



KEY POINT SUMMARY

OBJECTIVES

To evaluate whether there was a difference in energy expenditure and steps taken among acute care nurses when their work environment shifted from centralized to decentralized nurses' stations.

Effects of unit design on acute care nurses' walking distances, energy expenditure, and job satisfaction: A pre-post relocation study

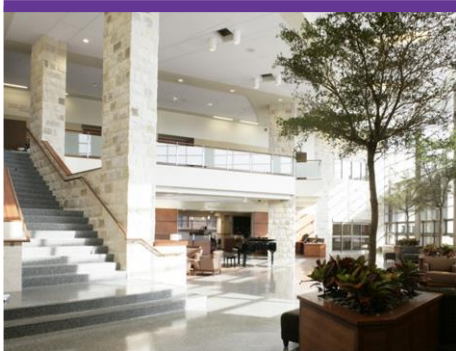
Copeland, D., & Chambers, M. 2016 | *Health Environments Research & Design Journal*. Pages 1-15

Key Concepts/Context

Numerous previous studies have focused specifically on the relationship between nurses and patients. For instance, several studies have shown that patient outcomes are directly associated with the amount of time nurses spend with their patients. In addition, other studies have found that nurses spend equal amounts of time with their patients as they do completing "non-value-added" tasks, such as searching for supplies, adapting to inconsistent layouts, or dealing with equipment failures. The authors also note that there have been numerous studies describing the differences between centralized and decentralized nursing stations. However, there is a lack of research that examines the same group of nurses before and after a structural change within a given hospital.

Methods

The researchers employed a pre-post-quasi-experimental design during the relocation of a 224-bed Level 1 trauma center. Nurses and project architects collaborated on the layout of the new facility. Pre-relocation data was gathered over three months before the move, while post-relocation data was collected across three additional months after nine months had passed since the move. The new hospital featured a number of upgrades, including several additional private patient rooms, two decentralized nurses' stations rather than one centralized station, additional medication dispensers and supply access points, and an optimized layout that increased visibility and reduced walking distances. For data collection, nurses with different types of shifts and varying degrees of experience answered open-ended qualitative questionnaires and wore pedometers. Patient fall data was also



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collected during these same time periods as a potential indicator for nurse response time and accessibility.

Findings

Post-relocation data revealed that nurses' mean steps taken and energy expenditures were significantly reduced. This finding is made even more significant due to the fact that post-relocation nurses worked notably longer shifts, and because there were eight more of the newer inpatient units than in the pre-relocation hospital layout. Additionally, the new patient rooms were 20 feet longer than their older counterparts. There was a 55% reduction in patient falls post-relocation, which is noteworthy due to the increased number of patient beds.

Limitations

The authors note a number of limitations within this study. The sample size was relatively small, and there was no field observation involved in the study design. Since participants were limited to RNs (nurses), the experiences of other healthcare workers were not accounted for. Details of other operational or unit changes within the hospital were not accounted for.

Design Implications

Collaboration between design teams and facility-based researchers early on in the design process can help ensure effective application of evidence-based research. Decentralized nursing stations were shown to maintain nurses' job satisfaction, reduce walking distances, and decrease patient falls. Additional, strategically located supply stations for nurses also contributed to an optimized workflow. The implementation of these designs may have similar results in other healthcare environments if the design process incorporates input from healthcare workers.

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