



KEY POINT SUMMARY

OBJECTIVES

This study aims to examine environmental features and their role in medication and nursing errors in long-term care facilities.

Long-Term Care Physical Environments- Effect on Medication Errors

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Key Concepts/Context

Medication errors contribute significantly to patient morbidity and mortality, and are associated with considerable healthcare costs, as well. The human and financial costs following preventable medical errors are high; data in the United States suggest an estimated 44,000 inpatients die each year from preventable medical errors. Nationally, preventable adverse event costs have been estimated at \$17 billion.

It has been estimated that medication errors are high in long-term care facilities because elderly patients are usually taking more medications, increasing error risks. Medication error rates in long-term care facilities vary – some are at 59 percent. Errors typically can be traced to deviating from drug, dose, route or timing in the physician's orders, manufacturer's guidelines or best practices, and they can arise during The literature suggests that reducing staff stress and subsequent errors using ergonomic interventions and environmental considerations (such as air quality, acoustics, lighting, etc.) can significantly influence staff health and also influence staff efficiency and contribute towards patient safety.

Methods

A mixed methodological strategy was used to triangulate data-collection using: focus groups with nursing and pharmacy staff; observing medication preparation and administration in selected facilities; and staff surveys. All participants were staff members working with a large, continuing care organization located in Edmonton, Alberta. Four long-term care facilities were selected based on direct consultation with the organization's administrative and nursing staff. The care facilities were selected to represent diverse physical environments; e.g., one recently built facility was designed as a "household" with no designated medication room. An old building had a traditional medication room and nurse station. The



other two had some variation in the resident rooms, medication room, dining space, and physical layout.

Findings

The study identified that, during the medication preparation phase, physical design, such as medication room layout, is a major source of potential errors. During medication administration, social environment is more likely to contribute to errors: interruptions, noise, and staff shortages were particular problems.

In addition, the environmental factors most commonly indicated (.65 percent) as playing an important role in medication errors included interruptions from residents or co-workers while administering medicines

(n = 47, 87 percent); inappropriate medication organization and supplies (n = 40, 74.1 percent); high environmental stimulation (e.g., noise and lighting levels) (n = 38, 71.7 percent); lack of privacy in work areas (n = 37, 68.5 percent); and insufficient counter and storage space for charting/record keeping (n = 37, 68.5 percent).

Nursing station location was viewed as a somewhat important environmental issue leading to medication errors (n = 22, 41.5 percent). All the physical environmental solutions suggested to be effective at reducing errors the following factors were to be considered: appropriate medication organization (n = 85.2 percent); reduced interruptions/distractions in dining room (n = 54, 85.2 percent), adequate privacy in workspace (n = 42, 77.8 percent); sufficient space for charting/record keeping (n = 41, 75.9 percent); adequate work surface in medicine room/area (n = 41, 75.9 percent); adequate lighting in medication room/area (n = 40, 74.1 percent); reduced noise (n = 39, 72.2 percent); appropriate nursing station lighting (n = 39, 72.2 percent); and adequate dining room lighting (n = 36, 66.7 percent).

Limitations

The authors of the study identified several limitations as follows: 1) the study does not include medication error frequency measures to objectively quantify the impact of study variables on the medical errors; 2) only limited physical environmental variables were investigated; and 3) the study included several facilities belonging to the same organization, which may limit how far results can be generalized.

Design Implications

Modifying the physical environment may help decrease medication errors during the preparation stage. Long-term care facility managers would need to focus on medication room (MR) design because the study suggests that a well-designed and centrally located MR can reduce errors. The MR would need to include the following: sufficient space for more than one person to work comfortably; adequate lighting; and enough counter space to prepare medications and to write notes.



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Additionally, they should be centralized and close to the nursing station, yet remain a sufficient distance from the unit entrance and dining room to minimize interruptions. Adequate lighting in nursing workspaces (e.g., the nursing station) and the dining room may also help. Incorporating design features that ensure privacy by keeping staff who are working on medication-related activities out of sight of other staff, residents, and family members will help to reduce interruptions.