SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

The article describes an observational investigation of a registered nurse (RN) and patient care technician (PCT) dyad, in which researchers used a new methodology for mapping the nursing process to understand the work and provide an analytical tool for examining how disruptions, including aspects of the built environment, contribute to errors.

Mapping the Nursing Process: A New Approach for Understanding the Work of Nursing

Potter, P., Grayson, D., Boxerman, S., Sledge, J., Wolf, L., Evanoff, B., Marshall, J.
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Key Concepts/Context

Over the last 10 years, hospitals have tried to reconcile patients' demands for high-quality, safe care along with payers' demands for lower costs. As a result, many hospitals are looking for ways to streamline work processes, gain productivity, reduce costs, and maintain quality. Human factors engineering (HFE) techniques, drawn from the sciences of industrial engineering, ergonomics, and mathematics, have been used to analyze clinical care processes and restructure patient care delivery. However, the nursing work is nonlinear and involves complex reasoning and clinical decision making, making the use of HFE as a sole means for analyzing this work problematic. Combining HFE analysis with qualitative observation creates a new methodology for mapping the process. A cognitive pathway offers a fresh perspective for understanding this work and analyzing how disruptions can contribute to errors. This is one of a few studies in this area.

Methods

An HFE and a nurse researcher observed an experienced RN during the first 10 hours of a routine 12-hour day shift. An additional HFE watched the PCT assigned to the RN during the same time period. The RN and PCT worked at a general acute medicine unit that practiced total patient care. The RN had more than 20 years of experience. The PCT had 6 years of experience.

Data collection included a listing of activities, time duration, and physical interactions with the environment and equipment as the healthcare providers performed patient care activities. The HFEs noted each activity the RN and PCT performed, recording the time in 1-minute intervals. They used a list of categories encompassing the most frequent patient care tasks to standardize observations.

They mapped the RN and PCT movements according to sequence of activities and the environmental layout of the nursing unit. The observers noted environmental conditions because they seemed to affect efficiencies in workflow. Data were collected on the cognitive pathway as the RN left each patient's room. The nurse researcher asked the RN to identify the patient problems and care priorities for the shift. Then the researcher shadowed the RN for the remainder of the observation period, recording all the activities the nurse performed, as well as the rationale for each activity. The intent was to see how and to what extent the five steps of the nursing process (assessment, diagnosing or problem identification, planning, intervention, and evaluation) were completed. The researched paired the qualitative data with the HFE data, providing a complete picture of the RN's activity for the 10-hour observation period.

After analyzing the RN's motion patterns, the HFE constructed a flow chart of the RN's tasks in the form of a link analysis. The data collected for this study were part of a larger study.

Findings

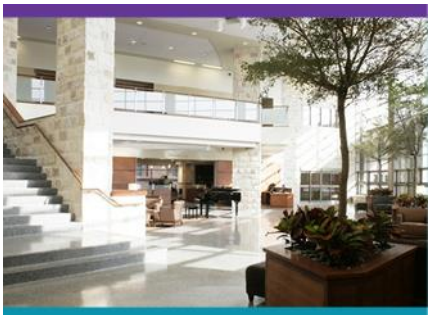
The link analysis graphically displays the flow of the RN's activities across the six patients under the nurse's care. A "link" is the sequence or connection between two elements of a task, such as walking to the supply room to obtain equipment. During the 10-hour observation, observers recorded 128 links. However, the link analysis created from the HFE data showed that the RN assumed an active work activity pattern, moving frequently between patient rooms, as well as key locations such as the nurses' station. These data were useful in tracking the RN's physical movement, while conducting nursing process activities. The cognitive pathway shows that the work of nursing is nonlinear.

The RN experienced 43 different interruptions during the 10-hour observation period. Interruptions were classified as delays in starting (occurred while the RN was not engaged in a step of the nursing process), direct disruption (occurred while the RN provided direct care activities), or indirect disruption (occurred while the RN provided indirect care activities). The three most common types of interruptions involved staff inquiries (seeking information from RN), staff communications (sharing unit management information), and equipment or resource access.

Compared with HFE analysis alone, the combined methods offer a clearer and more detailed view of the nature of nursing care and when environmental factors are most likely to create potential for error.

Limitations

These results were part of a larger research project and, thus, only included one nurse and PCT. Findings for this study are not generalizable. However, the main



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intent of this study was to offer a new methodology to understand workflow, not to explain all causes of interruptions of that workflow.

Design Implications

Traditionally, hospitals have made changes to the work environment as a result of HFE analysis alone. These changes brought efficiencies to linear procedures, such as medication preparation and test ordering, but the combined analysis of HFE and qualitative observation offers a new analytic perspective.

HFE and qualitative analysis offer a new and stronger methodology for examining ways to prevent omissions or commission in care when clinical problem solving becomes disrupted or blocked and for recommending innovative ways to support clinical decision making in patient care.

Reviewer note: This study's methodology reveals a new way to conduct behavior observations in healthcare. For designers, this type of method would combine the critical-thinking process of the worker along with his or her physical work patterns. It should enhance the understanding of the why behind the observed behavior.