An ever-thorny issue: defining key elements of critical care nursing and its relation to staffing

The nurse staffing deficit in critical care is an age-old problem, with the issue seeming to worsen over time. In light of an international shortage of nurses [1], COVID-19 and the global surge in critical care capacity [2], which resulted in a rapid expansion of critical care capacity, there has been widespread implementation of alternative staffing models, with non-critical care qualified nurses, such as support staff, allied health professionals (AHPs) and other professionals providing bedside care to critically ill patients, reaching 70% at the peak surge of hospitalisations in the UK [3].

The UK picture

In the UK, the prevailing model for critical care staffing has long been determined by National Health Service (NHS) service specification, with 50% of Registered Nurses (RNs) required to have ICU qualification and specified patient to registered nurse (RN) ratios linked to patient acuity and dependency levels[4, 5]. Yet, high vacancy rates of around 10-15% nationwide before the COVID19 pandemic[6] prompted increased interest in more flexible alternatives to the *status quo*. The UK has one of the lowest nurse numbers per capita in Europe, according to recent OECD data [7], and one of the lowest critical care bed numbers per 100,000 population[8], with deficits in overall capacity dependent almost entirely on critical care nurse numbers[9]. Optimising the deployment of this scarce critical care nursing workforce is paramount for patient safety, but also for staff wellbeing[10]. This was emphasised by Bae et al's systematic review[11], reported in this issue, highlighting the consistent link between nurse staffing and burnout. Repeated surges in critical care admissions associated with the pandemic globally, and the potential for COVID-19 to become endemic, coupled with an increased need for agile staffing in response to the demand placed by COVID-19[12], compels examination of critical care nurse staffing with a critical lens.

Implications for critical care nursing

Clear associations exist between nurse staffing and patient outcomes including mortality, nosocomial infection, hospital costs and family satisfaction [13-15], alongside nurse outcomes [16], and nurse-sensitive indicators[17]. This link has also been demonstrated in critical care units [18, 19] from a small number of epidemiological studies[20, 21]. However, casual mechanisms between critical care staffing and outcomes are not established[13]. It remains unclear how to describe what 'nurse staffing' comprises as an entity. This is the crux of the problem. As a profession it is arguable that we are struggling to define this: determining what constitutes nurse staffing in critical care has become increasingly blurred, particularly with the advent of new roles in the UK such as advanced critical care practitioners, nurse associates, and nurse apprentices, none of which require the postholder to be a registered nurse with a critical care qualification. While recognising that these roles and plans for an effective career framework in critical care are increasingly pivotal in addressing critical care staffing crises, there still needs to be more unpacking of what critical care nursing involves and how to nurture future workforces.

Challenges to the notions of what constitutes a critical care nurse

Critical care nurse staffing remains a complex phenomenon determined by a range of factors, including nurse: patient ratios, environment, workforce availability and skill mix. Numbers of registered nurses, with critical care qualification, and skill mix variation are undefined in much of the existing evidence; and subsequent inconsistency in measuring of staffing leads to vague conclusions in practice. There are no intervention studies to guide deployment of staffing in critical care, and no evidence to support one staffing model over another[10]. Most studies focus on reporting observed

variation within otherwise stable systems [10]. As is widely known, more RNs are positively associated with a range of patient outcomes[22] and decreased omissions in care[23].

Whether the simplistic ratio approach to staffing, predicated on organ system failure rather than patient acuity and dependency, and advocated in national guidance [24] sufficiently addresses the nuances and complexity of critical care requirements is questionable. This further compels the need for closer examination of model configuration[25]. Moreover, a lack of scrutiny of critical care nurses' roles in those models also warrants examination[26], given variations in practices and roles, leading to the question: what is it that defines the unique role of a critical care nurse, and why is this important to examine?

