"It's not just about the numbers": Inside the black box of nurses' professional judgement in nurse staffing systems in England and Wales: Insights from a qualitative cross-case comparative study

Davina Allen [a,*], Nina Jacob [b], Heather Strange [b], Aled Jones [a,1], Chris Burton [c], Anne Marie Rafferty [d]

[a] School of Healthcare Sciences, Cardiff University, Cardiff, UK
[b] Centre for Trials Research, Cardiff University, Cardiff, UK
[c] School of Allied and Public Health Professions, Canterbury Christ Church University, Kent, UK
[d] Florence Nightingale Faculty of Nursing, Midwifery and Palliative Care, King's College London, UK

ABSTRACT

Background: Whether implicit or explicit, professional judgement is a central component of the many nurse staffing systems implemented in high-income countries to inform workforce planning and staff deployment. Whilst a substantial body of research has evaluated the technical and operational elements of nurse staffing systems, no studies have systematically examined the role of professional judgement and its contribution to decision-making.

Objective: To explore nurses' use of professional judgement in nurse staffing systems in England and Wales.

Methods: A cross-case comparative design centred on adult in-patient services in three University Health Boards in Wales and three National Health Service Trusts in England. Data generation was undertaken between January 2021 and March 2023 through stakeholder interviews, observations of staffing meetings, and analysis of documents and artefacts. Observations were undertaken in clinical areas but limited to three cases by COVID-19 restrictions. Analysis was informed by translational mobilisation theory.

Findings: Two kinds of professional judgement were deployed in the nurse staffing systems: the judgement of clinical nurses and the judgement of senior nurse managers. The research highlighted the reflexive relationship between professional judgement and data, and the circumstances in which organisations placed trust in people and when they placed trust in numbers. Nurses' professional judgement was central to the generation of data, its interpretation and contextualisation. Healthcare organisations relied on the professional judgements of clinical nurses and senior nurse managers in making operational decisions to mitigate risk, where real-world understanding of the status of the organisation was privileged over formal data. Professional judgement had attenuated authority for the purposes of workforce planning, where data was a master actor. Nurses expressed concerns that strategic decision-making prioritised safety and efficiency, and formal measurement systems did not capture important aspects of care quality or staff wellbeing, which made it difficult to articulate their professional judgement.

Conclusions: The implementation of staffing systems is resource intensive. Given limited evidence on which to recommend any specific methodology, the priority for future research is to optimise existing systems. If nurses are to deploy their professional judgement to proactively influence the conditions for care, as well as responding to the challenges of risk mitigation, there is a need for robust systems of nursing measurement aligned with agreed standards of care and a vocabulary through which these judgements can be articulated.

Tweetable abstract: Health systems depend on nurses' professional judgement for operational staffing decisions, but data is privileged over professional judgement for workforce planning.

* Corresponding author at: Eastgate House, Room 13.08, Newport Road, Cardiff CF24 0AB, UK.
E-mail address: allenda@cardiff.ac.uk (D. Allen).
Social media: @allen_davina.
[1] Aled Jones, affiliated with School of Nursing and Midwifery, Plymouth University, Plymouth UK from August 2023.

What is already known

- High-income countries have implemented various nurse staffing systems to inform workforce planning and staff deployment in healthcare organisations.

- Many staffing systems rely on the professional judgement of nurses, along with formal workload measurement tools and 'nurse-sensitive' quality indicators.
- Previous research has focussed on the technical aspects of nurse staffing systems, but there is a lack of understanding about the role of professional judgement and how it contributes to decision-making.

What this paper adds

- This paper describes and explains the professional judgement deployed by clinical nurses and nurse managers in nurse staffing systems in England and Wales.
- The study found that the professional judgement of clinical nurses and nurse managers was central to operational decision-making to mitigate risk in the face of fluctuations in capacity and demand.
- Nurses faced challenges in articulating their professional judgements for workforce planning purposes because efficiency, safety and hard evidence were given considerable weight in decision-making, and staffing systems did not generate evidence on aspects of patient care and staff wellbeing nurses considered to be important.

1. Introduction

Ensuring sufficient nurses are available to care for patients is a policy concern in many countries. Substantial evidence relates lower nurse staffing levels to adverse patient outcomes in acute care (Rafferty et al., 2007; Kane et al., 2007; Ball et al., 2014; Aiken et al., 2014). A variety of nurse staffing systems have been implemented in high-income country healthcare systems. These include systems that are locally determined by individual organisations, as in Norway, through policy-led approaches, as in Finland and England, to systems that are mandated in law, such as Israel, Wales, and Germany. A diversity of formal methodologies has emerged including volume-based systems (such as nurse-to-patient ratios), patient classification, benchmarking, and time-task approaches (Griffiths et al., 2020).

Professional judgement is a central component of many nurse staffing methodologies, whether implicit or explicit, but previous research has focussed on the technical and organisational aspects of staffing systems (Griffiths et al., 2020). We know little about the role of professional judgement in staffing methodologies or its contribution to decision-making. The aim of this study was to address this gap in understanding through an examination of the role of professional judgement in nurse staffing systems in England and Wales.

