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The *Australian Journal of Advanced Nursing* is the peer-reviewed scholarly journal of the Australian Nursing and Midwifery Federation (ANMF). The Mission of *AJAN* is to provide a forum to showcase and promote a wide variety of original research and scholarly work to inform and empower nurses, midwives, and other healthcare professionals to improve the health and wellbeing of all communities and to be prepared for the future.

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EDITORIALS

Relaunched, the *Australian Journal of Advanced Nursing* in the year of the Nurse and Midwife

Two thousand and twenty; the year that was. The World Health Organization-designated Year of the Nurse and Midwife was in no way celebrated as intended but could not have highlighted more pertinently the global importance of the nursing and midwifery professions. Although challenging for all, we may also reflect that it was a year of many successes for the *Australian Journal of Advanced Nursing*. Successes which can be credited to the authors, peer reviewers, and readers who throughout the year committed their time and expertise to ensuring an excellent volume of issues. We are consistently humbled by the quality and clear effort of the contributions made to the journal.

Beginning the year with the relaunch of the journal's website, the platform through which four quarterly issues were published, we have seen contributions to research and discussion covering a vast array of relevant topics, from the role of rural and remote nurses in Australia, to the development of nurse-led models of care facilitating coordinated outpatient care for those with multimorbidity. As well as research reports, we have also received and published several guest editorials from some leading experts in nursing, health, and aged care that provide important points of view on critical issues including residential aged care in Australia and of course COVID-19. Beyond publishing, we have also expanded the Editorial Board, with a panel of nurses, midwives and academics providing a diversity of national and international knowledge and experience. Finally, in our ongoing effort to support authors, we released revised author guidelines which we hope provide clear direction throughout the process of manuscript development and submission.

The work however is not done. In 2021 we hope to continue improving our guidance for authors and peer reviewers and release further supportive materials. We will continue to expand the Editorial Team, welcoming new Associate Editors to handle author manuscripts through peer review. From authors, we also hope to receive submissions to some of the newer sections of the journal. This includes a section looking to capture interesting and relevant case studies – shorter manuscripts reporting work which may not present suitably as empirical research, but which provide a unique commentary on issues related to the Journal's mission and scope. Further, we invite Letters to the Editor, be they in response to published articles, or as independent works providing compelling commentary or debate to the readership. Finally, we plan to put out a call for papers on issues of topical importance. Works received, and successful through peer review, will be compiled for publication as a special series.

In this first issue of the new year and volume thirty-eight, we present the works of authors who highlight the importance of adherence to reporting and safety in health settings, as well as the opportunity for insight gained through reflection on practice. Further, authors report on research undertaken to better understand a nurse-led service of early medication abortion. This issue's guest editorial by professors Juanita Sherwood, Roianne West, and colleagues from several Australian universities signals the beginning of a developing community of practice as First Nations nurses and midwives, educators, practitioners, and researchers. Here, in response to 2020's Black Lives Matters movement and recent dialogues regarding Australia Day, the authors urge us to consider the importance of our shared roles and responsibilities to continue to challenge racism and oppressive practices in Australian healthcare and society more broadly.

We thank all our authors for their hard work in bringing this issue together and the reviewers for their useful and informed critical appraisal.

To all, we thank you again for your ongoing support -not just to the journal, but for contributions which expand and build on the important evidence base underpinning the delivery of nursing, midwifery, health, and aged care not only in Australia, but internationally. As 2020 has shown us, nursing and midwifery is critical beyond borders, and in times when we might be limited in our travel, it is more important than ever to share our knowledge and experience.

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EDITORIALS

"Taking our blindfolds off": acknowledging the vision of First Nations peoples for nursing and midwifery*

We acknowledge the sovereignty of
First Nations Peoples across the Earth
as the traditional custodians of Country and
respect their continuing connection
to culture, community, land, waters, and sky.
We pay our respect to Elders past and present
and in particular to those who led the way,
allowing us to realise our own aspirations to be
healers and carers, ushering our people
from and to the Dreaming.[1]

"You need to take your blindfolds off and come back to the fire". These were the words of a First Nations Elder and a custodian of the sacred fire speaking to Congress of Aboriginal and Torres Strait Islander Nurses and Midwives (CATSINaM) delegates and educational researchers during a recent visit to the Aboriginal Tent Embassy in Canberra. These words called to us to remember and to acknowledge our ways of knowing, doing and being as First Nations health professionals and researchers.[2] They also called to all who were present to critically reflect on our professional stance and practices as nurses, midwives and researchers in the light of the fire. This editorial responds to and draws on the words of a First Nations Elder, to remind us all of the importance of who we are, where we have come from and our place, position, and traditional practices within the Australian nursing and midwifery profession.

These words are a reminder of the importance of our shared role and responsibility to continue to challenge racism and oppressive practices in Australian healthcare for transformation and for better health outcomes for First Nations Peoples. Decolonising nursing and midwifery research and education is a clear transformational reform process to address oppressive practices and racism including attitudes, ignorance and bias, generalisations, assumptions,

* Please note the term "First Nations peoples" is used here to be respectful and inclusive of all Indigenous Peoples whose countries and nations have been and still are impacted by colonisation. The First Peoples of Australia represent over 500 Aboriginal and Torres Strait Islander nations who have never ceded sovereignty. In this editorial we use the term First Nations peoples to specifically refer to the peoples from the First Nations of Australia.

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uninformed opinions and commit to developing and embedding cultural safety in the nursing and midwifery professions.

As a collective of First Nations nurses and midwives, we acknowledge the distinctive countries we belong to that position our identities, experiences, roles, rights and responsibilities as educational researchers in nursing and midwifery. Collectively, we represent a growing community of researchers involved in decolonising nursing and midwifery research and professional education, united by a deep conviction to work together to counteract the repressive ways that sustain deficit approaches towards First Nations patients and nurses and midwives in education, health, and research contexts.

The Elder's words reminded us that as nursing and midwifery professionals we needed to "take off our blindfolds" to be able to see what we may not be able to see yet. What he reminded us about was the way we view or approach the ethics of care as both First Nations and the wider nursing and midwifery workforce and spoke to the ways in which racialising First Nations peoples in education, research or in clinical practice is still the norm in Australia.

We are grateful for the invitation to write the first guest editorial for 2021 for the *Australian Journal of Advanced Nursing*, and seek to take off our blindfolds and come back to the fire to build better and effective relationships within the Australian nursing and midwifery professions toward a shared commitment to cultural safety praxis. In particular, we seek to examine the nursing and midwifery professional socialisation that informs the lens through which nurses and midwives view First Nations people's rights to culturally safe healthcare. In doing so we acknowledge that current curriculum innovations involving First Nations peoples, their health needs, and our roles in addressing them in nursing and midwifery, present a defining challenge for our professions at this time.

In 1988 the nursing profession was first introduced to the concept of cultural safety through the work of Maori Nurse Irihapeti Ramsden and her work has now changed nursing and midwifery education and practice.[3] At the same time, First Nations nurses in Australia were establishing a collective identity and voice in research and healthcare through CATSIN, the Congress of Aboriginal and Torres Strait Islander Nurses. Almost 25 years later the 2020 International Year of the Nurse and Midwife saw an Australian First Nations collaboration with over 100 nursing and midwifery leaders issue a call to action advocating for a unified professional response to the Black Lives Matter movement, highlighting the continuing inequities in the Australian healthcare system. To heed the words of our Elders and remove any blindfolds we call for all of us to look with fresh eyes at the way nursing and midwifery education, research and practice can perpetuate these unjust practices under our watch if left unchecked.[4,5]

In this editorial, we outline why we need to take off our professional blindfolds and look at the elephant in the room in nursing and midwifery. As health professionals, we need to see how our education and research theories, methods and methodologies socialise our clinical worldview and the way our respective professions relate to Australia's First Peoples. This means being able to see and acknowledge the impact of our own cultural backgrounds on what we bring into quality and standards in nursing and midwifery care. We also need to make a commitment to transformative approaches in the life-long learning journey that growing culturally safe nurses and midwives entails. To enable this, we propose that Indigenist and decolonising ethics and approaches in research, education, the academy and in healthcare are critical tools to expedite First Nations people's right to access culturally safe care from, and within, the nursing and midwifery profession.[6–8]

As a research collective, we are united by the shared values and principles embedded in contemporary Indigenist and decolonising research approaches. Decolonising and Indigenist approaches refocus the object of the professional gaze more towards the professions, institutions and structures that frame First Peoples as objects in research and care.[6,9] Applying First Peoples knowledges and lived experiences to inform research praxis is challenging to articulate and frame in research and requires addressing core tensions and differences in the assumptions that underpin research. It does this by consciously and critically engaging with the need to transform the discourse, or the way we view, talk about, and create First Nations health.[10,11] For First Nations researchers and educators in nursing and midwifery this often involves addressing how our bodies, families and communities are perceived and storied in First Nations health research.[12–14]

Cultural safety is both a philosophy and strategy for reducing professional and institutional racism.[15] We argue that health practitioners have a responsibility to employ critical consciousness to developing strategic frameworks that promote and make space for a culturally safe working environment, and safe healing environment for Aboriginal and Torres Strait Islander people. History informs us that broader nurses and midwives in the not so distant past practiced as agents for government control. Complicit in enforcing government assimilation policies these health practices were discriminatory and experienced by First Nations nurses, midwives and patients as racism.[16,17] While cultural safety training is mandatory in nursing and midwifery education, the effectiveness of this in practice is unclear. There is currently a lack of published literature to document the impact of cultural safety curriculum innovations and the reduction of health inequities through creating safe work environments.

Cultural safety is both a right for Aboriginal and Torres Strait Islander peoples to experience in nursing and midwifery and in healthcare and a responsibility for health nurses and

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midwives to uphold and commit to. Many untold stories of the role played by nurses and midwives in government control and assimilation policies underpin the history of nursing and midwifery amongst First Nations peoples in Australia and the racism that First Nations nurses, midwives and patients continue to experience within healthcare.[16–17]

Our collective work is focussed on how cultural safety is researched, monitored and evaluated, as a critical component of patient safety inextricably linked to clinical safety, in Australia and importantly one not possible without the other. Our approach to cultural safety research also involves *being* culturally safe researchers. We seek to do this by being critically conscious and developing robust research theory and methodology that accommodate and value different ways of knowing, being and doing, and build a sense of ownership and community through research practice partnerships that contribute to the strategic goals of CATSINaM. Advocating and employing Indigenist and decolonising research approaches enables us to navigate a range of tensions that are common in cross cultural research and evaluation contexts. These tensions include:

- Balancing multiple accountabilities –
  - To the families and communities who as First Nations peoples we are accountable to.
  - To the Nursing and Midwifery professions that as Nurses and Midwives we are accountable to.
  - To Universities and Schools of Nursing and Midwifery that as Nursing and Midwifery Academics we are accountable to.
  - To health organisations that as health professionals we are accountable to.
- Upholding cultural responsibilities and obligations; and
- Addressing differing expectations of research.

