

Nursing Skill Mix and Experience Reduce Patient Mortality

Nurse and other healthcare researchers have not, for the most part, focused their efforts on investigating the effects that nursing care has on commonly recognized quality of care outcomes, such as mortality and readmission for hospitalized patients – the rationale being that the determinants of these outcomes are generally believed to be the patients' own characteristics and the medical process of care. However, there is mounting evidence that nursing care affects these patient outcomes and that these effects can be quantified (Aiken, Smith and Lake 1994; Hunt and Hagen 1998; Tourangeau et al. 2002).

The rationale for studying the relationship between nursing care structures and processes, and patient mortality and readmission rates, starts with the knowledge that there is wide variation among hospitals on risk and case-mix adjusted mortality and readmission rates. For example, in a sample of 75 Ontario teaching and community hospitals, the 30-day risk adjusted and weighted mortality rates for a homogeneous group of medical patients ranged from 10.5 to 21.5% (Tourangeau 2001). Several years earlier during 1993-94, in an ICES study of the Patterns of Healthcare in Ontario, the unplanned 30-day readmission rates for acute myocardial infarction in teaching and medium sized hospitals ranged from 6.7 to 24.5%. For this same group of Ontario acute care hospitals, the unplanned 30-day readmission rates for patients undergoing laparoscopic cholecystectomy surgery ranged from 0.7 to 8.8% (Goel et al. 1996).

One must ask why is there such a variation in mortality and readmission rates across hospitals? While it is important to acknowledge that death and readmission to hospital are unpreventable outcomes for some patients, the persistent wide variation in risk-adjusted rates across hospitals suggests that some portion of these outcomes is in excess and is preventable.

A necessary first step in preventing unnecessary patient deaths and readmissions is determining the characteristics of hospitals with lower risk-adjusted 30-day mortality and readmission rates, so that these can be more broadly adopted. Since nurses provide most of the ongoing care for hospitalized patients, it is reasonable to propose that the nursing care structures and processes are related to both the 30-day mortality and readmission rates for their hospitalized patients. If we find evidence to support relationships between these outcomes and the nursing care structures and processes for specific patient subpopulations, we can appropriately modify the related nursing care to decrease mortality and readmission to hospital.

Summary of Findings

- The mean risk-adjusted 30-day mortality rate for all sample hospitals was 15% (150/1,000 patients discharged).
 - A 10% increase in the proportion of RNs across all hospital types was associated with five fewer patient deaths for every 1,000 discharged patients.
 - In non-urban community hospitals, each additional hospital mean year of nurse experience on the clinical unit was associated with four fewer patient deaths for every 1,000 discharged patients.
 - In urban community hospitals, each additional hospital mean year of nurse experience on the clinical unit was associated with six fewer patient deaths for every 1,000 discharged patients.
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A recent ICES study of a sample of 75 Ontario hospitals, found that hospitals with a richer skill mix of registered nurses and with more years of registered nurse experience on the clinical unit also had lower risk-adjusted and weighted 30-day mortality rates (Tourangeau et al. 2002). Within each of the study hospitals, a homogeneous group of medical patients and a sample of the nurses who cared for these patients were included. The homogeneous group included patients with acute myocardial infarction, stroke, pneumonia, and septicemia. Patient data were accessed through the ICES administrative databases. Nursing data were accessed through the Ontario Hospital Reporting System and supporting appendices, and through the Ontario Registered Nurse Survey of Hospital Characteristics 1998-99 (completed as part of an international study of hospitals supported by the National Institute of Nursing Research of the U.S. National Institutes of Health [NR04513]). Across all sample hospitals, 150 patients of every 1,000 discharged died within 30 days of admission to hospital, whether they were still an inpatient or had been discharged outside of the hospital. It was found that across all sample hospitals, a 10% increase in the proportion of registered nurses in all nursing staff was associated with five fewer patient deaths in 1,000 patient discharges. In non-urban community hospitals, an average of one additional year of experience by registered nurses in their clinical units was associated with four fewer deaths in every 1,000 patients discharged. The effect of an average of one additional year of registered nurse experience was even larger for urban community hospitals, where six fewer patient deaths occurred for every 1,000 patients discharged.

What is not known is whether these relationships are similar across different subpopulations of hospitalized patients. We do

not know if similar relationships exist between nursing care hospital characteristics and other important quality outcomes such as unplanned readmission rates. In order to modify hospital structures and processes to improve hospital quality of care outcomes that will result in lower mortality and readmission rates, we need to further investigate these relationships using effective risk and case mix adjustment methods that will make comparisons between hospitals valid (Iezzoni 1997).

In summary, through research completed at ICES, it was found that hospital nursing care characteristics (skill mix and nurse experience) are related to patient mortality in at least one homogeneous group of medical patients. While further research is needed to extend this investigation to other groups of hospitalized patients, and to other hospital quality of care indicators such as unplanned readmission, these findings are nonetheless worthy of consideration by both hospital managers and nurses' unions.

References

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