Health policy in the United Kingdom is devolved. In Wales, the responsibilities of healthcare organisations for staffing in adult medical and surgical wards and children's wards are specified in the Nursing Staffing Levels (Wales) Act 2016. In England, nurse staffing is informed by policy guidance and subject to external regulation by the Care Quality Commission. Whilst national policies vary, and fine-grained differences exist between staffing methodologies, both England and Wales employ a triangulated approach. Quantitative data derived from patient acuity workload measurement tools and quality indicators are combined with 'professional judgement' to inform decision-making.

2. Methods

The research had a cross-case comparative design centred on adult in-patient services in three University Health Boards in Wales and three NHS Trusts in England (Jacob et al., 2021). Acute care settings were selected because the statutory duties specified in the Nursing Staffing Levels (Wales) Act were limited to these areas at the time of the study. Cases were selected to represent a variety of district general and tertiary hospitals in urban, rural, and city locations. Data generation

was undertaken between January 2021 and March 2023 through stakeholder interviews, observations of nurse staffing meetings, and analysis of documents and artefacts. Observations in clinical areas were undertaken but limited to three cases because of COVID-19 [see Table 1 for a summary of the case study data]. Ethics approval was granted by Cardiff School of Healthcare Sciences Ethics Committee and all participants gave full written consent. The questions guiding the research were:

- How do clinical leaders and nurse managers deploy professional judgement in assessing need, planning staffing levels, deploying nurses, and organising nursing work in response to changing demand patterns?
- What are the skills and knowledge that underpin nurses' professional judgements on staffing decisions?
- How do nurses articulate professional judgement in nurse staffing decisions?
- What weight is given to professional judgement in the triangulated approach to staffing decisions?
- What is the relationship between professional judgement, planning tools, and nurse sensitive patient outcomes data?
- Are there elements of nurses' professional judgement that could be supported by new measurement or decision tools?
- What are the implications of the research for nurse education, professional development, and leadership?
- What are the implications of the research for nurse staffing systems and future policy and practice?

The study was informed by a practice approach. This is an orientation to research which attends to human agency, how action is made possible by artefacts and resources, how knowledge is materialised through activity, and how agents interact with the socio-material conditions of the practice context in pursuit of their objectives (Nicolini, 2012). Data generation focussed on the activities and actors involved in nurse staffing systems; the artefacts, tools, and technologies deployed; the knowledge sources underpinning nurses' professional judgement; and how professional judgement was enacted, by whom and with what effects.

Snowball sampling was used to identify the stakeholders, documents, and meetings involved in the nurse staffing systems. Interviews took place using secure video conferencing software (Microsoft Teams). Whilst the study timeframe encompassed the COVID-19 pandemic, we asked participants to describe the pre-pandemic operation of staffing systems. Interviews were guided by standard templates, tailored to organisational roles, with flexibility to probe areas of interest. Meetings were observed, either virtually or in person. Most virtual meetings were recorded digitally; in-person meetings and a small number of virtual meetings (where digital-recording was not possible) were recorded as fieldnotes. Meeting organisation was impacted by the pandemic (i.e., most were undertaken virtually rather than in-person), but participants indicated that fundamental decision-making mechanisms were un-affected. Documents, tools, and technologies were analysed to understand the artefacts and organisational processes involved in nurse staffing systems. Observations were undertaken by shadowing senior nurses and clinical managers and recorded as low inference fieldnotes, which documented observations and conversations as they happened without interpretation.

Transcribed fieldnotes, interviews and pertinent sections of staffing meetings were uploaded into qualitative data analysis software (NVivo11) and coded using standard frameworks to facilitate data extraction and management. Data analysis was designed to build up an understanding of professional judgement in the nurse staffing systems. The process was led by DA, NJ, and HS and comprised independent interpretation and joint sense-making through a series of data analysis workshops. In the first phase analysis, we developed descriptions of the staffing systems in each case. For the second phase analysis, an

Table 1
Summary of case study data.

Data sources	Wales case study 1	Wales case study 2	Wales case study 3	England case study 1	England case study 2	England case study 3
Observations (clinical)	7 h	0	14 h	0	14 h	0
Observations (meetings)	4	1	4	3	3	13
Interviews: operational nursing staff (e.g. ward managers, senior/lead nurses, matrons)	3	1	8	4	8	4
Interviews: senior nursing staff (e.g. directors of nursing, workforce leads, chief nurses)	5	8	7	6	2	4
Interviews: non-nursing senior and managerial staff (e.g. finance managers, HR managers, chief operating officers, medical directors)	1	3	0	1	1	9

additional coding frame was applied to the data to explore the role of professional judgement in greater detail. Emerging findings were shared with case study representatives, via two on-line workshops, one for Wales and one for England, with participant insights informing the final analysis.

3. Theoretical framework

Translational mobilisation theory (Allen and May, 2017) informed the analysis. Developed from research on the organising work of nurses (Allen, 2015), translational mobilisation theory is founded on a practice approach and offers a conceptual framework to describe and explain systems of work. It attends to the relationships between people, materials, and technologies in achieving a shared goal (*the project*),

the *mechanisms* of action through which this is accomplished, and how activity is conditioned by the local context (*strategic action field*). [See Table 2 for a summary of translational mobilisation theory].

'Projects' are the units of analysis in translational mobilisation theory. Our examination of professional judgement in nurse staffing systems centres on two projects: the periodic activities through which staffing establishments are agreed for individual care settings (the strategic system), and the everyday practices involved in managing fluctuating capacity and demand (the operational system). We describe the structures, organising logics, interpretative repertoires, and technologies in each system's strategic action field, focussing on the relationship between the two principal interpretative repertoires used in nurse staffing systems: professional judgement and quantitative data. We deploy translational mobilisation theory's mechanisms of action to

Table 2
Summary of translational mobilisation theory (developed from Allen and May (2017)).

