Nurse staffing impacts on patient and nurse outcomes

by Anne Marie Rafferty (FRCN 2002)

Anne Marie Rafferty
DPhil (Oxon), FRCN, CBE, president, Royal College of Nursing UK, London, England; professor of health policy, King's College London, London, England

Email
anne_marie.rafferty@kcl.ac.uk

Although it's always been obvious that there has to be a link between nurse staffing levels and quality of patient care, it wasn't until the 1990s that research led by Linda Aiken in the United States (Aiken et al 1994) began to produce evidence of the nature of this relationship. I led the first study in England to establish whether or not similar links would be apparent in NHS hospitals, and its findings were reported in 2007 in the paper that underpins this article.

The idea for that study, however, took root some years before. It began in 1995 at a meeting in Bellagio, Italy at the Rockefeller Conference Center, nestled in the hills around Lake Como. It brought together some of the key international protagonists in nursing and outcomes research across Europe to start fleshing out a study design and ironing out methodological challenges in advance of writing a grant application. I was invited in my dual capacity as a new arrival at the London School of Hygiene and Tropical Medicine – as director of a think-tank for nursing and allied health research, the Centre for Policy in Nursing Research – and Harkness Fellow collaborator with Linda Aiken.

What a sublime start to a research study, one I haven't managed to repeat since, and in marked contrast to the usual wave of frantic, pent-up nervous energy that goes into grant writing. Instead, this was a more leisurely mix of workshops and scholarly seminars where we also mixed socially over dinner with colleagues from other disciplines who were resident at the centre, this being the practice there to foster cross-pollination of thinking. It was a perfect environment to enable ideas to ferment in a congenial and convivial setting.

Outcomes of variation in hospital nurse staffing in English hospitals: cross-sectional analysis of survey data and discharge records

Abstract

Context Despite growing evidence in the United States, little evidence has been available to evaluate whether internationally, hospitals in which nurses care for fewer patients have better outcomes in terms of patient survival and nurse retention.

Objectives To examine the effects of hospital-wide nurse staffing levels (patient-to-nurse ratios) on patient mortality, failure to rescue (mortality risk for patients with complicated stays) and nurse job dissatisfaction, burnout and nurse-rated quality of care.

Design and setting Cross-sectional analysis combining nurse survey data with discharge abstracts.

Participants Nurses (*n*=3984) and general, orthopaedic, and vascular surgery patients (*n*=118752) in 30 English acute trusts.

Results Patients and nurses in the quartile of hospitals with the most favourable staffing levels (the lowest patient-to-nurse ratios) had consistently better outcomes than those in hospitals with less favourable staffing. Patients in the hospitals with the highest patient to nurse ratios had 26% higher mortality (95% CI: 12-49%); the nurses in those hospitals were approximately twice as likely to be dissatisfied with their jobs, to show high burnout levels, and to report low or deteriorating quality of care on their wards and hospitals.

Conclusions Nurse staffing levels in NHS hospitals appear to have the same effect on patient outcomes and factors influencing nurse retention as have been found in the United States.

Citation
Rafferty AM, Clarke SP, Coles J et al (2007) Outcomes of variation in hospital nurse staffing in English hospitals: Cross-sectional analysis of survey data and discharge records. International Journal of Nursing Studies. 44, 175-182. doi: 10.1016/j.ijnurstu.2006.08.003

Link
www.sciencedirect.com/science/article/abs/pii/S0020748906002446?via%3Dihub

Introduction and background
In many ways the study started before Bellagio and had been incubating during the year I spent in 1994-5 on a Harkness Health Policy Fellowship at the University of Pennsylvania where I was mentored by Linda Aiken, the world-renowned policy researcher in nursing. I undertook a post-doctoral analysis of the American nursing political positioning and lobbying tactics used during the Clinton health reform effort in the early 1990s, and what we could learn in the UK from those tactics.

Part of my fellowship experience involved joining meetings that Linda was leading with her research group on different studies that were being proposed at this time. I was just a lowly lecturer and humble historian at the University of Nottingham and while my MPhil (Surgery) at Nottingham University in a previous life had given me some understanding of clinical research, I was blissfully unaware of the world of health services research. So, my initial baptism into that world occurred during my Harkness Fellowship, which has had a profound impact on my career and interests ever since. The policy analysis I undertook gave me some understanding of how evidence and policy could work together to bring about advocacy for change.

A notable meeting to which Linda invited me was at the American Academy of Nursing in Phoenix, where she was laying out the findings from what became the landmark paper published in Medical Care (Aiken et al 1994) and the first to demonstrate the impact of nurse staffing levels on patient mortality in acute care in the United States (US). What really impressed me at the time, and still does, is Linda's infallible and uncanny ability to articulate policy through evidence. As with the best researchers, she is also a brilliant communicator.

