KEY POINT SUMMARY

OBJECTIVES

The authors combined human factors engineering and nursing knowledge to conduct a mixed methods study to develop and pilot valid observational measures. Their goal was to identify potential improvements in the work and work environment, including the physical environment, of in-patient acute care nurses with a focus on interruptions and systems failures.

The Development and Piloting of Electronic Standardized Measures on Nursing Work: Combining Engineering and Nursing Knowledge

Key Concepts/Context

As healthcare resources decline and the demand for nurses increases, it is even more important than ever to understand nursing work to make sure it is done efficiently and safely. Finding no existing computerized measures, the authors developed measures and a computer program for this study.

Methods

The researchers developed their electronic Standardized Measurement of Nursing Work (e-SMNW) using 7 steps. They:

1. Reviewed previous studies on nursing work and conducted literature searches on electronic databases such as PubMed, Cinahl, Medline, ProQuest, Scopus, EBSCOhost, and Google Scholar.
2. Interviewed 10 registered nurses (RNs) and other experts to identify appropriate items to measure for this study.
3. Developed a computer interface for a handheld personal digital assistant (PDA).
4. Tested the first prototype of e-SMNW by collecting data in one medical and one surgical unit; six shifts in each unit.
5. Interviewed and recorded nurses after each shift, transcribed the interviews verbatim, and analyzed the content (two investigators).
6. Revised the e-SMNW.
7. Piloted the second prototype of the e- SMNW via empirical data gathering in four acute care in-patient medical and surgical units.

The researchers analyzed the data with Excel, SQL, R, and Graphviz, including frequencies, proportions, time-series analysis, and pattern analysis.

Findings

The researchers determined that they successfully measured the work and work environment of RNs and practical nurses (PNs) in acute care medical and surgical in-patient units using e-SMNW. With predetermined items of work activities and influencing factors in the work of nurses and full use of computer technology, the researchers gathered, analyzed, and displayed multilayered rich standardized data.

The researchers identified three main issues in the literature review: the type of work conducted and time allocated to each work type, influencing factors, and the complexity of nursing work.

From the interviews, the study participants identified the following issues as influencing their work: lack of assistance or collaboration with co-workers, information and communication issues, lack of supplies, and unexpected changes and extra duties.

Finally, the authors determined that eSMNW findings indicate that one observer was able to follow one participant without difficulty during a whole 8-hour shift and collect rich standardized computerized data.

Overall, state the authors, their study is an important contribution to closing the knowledge gap regarding methods to evaluate the complex work and work environment of RNs and PNs in acute care. By shedding light on nursing work and the work environment, they point out, the e-SMNW can identify potential improvements in hospital work design, as well as to maximize the use of the nursing workforce and its professional expertise to create a safer healthcare system and better patient care. They conclude that redesign and reprioritization of hospital nursing work activities and work flow processes are urgent.

Limitations

The study was limited by the pioneering nature of the work to develop measures for rich data collection with computer technology. The authors note that, although this type of study required substantial training of observers, however, it was not as burdensome as collecting observational data with paper and pencil.

Design Implications

Being able to collect and display standardized, rich data on the complex work of nursing increases the possibilities for effective and efficient preventive practices for clinicians, administrators, and policymakers. While the e-SMNW is a new tool still under development, designers can use it to better understand the functional space

needs of this unique population of caregivers, as well as others. They also will be able to test design hypotheses and work with renovated spaces more effectively.

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