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Higher Medication Administration Errors Associated with Automated Dispensing System Usage

Jillian Cramer
jillian.cramer@gmail.com

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Elizabeth Hartman, PhD, MSPH, MSN, RN
Jillian Cramer, MS, RN

Introduction & Background

- According to a report by The Institute of Medicine, medical errors were associated with up to 98,000 deaths and more than 1 million injuries each year in the United States.
- Nearly 58% to 70% of hospitals nationwide use automated dispensing cabinets (ADCs).
- According to the Pennsylvania Patient Safety Reporting System, up to 15% of errors reported cite ADCs as the source of the drug involved in the error.
- Nurses tend to play a critical role in promoting patient safety by surveilling and intercepting any possible errors that could occur during patient care, especially with medication administration.

Purpose

- To better understand the most common errors and risks associated with Pyxis usage and automated medication dispensing systems.
- To learn what benefits can be provided by using automated dispensing systems for medication administration.
- To understand what options are available to allow nurses to more effectively deliver medications to patients.
- Addressing these issues will allow nurses to decrease their rate of error.

Methods

- Data bases searched include: CINAHL Complete, PubMed, ProQuest Nursing & Allied Health Database, and Medline.
- Search terms: medication administration, errors, pyxis, automated dispensing system.
- Majority of journal articles came from disciplines including Nursing, Pharmacy, Information Technology, and Education.
- Theory of Planned Change designed by Kurt Lewin guided the literature review process as a conceptual framework.

Research Questions

1. What are the most common risks/errors that occur when using automated medication dispensing systems, such as Pyxis?
2. What are the benefits of using automated medication dispensing systems, such as Pyxis?
3. What methods/interventions have been put into place so that nurses limit their rate of medication administration error?
4. Have there been interventions targeting decreasing medication administration errors? What have those interventions demonstrated?

Nursing Implications

- Further research on the design and engineering of automated dispensing systems should be conducted. Nurses should collaborate with software developers in designing, developing, and testing electronic medication systems.
- There is limited research on the actual layout or pairing of similar medications in automated dispensing cabinets.
- Ongoing monitoring for quality improvement and consistent feedback to nursing staff regarding measure outcomes is critical to promote a culture of safety and maintain results at any health care organization.
- Recognition of medication administration as a high-risk activity is vital to transforming the culture and engaging nursing staff to promote the kind of cooperation necessary to limit avoidable errors during medication administration.

Results

- **Common Risks/Errors:** Medication administration errors can occur during any part of the medication process. Automated dispensing systems do not follow the five rights of medication administration.
- **Nursing Attitudes:** One study found that only 20% of nurses believed that AMDS reduced the risk of errors, while 30% saw no change, and 49% saw an increased risk.
- **Benefits and Improvements:** One study found that the implementation of an automated dispensing system resulted in a 53% reduction in medication administration errors.
- **Nursing Needs:** Several studies had suggestions including providing stress management techniques, redefining clinical work flow, and the number and location of systems available for use.
- **Stocked Medications:** More than 50% of the nurses in one study felt that packaging contributed to medication errors and almost 70% felt that the names of drugs were a factor.
- **Limiting Distractions:** Nearly 94% of the respondents in one study believed that distractions in the work setting during medication rounds contributed to medication errors.
- **Using Additional Features:** One study found that 100% of the users of an e-learning method thought it was beneficial and desired to receive more education.
- **Providing Training and Education:** Nearly 98% of students in one study felt that they were less likely to make medication errors because they were able to use an automated dispensing system in a simulation setting.

Conclusions

- Safer medication administration will be obtained by:
  - ensuring the proper initial and continued training for nurses and healthcare professionals
  - providing various support measures in terms of adequate administration settings and environments, which will improve patient safety and outcomes
  - encouraging nurses to act as an advocate for themselves and their fellow nurses

See attachment for references

DePaul University