Translational mobilisation theory		
Domain assumptions		
An ecological approach to collective activity		Translational mobilisation theory focusses on the relationships between people, materials and technologies involved in a collective activity and how these are conditioned by context. This approach to understanding systems of work is like the notion of an ecosystem in biology, which focusses on the interactions between organisms in an environment and how features of the environment impact on these relationships.
A process view of organisations		Translational mobilisation theory is underpinned by a process view of organisations. Human action and the formal features of healthcare organisation are treated as moving backwards and forwards in a dynamic relationship. Whilst formal structures are understood to shape the possibilities for action, their meanings are enacted by human agents through their use in practice. This domain assumption invites us to recognise the agency of participants in organisations and to understand organisations as produced through an on-going dynamic tension between stability and fluidity, formality and informality, as the people who work in the system make sense of situations in carrying out their work.
Activity is mediated by artefacts		Translational mobilisation theory underlines the importance of artefacts in mediating activity in a system of work. In using artefacts participants create, understand, and interact with the objects of their practice. Artefacts can be material (tools, technologies, or instruments) or cognitive (categories, rules of thumb, scores), formal or informal.
Activity is distributed between people, materials and technologies		Translational mobilisation theory conceptualises activity as distributed between people and non-human actors – such as materials or technologies. From this perspective, participants do not simply work with tools and technologies, rather tools and technologies perform functions, that is they 'act', within an overall activity. Sometimes technologies perform functions that might otherwise be performed by a person; sometimes technologies require work from humans to fulfil their functions. The basic point is to understand that activities typically have a socio-material distribution.
Core components		
Project		The project is the unit of analysis in translational mobilisation theory. It refers to the network of people, materials and structures involved in achieving a shared goal. Specifying the project of interest, defines the boundaries of analysis within the theory.
Strategic action field		The strategic action field refers to the features of context that condition projects.
	Organising logics	Elements of a strategic action field that provide a set of assumptions, values and beliefs that define the purpose and scope of action.
	Structures	Elements of a strategic action field that generate the entities, positions, and relationships through which an activity is organised (divisions of labour, hierarchies, departments, units, teams, interfaces).
	Materials	Elements of a strategic action field that provide the physical facilities, technologies, and concrete resources to support an activity.
	Interpretative repertoires	Elements of a strategic action field that provide the formal and informal meaning making resources: classifications, scripts, data, categories, mindlines, rules of thumb, pattern recognition, assessments.
Mechanisms of action		The mechanisms of action refer to how an activity is achieved.
	Object formation	Practices through which objects of practice are created and understood by participants to achieve a goal.
	Translation	Practices that allow different objects of practice and understandings to be shared between participants to enable concerted action.
	Articulation	Practices that assemble and align the diverse elements (people, knowledge, materials, technologies, actions, bodies) through which projects are accomplished.
	Sensemaking	Practices though which actors interpret and create order in conditions of complexity and connect the fluidity of practice with organisational structures.
	Reflexive monitoring	Practices through which actors evaluate a field of action to generate awareness of project trajectories.

explain how nurses produce the objects of their practice in generating an understanding of capacity and demand in the clinical areas and the organisation (*object formation*), interpret complex data (*sensemaking*), share their care systems understanding with corporate managers (*translation*), maintain awareness of capacity and demand (*reflexive monitoring*), and align resources to maintain safe care (*articulation*).

4. Findings

Despite differences in national policy contexts, and fine-grained differences in the staffing methodologies utilised across cases, the role of professional judgement in nurse staffing systems in England and Wales followed a common pattern. The presentation of these findings proceeds as follows. First, we describe the qualities and distribution of professional judgement in nurse staffing systems. Second, we use translational mobilisation theory to explain how clinical nurses and senior nurse managers deployed professional judgement in the strategic and operational staffing systems and how the authority of professional judgement was mediated by these different decision-making contexts. Third, we summarise the impact of COVID-19 on nurse staffing systems.

4.1. What is professional judgement?

When participants were asked to describe professional judgement in nurse staffing systems, it was typically characterised as qualitative, soft intelligence, based on experiential knowledge. Variously portrayed as 'a hidden art', 'second nature', or 'holistic skill', there were frequent references to its tacit qualities and the importance of 'intuition' or 'gut feeling' in decision-making.

> It's about having that future planning, that intuition, that operational nous [intelligence], that gut reaction of gosh, […], we're going to have a really challenged day here.
>
> [P402: Divisional Director]

> It's a very holistic skill […], not magical skill, that's a silly word to say, but there's a level of judgement that far surpasses anything I understand.
>
> [P610: Governance Director]

Accounts of practice identified two kinds of professional judgement in nurse staffing systems at different levels in the organisation: the judgement of clinical nurses (including clinical managers) and the judgement of senior nurse managers. Clinical nurses' judgements were based on an embedded understanding of their local areas. This included knowledge of the clinical population, unit operations, technologies, infrastructure, and staff. For the purposes of assessing capacity and demand, this knowledge was combined to generate an understanding of the care setting that was more than the sum of the individual parts.

