SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

This study examines how changes in a pediatric hospital's environment influenced the severity of medication errors over a five-year period.

Medication error trends and effects of person-related, environment-related and communication-related factors on medication errors in a paediatric hospital

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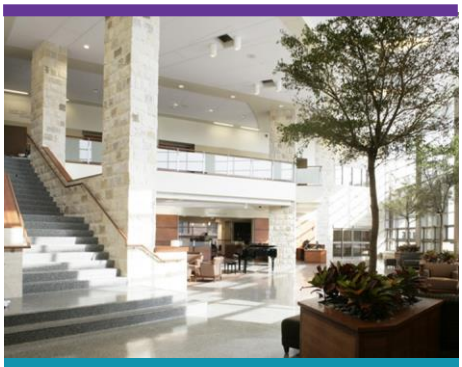
Key Concepts/Context

Previous studies have found that children receiving care in pediatric facilities can face a high risk of medication errors due to a combination of person-related, communication-related, or environment-related factors. This study further examines how environment-related factors specifically influence medication errors. The results suggest that the implementation of single-patient rooms with dedicated space for family members and medication rooms dedicated to specific wards helped reduce medication errors.

Methods

Medication errors submitted to an online system between July 2010 and June 2015 were analyzed. This reporting system belonged to a 334-bed pediatric hospital, which moved from an old site to a new building complex in October 2011. In the old site, only one ward featured a dedicated medication room. In all other cases, medication rooms were combined with patient rooms, which led to recurring distractions via interruptions and noise. In the new building complex, patients had private rooms with dedicated areas for family members, and there was a separate medication room dedicated to each ward. The staff members, nurse-to-patient ratio, guidelines, and policies were all the same between the old and new sites.

To categorize the medication errors according to person-, communication-, or environment-related factors, the researchers used the National Coordinating Council for Medication Error Reporting and Prevention tool. Environment-related factors entailed the new hospital site and structure versus the old, and the clinical site of the given medication error. Inferential and descriptive data analyses were conducted using SPSS, version 23. The influence of the new hospital structure and



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site on the data was investigated using an interrupted time series analysis that included a step-change (hospital site, old = 0; new = 1). All analyses were done using the quasi-Poisson model. Medication errors that occurred before 26 October 2011 were classified as 'old hospital site and structure.'

Findings

A total of 3340 medication errors were reported over the five-year period, or 5.73 medication errors per 1000 bed days. In the new hospital structure and site (i.e., data from after 26 October 2011) the risk of percentage medication errors per combined admission and presentation was reduced by 35.4% (relative risk = 0.598, 95% confidence interval (0.464-0.770)) and by 36.7% for the number of medication errors per 1000 bed days. Thus the new hospital structure and site were associated with reduced chances of medication errors that could have resulted in probable or possible harm as well as an overall reduction in reported medication errors.

The authors note that these findings, as well as previous research, indicate that the spatial designs that increased the proximity between patients, family members, and healthcare professionals helped enhance communication, especially from family members who could speak up if they suspected an error, thereby helping to reduce overall medication errors. The use of dedicated medication rooms separate from the patient rooms in the new complex may also have helped reduce medication errors by allowing healthcare professionals to make decisions and collaborate with minimal distractions or interruptions caused by noise. The dedicated medication rooms could also be used by pharmacists to clarify medication orders with physicians, quantify medication supply needs, and organize counselling sessions for discharge and admission sessions.

Limitations

This retrospective audit examined the medication error reporting system of only a single healthcare provider. Additional errors may have occurred that were not reported. At the time of the study, only 16 months of data were available from the old hospital site and structure, compared to 44 months of data from the new complex. All data were analyzed statistically; qualitative data from patient, staff, or families may have further supported the authors' conclusions.

Design Implications

Dedicated medication rooms that are separate from patient rooms may help reduce medication errors by allowing for effective communication and fewer distractions among staff. Patient rooms with space for family members may also contribute to fewer medication errors, as family members might be able to voice concerns if necessary.

And Also...

The authors provided helpful floorplans of the older and newer patient and medication room designs.