

## **Nurse-to-Patient Ratios are Important for Best Patient Care**

J.F.A. Murphy - Editor of the Irish Medical Journal

Florence Nightingale stated that the introduction of trained nurses leads to a reduction in the number of hospital deaths. In addition to her nursing expertise, she used her statistical skills to save the lives of the soldiers in the Crimean war. With her polar area diagram, she graphically demonstrated the decrease in preventable deaths between 1855 and 1856 following the introduction of sweeping changes in nursing care<sup>1</sup>. Her use of infographics was revolutionary at the time. Her call to action was that if we have evidence and fail to act, we are going backwards. Her data overturned the entrenched military belief that soldiers died from wounds rather than unsanitary hospitals. She is considered to be the founder of modern nursing.

In the modern era there is universal acceptance that good nursing care is critically important in making sick patients better. The importance of a competent, confident, and credentialed nurse has never been more crucial<sup>2</sup>. Nurses comprise more than 50% of the skilled healthcare workforce, 90% being women.

What is exceptional in nursing is the nature of the work: the continuous and intimate association with pain and not infrequent contact with death<sup>3</sup>. It has previously been stated that hospitals are held together, glued together, and enabled to function by the nurses.

The key role played by the nursing profession during the Covid pandemic is a testament to their skilled care of ill patients. However, there is still an active debate about how many nurses a ward or a hospital need in order to achieve the best patient outcomes. Despite the many discussions, policy tools to achieve safe nursing levels have rarely been implemented.

In an important paper, McHugh et al<sup>4</sup> have measured the impact of setting minimum nurse-to-patient ratios in selected hospitals in Queensland, Australia. The instruction was that the nurse-to-patient ratios on morning and afternoon shifts be no lower than 1:4 and on night shifts no lower than 1:7. The directive applied to medical-surgical wards rather than ICUs and labour wards which have more concentrated staffing ratios.

Patient clinical data and outcomes were collected at two time points. Baseline data was recorded May 1<sup>st</sup> to 31<sup>st</sup>, 2016. The results data was collected May 1<sup>st</sup> to 31<sup>st</sup>, 2018 two years post-implementation. It was an ambitious undertaking. There were 27 intervention hospitals and 28 comparison hospitals. There were 142,986 patients in the intervention hospitals, and 88,916 patients in the comparison hospitals were assessed at baseline. Subsequently, 160,167 patients in the intervention hospitals and 97,086 patients in the comparison hospitals were assessed in the post-implementation phase.

The main finding was that the minimum nurse-to-patient ratio introduced in the intervention hospitals reduced the 30-day mortality (OR 0.89). Secondly, the hospital length of stay decreased in both groups but was greater in the intervention hospitals (OR 0.95). Thirdly, the hospital readmission rates increased over time in the comparison hospitals (OR 1.06) but not in the intervention hospitals (OR 1.0).

The average number of nurses per patient in the comparison hospital was 6.13 at baseline and 5.96 at two years. In the intervention hospitals the number of nurses per patient was 4.85 at baseline, and 4.37 at two years.

The cost savings due to reduced length of stay and readmissions was more than twice the costs of the extra staff required to comply with the policy.

The study had an inbuilt flexibility. When a nurse had to take a break, others could provide cover. An individual nurse could have more or fewer patients so long as the average number did not exceed the ratio limits. This removed any sense of rigidity that would make the directive unworkable.

It is an important paper. Most previous studies on nurse-to-patient ratios have been cross-sectional. Also, the few longitudinal studies were small, retrospective, and relied on administrative data which tends to overestimate staffing by the inclusion of non-clinical nurses. The authors emphasise that that the investment in additional nurses provides a worthwhile return for patients.

This isn't the first study that has shown the relationship between nursing numbers and better patient outcomes. Needham et al<sup>5</sup> reported that a higher nurse-to-patient ratio resulted in lower rates of pneumonia, urinary tract infection, shock, upper gastrointestinal bleeds, sepsis, and deep vein thrombosis.

Aiken et al<sup>6</sup> found that each additional patient added to a nurse's workload was associated with 7% higher odds of a patient dying within 30 days of admission. On the other hand, for every 10% increase in nurses, there a 7% decline in mortality.

These findings are understandable in that nurses play an essential role in ensuring patient safety. They monitor for clinical deterioration and detect errors and near misses. They are efficient at analysing care processes and weaknesses in health care systems.

The years 2020-21 have been designated by WHO as the International Year of the Nurse and Midwife<sup>7</sup>. There are a number of goals; encourage greater investment in nursing, recruit more nurses in leadership roles, give nurses a more prominent voice in health policy making, encourage the sharing of best nursing practices and to conduct research in the areas that nurses have the most impact.

One of the recurring concerns throughout all the nursing literature are challenges around recruitment and retention. It has been pointed out that nursing is a very stressful job with a very flat career path<sup>8</sup>. One of the solutions is to develop and expand senior clinical grades such as advanced nurse practitioners (ANPs) and clinical nurse specialists (CNS). There are clear differences between the two roles<sup>9</sup>. The ANPs are more generalists and are to be found in areas such as emergency medicine, oncology, cardiology, or neonatal intensive care. The CNSs are usually defined by a specific disease diabetes, stroke, renal disease, or heart failure. A specialist implies a greater depth of knowledge within a specific clinical area, while a generalist requires a greater breadth of clinical knowledge. There is invariably some overlap between the two roles.

The conclusions are intuitive. Having sufficient nurses with manageable workloads is very important for good patient care and best outcomes.

## References:

1. Karami H, Alavi NM. Florence Nightingale: The mother of nursing. *Nurs Midwifery Studies* 2015;June 4(2):e29475.
2. Ullman AJ, Davidson PM. Patient safety: the value of the nurse. *Lancet* 2021;397:1861-1863
3. Abel-Smith B. A history of the nursing profession. New York: Springer, 1960.
4. McHugh MD, Aiken LH, Sloane DM, Windsor C, Douglas C, Yates P. Effects of nurse-to-patient ratio legislation on nurse staffing and patient mortality, readmissions, and length of stay: a prospective study in a panel of hospitals. *Lancet* 2021;397:1905-1913.
5. Needleman J, Buerhaus P, Mattke S, Stewart M, Zelevinsky K. Nurse-staffing levels and the quality of care in hospitals. *N Engl J Med* 2002;346:1715-1722.
6. Aiken LH, Sloane DM, Bruyneel L et al. Nurse staffing and education and hospital mortality in nine European countries: a retrospective observational study. *Lancet* 2014;383:1824-30.
7. WHO 2020-year of the nurse and the midwife. 2021. <https://www.who.int/campaigns/annual-theme/year-of-the-nurse-and-the-midwife-2020>.
8. Wunderlich GS, Sloan FA, Davis CK, eds. *Nursing staff in hospitals and nursing homes: is it adequate*. Washington DC. National Academy Press, 1996.
9. Cooper MA, McDowell J, Raeside L, the ANP-CNS Group. *The British Journal of Nursing* 2019;Nov 12