The effects of nurse to patient ratios

Working at NHS trusts has given me a rich experience – most of it positive. However, at times, I have felt my work compromised by what I saw as staff shortages. In contrast, working in Australia, I found lack of staff was rarely an issue.

This prompted me to consider whether the NHS is really understaffed, and if this affects the way we treat our patients. I also wondered whether this perception of understaffing was unfounded, and if my negative experiences were being influenced by other reasons.

I believed a literature review would help me better understand the relevance of poor staffing, and if staffing within the NHS is considered suboptimal.

Background

Nurses are concerned that demands on the NHS cannot be met by its current workforce. RCN members have said they are apprehensive about the difficulties of providing and guaranteeing safe, high quality nursing care (RCN, 2003).
5 key points

1 A computerised system would show whether wards need extra staff and also indicate why a ward’s dependency has increased

2 A group of “floating” staff can be employed to move from ward to ward to help out in busy periods

3 Staffing should be organised with a view to long-term priorities

4 The cost of additional staff can be offset against savings from reduced patient outcomes such as reduced inpatient stays

5 Identifying non-clinical tasks that can be allocated to non-nursing staff is one way of reducing the effects of low nurse to patient ratios

Table 1. Safe nurse staffing levels

<table>
<thead>
<tr>
<th>Ward Type</th>
<th>Morning Shift</th>
<th>Afternoon Shift</th>
<th>Night Shift</th>
</tr>
</thead>
<tbody>
<tr>
<td>City hospital - medical/surgical wards</td>
<td>1:4 + in charge</td>
<td>1:4 + in charge</td>
<td>1:8</td>
</tr>
<tr>
<td>District general hospital - medical/surgical wards</td>
<td>1:5 + in charge</td>
<td>1:5 + in charge</td>
<td>1:10</td>
</tr>
<tr>
<td>Aged care facilities</td>
<td>1:7 + in charge</td>
<td>1:8 + in charge</td>
<td>1:15</td>
</tr>
<tr>
<td>Labour wards</td>
<td>1:1</td>
<td>1:1</td>
<td>1:1</td>
</tr>
<tr>
<td>Large city hospital – A&amp;E</td>
<td>1:3 + in charge + triage</td>
<td>1:3 + in charge + triage</td>
<td>1:3 + in charge + triage</td>
</tr>
</tbody>
</table>


This table shows the safe nurse staffing levels according to legislation in Victoria, Australia.

meetings or training were not accounted for.

According to Gurses and Carayon (2007) other factors, such as the physical environment and communication between staff, also affect patient outcomes. This links to the idea that hospitals with low staffing levels may also have a poor physical environment and lack resources. This will result in poor outcomes and makes it difficult to set a ratio.

There has been little robust research on the relationship between hospital mortality and staffing levels. In 2006, Rafferty et al produced a UK study based on the model used by Aiken et al. (2002) in the US. Although UK hospitals varied far more in terms of how understaffed they were – with some having levels as low as one nurse to nearly 15 patients – mortality was similar to that in the US study.

Hospitals with the worst staffing had an mortality of 26% and 29% in the “failure to rescue” group. The nurses in the hospitals with the worst staffing were up to 92% more likely to show job dissatisfaction and burnout, and rated the quality of care on their wards as “low” or “deteriorating” (Rafferty et al, 2006). The findings suggested that, if the 30 trusts studied had had a nurse to patient ratio of around 1:7 (the best in the study), around 246 fewer deaths would have been seen.

Unfortunately, neither the US nor the UK studies suggest an optimal nurse to patient ratio, although they allude to 1:4 providing the best patient outcomes.

What the studies do agree on is that the more patients a nurse is allocated, the worse the patient outcome is likely to be. None of the studies includes information about non-nursing staff (which would greatly complicate the study designs) and their effect on patients and nurses.

For example, low doctor to patient ratios may have a negative effect on outcomes, and affect nurses’ stress levels. There are also no studies that demonstrate an intervention, nor are there controlled trials. All the studies are observational, collecting data on existing situations without intervening (Kane et al, 2007).

Not all the studies are concerned with negative outcomes only in terms of mortality. Others focus on patients who develop unexpected complications but survive to discharge. Studies have found associations between poor staffing levels and urinary tract infections (Needleman et al, 2002), hospital-acquired pneumonias (Kovner and Gergen, 1998) and extended length of stay (Needleman et al, 2002), among other adverse events.

Supporting safe staffing levels

So, if there is a growing body of evidence to support the idea that low staffing levels increase patient mortality and adverse events, what is being done?

In California in the US and Victoria in Australia, there is legislative backing for safe nurse staffing levels. The Victoria levels are shown in Table 1 (RCN, 2003).

