administration Distraction Observation Sheet (MADOS) identified 10 sources of distractions and interruptions (Pape, 2003). The modified survey tool (used with permission from the publisher) examined the perception of the reasons and frequency of distractions during the MA process on the nursing unit. The nurses were asked to rank the frequency of MA distractions and interruptions. A list of distractions was included on the MADOS survey tool. The nurses used the modified MADOS survey tool and ranked their perceptions of distractions from 1 being the most frequent, to 10 the least frequent. The RNs completed the modified MADOS survey before and one week after the implementation of the medication safety vest. Descriptive statistics were used to examine the categorical data for the distractions.

The MADOS survey tool Pape (2003) has been previously established in the literature as a classic survey tool with a high inter-rater reliability (.90) established despite its age. The modified MADOS survey tool was beneficial in determining types of interruptions and distractions from the nursing unit. The choices included reasons for distractions during MA as outlined by Pape (2003). Examples include phone calls to the nurses, patients, visitors, wrong dose, missing medications, physicians, and external noises.

The modified MADOS survey tool for the QI project was given to the nurses post-intervention to compare the perceptions of distractions after using the medication safety vest for a four week period. A week was designated for the collection of the pretest and posttest MADOS survey tools.

Perceptions Survey

The RNs also completed a survey for their perceptions of the safety vest, signage on the units and educational in-service upon completion of the project. The *Nurses Perceptions of the Medication Safety Vest, Signage and Education Survey* was developed by the project leader and administered. The survey included feedback on the effectiveness of the safety vest, signage, educational sessions and reference binder.

Medication Errors

RNs on the nursing unit were asked to administer medications during the intervention (four week) phase. The RNs wore the "medication safety vest" specifically provided for this project. The ME numbers of the nursing unit were evaluated for three months prior to the medication safety vest and after four weeks of using the medication safety vest.

Data Collection

The laminated *Do Not Disturb the Nurse* signage was placed in all 28 patient rooms, medication areas, and computer work stations for all individuals to observe during the project. The medication safety vests with *Do Not Disturb* written on the vest were worn by the RNs during the administration of medications with assigned patients only. The medication safety vest and signage were evaluated after four weeks by the RNs.

Compliance Survey

Data regarding the compliance of the nurses wearing the medication safety vest during the project were also collected. The nurse manager and the resource nurses on the nursing unit were invited and encouraged to be "Champions" for the QI project. *The Medication Safety Vest Compliancy Report* was used to track the nurses' compliancy of the vest usage each day. The compliancy reports were placed daily in the designated locked boxes located in the areas

discussed during the educational in-services at the nurse's station. Omissions of the compliancy reports were included as a response. The nurse manager assisted the project leader with reminding the champions to complete the compliancy reporting sheet daily and as necessary during staff meetings and daily huddles where information is exchanged by the RNs. The nurses were a pivotal part of the QI process success with ensuring outcomes through communication.

If a ME occurred during the four- week period, the champions monitoring the shift documented on the daily compliance sheet if the vest was worn during that occurrence of the error. The completed evaluations were placed in the locked box on the nursing unit. The compliance sheet listed percentage ratings (grade) from 100-90%, 89-80%, 79-70%, 69-60% and 59% below (a grade of A, B, C, D, E) to be used during observation of the shifts. The champions were staffed on each shift every day to observe the compliancy of the medication safety vest. A range scale (e.g. 100-90%) was used to allow the champion or project leader to identify the compliance grade of A, B, C, D, or E. The compliancy use of the safety vest was analyzed for its frequency and grade range to identify an outcome. The compliancy reports were statistically reviewed for percentage and frequency of RN compliance during the four week period.

Evaluation and Action Plan

The evaluation and action plan of the QI project generated new discussion and potential change for consideration in policy for the nursing staff on the unit post results. The project leader met with the nurse manager to review and explain the results and incorporate feedback regarding the outcomes. The results were also shared with the Chief Nursing Officer of the medical center.

There were 14 ME for the three months prior to the project. Of the 14, nine were directly applicable to the RNs on the nursing unit. After four weeks of the medication safety vest use and signage, the number of ME was reduced to one ME that was not related to the safety vest use, as it occurred during an emergency code situation on the unit. (See Figure 1).

