

Nursing Health Services Research Unit

a collaborative project of
the University of Toronto
Lawrence Bloomberg
Faculty of Nursing &
McMaster University
School of Nursing

Our mission is to develop,
conduct & disseminate
research that focuses on:

- design
 - management
 - utilization
 - outcomes
 - provision
- ...of nursing.

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FACT SHEET: APPLYING UTILIZATION LEVELS TO EVALUATE NURSE STAFFING

This fact sheet builds on selected content from the *Evidence-based Standards for Measuring Nurse Staffing & Performance Study* & 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.nhsru.com.

Background

This study examined variations in nurse staffing levels to provide evidence to guide policy & management decisions regarding the deployment & utilization of nursing personnel. Key findings indicated that lower nursing unit staffing levels were associated with significant financial & human declines in patient, nurse & organizational outcomes.

What Are Utilization Levels?

- Nurse staffing can be measured at the unit level as patient workload hours divided by nurse worked hours:

$$\text{Utilization} = \frac{\text{Patient Workload Hours}}{\text{Nurse Worked Hours}} \times 100\%$$

- This formula is the traditional definition of 'productivity' for the Canadian Institute of Health Information; however, because this formula neither accounts for the quality & outcomes of care delivered, nor the effect of length of stay on total cost, it is more accurately termed a measure of utilization.
- Utilization levels measure retrospectively how well a unit was staffed relative to patient care needs.
- The utilization rate should be high enough to ensure efficient use of human resources, but not so high that patient needs cannot be met.
- The appropriate utilization rate will depend on the predictability of workload (emergency has different needs than chronic care) & patient safety considerations (minimum staffing on nights).

Maximum Utilization Levels

- The maximum utilization level of a nursing unit is 93% because 7% of worked hours consist of mandatory paid breaks.
- At a utilization level of 93%, nurses are working flat out with no flexibility to meet unanticipated demands or rapidly changing patient acuity.
- On cardiac & cardiology acute care units (CCU, ICU, stepdown, in-patient) with mostly all Registered Nurse staffing, high utilization levels were associated with these negative outcomes:

Utilization Level	Outcomes
> 91%	Longer length of stay
> 90%	Higher costs per Resource Intensity Weight
> 88%	Less improvement in patient 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

- Based on the study findings, the recommended retrospective utilization levels for nursing units should target 85% plus or minus 5%. At this level, benefits include:
 - Lower costs
 - Improved patient health
 - Potential for increased nurse retention

How can Utilization Levels be used to Evaluate Staffing Levels?

When looking back to see how well a unit was staffed relative to patient care needs, two sources of data are used: workload hours & worked hours. Because worked hours includes paid breaks, minutes allocated to unpaid breaks need to be accounted for since the nurse is unavailable to provide care during a paid break and this gives us workload hours.

Example A: An 8 hour shift for one nurse

$$\text{Utilization} = \frac{\text{Workload Hours}}{\text{Worked Hours}} = \frac{7}{7.5} = 0.93 \times 100 = 93\%$$

Example B: A 12 hour shift for one nurse

$$\text{Utilization} = \frac{\text{Workload Hours}}{\text{Worked Hours}} = \frac{10.5}{11.25} = 0.93 \times 100 = 93\%$$

This is why the maximum utilization value for any staff is 93% when utilization is calculated retrospectively. In the study, utilization values were calculated using this formula at the unit level & were evaluated retrospectively.

Choosing Utilization Values

The study results suggested a range of potential utilization values depending on the outcomes to be achieved with mostly all RN staffing on cardiac & cardiovascular care units.

When considering utilization levels for other types of units, it is important to consider other factors including the type of demand on the unit, how work is distributed over shifts, skill mix, patient safety issues, etc.

Retrospective Target Values	
93%	Absolute minimum
85%	Adequate for predictive demand area (Medical, Complex Care, etc.)
80%	Safe staffing for variable demand unit (ICU, Emergency, Labour & Delivery, Active Surgical Unit, etc.)

Utilization Values & the Larger Study

When study findings are considered as a whole, organizations can reduce the cost & improve the quality of patient care by:

1. Hiring experienced, full-time, baccalaureate-prepared nurses.
2. Staffing enough nurses to meet workload demands (targeting utilization values of 85% ± 5%).
3. Creating work environments that foster nurses' mental & physical health, safety, security, & satisfaction.

The evidence supports the need for a significant change in the way organizations view costs & suggests that the emphasis on cost of inputs should shift to the cost of outputs & the quality of care.

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Reference: O'Brien-Pallas, L., Thomson, D., McGillis Hall, L., Pink, G., Kerr, M., Wang, S., Li, X., & Meyer, R. (2003). *Evidence based standards for measuring nurse staffing and performance*. Final Report. Toronto, Ontario, Canada: Canadian Health Services Research Foundation.