



KEY POINT SUMMARY

OBJECTIVES

Because the authors were unable to study the direct effects of the physical environment on medication error rates, they set out to answer the following research question: What is the nurses' perception of the role of the physical environment of medical/surgical nursing unit on occurrence of medication errors?

Nurses' Perceptions of How Physical Environment Affects Medication Errors in Acute Care Settings

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Key Concepts/Context

Medication errors in hospitals occur for a number of reasons, stemming from staff and organizational issues to aspects of the physical environment. Errors include omissions, giving the wrong type or amount of medication, and giving the wrong patient unneeded medication. Research has indicated that a significant amount of these errors are avoidable. From a physical environment perspective, it is argued that variables such as lighting, acoustics, and thermal conditions impact staff efficiency, which can have direct and indirect implications for errors. But there are very few empirical studies focused on the impact of the physical environment on medication error rates.

Methods

A survey of 84 nursing staff from four hospitals in the Pacific Northwest was conducted to understand nurses' perceptions of: (1) characteristics of the physical environment that either help or impede their work performance, (2) characteristics of medication rooms and nurses' roles in medication dispensation and preparation, (3) frequency and factors affecting medication and documentation errors, and (4) organizational and physical environment concerns that lead to errors. In addition to a section asking nurses to rank top five organizational and top five physical environment solutions that would reduce error rates, the questionnaire consisted of 79 items assessing the four sections outlined above. In addition, demographic information was collected, including age, gender, job title, years in the profession, and years in one's current position. In addition to frequencies and percentages summarizing nurses' selections for each question, Pearson's correlations were conducted to find whether relationships existed between nurses' reported



frequency of medication errors and factors that they believed contribute to medication errors.

Findings

Nurses reported that the location of the medication room within their nursing unit was a *somewhat helpful* environmental characteristic, although most other environmental characteristics in nursing units were perceived to be *somewhat problematic*. This included size of the medication room, noise levels, and heating and cooling systems. The error type that came up most frequently for nurses was missed doses of medication, while other types of errors were reported to not occur that frequently at the nurses' hospitals. In respect to causes of medication errors beyond staff and organizational issues, nurses cited lack of privacy in the nurses' work area, insufficient documentation space, inappropriate nursing unit space layout, insufficient space in the medication room, high noise levels, faulty equipment, and location of the nursing station as physical environment issues. The authors then looked to see whether relationships existed between the perceived frequency of medication errors and factors contributing to errors. They found that missed doses of medication significantly related to organization of supplies, noise levels, poor lighting, unreadable medication labels, and calculation errors. Another medication error, administering medication at the wrong time, was significantly related to the location of medication rooms, inadequately sized medication rooms, unreadable labels, lack of supplies, and calculation errors. Finally, nurses ranked the top five physical environmental solutions that would reduce medication errors. At the top of the list was having appropriate dispensation equipment. Beyond that, sufficient space for documentation, reduced noise levels, and adequate privacy in the work space were all listed as important solutions.

Limitations

A main limitation of the study was the fact that there was no data on actual medication error rates, due to the underreporting and unreliability of this information in hospitals. Additionally, the sample size of 84 nurses was small; a larger sample size would provide valuable variation of responses. Another limitation was the fact that an administrative contact helped recruit participants, which might have biased the sample/responses. Finally, the study was limited by the fact that nurses from only four hospitals participated. Those four hospitals may have certain medication administration and documentation processes, reducing the generalizability of findings to hospitals with other methods.

Design Implications

Based on nurses' perceptions of physical environment solutions that would reduce medication errors, providing increased work space for documentation and in



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medication rooms, fixing acoustics to reduce noise levels, providing adequate lighting for visibility, and providing privacy in work areas might reduce errors. More research is needed to determine whether these solutions would reduce actual medication error rates, but physical improvements that increase nurses' satisfaction may also decrease stress levels and indirectly impact error rates if not directly as well.