> It's weighing up everything, […] looking at the ward as a whole […] your staffing levels, […] your acuity, everything else that maybe going on.
>
> [P501: Matron]

> I can see that I've had five admissions and four discharges or I can see my […] levels of care, that's quite high, but it's a professional judgement of putting it all together. That's the vital part of interpreting.
>
> [P310: Nurse Manager]

Senior nurse managers had responsibility for safe care across the organisation and mediated the relationship between the clinical and corporate worlds. Whilst they did not have clinical nurses' embedded understanding of individual care settings, their professional judgement was founded on prior clinical and operational experience, relational knowledge of staff in front-line clinical and corporate roles, and awareness of organisational priorities.

> It is the knowledge of the people, be it their local skills or their experience […] some staff will take a busy or rapidly changing shift in their stride, others won't.
>
> [P601: Associate Nurse Director]

> [W]e've got an overview of all our areas so […] we're able to make that professional judgement of yes, it's safe to move a nurse from there to here.
>
> [P207: Clinical Lead]

Accounts of professional judgement highlighted its reflexive relationship with data. Professional judgement was described as a prerequisite for data use, essential for its interpretation, and a complementary source of intelligence in decision-making.

> I think professional judgement is using the data that is available […] but also using your gut feeling and your experience of what feels right.
>
> [P310: Nurse Manager]

> It's more than the data isn't it, it's the, what's going on here and now.
> [P402: Divisional Director]

> So that interpretation of the data, which, in effect, is the professional judgement element, is a vital ingredient.
>
> [P603: Managing Director]

The following sections examine how clinical nurses and senior nurse managers deployed professional judgement in the strategic and operational staffing systems, the relationship of professional judgement with data, and how its decision-making authority was mediated by context.

4.2. Professional judgement in the strategic nurse staffing system

4.2.1. Strategic action field

All cases had formal *structures* for reviewing and agreeing unit staffing establishments. 'Establishment' refers to the normal staffing profile aligned with a clinical area to support routine operations. A biannual activity, the strategic staffing system extended from ward to board; it typically included clinical nurse managers, senior nurse managers, general managers, directors of nursing, and finance and human resources managers. The strategic system was driven by an *organising logic* in which corporate responsibilities for staffing were balanced with considerations of cost and the need to manage divisional budgets. The *interpretative repertoires* deployed in establishment setting included quantitative data (staffing, workload, and quality indicators) and professional judgement. In Wales workload was measured using a national patient acuity measurement tool: Welsh Levels of Care tool (Health Education and Innovation Wales, n.d.). All cases in England used the Safer Nursing Care Tool (Shelford Group, n.d.). Quality data deployed in the case studies comprised of pressure ulcers, falls, medication errors, and patient complaints. These were collected routinely and recorded in Datix, an information system designed to manage data on adverse events and complaints. Workload and quality data were generated by clinical nurses. It entailed formal assessments of workload at least once a day; systematically recording adverse incidents; and on-going attention to the accuracy of rostering data. Professional judgement was a formally specified component of the strategic staffing system in all cases. The maturity of *technologies* varied, but typically included rostering systems, systems for recording adverse events, patient complaints, and workload assessments. In cases with more advanced systems, data were digitally generated at ward level, could be accessed centrally, and displayed using visualisers.

4.2.2. The mechanisms of establishment setting

Individual care settings were the *objects of practice* for establishment reviews. Clinical managers and senior nurse managers collaborated to generate an understanding of unit capacity and demand. This entailed assembling and appraising rostering, workload, and quality data, typically for a specified census period. Despite quality assurance processes across all cases, data quality was variable. This was partly because when clinical areas were busiest, nurses prioritised patient care, and partly because data technologies were cumbersome, and poorly integrated.

> It's as good as the information inputted [...] if you are short-staffed [...] they're more interested in giving care to the patient [...] rather than [...] update the information.
>
> [P107: Matron]

> We cross-check that information, [...] this becomes quite a laborious process because our information sets do not match up.
>
> [P402: Divisional Director]

Clinical managers deployed their local understanding of the care setting, and their *reflexive monitoring* of capacity and demand over time, to assess whether the census data aligned with their experience of real-world activity.

> Those individuals [...] running those services, are absolutely key to first review that data [...] sense check it. Does it feel right, you know, what's it telling you?
>
> [P401: Workforce Lead Nurse]

> The richest bit of analysing audit data is to sit down with the nurse in charge of that ward and ask her in her professional judgement does the score feel right.
>
> [P608: Director of Nursing]

Developing an understanding of capacity and demand for establishment setting also involved the mobilisation of contextual information not captured by formal metrics, such as wider aspects of the quality of patient care, work intensity, and staff wellbeing.

> We talk through their quality indicators, their acuity for that month [...] and their professional judgement, and then we just talk through the feel of the ward, what the staff experience is in respect of job satisfaction or their concerns around delivery of care.
>
> [P502: Division Nurse Director]

If nurses judged the staffing establishment was correct, this decision was formally ratified, through multiple approval processes from ward to board. In this context, nurses' understanding of the care setting, based on census data (acknowledged to be at best an approximation of activity) and professional judgement, had authority to act. If nurses judged changes to the staffing establishment were required, then additional work was necessary to *translate* their understanding of the care setting into a corporate *object of practice* for decision-making purposes.