The research we collectively do involves the broader cultural and social determinants of health. Including Indigenous, nurses and midwives' unique ways of knowing, doing and being in this work helps us navigate complex health spaces for our communities and for our non-Indigenous colleagues grappling with understanding the impact of their cultural backgrounds on nursing and midwifery education and research. As a collective we advocate for an approach within Indigenous nurses and midwives research that aligns with the three fundamental and interrelated imperatives of Indigenist research namely:

- resistance as the emancipatory imperative in research
- political integrity in Indigenous research
- privileging Indigenous voices in Indigenist research[18]

Our approach to research also aligns with the values and principles that guide the ethical conduct of research with Aboriginal and Torres Strait Islander peoples and communities in Australia of the National Health and Medical Research Council (NHMRC) and the Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS).

While we acknowledge these values and principles in research, we call for others to recognise and understand that these approaches hold value for the professional aspirations of nursing and midwifery education, and research.

In growing our research and education approach with others, we seek to use our collective Indigenous voice to raise and address critical health issues and create a legacy in Indigenous nursing and midwifery research. This is in part political, necessarily so – but it is also personal because of our position, responsibility and accountability to our communities. The International Year of the Nurse and Midwife 2020 marked a year of great change and challenges for the nursing and midwifery workforce, we have experienced social and health upheavals that have shocked and called us to attention, and reflect on who we are as nurses and midwives collectively. We can no longer be silent on issues that are unjust and oppressive.

Our Elders call for us all to "take off our blindfolds" and "come back to the fire" and they remind us to acknowledge our shared responsibility to be transformational in how we story and conduct research in nursing and midwifery. This editorial marks the beginning of developing our community of practice as First Nations nurses and midwives, educators, practitioners and researchers. We invite our nursing and midwifery colleagues to also return to the fire and critically reflect on what its light reveals for the nursing and midwifery profession and for those within our care. We urge you to not remain silent but to join us to speak into the silence that surrounds the tacit acceptance of culturally unsafe care.

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REFERENCES

1 Power T, Geia L, Adams K, Drummond A, Saunders V, Stuart L, et al. Beyond 2020: addressing racism through transformative indigenous health and cultural safety education. *J Clin Nurs*. 2020; Available from: https://doi.org/10.1111/jocn.15623

2 Martin K, Mirraboopa B. Ways of knowing, being and doing: a theoretical framework and methods for indigenous and indigenist re-search. *J Aust Stud*. 2003; *27*(76): 203–14.

3 Ramsden I. Cultural safety. *N Z Nurs J*. 1990; *83*(11):18–9.

4 Rigney LI. Indigenous Peoples' Wisdom and Power. Indigenist research and Aboriginal Australia. Bodmin: United Kingdom Ashgate Publishing Limited; 2006; 32–50.

5 Sherwood J. Who is not coping with colonization? Laying out the map for decolonization. *Australas Psychiatry*. 2009; 17(1_suppl):S24-S27. Available from: https://doi.org/10.1080/10398560902948662

6 Sherwood J, Edwards T. Decolonisation: a critical step for improving Aboriginal health. *Contemp Nurse*. 2006; 22(2): 178–90. Available from: https://doi.org/10.5172/conu.2006.22.2.178

7 Sherwood J. Do no harm: decolonising Aboriginal health research [dissertation]. Sydney: University of New South Wales; 2010. [cited 2021 Jan 26] Available from: http://unsworks.unsw.edu.au/fapi/datastream/unsworks:8457/SOURCE02?view=true

8 Sherwood J, Anthony T. Ethical Conduct in Indigenous Research: It's Just Good Manners. In: George L, Tauri J, Te Ata o Tu MacDonald L, editors. Indigenous Research Ethics: Claiming Research Sovereignty Beyond Deficit and the Colonial Legacy; 2020.

9 Rigney LI. A first perspective of Indigenous Australian participation in science: framing Indigenous research towards Indigenous Australian intellectual sovereignty. Aboriginal Research Institute, University of South Australia. Adelaide. 2001. [cited 2021 Jan 26]. Available from: https://cpb-ap-se2.wpmucdn.com/thinkspace.csu.edu.au/dist/c/3891/files/2020/10/LI_Rigney_First_perspective.pdf

10 Fforde C, Bamblett L, Lovett R, Gorringe S, Fogarty B. Discourse, deficit and identity: Aboriginality, the race paradigm and the language of representation in contemporary Australia. *Media Int Aust*. 2013; 149(1): 162–73. Available from: https://doi.org/10.1177/1329878X1314900117

11 Fogarty W, Bulloch H, McDonnell, S, Davis, M. Deficit discourse and Indigenous health: how narrative framings of Aboriginal and Torres Strait Islander people are produced in policy. The Lowitja Institute. Melbourne. 2018. [cited 2021 Jan 26]. Available from: https://www.lowitja.org.au/content/Document/Lowitja-Publishing/deficit-discourse.pdf

12 Bainbridge R, Tsey K, McCalman J, Kinchin, I, Saunders, V, Lui, FW, et al. No one's discussing the elephant in the room: contemplating questions of research impact and benefit in Aboriginal and Torres Strait Islander Australian health research. *BMC Public Health*. 2015; 15(1): 696–706. Available from: https://doi.org/10.1186/s12889–015–2052–3

13 Chandna K, Vine MM, Snelling S, Harris R, Smylie J, Manson, H. Principles, approaches, and methods for evaluation in Indigenous contexts: a grey literature scoping review. *Can J Program Eval*. 2019; 34(1): 21–47. Available from: https://doi.org/10.3138/cjpe.43050

14 Australian Government Productivity Commission. Indigenous evaluation strategy. Australian Government Productivity Commission. Melbourne. 2019. [cited 2021 Jan 26] Available from: https://www.pc.gov.au/inquiries/current/indigenous-evaluation/issues/indigenous-evaluation-issues.pdf

15 Ramsden I. Cultural safety and nursing education in Aotearoa and Te Waipounamu [dissertation]. Wellington: Victoria University of Wellington; 2002. [cited 2021 Jan 26] Available from: https://croakey.org/wp-content/uploads/2017/08/RAMSDEN-I-Cultural-Safety_Full.pdf

16 Cox L. Fear, trust and Aborigines: The historical experience of State institutions and current encounters in the health system. *Health History*. 2007; 9(2): 1–23. [cited 2021 Jan 26] Available from: https://eprints.qut.edu.au/26721/1/Cox_Health_and_History_08_FINAL.pdf

17 Forsyth S. Telling stories: nurses, politics and Aboriginal Australians circa 1900–1980s. *Contemp Nurse*. 2007; 24(1): 33–44. Available from: https://doi.org/10.5172/conu.2007.24.1.33

18 Rigney LI. Internationalization of an Indigenous anticolonial cultural critique of research methodologies: a guide to Indigenist research methodology and its principles. *Wicazo sa review*. 1999; 14(2): 109–21.

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Evaluating the impact of reflective practice groups for nurses in an acute hospital setting

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ABSTRACT

Objective: This study represents phase one of a three-year research project aiming to investigate the impact of reflective practice groups for nurses.

Background: Evidence indicates that increased job demands, and inadequate support contribute to nursing burnout, reduced capacity and workplace attrition. There is some evidence that group interventions may help address such issues.

Study Design/Methods: This study utilised a cross-sectional, quantitative research methodology. Overall, 251 nurses completed questionnaires incorporating 11 validated subscales. Levels of compassion satisfaction, intolerance to uncertainty, inhibitory anxiety, group cohesiveness, psychological distress, and psychosocial safety were evaluated in relation to number of groups attended, for both individual nurses and work groups. The data was then examined alongside existing personal and job resources.

Results: Individual nurses who attended 6–18 reflective practice groups demonstrated increased tolerance to uncertainty and less inhibitory anxiety, whilst those who attended more than 18 groups demonstrated increased compassion satisfaction and group cohesiveness. There was, however, no evidence to indicate more pervasive, work group benefits.

Whilst the second part of the study confirmed that reflective practice group attendance was significantly correlated with increased compassion satisfaction, it was not able to explain changes in levels of burnout, secondary traumatic stress or compassion satisfaction over and above personal factors, job factors and levels of psychological distress.

Conclusion: Professional quality of life involves a complex set of variables. Reflective practice group attendance is correlated with a number of benefits for nurses however cause and effect were not clearly determined. A subsequent study will focus on the more subtle mechanisms and indirect effects of the groups on nurses' personal resources.

Relevance: This research supports the role of person and job factors in explaining professional quality of life for nurses and provides evidence to support a number of positive outcomes for nurses attending reflective practice groups; establishing a foundation for future studies to explore impacts and mediators in greater detail.

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What is already known about the topic?
- Personal and job resources can buffer against job demands to improve Professional Quality of Life (ProQoL).
- Nurses who lack personal resources are more likely to report burnout.

What this paper adds:
- Personal resources of autonomy, self-efficacy and optimism are particularly important for nursing ProQoL.
- Higher levels of RPG attendance are correlated with improved tolerance to uncertainty, reduced inhibitory anxiety, increased compassion satisfaction and improved group cohesion.
- An explanatory link between RPG and variations in ProQoL is still not clear as RPG attendance in itself was not found to account for changes in ProQoL over personal resources, job resources and job demands.
- The study identifies a direction for further research into the role RPG may play in the development of personal resources for nurses.

Keywords: Nursing, group supervision, reflective practice, compassion satisfaction, stress, burnout

INTRODUCTION

Working as a nurse can be both rewarding and demanding. Cumulative stress, moral dilemmas, emotional labour,[1] compassion fatigue,[2] high task demands,[3] and decreased job satisfaction can lead to burnout and cause nurses to leave the profession.[4,5] With a global shortage of nurses predicted, addressing such adverse workplace factors provides an increasing focus for research.[6]

The Job Demands-Resources framework (JDR) proposes that a positive working environment is established by increasing beneficial resources and decreasing unfavourable workplace demands.[7] Excessively high job demands can adversely affect nurses' physical and emotional health and potentially patient care.[3, 8, 9] while job resources relate to "physical, psychological, social, or organisational aspects of the job that are functional in achieving work goals; reduce job demands and the associated physiological and psychological costs; and stimulate personal growth, learning and development." [7 (p. 312)] The JDR model proposes that any increase in beneficial supports within the work environment can help mitigate associated adverse impacts.[7] The 2019 joint position statement by Australia's peak nursing bodies advocates that all nurses and midwives receive regular supervision as one such beneficial support.[10]

This study represents part of a three-year, multi-method evaluation of Reflective Practice Groups (RPG) as a form of group clinical supervision (GCS) for nurses. RPG focus on the interpersonal aspects of nursing care with the aim of providing support with and encouraging participants to explore this element of their clinical work, thereby contributing to positive patient outcomes.[11]

To date, evidence regarding the positive impacts of RPG has largely been qualitative in nature.[11,12] While beneficial, qualitative evidence does not always provide incentive for decision-makers and quantitative measures of these benefits are also required. Professional Quality of Life (ProQoL) represents one such construct that attempts to quantify both the positive (i.e., compassion satisfaction [CS]) and negative (i.e., burnout; secondary traumatic stress [STS]) factors associated with the caring professions. While these negative factors have been identified as issues of concern for nurses worldwide,[13,14] research has also linked the construct of ProQoL to a host of positive personal and organisational outcomes.[15,16.]

