Safe-staffing: What do we know?

A large and increasing number of studies have reported a relationship between low nurse staffing levels and adverse outcomes, including higher mortality rates. Despite the volume of research undertaken, there remain some significant gaps in the evidence base. This has led to confusion about what is known about nurse staffing levels and how the evidence can be used to inform practice. For example, is there enough evidence on nurse staffing and patient outcomes to develop 'safe-staffing' guidance? If not, what more needs to be done?

In this 'Evidence Brief' we summarise what is known about safe-staffing, what is unknown and what more we need to know to inform policy and practice.

What is the problem?

Whilst the relationship between registered nurse (RN) staffing and patient outcomes has frequently studied, the National Institute for Health and Care Excellence (NICE) nonetheless concluded that there was insufficient evidence available to fully inform practice. So what are the problems with the evidence we have[1]?

A review of evidence – method

On behalf of NICE, we reviewed evidence on nurse staffing and patient outcomes, in order to inform the development of safe staffing guidelines for general adult acute wards. The first point to note is the huge number of studies that have been published in the past 20 years.

It allowed the review to be quite selective; to exclude studies if they failed to take account of number of health care support worker for example, or if they measured staffing at the hospital level as opposed to ward level nurse staffing.

The review focussed on patient outcomes (e.g. mortality, serious preventable events such as pressure ulcers, falls), patient experience/satisfaction, and care outcomes (e.g. care left undone, mediation omissions or errors).

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 USA.[2] Since then the research from other countries has increased, including Australia [3], China [4], England [5], Thailand [6] and across 12 European countries. [7,8]

In addition to systematic reviews, we found 35 primary studies that met our strict criteria. All the studies we 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 less than 1000 patients. In summary, we found:

- Strong evidence from several large observational studies that lower nurse staffing levels were associated with higher rates of death and falls
- Strong evidence that higher nurse staffing is 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 thrombo-embolisms

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 – that the reason we see an increase in negative outcomes when staffing levels are lower, is because low staffing levels cause worse outcomes. A longitudinal study which used shift-by-shift data on staffing levels is particularly note-worthy, as it established that increases in death followed periods of low staffing. [9]

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.

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Weaknesses of the evidence

Most studies used a cross-sectional design; associations between variables are established but we cannot prove causality. Although the causal relationship between staffing and patient outcomes seems probable, there are a number of gaps in some studies that allow for possible 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 such as acuity that influence outcomes 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 – e.g. nurses who are negative about staffing may generally be negative, and so are also negative about quality of care

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 the other countries will apply here? Since the NICE review, other research from the UK has however confirmed the overall finding that mortality rates are higher when staffing levels are lower.[10]

Using the evidence to inform practice

The evidence is also limited in its potential to offer operational solutions. Much of the research published in academic journals has presented associations between variables, focussing 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.

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

In trying to address this NICE used the limited evidence available from the UK, to discern what might be a 'warning level' – a level of staffing that could potentially increase risk of error, care left undone, or harm to patients. But 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 this evidence to practice. Future research needs to look to see what opportunities there are to address some of the challenges we have identified. The 'gold standard' – the randomised controlled trial – may not be easily undertaken in this field, but it is by no means theoretically impossible. Further observational research can still contribute much. Finally, technological developments are creating opportunities for far richer data to be accessed to explore the relationships between nurse staffing levels and quality of care.

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