'Penn' was to be a milestone in my career. It was while I was there that I was headhunted to take up the role of director of the new Centre for Policy in Nursing Research. This was a joint venture with the Royal College of Nursing (RCN) to produce an evidence base and policy justification to change funding structures for nurses and midwives and the allied health professions. It was a very exciting time in a dynamic multidisciplinary environment and I really relished that experience, including collaborating with Professor Michael Traynor, another RCN Fellow who has contributed an article to this collection.

The grant application we wrote following the Bellagio meeting was successful in getting funded by the National Institutes of Health in the US. The study laid down the foundations for a major platform for policy influence. We published a number of papers, mainly from the survey data, including reports of the state of the nursing workforce in the different countries where studies had been conducted ¬- Scotland, England, US, Germany and Canada – so that, in many ways, it was the prototype for subsequent studies which some of us would collaborate on and an antecedent for the RN4CAST study across different European countries (Sermeus et al 2011).

My co-authors on the 2007 International Journal of Nursing Studies (IJNS) report of the English study were Sean Clarke, James Coles, Jane Ball, Philip James and Martin McKee, along with Linda Aiken. We all learned a lot from this study about how different countries' health systems collected and curated their staffing type and numbers, and their outcomes data such as patient mortality and complications. I recall in meetings that data systems were a major focus. Across the Atlantic our meetings were scheduled to coincide with the American Academy of Health Services Research, their blue-chip meeting. It was exciting presenting our findings there to a health services and policy research audience.

Influence and impact
The 2007 IJNS paper has had over 650 citations in publications on subjects ranging from nurse satisfaction to burnout and education, with most relating to quality of

Acknowledgements
The author would like to give her profound thanks to Linda Aiken for her support and inspiration over the past 25 years; to all other co-authors of the 2007 International Journal of Nursing Studies paper and the teams from the hospital outcomes study and RN4Cast for exemplary collaborations; to Dr Ivanka Ezhova; and to Alison Tierney, long time mentor since my student days at Edinburgh University, for stellar editorial input to this article

RESOURCES

New European study overhauling hospitals for nurse wellbeing
www.nursingtimes.net/news/hospital/exclusive-new-european-study-overhauling-hospitals-for-nurse-wellbeing-24-02-2020

care and later research on staffing levels and patient mortality, patient safety and the work environment. Examples of publications that have cited this paper include Aiken et al (2012, 2014), Duffield et al (2011), Twigg and Duffield (2009), Sermeus et al (2011), Schubert et al (2008, 2012), Shekelle (2013), Ball et al (2014), Ausserhofer et al (2014), West et al (2014), Dall'Ora et al (2015).

Of course, one study and the publication of one paper rarely can change the status quo, but a new or counter narrative can be set in motion. And the paper remains important as a drawbridge between the initial large hospital outcomes international study and the replicability of that design, and as the bridgehead it provides into a successor study known as RN4CAST (Sermeus et al 2014) [Q1: Should this be Sermeus et al 2011 – Sermeus et al 2014 is not in the reference list?]. This has become one of the most successful studies in terms of its type, and one of the largest and most impactful studies in terms of nursing policy across Europe.

The RN4CAST study was designed to forecast nurse staffing requirements on the basis of known links between staffing and quality of care. The most significant paper published from that study quantified the impact of nurse staffing on patient mortality and confirmed that it was not only numbers but capabilities that mattered in terms of how nurses were educated, specifically whether or not to graduate level (Aiken et al 2014).

Current and future relevance

The RN4CAST study and all of the research that has been done over the past 20 years or so on the subject of nurse staffing and its impact on patient care link to the international debates that we are having in 2020, designated by the World Health Organization (WHO) as the International Year of the Nurse and the Midwife. Much of the content of the State of the World's Nursing (SOWN) report published in April (WHO 2020), focuses on or impinges on staffing. Gaping shortages in the workforce supply across the globe are revealed, with serious maldistributions as upward of 80% of these shortages are in lower to middle income countries. The world is short of six million of the 29 million nurses it is estimated to need, so there is a huge deficit in healthcare capacity worldwide.

We are at a critical juncture in our history. Staffing standards matter for patient safety, not just in countries with well-developed and aspirational healthcare systems but arguably even more so in low to middle income countries as an essential underpinning for implementing the sustainable development goals (SDGs) of the United Nations (UN) and for ensuring universal access to healthcare.

It is imperative that we now seek to lobby governments around the world to implement the recommendations of the SOWN report which advocates mass investment in education for nurses and midwives, decent jobs with good working conditions and leadership at all levels. These investments will in turn facilitate the UN's SDGs in health, education and gender development (RCN 2020).

In the UK, legislative reform has been leveraged in Wales in 2016 and Scotland in 2019 using evidence generated from the accumulated research over the past 20 years and now we hope that England and Northern Ireland will follow. The 2007 IJNS breakthrough paper provided part of the platform to support further cross-national studies in Europe (RN4CAST), but now it is time to move forward to building on the evidence base to focus on intervention. In a recently funded Horizon 2020 multi-country study (Magnet4Europe) of an organisational intervention designed to protect the mental health of nurses and doctors we are taking the evidence base in staffing and quality improvement to the next level.