BACKGROUND

JOBS DEMANDS-RESOURCES MODEL/PROQOL

According to the JDR model,[17] there are a number of factors that impact a person's ProQoL in any working situation; job demands, job resources, personal resources, and organisational outcomes. Job demands have been defined as aspects of work that involve emotional or physical effort over a sustained period.[7] Such demands can result in STS and burnout leading to unfavourable work outcomes (e.g., reduced job performance; reduced organisational commitment). Resources can mitigate job demands by assisting attainment of work goals, personal growth, and professional development.[18] In a hospital environment, job resources can include supportive co-workers and opportunities for autonomy. Meanwhile, personal resources may include things such as self-efficacy, optimism, or experience. According to the JDR model, personal and job resources can buffer against job demands to improve ProQoL. Whilst compassion fatigue (CF) combines the negative elements of burnout and secondary traumatic stress (STS)[19], compassion satisfaction (CS) is associated with higher job satisfaction and the feeling of having a positive impact.[19]

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Employers of nurses should have ample incentive to improve ProQoL as unfavourable ProQoL outcomes can be correlated with reduced organisational commitment and increased turnover.[20] Jones estimated that hospitals incur an overall cost ranging between 62,100 and 67,100 USD for every registered nurse that leaves (e.g., training costs; loss of experience).[21.]

Of the resources identified by the JDR, social support has been considered one of the most effective in increasing work engagement and enhancing job satisfaction.[22,23] Social support from colleagues can also enhance staff wellbeing and CS,[24] whilst mitigating burnout and STS.[12, 23, 25] Circenis, Millere, and Deklava, and Stamm note the impact of effective CS on quality of care, possibly because nurses who are supported by their colleagues feel more confident and able to think more critically about their work. [26–28]

Although nurses may benefit from interventions that improve ProQoL, many feel they do not have the time or capacity to participate. For this reason, organisational initiatives and logistical support are important.

REFLECTIVE PRACTICE GROUPS

Reflective practice groups are a form of facilitated group supervision where clinical practice issues are discussed, unpacked, and reconceptualised in a supportive space, with a particular focus on interpersonal aspects of practice.[29] The title RPG reflects a primary focus on reflective practice and aims to decrease resistance from nurses to the term supervision; thereby increasing levels of participation. The group format also aims to assist the development of workplace cohesion and collegial support.[11] According to the JDR framework, RPG could be considered a job resource as they aim to provide a buffer against job demands.

The current literature provides evidence of the benefits of RPG and other forms of group clinical supervision. Factors such as social support and cognitive reappraisal,[16, 24] both important aspects of RPG, have been associated with increased CS. McVey and Jones assessed the value of RPG by interviewing 12 nurses who reported that RPG encourage a safe psychosocial climate, group cohesion and the development of professional skills through thoughtful conversation.[30] Nurses also describe that RPG provide a safe place to discuss non-clinical issues that might be considered inappropriate whilst working. Other studies, however, have not found similar interventions to improve CS.[31,32] In fact, Manning, Cronin, Monaghan, and Rawlings-Anderson observed negative responses to RPG, indicating participants felt uncomfortable with the notion of discussing personal topics in a group; leading to anxiety, moral confusion, and psychological discomfort through forced vulnerability.[12] Ironically, nurses who might choose not to attend RPG for these reasons may stand to benefit the most in the longer term.[30] Edward and Hercelinskyj note that reflective practice and clinical supervision enable nurses to address professional and personal issues [33], and a pilot study of RPG utilising a modified version of the Clinical Supervision Evaluation Questionnaire and focus groups, identified themes such as stress management, team building, and fostering trust.[11, 34] In fact, participants placed importance on the strong supportive characteristics of the group; with mutual respect and openness seen to allow formative and normative aspects of supervision to evolve as the group matured.[35]

METHODOLOGY

INTERVENTION

The intervention under investigation consisted of fortnightly or monthly RPG for nurses. These 60-minute sessions were planned to occur during protected time slots, providing greater opportunity for nurses to attend. RPG in this study had been meeting for between two and ten years. The groups took place in confidential spaces adjacent to clinical work areas. All levels of clinical nursing staff could voluntarily attend the groups, however, whilst RPG attendance was encouraged and supported by management, managers did not attend. Group size generally ranged from four to twelve nurses. The groups were run by an external facilitator; characteristically a nurse from another area, assisted by a co-facilitator from within the workgroup who primarily provided logistical support. Facilitators attend a training workshop and complete a six to twelve month 'apprenticeship' in the model.[29]

ETHICS

Ethical approval was granted by The Prince Charles Human Research Ethics Committee: Reference number; REC/18/QPCH/132. Site-specific approval was obtained from the relevant health service.

STUDY AIMS

The current study aimed to quantitatively measure whether attending RPG had a beneficial effect of ProQoL in a sample of nurses (i.e., lower burnout and STS, and higher compassion satisfaction). It also investigated whether RPG were associated with other beneficial outcomes; using a variety of analyses to address the following hypotheses:

1) that nurses who attended a greater number of RPG would have lower burnout (H1) and STS (H2) and higher CS (H3) than their colleagues.
2) that, regardless of level of attendance, nurses who worked in wards with access to RPG might have lower burnout (H4) and STS (H5) and higher CS (H6) than nurses on non-RPG wards (cohort resource effect).
3) that the number of RPG attended would predict decreased burnout (H7) and STS (H8), and increased CS (H9) over and above the effects of existing variables.

To increase the validity of these cross-sectional models, the impact of RPG attendance on ProQoL was analysed in context of potential confounding variables (e.g., age, gender, personal resources, job resources and psychological distress) in an attempt to isolate specific effects that could be attributed to RPG.

DESIGN

The current study was cross-sectional in nature and utilised continuous variables. The first hypothesis used the independent variable of RPG attendance at three levels; low [0–6 groups], medium [7–18], and high [19–31+]). The dependent variables were ProQoL subscales of burnout; STS; CS, along with intolerance to uncertainty and group cohesiveness.

The second hypotheses used the same dependent variables, but the independent variable was altered. For the variable of nurse and ward RPG attendance, participants were combined into three groups using variables of personal RPG attendance (Yes or No) and ward RPG availability (Yes or No) with groupings made as follows: Group 1 (Y/Y), the nurse attended RPG and the ward participated in RPG; Group 2 (N/Y), the nurse did not attend but RPG were available on the ward; or Group 3 (N/N), the nurse did not attend and RPG were not available on the ward. This variable was labelled the cohort resource effect.

The third hypotheses utilised a total of seven control variables (age, self-efficacy, optimism, psychological distress, skill discretion, job autonomy, and job social support) alongside the predictor variable of RPG attendance. The three subscales of ProQoL (i.e., burnout, STS, and CS) were the outcome measures. A priori sample size calculation using G-power for multiple regressions showed a sample of n =109 would be required, and that for ANOVAs (3 groups, medium effect size, fixed effect, omnibus test) a sample of n=159. This indicated the sample (n=251) was sufficient for all aspects of the study.

DATA COLLECTION

RPG facilitators were not present while nurses completed anonymous questionnaires, either during RPG or during in-service sessions, and so the questionnaires were placed in sealed envelopes, ensuring confidentiality. Collected demographic information included gender, age, weekly working hours, years spent nursing, and number of RPG attended at time of measurement, with the questionnaire further including 11 scales measuring concepts prevalent within the literature. After data collection, items were averaged and evaluated using the mean score of the scale.

PARTICIPANTS, SETTING AND RECRUITMENT

A convenience sample of 251 nurses (86% female) was recruited from a range of clinical specialties; including ICU, medical, surgical, midwifery, mental health nursing, paediatrics, oncology and palliative care, at two public tertiary hospitals. One of these hospitals, from which the majority of participants were sourced, had recently been commissioned, meaning that many participants in the study were relatively new to their current context.

Participation in the study was voluntary with participants recruited in person by the researchers either during RPG, if they attended, or during other education times if they did not. Verbal information on the study was provided at the time, and brief written instructions were also included with the survey. Participants were made aware of the non-identifiable nature of their answers and advised that data would be ethically stored onsite at USC. Paper copies of the survey were administered along with participant information and consent form (PICF), withdrawal of consent form, and sealed envelope for completed survey.

Participants ranged in age between 20 and 69 years, with a mean age of 41.59, had worked an average of 33.33 (SD=7.49) hours per week and an average of 14.38 (SD=11.51) years nursing experience. Most reported attending 1–6 RPG (n=108) while relatively fewer attended 7–12 (46), 13–18 (20), 19–24 (8), 25–30 (6), 31+ (20), and 35 had attended no RPG's. Eight did not answer this question and were not included in data analyses. Participants were also excluded from the current sample if they did not consent to their data being used. No incentive was provided for participation. All participants completed the questionnaire apart from a small number (i.e., < 5 nurses) who were called away on urgent clinical business.

MEASURES

Internal consistency reliability for all included measures was considered to be within the acceptable range (see Table 1). As such, the researchers were confident that the scales represented stable underlying constructs.

Self-Efficacy was measured using the 10-item Generalised Self-Efficacy Scale. Items were scored using a four-point Likert scale with anchor points of (1) *not at all true* through to (4) *exactly true*. Items were totalled to obtain an overall score ranging between 10 and 40 with higher scores equalling higher self-efficacy.

Optimism was measured using the revised Life Orientation Test-Revised (LOTR). Items were scored using a five-point Likert scale with anchor points of (1) *strongly disagree* to (5) *strongly agree*. The measure consisted of six items, three of which were reverse scored (i.e., 2; 4; 5). Item one was removed resulting in an improvement in internal consistency reliability.

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Job Social Support was measured using the Job Social Support Scale. Items were scored on a five-point Likert scale with anchor points of (1) *strongly disagree* to (5) *strongly* agree that were totalled to score between four and 20.

Job Autonomy was measured using the Job Autonomy Scale; consisting of four items that were scored using a five-point Likert scale with anchor points of (1) *never* to (5) *always*. Total of all items formed a score of between four and 20.

