

# NURSE STAFFING

## NURSE STAFFING AND PATIENT DEATH

### Source

Tourangeau, A. E., Giovannetti, P., Tu, J. V., & Wood, M. (2002). Nursing-related determinants of 30-day mortality for hospitalized patients. *Canadian Journal of Nursing Research*, 33(4), 71-88.

### Objective

To understand the effect of nursing-related hospital variables on 30-day mortality rates for hospitalized patients with acute medical conditions.

### Background

In the last decade cost-cutting measures were undertaken in the delivery of nursing services to decrease health care spending. Many hospitals reorganized their nursing workforce through elimination and reduction of registered nurse (RN) positions, substitution of RNs with less qualified nursing personnel, and closure of clinical units. As a result, RNs were moved from one unit to another through a process referred to as “bumping”. Through this process, RNs may have been moved from a nursing unit in which they had developed clinical expertise with a particular group of patients to one where they had limited knowledge and experience.

These changes and others such as the reduction of clinical resources needed to support nurses<sup>1</sup> were made without understanding the effects these strategies would have on patient outcomes such as mortality. Mortality rates are important indicators of the quality of hospital care.

### Methods

- A retrospective design was used to test the 30-day Mortality Model. In this model, 30-day mortality rate measures the proportion of patients admitted to hospital who die within 30 days of admission regardless of whether the death occurred in hospital or after discharge. The mortality rate is adjusted to take into account various patient risk factors such as age and pre-existing conditions.
- The model includes such variables as nurse staffing dose (total inpatient nursing worked hours divided by the Ontario case weight<sup>2</sup>), nursing skill mix (proportion of RN hours of care to all nursing hours of care including

<sup>1</sup> In this study, ‘nurse’ refers to registered nurses (RNs) and registered practical nurses (RPNs). The title for a practical nurse in Canada, with the exception of Ontario, is licensed practical nurse (LPN). In Ontario, the title for a practical nurse is registered practical nurse (RPN).

<sup>2</sup> Ontario case weight is a measure of relative total resource consumption by patients.

RNs, RPNs and unlicensed assistive personnel), availability of professional role support, years of RN experience on the clinical unit, nurse capacity to work, condition of nursing practice environment, continuity of care, physician expertise, hospital status and location.

- The sample consisted of 46,941 patients discharged from 75 acute-care teaching and community hospitals in Ontario who had a diagnosis of acute myocardial infarction, stroke, pneumonia or septicemia.
- The mortality rate for these patients was linked to nurse staffing and skill mix data and to responses from 3,998 RNs working in the 75 hospitals to the Ontario Registered Nurse Survey of Hospital Characteristics.

## Principal Findings

Three predictor variables from the 30-day Mortality Model were statistically significant: nursing skill mix, years of nurse experience in the clinical unit and nurse capacity to work.

- A 10 per cent increase in the proportion of RNs in all hospital types was associated with five fewer patient deaths for every 1,000 patients who were discharged.
- Each additional mean year of RN experience on the clinical unit was associated with six fewer patient deaths for every 1,000 discharged patients in urban community hospitals and four fewer deaths for every 1,000 discharged patients in non-urban community hospitals.
- In non-urban community hospitals only, fewer patients died when RNs in these hospitals missed more shifts.<sup>3</sup>

## What do the Study Findings Mean?

- Increasing the proportion of RNs on a unit is associated with a reduction in the number of patients who die within 30 days of admission to hospital.
- If the number of RNs on a unit is reduced or RNs are substituted with lesser qualified care providers, more patients may die.
- When experienced nurses are transferred to other nursing units because of over-supply or practices such as bumping within collective bargaining agreements, more patients may die.
- Strategies are needed to recruit and retain experienced RNs.

January 2005

RS 1-11

---

<sup>3</sup> This is an unexpected finding that is difficult to explain. Nurses in non-urban community hospitals use considerably less sick time than their urban colleagues. It may be that RNs in these hospitals are not taking adequate time to recuperate. When they return to work, their ability to detect and intervene with serious patient complications may be reduced. This may contribute to higher 30-day mortality rates.