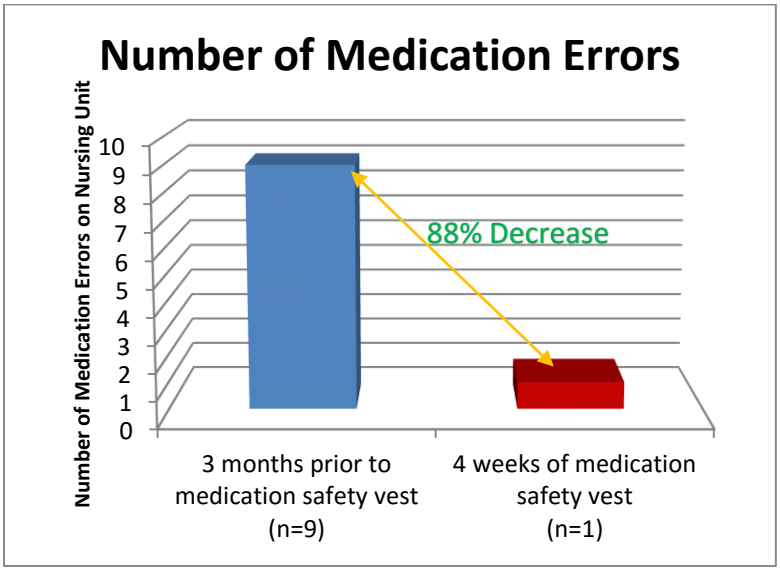

Figure 1. The number of ME was reduced 88% after the medication safety vest use and signage on the unit.

The evaluation and analysis of the distractions survey (MADOS) demonstrated a positive outcome after the use of the safety vest. (See Figure 2). During the safety vest and signage use there was a change in outcomes. The results identified a decrease in external noises after the project.

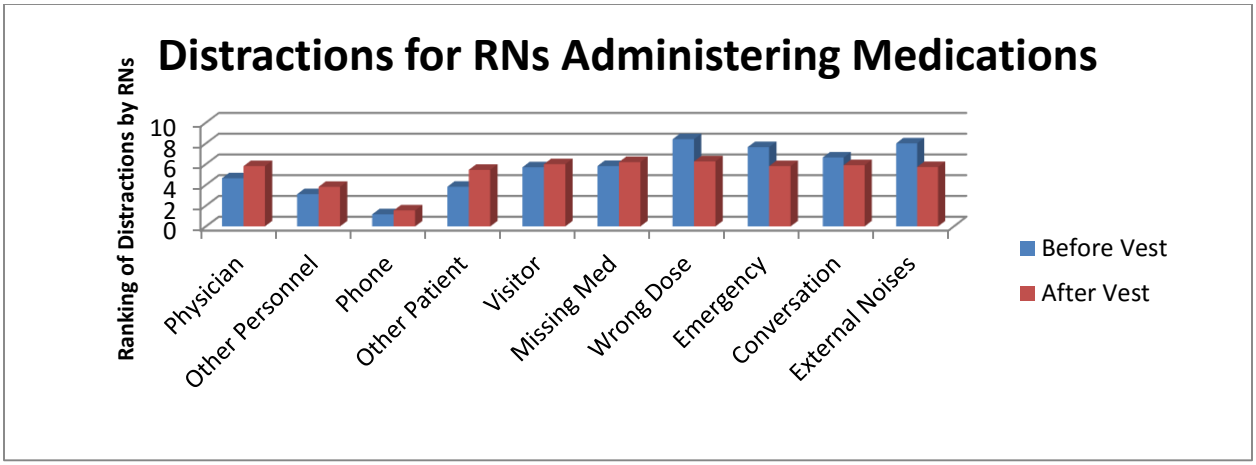

Figure 2. The frequency of distractions were ranked from 1-10. One being the most frequent distraction, 10 being the least frequent distraction before and after the use of the safety vest. A significance level of α = .05 was used for all tests.The phone was the most frequent before and after. The wrong dose was the least frequent before the vest use. External noises showed a statistical significant reduction at the .05 significance level p value =0.03 after the use of the medication safety vest.

The evaluation of the perceptions survey demonstrated a positive outcome in all areas. The RNs identified the effectiveness of the medication safety vest, signage use, educational session and reference binder effective for the project. There were no ineffective ratings on any of the perceptions surveys. (See Figure 3).