Skill Discretion was measured using the Skill Discretion Scale. The measure consisted of six items scored using a five-point Likert scale with anchor points of (1) *strongly disagree* and (5) *strongly agree*. Item 4 was removed to improve internal consistency reliability.

Psychological Distress was measured using the 6-item Kessler Screening Scale for Psychological Distress (K6). Items were scored using a five-point Likert-scale with anchor points of (1) *none of the time* and (5) *all of the time. These were* totalled to create a score ranging from five to 30; with higher scores reflecting higher levels of psychological distress.

Professional Quality of Life was measured using the Professional Quality of Life, Version 5 (ProQoL-5),[19] a 30-item measure included three 10-item subscales, namely CS, Burnout, and STS. Items were scored using a five-point Likert scale using anchor points of (1) *never* and (5) *very often*. Items were totalled and converted to *t*-scores with a mean of 50 and a standard deviation of 10. Items 2 and 15 were removed from the overall scale resulting in improvements in the internal consistency and reliability of the STS and burnout subscales.

Intolerance to Uncertainty Scale-12 (IUS-12) was used to measure critical thinking and resilience. This is a shortened version of the 27-item IUS which maintains a high correlation to the original ($r = .96$).[36] Items are rated on a 5-point Likert scale. The 7-item Prospective Anxiety (IUS-PA) subscale and the 5-item Inhibitory Anxiety (IUS-IA) subscale were also measured separately.

Group Cohesiveness Scale (GCS) is a 7-item scale evaluating the two subscales of cohesiveness (2 items) and engagement (5 items) using a 5-point Likert scale with anchor points at (1) *strongly disagree* and (5) *strongly agree;* higher scores indicating a prevalence of stronger group cohesion.

Psychosocial Safety Climate (PSC-12) measures levels of psychological health, safety, and social support; using a 5-point Likert scale with scores ranging from (1) *strongly disagree* to (5) *strongly agree* and higher score indicating greater feelings of psychosocial well-being.

DATA ANALYSIS

Data was evaluated using the Statistical Package for Social Sciences (SPSS) v24™.

The first two hypotheses were tested using univariate ANOVAs to assess significant results between individual RPG attendance groups and ward RPG attendance groups. Outcome scores were averaged and transformed into mean scores for each scale/subscale, creating a standardised measure to allow comparison between this study and other studies.

The final hypothesis was addressed by performing three hierarchical regression models, each using four blocks. The first block encompassed personal factors (i.e., age, optimism, and self-efficacy). The second block consisted of job-related factors (i.e. autonomy, social support, and skill discretion). The third block consisted of psychological distress. The order of these first three blocks reflected the way that variables were seen to relate to each other (e.g. a level of job autonomy cannot change a person's age). The fourth block represented RPG attendance and was considered after the other three

TABLE 1: MEANS, STANDARD DEVIATIONS, AND CORRELATIONS BETWEEN INCLUDED VARIABLES

	M	*SD*	1	2	3	4	5	6	7	8	9	10	11
1	41.59	11.43	(-)										
2	22.37	3.73	.14*	(.84)									
3	31.09	3.63	.10	.46***	(.87)								
4	13.18	2.71	.03	.20**	.12	(.83)							
5	16.13	2.62	-.06	.20**	.11	.41***	(.83)						
6	20.66	2.58	-.03	.23***	.16*	.27***	.38***	(.77)					
7	10.71	3.83	-.23***	-.51***	-.38***	-.23*	-.16**	-.07	(.86)				
8	1.82	1.66	.16*	.12*	.16*	-.12*	.01	.15*	-.07	(-)			
9	50.00	10.00	-.15*	-.41***	-.28***	-.33***	-.25***	-.21**	.56***	-.11	(.75)		
10	50.00	10.00	-.05	-.33***	-.29***	-.11	-.13*	-.02	.61***	-.01	.59***	(.83)	
11	50.00	10.00	.08	.23**	.19**	.35***	.24***	.38***	-.27***	.16*	-.61***	-.15*	(.82)

Note. (1) Age; (2) Optimism; (3) General Self-Efficacy; (4) Job Autonomy; (5) Job Social Support; (6) Skill Discretion; (7) Psychological Distress; (8) Number of RPGs attended; (9) Burnout; (10) Secondary traumatic stress; (11) Compassion Satisfaction. Cronbach's Alpha for each variable is reported on the diagonal in brackets. Variables which were not validated measures were indicated using a dash.

* p < .05; ** p < .01; *** p < .001.

in an attempt to identify any direct variance in ProQoL from attending RPG as measured against three dependent variables: burnout, STS and CS.

RESULTS

HYPOTHESIS ONE: INDIVIDUAL RPG ATTENDANCE

A series of univariate ANOVAs were performed to locate significant differences between three groupings of individual RPG attendance. Levene's test of homogeneity reported no significance, indicating a homogenous sample with similar group variation. The assumption of independence was satisfied through the segregation of the independent variable of RPG participation and there being no coercion for participation.[37,38] Due to the large sample size, any deviations from normality were considered acceptable and no data transformations were conducted.

Compassion Satisfaction. A pair-wise comparison using the Bonferroni adjustment showed that nurses who attended the most RPG (Group 3) had significantly higher CS than those who attended limited RPG (Group 1), t (155) = 2.94, p = .011. The remaining pair-wise comparisons were not significant.

Group Cohesiveness

A pair-wise comparison using the Bonferroni adjustment showed that nurses who attended the most RPG (Group 3) reported significantly higher group cohesiveness compared to those who attended limited RPG (Group 1), t (182) = 2.63, p = .027, and those who attended a moderate amount of RPG (Group 2), t(88) = 2.62, p = .028. The remaining pair-wise comparison was not significant.

Intolerance to Uncertainty

A pair-wise comparison using the Bonferroni adjustment showed that the nurses who attended a moderate number of RPG (Group 2) had significantly lower intolerance to uncertainty than those who attended limited RPG (Group 1), t (182) = 2.69, p = .025. The remaining pair-wise comparisons were not significant.

Inhibitory Anxiety

A pair-wise comparison using the Bonferroni adjustment showed that the nurses who attended a moderate number of RPG (Group 2) had significantly lower inhibitory anxiety than those who attended limited RPG (Group 1), t (182) = 3.06, p = .007. The remaining pair-wise comparisons were not significant.

HYPOTHESIS TWO: THE COHORT RESOURCE EFFECT

A series of univariate ANOVAs were completed to assess ifany significant differences between ward RPG attendance groups occurred. Assumption testing found that Levene's test of homogeneity was non-significant for all ANOVAS. A significant result would indicate that wards had different population variances and may not be directly comparable, however non-significance indicated similar group variation and further comparisons were able to be pursued. The assumption of independence was satisfied through the segregation of the independent variable of RPG participation by ward and the promotion of no coercion between groups.[36] This was achieved by researchers distributing and describing the questionnaire separately to each ward and promoting anonymity of responses.

TABLE 2: MEANS, STANDARD DEVIATIONS, AND ANOVA RESULTS FOR THE OUTCOMES OF INDIVIDUAL NURSE'S PARTICIPATION IN RPGS

Outcomes	Group 1: 0–6 RPG sessions attended (n = 124)		Group 2: 7–18 RPG sessions attended (n = 60)		Group 3: 19–31+ RPG sessions attended (n = 31)		F(2,211)	η^2	Observed Power
	M	SD	M	SD	M	SD			
Compassion Satisfaction	3.93	0.45	4.04	0.41	4.17	0.35	4.62*	.042	.776
Burnout	2.39	0.49	2.34	0.55	2.19	0.47	2.33†	.022	.469
Secondary Traumatic Stress	2.09	0.55	1.98	0.65	1.97	0.64	1.22	.011	.265
Intolerance to Uncertainty – Global Scale	2.36	0.67	2.06	0.67	2.21	0.69	3.76*	.035	.682
Intolerance to Uncertainty – Prospective Anxiety Subscale	2.59	0.70	2.34	0.73	2.55	0.74	2.17	.020	.441
Intolerance to Uncertainty – Inhibitory Anxiety Subscale	2.04	0.76	1.66	0.73	1.73	0.72	5.75**	.052	.863
Group Cohesiveness Scale	3.88	0.52	3.83	0.52	4.16	0.54	3.99*	.037	.710
Psychological Distress - K6	1.85	0.65	1.66	0.57	1.64	0.71	2.51†	.023	.499
Psychosocial Safety Climate	3.01	0.74	3.03	0.79	2.90	0.90	0.46	.004	.124

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

The test of normality was observed to be violated using a variety of measures through the Kolmogorov-Smirnov and Shapiro-Wilk tests. Procedures to transform the data to a normal distribution were used, although the results showed the same patterns so analysis used the untransformed data.

The means, SDs and F values for ward participation are shown in Table 3. No significant findings were located between any of the three groups, due to low power in the analyses and the small effect sizes, as shown by the partial eta squares. This suggests there were no generalised workplace benefits for wards with RPG's.

HYPOTHESIS THREE: RELATIONSHIP BETWEEN RPG ATTENDANCE AND OTHER VARIABLES

Regression model for Burnout

Block 1 (personal factors such as age, optimism, and self-efficacy) added significantly to the explanatory model for burnout, $F(3,225) = 17.53$, $p < .001$, $R^2 = .204$. Block 2 (job-related factors such as autonomy, social support and skill discretion) added further significant variance, $\Delta R^2 = .065$, $F(3,222) = 6.49$, $p < .001$. Block 3 (psychological distress) also added significant variance, $\Delta R^2 = .134$, $F(1,221) = 48.50$, $p < .001$. However, Block 4 (RPG attendance) did not add significantly, $F(1, 220) = 0.18$, $p = .676$. Self-efficacy and optimism explained reduced burnout in the first step. Job autonomy explained burnout in the second, third, and fourth steps. Psychological distress mediated the effect of optimism on burnout in the third step. In the final model, burnout was explained by psychological distress and job autonomy.

Regression model for Secondary Traumatic Stress

Block 1 added significantly to the model for STS, $R^2 = .154$, $F(3,225) = 12.89$, $p < .001$. Whilst Block 2 did not add further to the model, $F(3,222) = 1.26$, $p = .288$, Block 3 added significantly to the model, $R^2 = .236$, $F(1,221) = 86.52$, $p < .001$. Block 4 did not add significantly to the model to explain STS, $F(1,220) = 0.18$, $p = .669$. Self-efficacy and optimism explained a reduction in STS in the first two steps of the model. Psychological distress significantly explained increased STS in the third step of the model and mediated the effects of self-efficacy and optimism. In the final model, psychological distress alone explained STS.