With COVID-19, we've seen the advent of task-teams often focusing on fundamentals of care, such as moving and handling (proning), mouth care, hygiene care, that have created anxiety for many critical care nurses around the reduction of nursing to tasks, and the erosion of what it is to be a critical care nurse. A national staffing framework in the UK was developed to meet exceptional ICU demand during COVID19[27, 28] that involved critical care nurses moving to supervisory roles, overseeing support workers (non RNs), AHPs, physician colleagues and RNs, with delegation of many clinical tasks. Similar models, described as pod models, were implemented globally[29]. Hospitals also created internal solutions to extreme staffing issues associated with an influx from COVID-19 related admissions. Critical care nurses, by necessity, moved to supervise non-critical care staff to provide bedside patient care. This has presented a threat to the concept of what it is to be a critical care nurse. The World Federation of Critical Care Nursing outlined the highly skilled nature of the critical care nursing workforce and suggest that critical care nurses should focus on the tasks that require expert advanced skills, expertise and knowledge of best practice in patient care[30]. Moreover, various staffing models should be considered, including use support staff to prioritise critical care nurses for delivery of high quality expert care[30]. The notion of a critical care nurse was

challenged in recent research, the SEISMIC study (Study to Evaluate the Introduction of a Staffing Model in Intensive Care, National Institute for Health Research ref: 200100) [31], where senior leaders who were interviewed suggested that bedside care did not always need a qualified critical care nurse. This finding potentially compounds the fear of not being able to clearly identify the attributes of a critical care nurse and, in turn, what that means for planning nurse staffing in critical care.

Several large hospital Trusts in the UK are using different establishments of non-RNs in critical care, with those with no healthcare background at all (who are supported through internal training programmes), comprising as much as 30% of their 'nursing' workforce. We don't yet know the implications of these changes in practice, and what the downstream effect will be on patient outcomes, attrition, job satisfaction, and nurse-sensitive outcomes. Indeed, a question arises on how critical care nurse-sensitive outcomes (e.g. hospital-acquired infections, satisfaction, weaning, falls, pressure injuries, staffing), are measured if registered critical care nurses are not delivering the bedside and fundamental care?

The Royal College of Nursing in the UK has historically defined a critical care nurse as:

'a registered nurse who has the right knowledge, skills, and competencies to meet the needs of a critically ill patient without direct supervision. The knowledge, skills and competencies they require to nurse critically ill patients should reflect the level of patient need, rather than being determined by the patient care environment (for example, a high dependency or intensive care unit).'[32].

The key difference between critical care nurses and support workers or other RNs working in critical care, centres on the planning and supervision of care, and delivery of expert care requiring advanced skills; while non-nurses may be able to deliver elements of fundamental nursing, the care must be overseen and planned by a registered critical care nurse who can independently care for a critically ill person. A critical care nurse is much more than a technologically competent practitioner, but a professional who is able to interpret complex information, provide therapeutic benefit through

presence and comfort measures, and plan a dynamic programme of care for critically ill patients in a critical care unit, as well as supporting other staff to provide critical care.

The invisible work of critical care nurses

Allen's seminal contributions through ethnographic research on the invisible work of nursing outlines how nurses undertake 'organising of work'[33], which is viewed as 'dirty' or 'invisible' work, as not involving direct patient care. Considerable energy is spent on creating working knowledge, through information location, interpretation, sense-making and checking to translate into narratives for contributing to individuals care trajectories[33]. This could include a senior critical care nurse in charge of a shift organising staffing and contributing to patient flow in the hospital through discharge discussions. There can be a tension between a managerial nursing focus on maintaining patient flow, supporting the efficiency of the organisation and wider population needs, and the professional impetus to care for individuals (such as the bedside nurse caring for a sick individual who does not want to discharge someone to the ward too early). The complexity of patients and the organising of work supersedes the notion of staffing numbers. All too frequently, it is easy to become distracted by the notion of numbers and ratios, rather than understanding what nursing resource is required to safely meet individual and population needs in a healthcare organisation, mitigating risk and ensuring delivery of high-quality care. Lydahl [34] outlines the invisibility of nursing work in delivering person-centred care through articulation of care, linking tasks together to maintain a patient narrative, ensuring partnership and documenting care, moving away from routinisation of care. This can present a challenge in that classifying tasks render care more visible, and more likely to be subject to determining costs of services; discretionary judgement, autonomy and developing contingencies. Nurses have to find a way to coordinate contradictory and information and tasks[34]. For critical care nurses at the bedside, this invisible work is often manifested in the need to balance technology and caring; coordinating these to achieve person-

