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FACT SHEET: EVIDENCE-BASED STANDARDS FOR MEASURING NURSE STAFFING & PERFORMANCE

This fact sheet presents selected content from *Evidence-based Standards for Measuring Nurse Staffing & Performance*, & is based on the completed research of O'Brien-Pallas, L., Thomson, D., McGillis Hall, L., Pink, G., Kerr, M., Wang, S., Li, X. & Meyer, R. (2004). The full report is available on line at *www.chsrf.ca* or *www.hhr.utoronto.ca.*

Variations in nursing performance & staffing patterns are frequently observed across as well as within hospitals. Decision makers are challenged to maximize performance & minimize staffing costs, while ensuring the quality of care.

This study examined variation in nurse staffing levels to provide evidence to guide policy & management decisions regarding the deployment & utilization of nursing personnel. Key findings indicate that excessively low nursing unit staffing levels result in significantly worse patient, nurse & system outcomes, both in financial & human terms.

How Were Nurse Staffing Levels Measured In This Study?
Nurse staffing level was measured at the unit level as patient workload divided by nurse worked hours. Although this formula is the traditional definition of productivity for the Canadian Institute of Health Information, it is more accurately termed a measure of utilization. The utilization level is an index of how well a unit is staffed relative to patients care needs. The higher the utilization level, the lower the nurse worked hours relative to the patient workload & vice versa. In other words, the more understaffed a unit is (reflected by high utilization levels), the lower the amount of actual nursing time available for each patient.

The maximum utilization of a nursing unit is 93%, because 7% of the shifts consist of paid mandatory breaks. At a utilization level of 93%, nurses are working flat out with no flexibility to meet unanticipated demands or rapidly changing patient acuity.

What Questions Did The Researchers & Policy Makers Ask?
1) What factors explain variation in nurse staffing & outcomes for patients, nurses & hospitals?
2) How can nurse staffing patterns be optimized to improve nursing utilization & outcomes for patients, nurses & hospitals?
3) Which data elements, in addition to those routinely collected for administrative databases, are critical for routine health care data collection in Canada?

How Was The Research Conducted?
Setting & Participants: The study was conducted in 24 cardiovascular & cardiac care units in six Canadian hospitals in Ontario & New Brunswick accounting for 1,230 patients, 8,113 patient days of data & 727 nurse surveys.

Study Design: A cross-sectional & longitudinal design was used to test an adaptation of the Patient Care Delivery Model.[i] This model emphasizes that characteristics of patients, nurses & the system, as well as system behaviours, interact within the care delivery system to produce outputs, including unit utilization, daily hours of care per patient, & patient, nurse & system outcomes. These outcomes provide feedback to the entire system.

Data for patients, nurses & nursing units were collected from patients, nurses & administrative sources on each study day. Study nurses completed a survey that measured burnout, the balance between work efforts & rewards, nurse-physician relationships, autonomy & health. Data were analyzed using descriptive statistics & hierarchical linear modeling to account for interactions between patient, nurse & unit level variables.

What Were the Findings?

Overall, as utilization levels begin to exceed 80%, the number of negative outcomes increases for patients, nurses & the hospital (see Table 1). On 46.5% of the study days, utilization levels were higher than 93%. On 61.5% of the study days, utilization levels exceeded 85%. Selected findings include:

- Improvements in patients' physical health between admission and discharge are more likely when utilization levels are below 80% & if patients are cared for by nurses who work less overtime.
- Utilization levels below 80% lead to increased job satisfaction & reduced absenteeism.
- Nurse retention is more likely when there is job security & when utilization levels are below 83%.
- Patients' health behaviour improves when nurses have a satisfying work environment, secure employment, & when unit utilization levels are below 88%.
- Costs are lower when hospitals maintain utilization levels below 90%, & implement strategies to improve nurses' physical health & to retain experienced nurses.
- Nurses report improved quality of patient care when they report higher autonomy in their practice.
- Enhanced nurse autonomy & more full-time employment on the unit are associated with improvements in patients' knowledge about their condition.

Table 1

Utilization Levels (%)	Outcomes on Cardiac & Cardiovascular Nursing Units
> 91	Longer length of stay
> 90	Higher costs per Resource Intensity Weight
> 88	Less improvement in patient health behaviour scores at discharge
> 85	Higher nurse autonomy Deteriorated nurse relationships with physicians
> 83	Higher intention to leave amongst nurses
> 80	More nurse absenteeism Less improvement in patient physical health at discharge Less nurse job satisfaction

What are the Implications for Policy, Practice, & Future Research?

The evidence supports the need for a significant change in the way organizations view costs, & suggests that the emphasis on cost of inputs, such as nurse-to-patient ratios & nurse skill level, should shift to the cost of outputs, such as nurse absenteeism, length of stay & quality of care.

1) Overall, the study findings suggest that organizations can implement many strategies to reduce the cost & improve perceptions of the quality of care on cardiac & cardiovascular units by:
   I. Hiring experienced, full-time, baccalaureate prepared nurses
   II. Retaining experienced nurses
   III. Staffing with enough nurses to meet workload demand based on targeted utilization levels of 85 ± 5%
   IV. Creating work environments that foster nurses' health, safety, security & job satisfaction
   V. Balancing the efforts & rewards associated with work; promoting nurse autonomy, full scope of practice & innovative work schedules; & fostering managerial relationships.
2) Investment is needed for infrastructure to collect data that will monitor & improve care delivery processes & measurement of performance outcomes
3) Data that should be routinely captured includes valid workload measurement; environmental complexity; nursing diagnoses & OMAHA ratings of knowledge, behaviour & status; nurse & patient SF-12 health status; & utilization. A number of important nurse indicators could also be collected through the National Nursing Health Survey.

Although hospitals have little control over patient characteristics & complexity, organizations can manage nurse characteristics, system characteristics & behaviours, & environmental factors that influence outcomes. Adopting the study's recommendations will make a significant contribution to optimizing patient, nurse & system outcomes.

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Fact Sheet developed by Amanda Cook, Raquel Meyer & Julie Hiroz (December, 2004).

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[i] O'Brien-Pallas et al. (2001). Evaluation of a client care delivery model, part 1: Variability in nursing utilization in community home nursing. *Nursing Economic$, 19*(1), 267-276.