Regression model for Compassion Satisfaction

Block 1 added significantly to the model for CS, $R^2 = .067$, $F(3,225) = 5.40$, $p = .001$. Block 2 added further significant variance, $\Delta R^2 = .173$, $F(3, 222) = 16.82$, $p < .001$. Block 3 also added significant variance to explain CS, $\Delta R^2 = .020$, $F(1,221) = 5.86$, $p = .016$. Despite a significant correlation, Block 4 (RPG attendance) did not add significant variance to CS, $F(1,220) = 1.15$, $p = .286$. Optimism explained CS in the first block before being fully mediated in the second step. Autonomy and skill discretion significantly explained increased CS in the second step. Psychological distress explained decreased CS in the third step of the model. In the final model, job autonomy, skill discretion, and psychological distress explained changes in CS.

TABLE 3: MEANS, STANDARD DEVIATIONS AND ANOVA RESULTS FOR OUTCOMES OF WARD ATTENDANCE AT RPG

Outcomes	Group 1: Ward Provides RPG/ Individual Attends (n = 170)		Group 2: Ward Provides RPG/ Individual Does Not Attend (n = 14)		Group 3: Ward does not provide RPG/ Individual Does Not Attend (n = 34)		F (2,211)	η^2	Observed Power
	M	SD	M	SD	M	SD			
Compassion Satisfaction	4.01	0.03	3.98	0.12	3.95	0.08	0.434	0.004	.120
Burnout	2.34	0.04	2.36	0.14	2.34	0.09	0.015	0.000	.052
Secondary Traumatic Stress	2.08	0.05	1.95	0.16	1.93	0.10	1.002	0.009	.223
Intolerance to Uncertainty – Global Scale	2.29	0.05	2.20	0.18	2.14	0.12	0.663	0.006	.161
Intolerance to Uncertainty - Prospective Anxiety Subscale	2.56	0.06	2.36	0.19	2.41	0.12	1.080	0.010	.238
Intolerance to Uncertainty - Inhibitory Anxiety Subscale	1.92	0.06	1.99	0.20	1.77	0.13	0.457	0.004	.124
Group Cohesiveness Scale	3.94	0.04	3.63	0.14	3.87	0.09	2.429†	0.022	.486
Psychological Distress - K6	1.76	0.49	1.79	0.17	1.73	0.11	0.075	0.001	.061
Psychosocial Safety Climate	3.02	0.06	3.01	0.21	2.94	0.14	0.223	0.002	.085

Note. † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

DISCUSSION

HYPOTHESIS ONE: INDIVIDUAL RPG ATTENDANCE

Nurses who attended between 7–18 RPG sessions reported significantly lower intolerance to uncertainty and less performance hindering anxiety than those who attended 0–6 RPG. These findings align with what we know about the concept of resilience, defined as one's ability to positively adapt to adversity.[39] A study of 482 Australian mental health nurses found that clinical supervision improved resilience levels within nurses and other research has previously linked resilience to interventions similar to RPG.[33, 40] Previous findings have also shown that reflective practice stimulates critical thinking.[41] If attending a moderate number of RPG is associated with a reduction in behaviour restraining anxiety and increased ability to respond to unexplainable scenarios, this could indicate that similar benefits may be gained from attending regular RPG that encourage critical reflection in a social support setting.

Nurses who attended 19 or more RPG sessions reported significantly higher compassion satisfaction than those attending 0–6 RPG, indicating greater satisfaction in performing professional duties. This finding might highlight a benefit from attending RPG over time. One hundred and forty neonatal nurses in Barr's study had similar levels of CS to nurses with little or no RPG attendance in the current study.[24] In addition, long term RPG attendees in this study had higher CS than 500 Latvian nurses and 463 nurses in Stamm's original study, also potentially highlighting the benefit of longer-term RPG attendance. [26, 27]

Nurses who attended 19 or more RPG sessions also reported significantly higher group cohesion within their ward than those who attended 0–6 and 7–18 RPG. These results align with the literature, indicating that the opportunity for nurses to discuss experiences within a supportive group setting promotes an improved perception of workplace efficiency and teamwork.[11,29,42,43] Although RPG attendance appears to have improved group cohesion within the current context, other studies report stronger overall group cohesion from interventions.[30] This might be explained by differences in group makeup, task and goals influencing participant perceptions of cohesiveness.[8]

HYPOTHESIS TWO: COHORT RESOURCE EFFECT

The second hypothesis pertained to the inter-relatedness of personal attendance and ward availability of RPG and revolved around the premise that there might be a more pervasive effect from running RPG in work areas; even for nurses who did not attend. The resulting data analysis returned no significant variance between attendance groups, supported by the low power, F-ratios and the small effect sizes as seen in Table 2.[44] Therefore, the results from the current study do not indicate that RPG had a more pervasive impact on the workplace.

Despite the findings in this study, it is still possible that RPG may have ward-wide benefits, as suggested by previous research relating to social support and psychosocial climate.[23] One possible reason for non-significant results is the inconsistency of group sizes, especially the small cohort ($n = 14$) in Group 2. Although results may be considered if a sample size is equal or greater than 12, the central limit theorem states a sample is considered robust only if the group is 30 participants or above.[37,38] The unequal variance created by such different group sizes may have influenced the significance of these findings.

HYPOTHESIS THREE: RELATIONSHIP BETWEEN RPG ATTENDANCE AND OTHER VARIABLES

Regression model for burnout

Nurses who lacked the personal resources of optimism and self-efficacy were more likely to report burnout, which supports the existing literature.[45,46] Additionally, consistent with the findings of Jang et al., nurses who had jobs that allowed for autonomy were less likely to report burnout. [47] This seems logical as nurses who can alter their working conditions in response to overwhelming stressors may be less likely to burn out. This finding also implies that employers of nurses might reduce burnout by providing more autonomy.

The addition of psychological distress fully mediated the effects of self-efficacy, and optimism. It also partially mediated the effect of job autonomy. This suggests that nurses who experience psychological distress are at increased likelihood of burnout regardless of how they feel about their abilities or their level of optimism. This provides an incentive for organisations to manage the psychological distress of their employees, as the contribution of psychological distress to burnout is consistent with the current literature.[48]

The number of RPG that nurses attended did not appear to indicate further variation to burnout above personal resources, job resources, and psychological distress. It could be argued that this finding is in contrast to previous studies that report reductions in burnout due to clinical supervision or stress management interventions, [31, 49] however the clinical supervision was delivered individually, and the stress management intervention involved provision of general information rather than specific clinical issues. As such, differences between interventions and samples may partially account for the differing results. Koivu evaluated clinical supervision groups for nurses over a four-year period and found improvements in wellbeing related to increased self-efficacy for a majority of nurses but that this did not mitigate the risk of burnout for otherwise vulnerable nurses.[22]

Consistent with the JDR model,[7, 18] the personal resources of self-efficacy and optimism appeared to act as a buffer against the impact of job demands to reduce burnout. The job resource of autonomy also explained reduced burnout. The introduction of a further job resource, RPG, was not found

to directly provide additional buffering above the existing effects of personal and job resources.

Regression model for STS

Nurses who reported low self-efficacy and optimism were considered at increased risk of developing STS. This suggests that nurses who reported little belief in their abilities or pessimistic views are more likely to be adversely affected by the traumatic stress of their patients. As per the JDR model, optimism and self-efficacy can be considered personal resources that buffer against work demands to reduce the likelihood of developing STS symptoms. This effect remained after accounting for job factors indicating that personal resources may be more important than the job in explaining STS, the variance accounted for by psychological distress fully mediated the effects of both self-efficacy and optimism. In other words, nurses who develop psychological distress were also identified as more likely to develop STS regardless of their level of self-efficacy and optimism. Organisations intending to avoid STS in nursing staff should, therefore, prioritise the management of psychological distress.

The addition of RPG attendance resulted in no further variation in STS after accounting for person factors, job factors, and psychological distress. This is consistent with the findings of Grundlingh et al., who found no difference in STS between violence researchers randomised to group debriefs or a control group,[50] but contradictory to the findings of Morrison and Joy,[14] where nurses qualitatively reported that debriefs were helpful in managing STS. Such variations may illustrate differences between qualitative and quantitative methodology and sample size, as much as between nurses and violence researchers.

Regression model for CS

Nurses who scored high on optimism demonstrated increased CS. This makes intuitive sense as interpreting work events as positive would likely allow nurses to gain more satisfaction from their roles. The effect of optimism was, however, fully mediated by the effects of job autonomy and skill discretion. This suggests that nurses who have freedom of choice in their work and can utilise their skills to solve challenging problems tend to gain more satisfaction from helping others even if they are not optimistic. This is an important point as it implies that an organisation can foster CS in all nurses by altering the nature of their role. Nurses who experienced psychological distress were more likely to have low CS.

Whilst there was a significant correlation between the number of RPG that nurses attended and higher CS, it was not possible to explain this over and above person factors, job factors, and psychological distress. In other words, optimistic nurses who have a good job that allows for autonomy and skill discretion, and who report low psychological distress were not noted to obtain further increases in CS from attending RPG. This finding is consistent with the studies of Wallbank and Hatton and Wood et al., [31,32] who found no change in CS following a stress management intervention and clinical supervision, respectively, but appears to conflict with Barr and Măirean who found that social support and cognitive reappraisal were positively associated with CS.[16,24] Whilst RPG attendance seems to be related to increased CS in some way, this needs to be considered in relation to person factors, job factors, and psychological distress.

Although RPG attendance did not explain increased CS, decreased burnout or STS after accounting for variances in person factors, job factors, and psychological distress; the indirect influence of RPG attendance on these factors now needs to be considered.

LIMITATIONS

One consideration with this study is that the majority of data originated from a newly commissioned hospital that had only recently been built. Staff were still undergoing transition into the new hospital during the research period and this may be considered a confounding variable. More than half the nurses in the study had attended less than six RPG sessions, with less than one-fifth attending more than 18 groups, potentially making it more difficult to ascertain the true impact of RPG on personal resources over time, as was done in Koivu's study.[22]

Another methodological limitation associated with cross-sectional survey design is self-report bias. The researchers attempted to combat this by clearly explaining to participants that responses would not be seen by members of their organisation at any point and by using hierarchical regression. Despite these measures, a longitudinal design should provide more robust findings and it is recommended that further evaluations be performed when more of the cohort has had the opportunity to attend a greater number of RPG.

CONCLUSION

This study provides some evidence supporting the benefits of social support and reflective group supervision interventions. Findings indicate the presence of a 'dose effect'; as nurses who attend more RPG's were more likely to have greater positive resource factors. Moderate levels of RPG attendance (6–18 groups) were correlated with decreased intolerance to uncertainty and inhibitory anxiety while longer-term attendance (19+ groups) was linked to increased compassion satisfaction and group cohesion.

