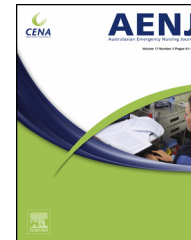




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RESEARCH PAPER

# Ratios and nurse staffing: The vexed case of emergency departments



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## KEYWORDS

Emergency departments;  
Staffing;  
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## Summary

**Background:** Within Australia nursing unions are pursuing mandated nurse–patient ratios to safeguard patient outcomes and protect their members in healthcare systems where demand perpetually exceeds supply. Establishing ratios for an emergency department is more contentious than for hospital wards. The study's aim was to estimate average staffing levels, skill mix and patient presentations in all New South Wales (NSW) Emergency Departments (EDs).

**Methods:** The design was a retrospective historical census audit. Nurse rosters and patient presentation data were collected for three randomly selected census days in May 2010. Twenty-six valid responses out of 44 were returned. A ratio of the number of beds per nurse was calculated as well as skill mix and bed occupancy.

**Results:** The average beds per nurse ratios found were 3.8 (morning shift), 3.6 (evening), and 5.1 (night). However, ratios as high as 8.4 (morning), 7.3 (evening) and 16.0 (night) were identified

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on particular shifts. Overall a rich skill mix was found with an average of 90% of nursing hours being provided by Registered Nurses. The average daily bed occupancy of 4 patients per bed was similar across ED levels.

**Conclusions:** The study adds to the limited literature on ED staffing and demonstrates the utility in the simplicity of ratios in flagging potential staffing problems. The audit revealed wide variation in staffing levels which was not always linked to patient activity. Of particular concern were the regional EDs (Level 5) which have the capacity to deal with all types of emergencies but where ratios as high as 7 beds per nurse were found during the day. Ratios cannot be used to determine the optimal staffing levels in every clinical situation; their purpose is to force an increase in nursing supply and to prevent individual units from becoming understaffed.

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### What is known

- It is well established that low RN staffing has negative consequences for nurses and patients. Nursing unions all over the world are employing this evidence to pursue an industrial strategy of mandated nurse–patient ratios to protect their members.

### What this paper adds?

- The study adds to the limited literature on ED staffing and the use of ratios in particular. It demonstrates the utility in the simplicity of ratios in flagging potential staffing problems and discusses the challenges of implementing ratios in EDs.

## Introduction

The global pressure on healthcare systems is caused by a mismatch in demand and supply. Forero et al.'s<sup>1</sup> analysis of Australian data found that while there were around the same number of hospital beds available in 2006–07 compared to 1998–99, the number of emergency department (ED) presentations almost doubled from 3.5 to 6.7 million. A number of studies have examined the consequences of this imbalance on a range of ED performance indicators including length of stay (LOS), waiting times and overcrowding.<sup>1–4</sup> To date no studies have examined the impact of ED nursing workload on patient outcomes. However, there is a significant body of research in acute hospital ward settings which has demonstrated that high nurse–patient ratios (that is more patients per nurse) are associated with a range of negative patient outcomes including failure to rescue, mortality, falls, medication errors, hospital acquired pneumonia, and respiratory failure.<sup>5–11</sup> High ratios have also been linked to negative nurse outcomes in terms of work exhaustion, dissatisfaction and intentions to leave their current role.<sup>12–14</sup>

Skill mix, that is the proportion of nursing hours provided by Registered Nurses (RNs), has also been tested against patient outcomes in acute hospital ward settings. Lang et al.<sup>15</sup> identified a relationship between richer skill

mix and lower failure to rescue and mortality rates. Similarly, McGillis Hall et al.<sup>16</sup> found that the lower proportion of RN staff in the skill mix, the higher the incidence of medication errors and wound infections. Identifying the appropriate number and mix of nurses to guarantee the optimal balance between safety, quality and cost is an attractive but vexing goal. Mediating factors such as case mix, organisation of care and the work environment, as well as the experience and skill levels of staff interact in different ways to influence outcomes.<sup>5,7,8,17,18</sup> That said, as Unruh<sup>19</sup> argues, there is clear evidence that adequate staffing and balanced workloads are essential to achieving good patient and nurse outcomes.

For an increasing number of hospital units, including EDs, nurse staffing level are determined by industrial awards as unions seek to alleviate workload pressure by controlling the number of patients under care. In 2010 the New South Wales (NSW) Nurses Association successfully mounted an industrial campaign for nurse–patient ratios (in the form of Nursing Hours Per Patient Day) after research found low levels of nurse staffing in certain areas, including some EDs.<sup>20</sup> The resulting industrial instrument (the Award<sup>21</sup>) set minimum nurse staffing standards for public hospital wards but not for EDs. A retrospective staffing method based on the number of beds and overall budget was retained in EDs complemented by minimum staffing standards for triage, shift coordination and resuscitation.<sup>21</sup> The exclusion of EDs from the NSW ratios legislation is in contrast to California that has a mandated 4 patients per nurse ratio. Elsewhere in Australia, the State of Victoria formulates its ED ratio on the number of beds rather than patients stipulating 3 beds for 1 nurse plus a dedicated triage nurse for the highest level EDs.<sup>22</sup> Just two studies have examined the operation of legislated ratios in EDs, both were conducted in California. In one ED which had chronic, pre-existing nurse shortages waiting times increased because beds had to be closed when the ratios could not be staffed as mandated.<sup>23</sup> In the second study,<sup>24</sup> in a better resourced ED, waiting times and length of stay reduced when the ED operated within the mandated ratios suggesting that controlling the number of patients under care may improve efficiency.

A criticism often levied against the ratios approach to workload regulation is that it is insensitive to variations in acuity.<sup>23,25</sup> This is particularly relevant to the ED environment where the range and variation in patient acuity is high. Ray et al.<sup>26</sup> and Robinson et al.<sup>27</sup> note that under ratios and another common ED staffing method known as Hours

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