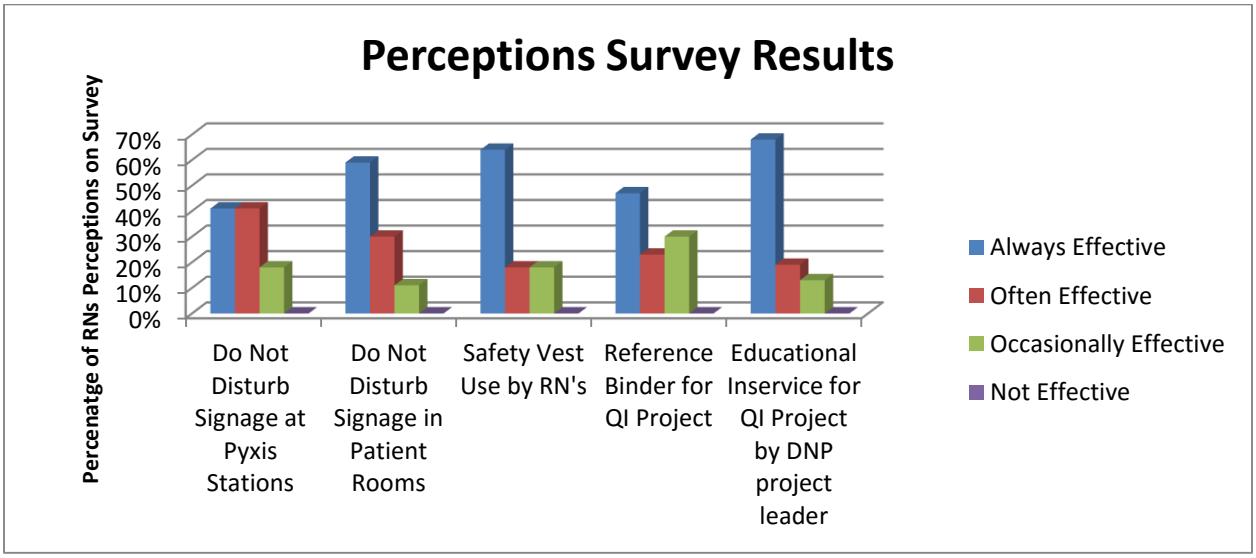

Figure 3. This figure represents the perceptions of the various items evaluated by the RNs (N=17) post QI project. The vast majority identified the signage, safety vest use, reference binder and educational in-service highly effective overall.

The compliance of the medication safety vest revealed a high level of usage on day shift and night shifts combined. Day shift had a 76% of an A or B rating, while night shift had 100%

rating of an A and or B grade during the four week period. Overall compliance on day and night shift was 86%, representing a grade of A and B. (See Figure 4). The overall positive compliance resulted in a 75% survey return during the four week period. The medication safety vest could be linked to the reduction of ME numbers reported earlier.

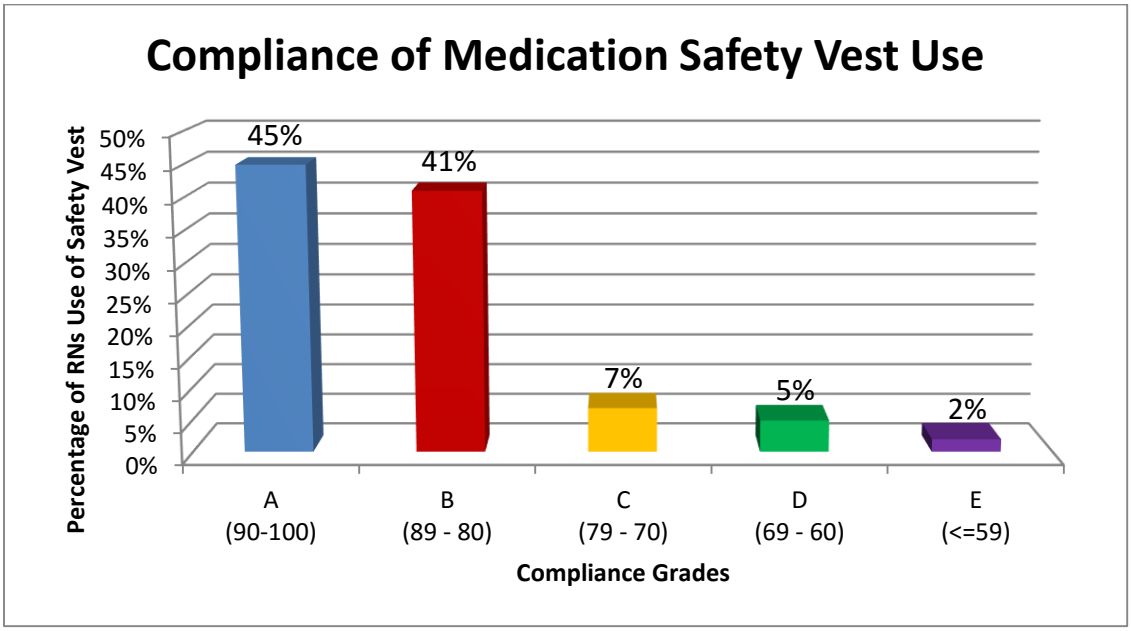

Figure 4. The RNs demonstrated a very positive outcome or compliance with the safety vest use. Approximately 86% of the time compliance of the safety vest use was rated an A and or B grade.