Despite previous research suggesting the possibility of broader workplace benefits from the introduction of social support resources, analysis of data regarding the 'cohort resource' effect in this study has found it non-significant.

This study supports the predictions of the JDR theory that personal and job resources explain improvements in ProQoL,[9] by indicating that individual resources, job resources and demands are significant variables influencing ProQoL for nurses. Whilst findings from the regression analysis support the correlation between RPG and CS, they were not able to explain increased CS above personal and job resources. Similarly, the study was unable to identify an explanatory link between RPG attendance and variations in either burnout or STS.

Overall, the findings of this study provide further evidence linking RPG with positive outcomes for individual nurses; however, the mechanisms involved are still not clear. The study provides a foundation from which future research can explore the correlation between RPG attendance and personal/job resources exploring the more subtle, indirect effects that RPG might have on the development of these resources over time.

Authorship statement: All listed authors were involved in:

- Contributing to the conception & design of this work
- Drafting & revising the work critically
- All parties have given final approval of the version to be published.
- All parties agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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REFERENCES

1 Golfenshtein N, Drach-Zahavy A. An attribution theory perspective on emotional labour in nurse-patient encounters: a nested cross-sectional study in paediatric settings. *J Adv Nurs.* 2015; 71(5): 1123–34. Available from: https://doi.org/10.1111/jan.12612

2 Hemsworth D, Baregheh A, Aoun S, Kazanjian A. A critical enquiry into the psychometric properties of the professional quality of life scale (ProQol-5) instrument. *Appl Nurs Res.* 2018; 39: 81–88. Available from: https://doi.org/10.1016/j.apnr.2017.09.006

3 Mealer M, Moss M. Moral distress in ICU nurses. *Intensive Care Med.* 2016, 42(10): 1615–17. Available from: https://doi.org/10.1007/s00134–016–4441–1

4 Zou G, Shen X, Tian X, Liu C, Li G, Kong L, et al. Correlates of psychological distress, burnout, and resilience among Chinese female nurses. *Ind Health.* 2016; 54(5): 389–95. Available from: https://doi.org/10.2486/indhealth.2015–0103

5 Sawatzky JA, Enns CL. Exploring the key predictors of retention in emergency nurses. *J Nurs Manag.* 2012; 20(5): 696–707. Available from: https://doi.org/10.1111/j.1365–2834.2012.01355.x

6 Moloney W, Boxall P, Parsons M, Cheung G. Factors predicting Registered Nurses' intentions to leave their organization and profession: a job demands-resources framework. *J Adv Nurs.* 2018; 74(4): 864–75. Available from: https://doi.org/10.1111/jan.13497

7 Bakker AB, Demerouti E. The Jobs Demands-Resources model: state of the art. *J Manag Psychol.* 2007; 22(3): 309–328. Available from: https://doi.org/10.1108/02683940710733115

8 Vignoli M, Muschalla B, Mariani MG. Workplace phobic anxiety as a mental health phenomenon in the job demands-resources model. *Biomed Res Int.* 2017; 1: 1–10. Available from: https://doi.org/10.1155/2017/3285092

9 Gountas S, Gountas J. How the 'warped' relationships between nurses' emotions, attitudes, social support and perceived organizational conditions impact customer orientation. *J Adv Nurs.* 2016; 72(2): 283–93. Available from: https://doi.org/10.1111/jan.12833

10 Australian College of Nurses, Australian College of Mental Health Nurses, Australian College of Midwives. Clinical Supervision for Nurses and Midwives - Joint position Statement. 2019. [cited 2021 Jan 18] Available from: https://www.midwives.org.au/resources/clinical-supervision-nurses-and-midwives-joint-position-statement-2019

11 Dawber C. Reflective practice groups for nurses: a consultation liaison psychiatry nursing initiative: part 2 – the evaluation. *Int J Ment Health Nurs.* 2013; 22: 241–8. Available from: https://doi.org/10.1111/j.1447–0349.2012.00841.x

12 Manning A, Cronin P, Monaghan A, Rawlings-Anderson K. Supporting students in practice: an exploration of reflective groups as a means of support. *Nurs Educ Prac.* 2009; 9(3): 176–83. Available from: https://doi.org/10.1016/j.nepr.2008.07.001

13 Fu C, Yang M, Leung W, Liu Y, Huang H, Wang R. Associations of professional quality of life and social support with health in clinical nurses. *J Nurs Manag.* 2017; 26: 172–79. Available from: https://doi.org/10.1111/jonm.12530

14 Morrison LE, Joy JP. Secondary traumatic stress in the emergency department. *J Adv Nurs.* 2016; 72(11): 2894–906. Available from: https://doi.org/10.1111/jan.13030

15 Günüşen NP, Wilson M, Aksoy B. Secondary traumatic stress and burnout among Muslim nurses caring for chronically ill children in a Turkish hospital. *J Transcult Nurs.* 2018; 29(2): 146–54. Available from: https://doi.org/10.1177%2F1043659616689290

16 Măirean C. Emotion regulation strategies, secondary traumatic stress, and compassion satisfaction in healthcare providers. *J Psych.* 2016; 150(8): 961–75. Available from: https://doi.org/10.1080/00223980.2016.1225659

17 Demerouti E, Bakker AB, Nachreiner F, Schaufeli WB. The Jobs Demands-Resources model of burnout. *J Appl Psych.* 2001; 86: 499–512.

18 Schaufeli WB. Applying the Jobs Demands-Resources model: a 'how to' guide to measuring and tackling work engagement and burnout. *Org Dyn.* 2017; 46: 120–32. Available from: https://doi.org/10.1016/j.orgdyn.2017.04.008

19 Stamm BH. The Concise ProQoL Manual (2nd Ed). Idaho, USA: ProQoL.org. 2010. [cited 2021 Jan 18] Available from: https://proqol.org/uploads/ProQOLManual.pdf

20 Vagharseyyedin SA, Zarei B, Hosseini M. The role of workplace social capital, compassion satisfaction and secondary traumatic stress in affective organisational commitment of a sample of Iranian nurses. *J Res Nurs.* 2018; 23(5): 446–56. Available from: https://doi.org/10.1177/1744987118762974

21 Jones CB. The cost of nurse turnover, part 2: Application of the nursing turnover cost methodology. *J Nurs Admin.* 2005; 35(1): 41–9. Available from: https://doi.org/10.1097/00005110–200501000–00014

22 Koivu A. Clinical supervision and well-being at work, a four-year follow-up study on female hospital nurses. University of Eastern Finland, Faculty of Health Sciences. 2013. Publications of the University of Eastern Finland. Dissertations in Health Sciences 175.

23 Sun N, Lv DM, Man J, Wang XY, Cheng Q, Fang HL, et al. The correlation between quality of life and social support in female nurses. *J CLIN NURS.* 2017; 26(7–8): 1005–10. Available from: https://doi.org/10.1111/jocn.13393

24 Barr P. Compassion fatigue and compassion satisfaction in neonatal intensive care unit nurses: relationships with work stress and perceived social support. *Traumatology.* 2017; 23(2): 214–22. Available from: https://doi.org/10.1037/trm0000115

25 Van der Heijden BIJM, MulderRH, König C, Anselmann V. Toward a mediation model for nurses' well-being and psychological distress effects of quality of leadership and social support at work. *Medicine.* 2017; 96(15): e6505. Available from: https://doi.org/10.1097/MD.0000000000006505

26 Circenis K, Millere I, Deklava L. Measuring the Professional Quality of Life among Latvian nurses. *Procedia Soc Behav Sci.* 2013; 84: 1625–9. Available from: https://doi.org/10.1016/j.sbspro.2013.07.003

27 Stamm BH. The ProQOL Manual: The Professional Quality of Life Scale: Compassion satisfaction, burnout & compassion fatigue/secondary trauma scales. Baltimore, MD: Sidran Press; 2005.

28 Carleton N, Norton A, Asmundson GJ. Fearing the unknown: a short version of the Intolerance of Uncertainty Scale. *J Anxiety Disord.* 2007, 21(1): 105–17. Available from: https://doi.org/10.1016/j.janxdis.2006.03.014

29 Dawber C. Reflective practice groups for nurses: a consultation liaison psychiatry nursing initiative: part 1 – the model. *Int J Ment Health Nurs.* 2013; 22: 135–44. Available from: https://doi.org/10.1111/j.1447–0349.2012.00839.x

30 McVey J, Jones T. Assessing the value of facilitated reflective practice groups. *Cancer Nursing Practice.* 2012; 11(8): 32–7. Available from: https://doi.org/10.7748/cnp2012.10.11.8.32.c9357

31 Wallbank S, Hatton S. Reducing burnout and stress: the effectiveness of clinical supervision. *Community Pract.* 2011, 84(7): 31–5.

32 Wood AE, Prins A, Bush NE, Hsia JF, Bourn LE, Earley MD, et al. Reduction of burnout in mental health care providers using the provider resilience mobile application. *Community Ment Health J,* 2017; 53: 452–9. Available from: https://doi.org/10.1007/s10597–016–0076–5

33 Edward KL, Hercelinskyj G. Burnout in the caring nurse: learning resilient behaviours. *Br J Nurs,* 2007; 16(4): 240–2. Available from: https://doi.org/10.12968/bjon.2007.16.4.22987

34 Horton S, Drachler MDL, Fuller A, Leite JCDC. Development and preliminary validation of a measure for assessing staff perspectives on the quality of clinical group supervision. *Int J Lang Commun Disord,* 2008; 43(2): 126–34.

35 Proctor B. Supervision: a co-operative exercise in accountability. In Marken M, Payne M, editors, Enabling and ensuring. Leicester National Youth Bureau and Council for Education and Training in Youth and Community Work, Leicester; 1986. 21–3.

36 McEvoy PM, Mahoney AEJ. To be sure, to be sure: intolerance of uncertainty mediates symptoms of various anxiety disorders and depression. *Behaviour Therapy,* 2012; 43(3): 533–45. Available from: https://doi.org/10.1016/j.beth.2011.02.007

37 Field AP. Discovering statistics using SPSS: IBM SPSS Statistics. 4th ed. London ECY1 1SP: Sage Publications Ltd; 2016.

