Evidence on the effect of nurse staffing levels on patient outcomes

Key points

1. In the past 20 years, many studies have explored the relationship between nurse staffing levels and patient outcomes.
2. Large observational studies show that lower nurse staffing levels are associated with higher rates of falls and deaths.
3. Much of the research on nurse staffing levels and patient outcomes comes from outside the UK.
4. A lack of specificity limits the ability to translate the current evidence into practice.
5. One of the challenges is to present evidence in a way that can inform policy and practice.

Authors Jane Ball is principal research fellow; Peter Griffiths is chair of Health Services Research; Jo Hope is research fellow; all at the University of Southampton.

Abstract A large and increasing number of studies report a relationship between low nurse staffing levels and adverse patient outcomes, including higher mortality rates. However, despite the volume of research undertaken, significant gaps in the evidence base remain. Is there enough evidence on nurse staffing and patient outcomes to develop 'safe-staffing' guidance? If not, what more needs to be done? This article summarises what is known, what is not known and what more we need to know about safe staffing to inform policy and practice.

Citation Ball J et al (2017) Evidence on the effect of nurse staffing levels on patient outcomes. Nursing Times; 113: 1, 48-49.

What do we know?

A systematic review of research confirming the relationship between low nurse staffing levels and adverse patient outcomes found 101 studies published up to 2006, mainly from the US (Kane et al, 2007). Since then, research from other countries has increased, with studies from Australia (Twigg et al, 2011), China (You et al, 2013), England (Rafferty et al, 2007), Thailand (Sasichay-Akkadchanunt et al, 2003) and from across 12 European countries (Aiken et al, 2014; Aiken et al, 2012).

In addition to systematic reviews, we found 35 primary studies that met our strict criteria. All the studies identified used cross-sectional data (survey or routinely collected data). Sample sizes varied from studies covering hundreds of hospitals with millions of patients, to single-centre studies and studies with fewer than 1,000 patients. Box 1 summarises the findings of our review.

Strengths of the evidence

The current evidence is important in that it elucidates the potential risks associated with low RN staffing levels and highlights...
the benefits of higher nurse staffing. Overall, it is broadly consistent with a cause-and-effect relationship – the reason we see an increase in negative outcomes when staffing levels are lower is that low staffing levels cause worse outcomes. A longitudinal study that used shift-by-shift data on staffing levels is particularly noteworthy, as it established that increases in deaths followed periods of low staffing (Needleman et al, 2011).

The evidence base has raised awareness of staffing levels as a key issue in patient safety, with the government asking for trusts to be given guidance on ‘safe-staffing’ – a phrase that denotes the importance of nurse staffing to safety.

Weaknesses of the evidence
Most studies used a cross-sectional design; associations between variables are established but causality cannot be proven. Although the causal relationship between staffing and patient outcomes seems probable, there are, in some studies, a number of gaps that might have created bias and weaken the evidence base overall. Core limitations include:

- Omitted variables: for example, few studies take account of staffing levels of doctors; some studies do not consider differences in the mix of patients;
- Simultaneity: factors that influence outcomes, such as acuity, influence staffing levels at the same time;
- Common-method variance: a reported association could be a result of both things being measured within the same questionnaire – for example, nurses who are negative about staffing may generally be negative, so may also be negative about the quality of care.

Box 1. Key findings from the review of safe staffing research

- Strong evidence from several large observational studies that lower nurse staffing levels were associated with higher rates of falls and deaths
- Strong evidence that higher nurse staffing levels were associated with reduced length of stay and lower readmission rates
- Similar but less consistent evidence on infections
- Contradictory evidence on pressure ulcers
- No evidence of an association with venous thromboembolisms

Added to this, much of the research has come from outside the UK, particularly from the US. Can we be sure that the relationships found in other countries will apply here? However, since the review undertaken for NICE (Griffiths et al, 2016a), other research from the UK has confirmed the overall finding that mortality rates are higher when staffing levels are lower (Griffiths et al, 2016b).

Using the evidence to inform policy and practice
The evidence is limited in its potential to offer operational solutions. Much of the research published in academic journals has presented associations between variables, focusing on the strength of the relationship, without describing the actual staffing levels. This lack of specificity is a real problem in translating the findings into practice.

“The evidence base has raised awareness of staffing levels as a key issue in patient safety”

One of the biggest challenges faced by NICE, and latterly by NHS Improvement, in developing safe-staffing guidance is to find evidence that is not only based on high-quality research, but also presents the findings in a way that allows the results to be interpreted in order to inform policy and practice. What is needed is research that reports the levels of RN staffing in different contexts associated with good, mediocre or poor patient outcomes.

Trying to address this, NICE used the limited evidence available from the UK to discern what might be a ‘warning level’ – that is, a level of staffing that could increase the risk of error, of care left undone or of harm to patients. However, guidance on what to avoid is not as operationally applicable as guidance on the nurse staffing levels required for care to be delivered safely.

What more do we need to know?

There are complex challenges in researching the relationships between staffing and patient outcomes, and in attempting to apply the evidence to practice. Future research needs to look at what opportunities there are to address some of the challenges we have identified. The gold standard – a randomised controlled trial – may not be easily undertaken in this field, but it is by no means theoretically impossible, while further observational research can still contribute valuable evidence. Finally, technological developments are creating opportunities for far richer data to be accessed in order to explore the relationships between nurse staffing levels and quality of care. NT

References

For more on this topic go online...

- Developing a dependency and capacity staffing tool
  Bit.ly/NTStaffingTool

Nursing Times January 2017 / Vol 113 Issue 1 49

www.nursingtimes.net