Results and Limitations

The results of the project were surprisingly positive overall. One of the key factors in having the participation of the nursing staff was the advance planning and communication with the nursing leadership and management. The ability of the RNs to have scheduled time to clarify, and ask questions about the information related to the project expectations was critical for the results and initiation of the project. This was essential for the success and the consideration of the RNs to participate in the project. The project leader also sent an email to all departments of the medical center making them aware of the QI project since this was not the practice among all nursing units.

Results

The MVRS results identified ME rates from three months prior to the vest and during the use of the medication safety vest. The results decreased from a total of nine over the previous three months to a total of one reported. This resulted in an 88% decrease in ME numbers for the nursing unit. This result was a significant change in reduction in number of ME on the unit. The quality of care for this area improved on the unit during this time with MA and ME results.

Results of the MADOS surveys, for WI had a significant finding. The external noises distraction demonstrated a significant change at the 0.5 significance level. The p value was 0.03 which indicated a significant difference in the mean. A two *t*-test was performed on the MADOS results pretest and posttest because of the small sample size.

The perceptions of the project demonstrated favorable responses. The RNs felt 82% of the time, the signage in the patient rooms was always and or often effective. The perceptions of the signage in the medication areas was rated always and or often effective 89%. The medication safety vest was favorable 84% always and or often effective. Lastly, the reference binder and education sessions were rated 70% and 84% respectively as always and or often effective. There were no negative responses recorded by the RNs during the perceptions survey results.

The compliance of medication safety vests results was above average on both shifts (day and night). The evaluation of the data graded by the champions represented positive outcomes. The RNs used the medication safety vest 86% of the time over the four-week period. This result was demonstrated above average use of the medication safety vest during MA for the project.

Field Log Visits

The field log visits identified subjective feedback from the nurses during the four-week medication safety vest use. The RNs stated they liked wearing the vest, that it worked, and it was helpful. Some of the nurses said they would forget to put it on once in a while during MA. Two RNs stated that other departments did not like the vest, as it caused others to not interrupt the nurse and slowed others within the interdisciplinary team to retrieve information elsewhere. One RN indicated that a patient's family member asked for a safety vest to give to her daughter who was an RN to use as she thought it was a wonderful idea for patient safety at another hospital. A few nurses stated they did not want to stop wearing the vest after the project ended, as they said it worked and helped them become more efficient with time management.

Limitations

There were several limitations with the QI project including the sample size, response time and incomplete sets of MADOS surveys. Another limitation was the potential Hawthorne effect as nurses potentially changed behavior and put the vest on when the project leader made rounds for the observation and field log. The Hawthorne effect is something that impacts the participant's awareness and makes them conscious about being watched or evaluated (Polit & Beck, 2012). Another limitation was the major distraction of the phone. Given that nurses are required to carry a phone at all times, this distraction could not be eliminated as part of the project.

Nursing Implications

The QI project demonstrated that wearing the safety vest increased SA. In addition, external noises within a controlled environment decreased. The nurses were supportive of the vests as they recognized the value in not being distracted or interrupted by others on the unit and

could focus on medication safety. The quality outcome during the four-week timeframe was improved as evidenced by the reduction in number of ME. Further study or replication for this project would be recommended for future.

Conclusion

MA and WI is a serious issue in nursing today. The significance of the problem is well documented. If the clinical problem is unexplored, WI will continue to cause injury and death of patients. This is substantial to the patient population receiving medications. The significance is critical for all the stakeholders involved to make improvements with addressing the clinical problem of WI with MA.

The QI project demonstrated a potential evidence-based solution to reduce ME and improve patient safety outcomes on the nursing unit. The use of SA is a potential solution for creating a new clinical guideline for improving patient outcomes. Creating conscious awareness through the use of devices, such as the medication safety vest, signage and education with renewed mindful efforts for all healthcare personnel and patients is vital for improvement. The need for improved quality, quantity, and consistency with future studies to reduce WI related to MA, and improve patient safety outcomes is justified.

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Learner name and date	Janet Tompkins McMahon, November 17, 2015
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