I am delighted to be involved in this exciting new study which is under the overall leadership of Linda Aitken and Walter Sermeus, with the UK arm led by Jane Ball, another RCN Fellow and one of the team who worked with me on the 2007 study. Burnout was a significant finding in that study and it remains a pressing issue, only likely to increase in the future. Given we are in the grip of a pandemic, this move towards intervention is highly relevant to the present situation and how we might respond and future-proof the workforce.

Evidence alone can rarely change the policy weather but it can raise the temperature by feeding into dialogue and the heat of a campaign. The RCN (2020) is building a level of sophistication in campaigning methods and garnering public support with a cast-iron evidence-based case for legislation. Northern Ireland led the way by taking a stand on staffing and pay, even being prepared to take strike action. COVID-19 has raised the profile of nursing as never before. This is our moment and we, as nurses, need to seize the day.

References

Aiken LH, Smith HL, Lake ET (1994) Lower Medicare mortality among a set of hospitals known for good nursing care. Medical Care. 32, 8, 771-787. doi: 10.1097/00005650-199408000-00002.

Aiken LH, Sermeus W, Van den Heede K et al (2012) Patient safety, satisfaction, and quality of hospital care: cross sectional surveys of nurses and patients in 12 countries in Europe and the United States. BMJ. 344, e 1717. doi: 10.1136/bmj.e1717

Aiken LH, Sloane DM, Bruyneel L et al (2014) Nurse staffing and education and hospital mortality in nine European countries: a retrospective observational study. Lancet. 383, 9931,1824-1830. doi: 10.1016/S0140-6736(13)62631-8

Ausserhofer D, Zander B, Busse R et al (2014) Prevalence, patterns and predictors of nursing care left undone in European hospitals: results from the multicountry cross-sectional RN4CAST study. BMJ Quality and Safety. 23, 2, 126-35. doi: 10.1136/bmjqs-2013-002318

Ball JE, Murrells T, Rafferty AM et al (2014) 'Care left undone' during nursing shifts: associations with workload and perceived quality of care. BMJ Quality and Safety. 23, 2,116-25. doi: 10.1136/bmjqs-2012-001767

Dall'Ora C, Griffiths P, Ball J et al (2015) Association of 12 h shifts and nurses' job satisfaction, burnout and intention to leave: findings from a cross-sectional study of 12 European countries. BMJ Open. 5, 9. doi: 10.1136/bmjopen-2015-008331

Duffield C, Diers D, O'Brien-Pallas L et al (2011) Nursing staffing, nursing workload, the work environment and patient outcomes. Applied Nursing Research. 24, 4, 244-55. doi: 10.1016/j.apnr.2009.12.004

Rafferty AM, Clarke SP, Coles J et al (2007) Outcomes of variation in hospital nurse staffing in English hospitals: cross-sectional analysis of survey data and discharge records. International Journal of Nursing Studies. 44, 2,175-82. doi: 10.1016/j.ijnurstu.2006.08.003

Royal College of Nursing (2020) Investing in the Global Power of Nursing. www.rcn.org.uk/news-and-events/blogs/investing-in-the-global-power-of-nursing-180220 (Last accessed: 4 September 2020.)

Schubert M, Glass TR, Clarke SP et al (2008) Rationing of nursing care and its relationship to patient outcomes: the Swiss extension of the International Hospital Outcomes Study. International Journal for Quality in Health Care. 20, 4, 227-37. doi: 10.1093/intqhc/mzn017

Schubert M, Clarke SP, Aiken LH et al (2012) Associations between rationing of nursing care and inpatient mortality in Swiss hospitals. International Journal for Quality in Health Care. 24, 3, 230-238. doi: 10.1093/intqhc/mzs009

Sermeus W, Aiken LH, Van den Heede K et al (2011) Nurse forecasting in Europe (RN4CAST): rationale, design and methodology. BMC Nursing. 10, 1,1-9. doi: 10.1186/1472-6955-10-6

Shekelle PG (2013) Nurse–patient ratios as a patient safety strategy: a systematic review. Annals of Internal Medicine. 158, 5_Part_2, 404-9. doi: 10.7326/0003-4819-158-5-201303051-00007

Twigg D, Duffield C (2009) A review of workload measures: a context for a new staffing methodology in Western Australia. International Journal of Nursing Studies. 46, 1,132-40. doi: 10.1016/j.ijnurstu.2008.08.005

West E, Barron DN, Harrison D et al (2014) Nurse staffing, medical staffing and mortality in intensive care: an observational study. International journal of nursing studies. 51, 5,781-94. doi: 10.1016/j.ijnurstu.2014.02.007

World Health Organization (2020) State of the World's Nursing. www.who.int/publications/i/item/9789240003279 (Last accessed: 4 September 2020.

