



## Cost-effectiveness study

# Increasing nurse staffing levels in cardiac surgery centres appears to be a cost effective patient safety intervention

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Commentary on: **Van den Heede K, Simoens S, Diya L, et al.** Increasing nurse staffing levels in Belgian cardiac surgery centres: a cost-effective patient safety intervention? *J Adv Nurs* 2010;**66**:1291–6.

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Over the past decade there has been worldwide interest in the effect of nurse staffing on quantifiable patient outcomes. In numerous multi-centre studies of hospitalised adults, in-hospital mortality has been reported to be inversely associated with nurse staffing levels.<sup>1–3</sup> There are fewer published data establishing the trade-offs and associations between resources provided and quality of care. Policy makers interested in the cost, quality and effectiveness of healthcare will find guidance in this article.

Van den Heede and colleagues reported on their cost-effectiveness analysis from a hospital perspective of increased nurse staffing levels to the 75th percentile in Belgian general cardiac postoperative nursing units in the year 2003. They compared the costs of increased nurse staffing levels with the benefits of reducing mortalities. A two model approach included the simulation of an increase in the number of nursing hours per patient day to the 75th percentile for nursing units below that level. A 'do nothing' alternative model was used for the comparator group. Cost data from the year 2007 were extracted and the results were expressed in the form of the 'additional costs per avoided death' and the 'additional costs per life-year gained'. In this study, increasing nurse staffing levels appears to be a cost-effective strategy in comparison to other cardiovascular interventions.

## Nurse staffing

Registered nurse (RN) staffing is complex and a topic of rigorous debate, in large part because of the financial implications. RNs constitute the largest group of health professionals in hospitals and account for more than half of the operating expenses in hospitals. Economic theory explains nurse ratios as a function of patient care constrained by hospital budgets and relative wages for different inputs across geographic areas. Empirical data establishing optimal nurse to patient ratios and nursing hours for any group of patients have yet to be determined; to date there is a lack of science in this domain. The authors have contributed an important study to further our understanding.

## Mortality as an outcome

There are a number of factors that contribute to mortality, and risk adjustment methodology was not used in this study. To isolate the nursing factors, it is important to control for patient factors that contribute to mortality.

Although their analysis showed that increased nurse staffing levels in general cardiac postoperative nursing units were significantly associated with decreased mortality, they did not find this association in their previous study about nurse staffing and mortality in cardiac postoperative intensive care units. This finding is consistent with a study by our group in paediatric cardiac intensive care units across 38 children's hospitals in the USA.<sup>4</sup> We speculate that the outcome variable of mortality may be insensitive to nursing characteristics as long as certain staffing thresholds have been achieved. Generally, adult and paediatric intensive care units are staffed at higher levels than general care units, and above the threshold where a difference in mortality would be found.

## The cost of care

The researchers stated the limitations of their study. However, their cost effectiveness analysis appears to be an excellent model for replication in other diagnostic groups. Their analysis has important economic, patient safety and quality implications. Cardiac surgery patients generally require a large portion of healthcare resources, including nurses in healthcare institutions. Their findings have shed light on important considerations with alternative cardiovascular interventions.

This study adds to our knowledge about the costs and benefits of nurse staffing on patient outcomes. Another benefit of this research is its potential to guide and inform healthcare providers and policy makers as they address significant issues for this vulnerable group of patients who consume a disproportionately large amount of healthcare resources across the globe.

Competing interests None.

## References

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