Clinical nurse managers' assessments of staffing establishments were informed by experiential judgements based on an embedded understanding of real-world unit activity and its impacts on patient care and staff. But in the corporate world, decisions about staffing establishments were underpinned by a rational-analytic approach founded on hard data, which was detached, distant and reductive. Creating a corporate object of practice for strategic decision-making involved translating clinical nurse managers' judgements into an evidence-based narrative aligned with the wider organisational agenda. Senior nurse managers had a central role in supporting this process.

> Most of the time [...] the sister's feelings are right [...] then it's for us [...] to articulate that to the Clinical Board and then to the Exec Team ... utilising the other data that's available to also support that.
>
> [P608: Nurse Director]

> I know what it feels like on the ground. I know what it sounds like on the ground. I know what the activity is on the ground, but it's about making sure that [...] you're able to articulate your story. You're able to provide that assurance that this is the right thing to do and here's the evidence of why.
>
> [P407: Associate Nurse Director]

Assembling the evidence involved mobilising formal census data, and other kinds of evidence generated by nurses to support their case, such as operational information, or the impact of the unit infrastructure on the organisation of work. Data did not speak for themselves; and creating a corporate object of practice for the purposes of establishment change also required a justificatory narrative. As one participant expressed it, 'data tells, but stories sell'. The construction of justificatory narratives for establishment setting was not neutral, however. Participants referred to the importance of *translating* professional judgement about capacity and demand into narratives oriented to corporate priorities, which centred on safety and efficiency.

> [T]he best cases always describe if you've had incidents or if there's any adverse patient outcomes that have been occurring, that's always useful information to go into a business case if you're looking to improve.
>
> [P604: Matron]

> I didn't go saying I need all this money, I went saying I have this pot of money, I'm spending premium agency, I'm hand over fist, paying an agency, let me use the premium money, let's reinvest, let's be creative about it.
>
> [P114: Nurse Director]

Quality of care, an important operational and moral concern for clinical nurse managers, was not perceived by senior nurse managers to have discursive legitimacy in creating a corporate object of practice.

> Ward managers just see it as, "but this is about quality" [...] and I will say to them, [...] "if you went to a bank and asked for money that wasn't yours, they will want to know everything about you before they give you the money. It's the same transactional relationship".
>
> [P407: Divisional Director]

> [Y]ou're saying you need two more nurses because your ward is very busy. When they ask you, "that would be a cost pressure, and what will they be doing?" It's very subjective. So, you're going to say, "Well, it's going to improve your patient experience, and it's going to do this and it's going to do that." But you can't quantify.
>
> [P409: Clinical Lead]

Nurses recognised the power of data in decision-making and valued having evidence to support their professional judgement. But they also expressed concerns that formal measurement systems did not capture important aspects of patient care quality or staff wellbeing.

> So everything we struggle to articulate, and everybody would say in the past, oh, it's anecdote, it's anecdote, it's much easier, because we've got it evidenced.
>
> [P114: Nurse Director]

> Yes, and four patients in the four bedder didn't get washed, because there is a cognitively impaired patient, that took up three nurses' time. [...] That's the reality. [...] We couldn't get to feed the patient

at twelve o'clock, and their food was cold. So, there's so much else that is not right, if you haven't got the right staffing levels.

[P313: Head Corporate Nursing]

So staff wellbeing, enough people to get breaks, those are things you can't really measure.

[P404: Head Practice Development]

Our data contain multiple accounts of success in securing establishment changes. These frequently included descriptions of nurses' ingenuity in 'thinking outside the box' of the formal sources of data to generate alternative evidence to substantiate their justificatory narratives.

We've got 20 escorts a day, up and down for [scans]. That's been a new thing, but we're capturing that now.

[P114: Nurse Director]

Notwithstanding these positive examples, other accounts were more cynical, describing the establishment setting process as a bureaucratic exercise which did not produce change.

I don't think it's changed anything other than add bureaucracy […] it's been an extra half an hour's administrative work for a busy Ward Sister a day, for exactly the same establishment.

[P201: Senior Nurse]

I bet no one is going to tell me that I'm going to get extra nurses because of my acuity. Everyone will tell me that your staffing is staying the same because we haven't got money. So, I don't really see the point […] when nothing changes.

[P105: Matron]

The challenges nurses experienced in creating a corporate object of practice for strategic decision-making were widely acknowledged.

It's not a natural space for them to deliver their professional judgement through a more unitary business lens and I think there is a significant training gap there.

[P209: Chief Operating Officer]

[W]e will use the workforce hub data, to say this is what is required for the skill mix for that area. So it just removes the ability of … that's anecdotal, that's anecdotal, that's anecdotal. And nurses are always so feely, touchy feely.

[P114: Nurse Director]

I think nurses are often not articulate, often not evidence-based, and not particularly data literate at describing their professional judgement […] it sounds like a moan, […] and a whine as opposed to a more well-formed, evidenced-based, data-driven, considered position.

[P209: Chief Operating Officer]

Understood by some participants as indicative of a training gap, these data highlight the challenges of articulating professional judgement in decision-making contexts that privileged certain forms of knowledge and led to nurses being described as 'touchy feely', 'emotional' or 'subjective'.

4.3. Professional judgement in the operational nurse staffing system

4.3.1. Strategic action field

The purpose of the operational nurse staffing system was to ensure safe care within agreed staffing establishments in the face of fluctuating capacity and demand. Healthcare is inherently unpredictable; workload varies, front-door pressures produce outlier and boarded patients, and staffing rosters can be impacted by unplanned absences. Considerable effort was expended managing the staffing establishment: reorganising rosters, deploying bank staff, or in exceptional circumstances, using nursing agencies. But in all cases there was rarely sufficient staff to fill planned rosters. The dominant *organising logic* in the operational staffing system was risk mitigation, in which 'risk' was an organisational concern.