38 Jolliffe IT. Sample sizes and the central limit theorem: the Poisson distribution as an illustration. *Am Stat.* 1995; 49(3), 269. Available from: https://doi.org/10.1080/00031305.1995.10476161

39 King GA, Rothstein MG. Resilience and leadership: the self-management of failure. Self-management and leadership development Cheltenham, UK: Edward Elgar Publishing Ltd. 2010. Available from: https://doi.org/10.4337/9781849805551.00021

40 Delgado C, Roche M, Fethney J, Foster K. Workplace resilience and emotional labour of Australian mental health nurses: results of a national survey. *Int J Ment Health Nurs.* 2020; 29(1): 56–68. Available from: https://doi.org/10.1111/inm.12598

41 Taylor B, Edwards P, Holroyd B, Unwin A, Rowley J. Assertiveness in nursing practice: an action research and reflection project. *Contemp Nurse.* 2005; 20(2): 234–47. Available from: https://doi.org/10.5172/conu.20.2.234

42 Ko YK. Group cohesion and social support of the nurses in a special unit and a general unit in Korea. *J Nurs Manag.* 2011; 19(5): 601–10. Available from: https://doi.org/10.1111/j.1365–2834.2010.01186.x

43 Goudreau J, Pepin J, Larue C, Dubois S, Descôteaux R, Lavoie P, et al. A competency-based approach to nurses' continuing education for clinical reasoning and leadership through reflective practice in a care situation. *Nurse Educ Pract.* 2015; 15(6): 572–8. Available from: https://doi.org/10.1016/j.nepr.2015.10.013

44 Cohen J. Statistical power analysis for the behavioural sciences 2 ed. Hillsdale, NJ: L. Erlbaum Associates. 1988.

45 Happell B, Koehn S. Seclusion as a necessary intervention: the relationship between burnout, job satisfaction and therapeutic optimism and justification for the use of seclusion. *J Adv Nurs*. 2011; 67(6): 1222–31. Available from: https://doi.org/10.1111/j.1365–2648.2010.05570.x

46 Verhaeghe S, Duprez V, Beeckman D, Leys J, Meijel BV, Hecke AV. Mental health nurses' attitudes and perceived self-efficacy toward inpatient aggression: a cross-sectional study of associations with nurse-related characteristics. *Perspect Psychiatr Care*. 2016; 52: 12–24. Available from: https://doi.org/10.1111/ppc.12097

47 Jang I, Kim Y, Kim K. Professionalism and professional quality of life for oncology nurses. *J Clin Nurs*. 2016; 25: 2835–45. Available from: https://doi.org/10.1111/jocn.13330

48 Nilsen W, Skipstein A, Demerouti E. Adverse trajectories of mental health problems predict subsequent burnout and work-family conflict: a longitudinal study of employed with children followed over 18 years. *BMC Psychiatry*. 2016; 16: 384–94. Available from: https://doi.org/10.1186/s12888–016–1110–4

49 Sui OL, Cooper GL, Phillips DR. Intervention studies on enhancing work well-being, reducing burnout, and improving recovery experiences among Hong Kong health care workers and teachers. *Int J Stress Manag*. 2013; 21(1): 69–84. Available from: https://doi.org/10.1037/a0033291

50 Grundlingh H, Knight L, Naker D, Devries K. Secondary distress in violence researchers: a randomised trial of the effectiveness of group debriefings. *BMC Psychiatry*. 2017; 17: 204–16. Available from: https://doi.org/10.1186/s12888–017–1327-x

RESEARCH ARTICLES

Identifying barriers and facilitators of full service nurse-led early medication abortion provision: qualitative findings from a Delphi study

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ABSTRACT

Objective: To explore factors that can influence implementation of a nurse-led model of care for early medication abortion provision in the primary healthcare setting of regional and rural Victoria, Australia.

Background: Global research indicates that an increased involvement of primary healthcare nurses in the delivery of early medication abortion provision has the potential to improve abortion access. In Victoria, access in regional and rural areas is restricted despite abortion being legal. A nurse-led early medication abortion provision model is feasible and can potentially improve the current situation.

Study design and methods: An online three-round classic Delphi method was used. This paper reports the qualitative findings. Non-probability sampling techniques were used to recruit a panel of professional experts. Data from the three questionnaires were collected and analysed using thematic analysis. Factors influencing model implementation were categorised into the Capability, Opportunity, Motivation-Behaviour framework.

Results: A total of 24 medical and other health professionals participated. They identified a range of factors that can hinder model implementation, including a lack of affordable medication abortion education, no remuneration for nurse-led early medication abortion provision, and concerns related to stigma and support.

Discussion and conclusion: Understanding and addressing barriers to model implementation may enable the development of primary healthcare nurses' role in the delivery of early medication abortion provision to improve abortion access.

Impact: To improve abortion access in Victoria's under-served regions, the potential of nurse-led early medication abortion provision was explored. Barriers to model implementation relate to a lack of medication abortion education and funding, professional support and stigma concerns. The study identified a range of support elements that would enable primary healthcare nurses to develop new roles and responsibilities in the delivery of medication abortion services.

What is already known about the topic?

- Evidence indicates that appropriately trained primary healthcare nurses can provide early medication abortion and associated tasks as effectively, safely and satisfactorily as physicians.
- Nurse-led early medication abortion provision is a worldwide recognised strategy to overcome the shortage of early medication abortion providers and to improve equity in access to abortion services.
- The legal climate of Victoria allows qualified registered nurses to independently administer physician-prescribed early medication abortion drugs to women.

What this paper adds:

- The Delphi panellists of this study all endorsed nurse-led early medication abortion provision in regional and rural Victoria and beyond.
- The study provides a range of model implementation barriers, which are categorised into the components of the Capability, Opportunity, and Motivation Model of Behaviour. Those barriers need to be challenged and addressed to improve abortion access in underserved regions.

Key words: Nurse-led model, medication abortion, barriers, Delphi, general practice, Victoria

INTRODUCTION

A lack of skilled abortion providers, particularly in regional and rural areas, is globally one of the most critical barriers for women accessing safe abortion services.[1] Using medication rather than surgical abortion methods, the pool of abortion service providers can potentially be expanded, in particular within the primary healthcare (PHC) sector.[2] However, in Australia, where medication abortion has been available since 2012 for abortions up to 63 days' gestation, the uptake of medication abortion provision among regional and rural general practitioners (GP) remains low.[3]

BACKGROUND

In Australia, most abortions are costly and provided in metropolitan-located private practices, which limits the access to abortion services for women residing in regional and rural areas.[3] The provision of medication abortion in the PHC setting within the legal gestational timeframe of 63 days could improve this situation. The early medication abortion (EMA) process consists of a combination of mifepristone (200 mg) taken at a clinic, and misoprostol (800 mcg) taken 36–48 hours later at home. While EMA has been widely available in Australia since 2012, to date, only a small number of regional and rural GPs are certified prescribers.[3,4]

One acceptable and achievable solution for the delivery of safe EMA care in the PHC sector is the practice of task shifting and task sharing.[1] Increasing the tasks of associate health workers in the EMA provision process not only addresses the shortage of EMA providing GPs and the multi-phase, time-consuming aspect of the EMA process, but also removes the need for women to travel long distances to specialised abortion clinics.[1] This public health strategy is endorsed by the World Health Organization[1] and currently applied in a number of countries.[5,6] Evidence indicates that appropriately trained healthcare workers can provide EMA and associated tasks as effectively, safely and satisfactorily as physicians.[1,7]

In the last few decades, due to the ageing population and the growing burden of chronic and complex diseases, the workforce size, as well as the role of the Australian general practice nurse, has gradually evolved.[8,9] Australian PHC nurses have proven to be capable of making autonomous decisions and delivering equitable PHC services.[10] Therefore, moving towards nurse-led models, especially in service-poor areas, has the potential to improve health outcomes and increase access to PHC services.[1,11] Nurses working in Australian general practice are usually either 'enrolled nurses', trained for 18–24 months at certificate or diploma level, or 'registered nurses', with a three-year Bachelor degree.[12] While enrolled nurses are responsible and accountable for their own practice, they need to work under the direction and supervision of a registered nurse at all times.[13] The registered nurse can provide care independently and not solely on behalf of the GP.[13]

In this paper, we will use the overarching term 'primary healthcare registered nurse' (PHCRN), which refers to registered nurses working in any PHC setting, including general practice, and community/domiciliary/educational/occupational settings.[14] Across Australia, extended EMA provision roles of PHCRNs are restricted by jurisdictional legal requirements and regulations. Yet, within the context of Victoria, one of Australia's jurisdictions where abortion is legalised, appropriately trained PHCRNs are allowed to be independently involved with the EMA provision process.[13,15] Australian Government requirements, however, still dictate the personal attendance of a local GP for the prescription of the abortion medications and for pathology refund payments.[15,16]

EMA provision is a lengthy procedure and usually requires two or more visits to the health facility, although single consultations are also offered to Australian women who live long distances from a clinic or are close to the 63 days' gestational limit.[17–19] A previous paper reported on the

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development of a nurse-led model of EMA provision in the PHC sector of regional and rural Victoria using the Delphi methodology.[20] In this model, full-service EMA provision involves three consecutive phases: 1) Assessment of EMA eligibility; 2) Medication administration and management; and 3) Management abortion complications, process, and after-care.[1,20,21] Table 1 presents the three phases including all tasks involved in full-service nurse-led EMA provision.

TABLE 1: TASKS OF PHCRNS IN A FULL-SERVICE NURSE-LED EMA PROVISION MODEL†,20

1st phase: Assessment of EMA eligibility
Non-directive pregnancy counselling‡
Medical and physical assessment EMA eligibility
Provision of blood test and ultrasound referrals§ for pregnancy dating, assessment blood group, rhesus status and co-morbidities
2nd phase: Medication administration and management
Assessment of blood test and ultrasound
If eligible: prescription EMA§
Administration mifepristone
Provision of procedure instructions
Management prophylactic pain medication
Discussion contraception options
3rd phase: Management abortion complications, process, and after-care
Management non-life-threatening complications
Assessment completion abortion
Carry out contraception plan‡
Provision of emotional support‡

Note: †The different phases can be delivered in up to three face-to-face contacts with the abortion requesting person. ‡Provided only if required. §Currently, in Victoria, pathology referrals and EMA scripts need to be provided by GPs to allow women to receive healthcare rebates and to comply with current legal requirements.

To date there has been only one Australian study that has explored nurses' role in the provision of EMA in regional and rural Victoria, where abortion access, despite abortion reform, remains limited.[23] The present paper aimed to add to the literature by reporting the qualitative findings of a previous Delphi study,[22] which relate to the barriers and enablers of nurse-led EMA provision model implementation. To underpin the identified factors with a theoretical understanding, we used Michie, Van Stralen and West's Capability, Opportunity and Motivation-Behaviour (COM-B) model.[24] This model was developed to determine what behavioural patterns need to change and ultimately, what intervention strategies are required to implement evidence-based practice in healthcare settings effectively.

METHODS

AIM

This study aimed to explore Delphi panellists' views on the factors that can influence implementation of a nurse-led model of care for EMA provision in the PHC setting of regional and rural Victoria, Australia.