The Victoria ratios are set out in terms of group A and group B hospitals: group A hospital is equivalent to a city or teaching hospital in the UK; group B hospital is more on a par with a district general hospital. They cannot be compared directly because of the considerable differences between hospital and population size in Australia and the UK. However, the model can give a guide.

In California, the ratio has been set at 1:5 for medical and surgical wards, with an eventual aim of 1:4; this applies to public and private hospitals. In Victoria, the ratios only apply to public hospitals. Less detail was available, for example, on night shift staffing, for the US legislation.

Nurses’ self-esteem has been boosted since fixed staffing ratios were introduced. More have returned to practice and recruitment and retention have increased across Victoria (O’Connor, 2006). The Australia Nursing Federation (ANF) has suggested many nurses would consider quitting, retiring early or cutting their hours if protected nurse to patient ratios were
abolished. Similarly, the California Nurses Association (CNA) favours fixed nurse to patient ratios, and suggests that nurses are far happier with the care they provide with better staffing levels.

Work has yet to begin with regard to in-hospital mortality since fixed staffing levels were introduced. Much more needs to be done to show if an increase in staffing alone improves patient safety. Most studies highlight that the way data is gathered in this area is inconsistent. Many draw the same conclusions – that low staffing leads to adverse outcomes for patients, as well as poor staff morale. However, interpreting data is difficult because of the lack of consistent methodology, so future research needs to follow more concise guidelines to make evidence from different studies, hospitals and countries comparable.

**Current staffing deficit**

Many perceive that the NHS is understaffed but, compared with an ideal, how much of a deficit is there?

It is difficult to establish from public information how poorly staffed UK hospitals are, because it is difficult to find out the average number of staff allocated per patient. Since there is no mandatory staffing level, decisions can be made at trust level so vary from trust to trust and from ward to ward. Even if a “safe” level was set, there is no information on how trusts’ staffing compares with desired levels.

What is known is that nurses work an average of six hours per week unpaid, according to the Royal College of Nursing (2003), which works out at 322 days per nurse. It could be the result of them not being able to take breaks, or having to work after a shift has ended. This has huge implications if nurses worked to rule.

Table 2 shows how between one and six hours of unpaid overtime equates to hours, costs and cover if the profession worked to rule. While employing nurses to cover would allow staff to take breaks and leave work on time, it would not actually improve the staff to patient ratio because this would require a further boost in the number of nurses.

The figures are based on 322,425 full-time equivalent (FTE) nurses on mean basic salaries of £25,200 and provided by the NHS Information Centre for Health and Social Care (October-December 2009 salary).

The RCN (2003) survey, although sizeable, did not interview every NHS nurse, so the six hours of average overtime may or may not be a true reflection. However, it had some 16,000 respondents, which should give a good cross-section. Even a conservative estimate of half of the six hours worked equates to some 25,794 nurses.

Some UK nurses look after as many as 15 patients (Rafferty et al, 2006) – more than the ANF and CNA levels and more than three times the levels suggested as optimal by Aiken et al (2002). The more the figures are broken down, the more the deficit appears to be spiralling out of control. The figures suggest that some trusts may have to double – if not more – their nurse FTEs to meet a safe staffing level.

Given that the NHS has a limited budget and increasing staffing levels threefold is unlikely, where does it go from here?

The first area that needs to be tackled is how information on the latest research and regular updates on nursing needs and any seasonal change.

For example, a patient needing complex drug regimens would fall into level 1b and need the equivalent of 1.86 FTE nurses per bed. The document provides FTE nursing requirements for all dependency levels – this can be used to calculate the number of nurses needed for the entire contingency of patients on any ward. Over time, this kind of data can be collated to identify staffing needs and any seasonal change.

Again, allowing for non-clinical tasks with this system seems problematic. If “all time needed” is calculated on the basis of patients’ needs and acuity, it is time for non-clinical tasks to be accurately assessed?

Simple completing an acuity score that shows a ward needs a certain number of nurses does not ensure their allocation. When future data is interpreted, whether wards have in fact been allocated all the staff they require should be studied to highlight any deficits in the nursing workforce.