[B]ecause our gaps are so big; we very rarely have a ward that's fully staffed anyway […] it's more around balancing the risk.

[P509: Divisional Nurse]

The primary actors in the operational system were clinical nurses/managers and senior nurse managers. The operational system shared *technologies* and *interpretative repertoires* used in the strategic staffing system: namely rostering and workload measurement. Operational decision-making also depended on technologies for generating information on patient flows and bottlenecks, such as bed capacity, emergency department activity, and planned admissions, which were well-developed and embedded. In all cases, the operational system depended exclusively on the professional judgements of clinical nurses and senior nurse managers for assessing safety and intervening to mitigate risk.

4.3.2. The mechanisms of operational nurse staffing decisions

Decision-making in the operational system entailed the generation of two objects of practice: an understanding of the status of individual clinical areas and an understanding of capacity and demand within the wider organisation. Ensuring safe care required balancing these perspectives.

Understanding the care setting for operational purposes required clinical nurses to measure and report nursing workload and ensure rostering information was up to date. These metrics-based representations were recognised as a crude indicator of real-world capacity and demand, however, and thus object formation required additional sensemaking by clinical nurses to appraise activity on the ground. This involved going beyond the data to consider the skills, experience and capabilities of the specific nurses rostered for the shift, workload not captured by formal tools, impacts of wider operational activity such as admissions and discharges, patients requiring a nurse escort to attend an intervention or event, peaks in demand, and the impact of accumulative activity at any given time.

Understanding the skillset experience and expertise of nurses because that can affect your staffing ratio for the shift.

[P604: Matron]

Take yesterday where we had three mental health patients, one who is sectioned and all require 1 to 1s, that is not reflected in the Safer Nursing Care Tool so it comes up as green which on paper looks like we have staff to spare.

[England 1 Fieldnotes: Ward Manager]

These processes generated an understanding of the care setting derived from embedded assessments of capacity and demand. Senior nurse managers were critical of clinical nurses who generated objects of practice exclusively from the data and would intervene to develop the real-world understanding required for operational decision-making.

The organisation formed the object of practice of senior nurse managers. This required developing a 'helicopter view' which included oversight of capacity and demand across individual clinical areas, intelligence on bed capacity, emergency department activity, and planned admissions. All cases had well-developed systems for monitoring patient flow and bed management, but the variable maturity of staffing technologies impacted senior nurse managers' work. Some senior nurse managers had data access from their offices, but where technologies

were more rudimentary, individuals were required to visit clinical areas to obtain this information.

> [W]e're kind of launching a probe to go to Mars, and […] I can't go on a computer anywhere […] and see what the ward staffing is.
>
> [P201: Senior Nurse]

Irrespective of the organisation's technological maturity, senior nurse managers underlined the importance of engaging directly with clinical areas to draw on the professional judgements of clinical nurses.

> But yeah, the wandering round the wards is […] really important to get a feel for the place […]. You really get a flavour for what the risk is.
>
> [P505: Senior Nurse]

Through engagement with the objects of practice generated by clinical nurses, senior nurse managers could identify clinical areas where formal data indicated that the ward was under-staffed, but the clinical nurse judged that there was sufficient capacity; or apparently appropriately staffed wards, where demand exceeded capacity and additional support was required.

> We use that professional judgement to determine if the area is at risk, because what we have found is, even though the acuity levels is based on objective data, there is some softer evidence, which is more intuitive which we would use as part of the professional judgement process.
>
> [P313: Nurse Director]

Healthcare systems are inherently turbulent, and the operational nurse staffing system involved continuous reflexive monitoring at both ward and organisational levels. Each day senior nurse managers held multiple meetings to review and respond to the evolving shape of the organisation.

> [Y]ou think you've got your staffing sorted, 2 hours later, it all goes pants, and you have to rejig again.
>
> [P207: Head Corporate Nursing]

> I think it's about remaining flexible to the needs of a fluctuating service really.
>
> [P607: Matron]

> So, it's constantly reviewing the situation; what are your staffing levels, do they meet the needs of the patients that are currently on the wards.
>
> [P207: Clinical Lead]

Managing daily fluctuations in capacity and demand involved complex judgements. In all cases, there was an expectation that clinical nurses should act to mitigate risk in their areas before escalating to senior nurse managers. In several cases protocols were used which listed 'reasonable steps' that could be taken, with the expectation that these should be documented. Intervening to mitigate risk required *articulation work* which included organising work differently, adjusting the roster, 'cohorting' patients at risk of falls in a single area, redeploying staff (specialist nurses, practice educators), drawing staff that were supposed to be supernumerary (ward managers, student nurses) into the establishment, modifying patient care plans, negotiating with another ward to cover short-term demands, and in extremis utilising nonclinical personnel (such as security staff to supervise restless patients).

> If they think that they can't cope with the numbers of staff available to them they will look at all the actions you would take in terms of swapping people around on the off duty to bring people

in, they'll buddy up with another ward, […] for mutual aid if that's available.
>
> [P608: Nurse Director]

The relational knowledge of senior nurse managers enabled them to identify which clinical nurses could be trusted to use professional judgement in mitigating risk, and those who required additional support.

