

The Effects of Nurse Staffing and Environment on Patient Safety

The nationwide nursing shortage and other factors have left many facilities with fewer registered nurses. By 2020, the number of hospital nursing vacancies is expected to reach 800,000. Experts worry that this staffing shortage will lead to a more dangerous environment for patients. Numerous studies have found that short-staffed hospital units are more likely to have higher rates of hospital acquired illnesses (e.g. pneumonia, gastrointestinal bleeding) which lead to longer lengths of stay and added costs to the health care system.

The Institute of Medicine has called for more research on the relationship between nurse staffing and patient outcomes. Nurses are leading efforts to understand what drives better nursing care to keep patients safe and the environments that are crucial to making that happen. Here are some highlights of this work, funded by the Robert Wood Johnson Foundation Interdisciplinary Nursing Quality Research Initiative (INQRI) program:

Preventing bad outcomes. Does the composition of hospital nurses matter when it comes to preventing costly complications and death following those complications? A team at the University of California¹ examined the extent to which nurse staffing levels affected the incidence of complications and the failure to rescue from those complications, (i.e. death following complications). Their examination showed that nursing hours per patient day were strongly associated with lower rates of pressure ulcers and hospital acquired infections, and fewer deaths from complications. Further, more RN hours in the mix had additional benefit with still lower rates of failure to rescue and hospital acquired infections. Their work shows that higher levels of nursing hours per patient day and RN skill mix in intensive care units and in general units will lead to better patient outcomes, information that can guide states considering regulation of nurse-patient staffing ratios to address patient safety gaps.

Keeping babies healthy. Preliminary findings from the first study to look at the link between nursing and very low birthweight infants in the neonatal intensive care unit (NICU) indicate that nurse staffing and practice environment do matter. Researchers at the University of Pennsylvania² who are examining care in more than 100 NICUs around the U.S. are finding that when babies are treated in units where nurses have less support and less frontline experience they are at higher risk of developing infections. Babies in hospitals where nurses are supported and have more experience are less likely to have medical complications such as bleeding in the brain, which leads to costly complications. The team has found that higher levels of nurse staffing and the proportion of nurses with bachelor's degrees in nursing and NICU experience are associated with better infant outcomes. The study results could guide decisions related to setting standards for all hospitals to follow when creating and staffing a neonatal intensive care unit where infants thrive.

INQRI continues to invest in projects that are attempting to show how staffing levels and work environment can affect patient care. Several teams are in the midst of this research and will have findings to share in September, 2010.

Nurse staffing in long term care settings. A team of researchers from the Palo Alto Institute for Research and Education³ and Columbia University will examine the relationship between nurse staffing on patient outcomes in long term care (LTC) facilities. This team is studying the tradeoffs between personnel costs and cost savings due to improved patient outcomes.

Nurse workload and expertise. Researchers at the University of California, San Francisco⁴ are working to develop a model reflecting the link between nurse workload, nurse characteristics (education, experience and certification) on the incidence of falls and fall related injuries, the prevalence of hospital acquired pressure ulcers and medication errors and the incidence of central catheter associated blood stream infections in PICC lines in medical and surgical units.

“Workarounds.” Researchers at the University of Texas Health Science Center, San Antonio⁵ are examining whether front line nurses can redesign the way they usually solve small problems with temporary fixes and workarounds into ways that produce organizational learning to drive large improvements in safety, quality and efficiency.

Off-peak hours. A team at Midwestern State University⁶ is examining how the challenges facing nurses working during evenings and weekends could affect patient care. Researchers are learning about the hospital work environment during “off peak” hours and how the extra duties imposed on nurses due to a lack of ancillary staff could be harmful to patients.

Presenteeism. Researchers at the University of North Carolina⁷ are looking at the problems that may occur when nurses come to work sick. It is suspected that decreased productivity may lead to poorer patient outcomes and higher healthcare costs. Specifically, the study is looking at how such things as pain and depression, conditions that seem to affect nurses more than others, affect the prevalence of errors and perceived quality of care.

Across the country, nurses are on the frontlines of confronting staffing and workplace challenges in health care. These studies highlight the impact that better nurse staffing levels and improved work environments can make in improving the quality of care patients receive.

1. Blegen, Mary, “Examining the Casual Relationship Between the Quality of Nursing Care and Patient Outcomes in Acute Inpatient Units.” Robert Wood Johnson Foundation ID#58296. 9/1/06-8/31/08.
2. Lake, Eileen, “Acuity-adjusted Staffing, Nurse Practice Environments and NICU Outcomes.” Robert Wood Johnson Foundation ID#62601. 9/1/07-8/31/09.
3. Phibbs, Ciaran and Stone, Pat, “The Impacts of Nurse Staffing, Skill Mix, and Experience on Quality and Costs in Long-Term Care.” Robert Wood Johnson Foundation ID#63959. 9/1/08-8/31/10.
4. Donaldson, Nancy and Aydin, Carolyn, “Impact of Medical Surgical Acute Care Microsystem Nurse Characteristics and Practices on Patient Outcomes.” Robert Wood Johnson Foundation ID#63512. 9/1/08-8/31/10.
5. Stevens, Kathleen and Ferrer, Robert, “Small Troubles, Adaptive Responses [STAR]: Fostering a Quality Culture in Nursing.” Robert Wood Johnson Foundation ID#63510. 9/1/08-8/31/10.
6. Hamilton, Patti and Gemeinhardt, Gretchen, “The Effect of Off-peak Hospital Environments on Nurses' Work: an Institutional Ethnography.” Robert Wood Johnson Foundation ID#63514. 9/1/08-8/31/10.
7. Letvak, Susan and Ruhm, Christopher, “The Effects of Nurse Presenteeism on Quality of Care and Patient Safety.” Robert Wood Johnson Foundation ID#63515. 9/1/08-8/31/10.