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**Table 2. Value of unpaid overtime**

<table>
<thead>
<tr>
<th>Overtime worked per nurse (hours per week)</th>
<th>Total overtime by NHS nurses (hours per week)</th>
<th>Value of unpaid overtime (per week)</th>
<th>Nurses required to cover unpaid overtime (FTE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>322,425</td>
<td>£4,826,702</td>
<td>8,598</td>
</tr>
<tr>
<td>2</td>
<td>644,850</td>
<td>£9,653,405</td>
<td>17,196</td>
</tr>
<tr>
<td>3</td>
<td>967,275</td>
<td>£14,480,107</td>
<td>25,794</td>
</tr>
<tr>
<td>4</td>
<td>1,289,700</td>
<td>£19,306,809</td>
<td>34,392</td>
</tr>
<tr>
<td>5</td>
<td>1,612,125</td>
<td>£24,133,511</td>
<td>42,990</td>
</tr>
<tr>
<td>6</td>
<td>1,934,550</td>
<td>£28,960,214</td>
<td>51,588</td>
</tr>
</tbody>
</table>

This table shows how between one and six hours of unpaid overtime equates to hours, costs and cover if the profession worked to rule.
Implications for practice

While we need to aim for safe staffing levels, allocating staff could become a more dynamic, innovative process. For example, by collecting more evidence, a baseline safe staffing level could be arrived at for general wards.

A computerised system may reveal on any day whether a ward will need extra staff. A sophisticated system would tell a user why the dependency of a ward has changed. Often, busy periods are not uniform: ward A may be hectic in the morning because there are three patients dependent for hygiene needs; ward B may be busy in the afternoon because there are two routine blood transfusions to run.

A hospital could employ “floating” staff who move from ward to ward to assist in busy periods. Where they work can be agreed from the beginning of the day because the system will predict what need is where. So as not to deskill ward nurses, the float nurses would not always be responsible for the same task – such as complex dressings – but could cover other tasks.

This idea would not remove the need for mandatory staffing levels. However, a sophisticated allocation system and experienced ward managers would recognise that, although a 20-bed ward may have five nurses, this does not mean a 1:4 split – one nurse may be with two seriously ill patients, while another cares for six who are less ill (O’Connor, 2006).

UK hospitals would struggle to meet a 1:4 ratio in the near future but, with float staff, hospitals could explore the idea that when a ward needs assistance, extra staff could be found – but not necessarily for an entire shift.

Articles have looked at how the dilution of skill mix can influence patient outcomes (Gainsbury, 2009; Browne and Odell, 2004). However, this article does not have the breadth to discuss skill mix at length. Skill dilution can have a negative impact on patient outcomes (Carr-Hill et al, 1992) but not all studies agree on this (Meyer and Spilsbury, 1998).

Increasingly, there are fewer qualified nurses and more healthcare assistants on general wards, and much hands-on care is being undertaken by such staff. More research is needed on the effects of diluting skill mix. If nurse to patient ratios are set at a mandatory level, it stands to reason that there also needs to be a gold standard for nurse skill mix – namely band 5 to band 7 – and also a nurse to HCA ratio. The RCN (2003) recommends a 65:35 ratio of nurses to HCAs. This is figure is supported by the Healthcare Commission (2005) but the DH offers no ratio recommendation (Gainsbury, 2009).

Levels of other staff, such as doctors, physiotherapists, occupational therapists, specialist nurses and dietitians will play a part. Further studies could be conducted on the multidisciplinary team as a whole, and into how the understaffing of branches of it will affect patients and other staff.

Medical staff in particular have been identified by other studies as needing scrutiny. Similar studies to that undertaken by Aiken et al (2002) could look at doctor to patient ratios, rather than nursing ratios.

Many non-staffing issues lead to adverse outcomes for patients and low staff morale, and these need to be researched. Poor access to supplies, a dysfunctional work environment and highly dependent patients’ family members can all add to nurses’ workload (Gurses and Carayon, 2007). Some issues are difficult to change without significant investment, but simple changes could be made to improve others. Streamlining how wards operate to make all services efficient is extremely important, particularly when they are understaffed.

Studies into time spent on mandatory but non-clinical tasks would be useful. They may highlight some activities that could be redirected towards clerical staff.

Several studies I have discussed were undertaken outside the UK, where service delivery and client groups may be different. The size and allocation of healthcare budgets may also be significantly different, particularly where the private sector provides the majority of healthcare. Given that many of the studies are somewhat dated, we need more current UK research into the effects of staff to patient ratios and skill mix.

Conclusion

Although providing additional staff would be expensive, the difference it could make to outcomes could offset this cost, for example by reducing inpatient stays. Recruitment and retention would almost certainly improve and, in the long run, this should reduce spending. Staffing should be considered in the long term.

Shortfalls in staff make it difficult to achieve excellence in standards of care. The likelihood of patients experiencing adverse outcomes will increase as staffing is continually compromised. The warning as budget cuts and recruitment freezes loom is stark – the fewer nurses per patient, the higher the chances of adverse outcomes, increased mortality and staff exhaustion. NT

References