> There would be certain wards who always wanted help and yet there would be others who through the leadership of their ward sister would organise their work, allocate it and deal with it that way.
>
> [P601: Associate Nurse Director]

> If it's a very experienced person, and you trust their judgement, and most of the time, when they tell you something, you know that you don't have to necessarily go to the ward to look for yourself.
>
> [P409: Clinical Lead]

In addition to supporting individual clinical areas, senior nurse managers were responsible for mitigating risk across the organisation. This involved complex decisions which entailed balancing the concerns of clinical nurses for their individual areas with the needs of the organisation.

> It's like a chess game, so you can see people going okay, so if I move that person there and that person there is that going to make it all safe, how do we mix this up a little bit so that everybody's safe, so you've got those different levels of I need to keep my area safe, I've got to keep my department safe, I've got to keep my area, my whole division safe.
>
> [P610: Head of Governance]

> For every nurse working on a ward, they will feel that they haven't got enough nurses and they'll feel under pressure, […] when you're in these roles, you do hear it daily. And it's about hearing it, listening to it, talking it through, because often they can't see beyond their area.
>
> [P109: Operations Manager]

> So, it is an unhappy role, the Site Manager or the senior nurse who is making those decisions, because you are quite unpopular. […] They must have big enough boots to make decisions and to make the right decision for everybody, which is often the tough one.
>
> [P603: Managing Director]

Senior nurse managers underlined the importance of working with clinical nurses so they better understood the organisational perspective. They routinely involved them in mechanisms of *translation*, in which assessments of individual ward risk, were reframed within the organisational context.

> The whole thing for me is around getting the ward mangers to […] have an understanding of what is happening in other areas compared to what's happening in their area. And also an understanding of how we mitigate risk across the system.
>
> [P314: Patient Flow Coordinator]

For operational purposes, then, nurses' professional judgements were the master actors, and essential to the decision-making required to mitigate risk in unpredictable and pressurised work environments.

> But ultimately, irrespective of what the numbers are telling you, the professional judgement probably will override that, because sometimes there's nothing you can do about the numbers.
>
> [P108: Matron]

> But 90 % of the time, you don't bring the data into it. […] [I]t's almost like you're, I wouldn't say firefighting, but you're trying to prevent

something before it happens, I would use my professional judgement. And I would forget about the data until afterwards.

[P409: Clinical Lead]

[I]f we've made a decision about staff in one area that day it's not written down anywhere, it doesn't have to get approved anywhere, professional judgement is kind of accepted.

[P607: Matron]

The authority of professional judgement in the operational system came with an attendant burden. In the context of sustained workforce shortages, many acknowledged that providing care that was 'safe' rather than 'good' challenged professional identities.

[W]e have to make it safe, but [...] people don't want it to be safe, they want it to be good, they want it to be better than safe.

[P609: Sister]

It would be amazing to use it to be able to advocate for your nurses, to be appropriately staffed but the reality is that we are using professional judgement just to be safe, what is the bare minimum we can get away with just to be safe.

[England 1 Fieldnotes: Senior Nurse]

[Y]ou've got to take some judgements that [...] there's going to be a risk, but you've got to understand [...] what that risk is. The risk might be that some of your patients are not going to get pressure area care for the shift, or are not going to get their observations done every hour, they might have to go to two hourly or something like that. There's quite a lot of things to consider.

[P604: Matron]

4.4. Postscript: the impacts of the COVID-19 pandemic

Participants were invited to describe the impact of the COVID-19 pandemic on nurse staffing systems. The following insights are offered by these data. First, healthcare organisations increased their reliance on the professional judgements of nurses to mitigate risk for operational purposes, as normal fluctuations in capacity and demand were amplified.

We've had to use our professional judgement even more during Covid because we've had to make some very difficult decisions.

[P504: Corporate Head of Nursing]

Second, formal establishment reviews were required when the routine operation of care settings had to be reconfigured, these decisions were informed by professional judgement.

It's more of a professional judgement [...] we just need to report each time a ward changes.

[P301: Senior Nurse]

Third, the wide-spread use of virtual meetings, made regular reviews of capacity and demand more efficient and these new ways of working were likely to be maintained. Fourth, the workforce challenges of the pandemic led to greater collaborative working within organisations and strengthened the relationships between senior nurse managers and clinical nurse managers. Fifth, the challenges of risk mitigation made it more difficult for senior nurse managers to visit care settings and support less experienced clinical nurses.

Concern for people's wellbeing [...] goes out the window. [...] ordinarily a nurse crying [...] I'd want to be there [...] Now,

[...] a crying nurse doesn't feature in the decision-making.

[P201: Senior Nurse]

5. Discussion

Translational mobilisation theory was deployed to examine how clinical nurses and senior nurse managers exercised professional judgement in nurse staffing systems in England and Wales. The research highlighted the reflexive relationship between professional judgement and data in decision-making, and the circumstances in which organisations placed trust in people and when they placed trust in numbers (Porter, 1986). Nurses' professional judgement was central to the generation of data, its interpretation and contextualisation. Nurses accepted when data had to be disregarded for operational decision-making but recognised its value for strategic purposes. Healthcare organisations relied on the professional judgements of clinical nurses and senior nurse managers in making operational decisions to redeploy staff and reorganise care to mitigate risk, but professional judgement had attenuated authority for the purposes of strategic decision-making and workforce planning.