centred care. Locsin's revisiting of her original dialectic on technology and caring[35], where critical care nurses were viewed as connoisseurs of technology, achieving knowing of the person through delicately managing complex responses to meet human needs, emphasised how tasks need to be skilfully managed through nurses and that technology and caring can co-exist in critical care [36].

Tensions in the balance between the art and science of nursing, where critical care nurses wanting to be technologically competent but remain caring and focused on the needs on an individual and their family, have been heightened in recent months with COVID-19 and nurse-patient ratios as high as one critical care nurse overseeing six patients (with support from non-critical care nurses and non-RN support workers) in some parts of the world[37-39]. The organising of work, and supervision, has had to take primacy over direct care for many critical care nurses who have found themselves in a supervisory capacity during the pandemic.

Pressures to meet safe staffing

So, while numbers are important for understanding overall establishments at a unit level in critical care, or daily requirements, the past year has presented an unprecedented challenge to both bedside nurses and those planning care. The pressure to meet safe levels of critical care nursing care have at times felt unbearable since the pandemic-induced staffing surges. Chronic shortages in critical care nurses[40], with high intention to leave[41], and poor nurse well-being[42, 43] have been compounded with the pandemic, and warrant examination of not only the role of nursing in critical care, but also how different workforce models affect critical care nursing. The human costs of recent staffing pressures are all too clear, with a predicted exodus of critical care nurses[42], risking further dilution of qualified critical care nursing workforce and the available skill mix to staff critical care.

The pandemic has shone a light on how contextual and situational factors are highly important[26] in relation to staffing models, and tools to support staffing deployment decisions lack a robust evidence base [10, 13, 44]. A consistent message from these systematic reviews has been that there is a lack of evidence to support one model of critical care nurse staffing over another, and that a higher level of staffing was associated with improved outcomes (patients/services/nursing), however there is ongoing dispute over the 1:1 nursing model (where one critical care nurse cares for the highest acuity critically ill patient).

In spite of all this work there is a huge amount still to address, for instance, a high degree of heterogeneity exists in defining skill mix more broadly (e.g percentage of nurses that are RN; proportion of care provided by RN), suggesting a need for clarity[22, 25], and this is likely to be even more complex in critical care, especially with the advent of the aforementioned new roles. While skill mix is a known factor within staffing models, it does not account for context and how care is organised (e.g. shift patterns/patient flow), and the associated nursing work in organising this care. We need to understand how alternative models addressed unprecedented staffing challenges in COVID, and their legacy, such as patient outcomes (e.g. mortality, adverse events, rehabilitation), service outcomes (e.g. staff costs/shift patterns) and nurse outcomes (e.g. retention).

Some Trusts have retained flexible models[31], using these outwith pandemic surge scenarios, but as yet we have little evidence on the effectiveness of these approaches from both nursing and patient outcome perspectives. The UK has one of the lowest numbers of ICU beds per population across Europe and there are moves to address this nationally, however with that comes new anxieties on how to meet the increased staffing demand, and what will that mean for the future of critical care nursing? We have to recruit and train more critical care nurses[9], not just in the UK but globally, by making it an attractive area in which to work, emphasising the varied career trajectories, camaraderie, autonomy and opportunities available, as well as value the highly skilled workforce that defines critical care nursing. Through being our own advocates, and defending the unique

contribution of critical care nursing to critical care as a specialty, we hold on to hope for the future of critical care nursing and developing a workforce fit to meet the population demands.

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