



KEY POINT SUMMARY

OBJECTIVES

The objective of the paper was to assess the characteristics and effectiveness of fall prevention interventions in hospitals by conducting a review of the literature, leading to the development of a fall prevention model based on the evidence.

Developing a Multi-Systemic Fall Prevention Model, Incorporating the Physical Environment, the Care Process and Technology: A Systematic Review

Choi, Y.-S., Lawler, E., Boenecke, C. A., Ponatoski, E. R., & Zimring, C. M. 2011 | *Journal of Advanced Nursing Volume 67, Issue 12, Pages 2501-24*

Key Concepts/Context

Falls are the most frequently reported negative events in hospitals in the United States and other countries, and about one-third of them result in injury of some type. Injury from falls can result in increased hospital stays, increased costs and litigation, among other problems. The authors reviewed the literature on falls, fall injuries, fall risk factors, and interventions to better understand the effectiveness of different methods for fall prevention in hospital settings.

Methods

The authors conducted a quantitative, systematic review of literature focused on the reduction of falls and fall-related injuries in adult hospital inpatient populations. Articles had to be published in peer-reviewed journals between January 1990 and June 2009. Search terms included *falls, prevention, intervention, injury, hospital design, physical environment, and ergonomics*. The authors first set out to find articles about fall prevention interventions in hospitals relating to a broad range of environmental and non-environmental changes. Due to a lack of environment-related intervention studies, they then expanded the search to include articles assessing the impact of environmental interventions on secondary outcomes aside from but associated with falls and fall prevention, such as reduction in postural sway. After screening over 6,700 initial articles against inclusion and exclusion criteria, 34 studies remained for the review. Details about each study are listed in tables in the article, including age of patients, components of interventions, setting, study design, and findings. Findings from the studies were then reported in a narrative summary.



DESIGN IMPLICATIONS

The authors summarized specific environmental factors that the research indicated may result in decreased falls and injuries from falls. Unit layouts and acuity-adaptable single-patient rooms with decentralized nursing stations related to reduced number of falls. Also, carpeted flooring was related to the reduced severity of fall-related injuries.



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Findings

The authors found three themes that emerged from 14 studies focused on multifaceted fall interventions. Interventions tended to be physical environment changes, changes to the care process and culture, and technology-related changes. Specific physical environment interventions in healthcare settings that were found to reduce falls or fall-related injuries were connected with carpeted flooring and bedrail reduction. One study found that fewer falls occurred on vinyl floors than carpeted ones. Another study found that while bedrails traditionally reduce patient falls, the more serious fall-related injuries seemed to decline with the introduction of a bedrail reduction policy and education program. Other environment-related observational research found that nursing unit layout with decreased visual access to the patient was associated with significantly higher falls and fallers. The study found that a switch to single-bed rooms and decentralized nursing stations significantly decreased patient transfers, falls, and medication errors. In addition, lab experiments looking at flooring found that softer floors increased postural sway in older adults. But while in some studies more falls were found to occur on carpeted floors, the softer floors also tended to reduce the severity of fall-related injuries. After reviewing all of the literature, the authors arrived at a multi-systemic fall prevention model that incorporated the three arenas (listed previously) related to preventing falls and injuries. Installing a high-efficiency filter (MERV 16) or a HEPA filter reduces the risk by 35-40% relative to the MERV 7 filter.

Limitations

There is potential that the review could be biased, as the authors did not use two independent reviewers to select studies, assess quality, and extract data, and no studies were excluded from the review beyond the application of basic inclusion and exclusion criteria. Additionally, because the studies' interventions and outcome measures were extremely different from one another, findings were reported as a narrative rather than a meta-analysis. Finally, the generalizability of the findings may have been limited because: (1) there were no papers in languages other than English, (2) the search was limited to electronic databases, and (3) qualitative evidence was excluded, reducing the richness of the findings.