Staffing methodologies typically aim to arrive at optimal staffing levels based on the average demand associated with a patient population. There are, however, multiple sources of variation in daily practice but limited research on how these are managed (Griffiths et al., 2020). This study has revealed that for operational purposes data were considered a crude representation of real-world capacity and demand, and decision-making and interventions to mitigate risk were exclusively based on the professional judgements of nurses.

The question of how best to identify the required staffing levels for different clinical units remains unanswered despite the proliferation of formal staffing methodologies (Griffiths et al., 2020). Workforce planning in our case studies was underpinned by the instrumental rationality of modern organisations, where data were master actors. The challenges nurses experienced in articulating their understanding of the clinical environments within this discursive space may explain the widespread appetite for formal tools.

Decision-making in the strategic staffing system determined staffing establishments and created the environments for care. The professional judgements of nurses enabled organisations to function in conditions of fluctuating capacity and demand and were an important source of organisational resilience (Greenhalgh and Papoutsi, 2018). But at what cost? The dark side of resilient work practices is that they mask faulty systems, a phenomenon described as the 'the tragedy of adaptability' by Wears and Hettinger (2014). The expressed concerns of nurses about the quality of patient care and staff wellbeing identified in the study are indicative of moral injury, which risks perpetuating existing workforce challenges and/or normalising poor-quality care.

Our findings raise important questions about what we quantify and with what effects. Nurses recognised the power of data in enabling them to articulate professional judgements. But data create a specific way of seeing the world, and measurement can narrow our appraisal of value to that which is measured. In all cases, the nurse staffing systems reduced nursing work and patient care to a limited number of indicators. As we have shown, nurses' professional judgements were necessary to identify aspects of workload not captured by formal measurement tools, and in their accounts of practice they expressed concerns that formal metrics restricted understanding of the quality of care to that which was safe rather than good. The emphasis on safe, rather than good care, reflects the prevailing emphasis in the research literature on the association of adverse events with nurse staffing levels. But the question of optimal staffing levels is inextricably linked to the more challenging question about the standard of patient care healthcare systems are prepared to pay for and how this can be measured. This question remains unanswered.

Skill mix is rarely addressed in the literature on nurse staffing methodologies. Recently published workforce plans in England (National Health Service England, 2023) and Wales (Welsh Government, 2023) signal new roles and training programmes, which suggest that the challenges of workforce planning and staff deployment will intensify. Formal systems must be fit for this purpose.

Staffing systems are evolving all the time, and our findings point to several areas for improvement in the examples analysed in this study. First, there is a need to equip nurses with a vocabulary which enables them to articulate their sophisticated understanding of care systems for strategic decision-making. Second, healthcare organisations would benefit from expanding their own knowledge systems and discursive repertoires, to utilise the expertise of front-line staff. Despite the evolution of hybrid clinical-management roles in healthcare, the politics of knowledge is very evident in our data. Third, if, as Espeland and Stevens (2008) have argued, it is very easy for the real to become coextensive with what is measured, then it is essential that quantification is a meaningfully representation of the nursing workload and the quality of care. Measures of workload need to evolve to incorporate shifts in the roles and responsibilities of registered nurses in organising care within a complex skill-mix. Further research is needed to identify a small number of highly sensitive quality indicators aligned with an agreed standard of patient care, which go beyond adverse events to offer an early warning of causes for concern, but do not increase the data generation burdens of nurses.

6. Limitations

This study was undertaken during the COVID-19 pandemic which may have impacted findings. First, we had limited access to clinical areas for the purposes of observation. Clinical nurses are less well represented in our interview data and their perspectives are often reflected through the accounts of others. Second, our aim was to explore the nurse staffing systems as they typically operated. Whilst participants were able to compartmentalise their responses, recent experiences may have influenced their perspectives. The study findings were presented to representatives from the case study sites, who confirmed their face validity and did not identify any major omissions in the analysis. They also indicated that whilst cases were operating in profoundly challenging workforce conditions during the period of data collection, these predated the pandemic, and have since deteriorated further.

7. Conclusions

The implementation of staffing systems is resource intensive (Taylor et al., 2015). Given the limited evidence on which to recommend any specific tool or methodology, and the centrality of professional judgement in their operation, the priority for future research is to identify how existing systems might be refined. If nurses are to deploy their professional judgement to proactively influence the conditions for care, as well as responding to the challenges of risk mitigation, there is a need for robust systems of nursing measurement and a vocabulary through which these judgements can be articulated, coupled with a new discursive context for corporate decision-making. Translational mobilisation theory offers a useful conceptual framework for systematically examining these relationships.

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CRediT authorship contribution statement

Davina Allen: Writing – original draft, Project administration, Methodology, Funding acquisition, Formal analysis, Conceptualization. **Nina Jacob:** Writing – review & editing, Project administration, Investigation, Formal analysis, Data curation. **Heather Strange:** Writing – review & editing, Project administration, Investigation, Formal analysis, Data curation. **Aled Jones:** Writing – review & editing, Methodology, Funding acquisition. **Chris Burton:** Writing – review & editing, Methodology, Funding acquisition. **Anne Marie Rafferty:** Writing – review & editing, Methodology, Funding acquisition.

Data availability

Data is unavailable for sharing owing to the terms of participant consent and ethics approvals.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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