METHODOLOGY

We used a three-round Delphi study to build consensus among professional experts about the development and implementation of a nurse-led model of EMA provision in the PHC setting of regional and rural Victoria. Round one employed a qualitative design to acquire a broad range of opinions on the topic. The two subsequent rounds used a quantitative design to establish agreement levels in Round 1 generated statements, as well as open-ended questions to add depth to the information gained from the ratings.[25] Feedback on agreement levels was provided to the panellists between rounds, which allowed the panellists to acquire additional insight and to reconsider their initial opinions.[26] Consensus on a statement was reached when 75% or more of the panellists agreed.[27] This paper examines the study's qualitative findings relating to the barriers and facilitators of nurse-led EMA provision model implementation.

PARTICIPANTS

Ideally, a Delphi panel consists of a range of professionals who have knowledge of and experience with the specific topic, and the motivation and time to participate.[28] The professionals in our study needed to be either: physicians (GPs or gynaecologists/obstetricians); registered nurses working in general practice, community- or sexual/reproductive health, academia or for a professional organisation; or 'others', including academics, politicians and health promotion officers without a medical background. This study used non-probability sampling, including snowballing techniques, to recruit the panel of professional 'experts'. Potential panellists were located and invited via internet searches and via expressions of interest from a prior study.[22] Additional invitations to participate were published on the social media platforms of professional nursing organisations, women's health agencies, and regionally and rurally located Primary Health Networks.

INSTRUMENT AND DATA COLLECTION

The Round One Delphi questionnaire consisted of demographic characteristics and seven open-ended questions, which were developed by the researcher, informed by a literature review.[30,31] Questions related to the current and future involvement of GPs and PHCRNs in the provision of EMA in regional/rural Victoria, and the barriers and solutions of nurse-led EMA provision in this setting. The responses to the open-ended questions were transformed into statements

and rated for agreement in the following rounds to establish consensus. At the same time, panellists were able to provide explanatory remarks.

To minimise researcher bias and comprehension errors, the first-round questionnaire was pre-tested with a convenience sample of seven experts. They were asked to provide feedback on the language and phrasing of the items, on the instructions provided, and on any encountered technical problem.[32] The Delphi instruments of Round Two and Three were checked for grammar, sentence structure and technical issues by a small group of known contacts of the research team with research process and editing experience. Data were collected using the web-based software Qualtrics.[33]

ETHICAL CONSIDERATIONS

The study was approved by the Human Research Ethics Committee of Deakin University (nr: 2015–314). In line with Deakin University's ethical conditions, informed consent was obtained from all panellists and data privacy and confidentiality were maintained throughout the study.

Data analysis

This paper focuses on the qualitative data obtained from the Delphi panel responses to the seven open-ended questions of Round One and the open-ended questions of Round Two and Three. The first author read the responses multiple times to familiarise with the data and to identify the reported wide range of barriers and facilitators to nurse-led model implementation. Next, in continuous consultation with the other authors, deductive thematic analysis was used to categorise identified factors into the three main components of Michie et al.'s theoretical model: Capability (psychological and physical): the knowledge, skills and self-efficacy to engage in the behaviour (EMA provision); Opportunity: the outside factors that make the behaviour possible (environmental and social); and Motivation: the brain processes that direct our decisions (automatic and reflective).[24, 34] The categorised data were imported into NVIVO 12 and assessed for similar content to allow further amalgamation into subthemes.[35] Representative verbatim quotations within each component of the model were identified and anonymised, and assigned with a unique code in brackets, relating to expert group, panellist number and Delphi Round.

RESULTS

Twenty-four panellists participated in the three-round Delphi study, consisting of 10 (44%) nurses, seven (30%) physicians, and seven (26%) professionals belonging to the 'other' group. Most (n=17; 74%) panellists worked in a regional or rural location. Three panel members only participated in Round One, two only in Round One and Two, one panel member skipped Round Two, and one entered the study in Round Two (Figure 1).

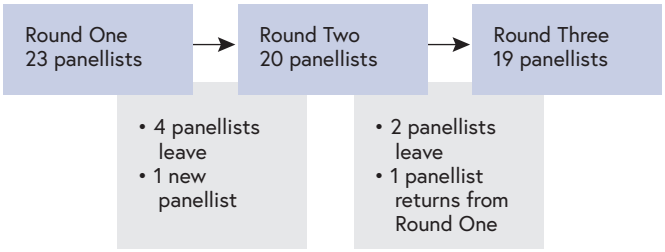

FIGURE 1: PANELLIST ATTRITION OVER THREE DELPHI ROUNDS

Figure 2 shows the results of the deductive content analysis applied to the qualitative data. Responses related to the barriers and facilitators of nurse-led EMA model implementation were categorised into each of the three main components of the COM-B framework. They are discussed in the following sections.

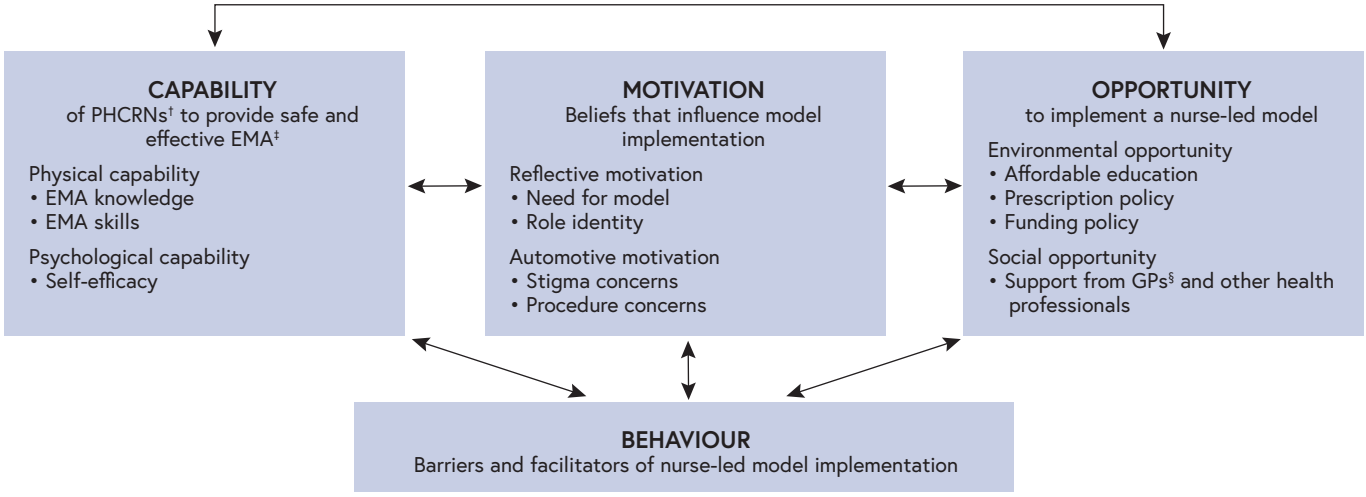

FIGURE 2: COM-B FRAMEWORK APPLIED TO THE BARRIERS AND FACILITATORS ASSOCIATED WITH NURSE-LED EMA MODEL IMPLEMENTATION

Source: Michie, Van Stralen, West[24]. Note: † Primary healthcare Registered Nurses; ‡ Early medication abortion; § General Practitioners

CAPABILITY

The physical and psychological capability of PHCRNs to engage in EMA provision is the first of the three components of the COM-B framework that may influence model implementation.[24] Physical capability relates to EMA knowledge and to the skills required for safe and effective EMA provision. Overall, panellists indicated that many PHCRNs lack in medication abortion knowledge and that they perceived PHCRN's interest in EMA provision training as low. However, it was believed that PHCRNs are extremely well placed to develop professional relationships with women visiting general practice. These views are illustrated in the following quote:

> *PHCNs* [primary healthcare nurses] *have excellent skills generally in having challenging conversations about difficult topics, have more time to discuss the wellbeing of the patient and provide a more empathetic ear to listen to a woman's concern. We also know patients are more likely to disclose sensitive issues to a nurse than a doctor… PHCNs are also very well connected and aware of the resources/clinics/supports available locally to refer the woman to.* (Nurse 6, Round 1)

Further, PHCRNs were regarded as being able to independently provide, if required, non-directive pregnancy support counselling and to rule out EMA contra-indications with the use of a patient history, a physical examination, the assessment of comorbidities, and pathology tests. Additionally, panellists believed that PHCRNs can autonomously handle the tasks involved in the second and third phase of the EMA provision process, including the interpretation of ultrasounds and blood test results; the administration of mifepristone; the assessment of abortion completion; and, when required, the management of post-abortion contraception:

> *Nurses can be trained to provide all steps of MTOP* [medical termination of pregnancy] *independently.* (Physician 7, Round 3)

> *If there is trust between the GP and the nurse, full control shouldn't be an issue.* (Other 2, Round 3)

Panellists, however, had varied views about the PHCRN's capability to be responsible for non-life-threatening EMA complications. It was suggested by some that complications should be discussed with a physician:

> *All of these* [tasks] *can be done by a nurse, but if it were me I'd like to be able to confer with a Dr, especially re infections/ haemorrhage.* (Nurse 8, Round 3)

Others advised that, if appropriately trained, PHCRNs should be able to manage non-life-threatening complications alone, for instance with the help of 'protocols' (Physician 7, Round 3), and that only if required, a consultation or referral needs to be organised. Panellists considered, though, that in more isolated rural areas independent management of post-abortion complications by PHCRNs could be problematic.

Overall, it was reported that more evidence-based practice research is required to demonstrate the quality, effectiveness and safety of nurse-led EMA provision, as highlighted in the following quotes:

> *Continue to challenge traditional nursing duty 'norms' and ensure stringent use of evidence, best practice and regulation as boundaries to practice scope are shifted.* (Nurse 7, Round 2)

> *Having a quality aspect to data collection, such as that used by VCS* [Victorian Cytology Service] *for nurse led cervical screening, is vital to ensure a good service.* (Nurse 1, Round 2)

While panellists approved and supported the fact that PHCRNs have the physical capacity to deliver MA, different views were expressed regarding PHCRNs' psychological capability, including their self-efficacy. Self-efficacy is regarded as an important factor for the improvement of nurses' practice behaviour, as without a full understanding of their possibilities and skills and the belief that they are competent to execute those skills, nurses may not work to their full potential.[36] All panellists therefore highlighted the importance of additional professional development and training to improve PHCRNs' confidence regarding most of the tasks involved with EMA provision. Currently, however, EMA training options for PHCRNs seem to be limited, as illustrated in the following quote:

> *There is very limited training available for nurses re. providing MTOP, all the clinical training up to date is for GPs.* (Nurse 4, Round 2)

Although all the essential clinical competencies to provide EMA are embedded in the scope of PHCRNs' practice, panellists considered that besides appropriate education to develop knowledge and skills, initial guidance from a practice GP will be essential:

> *In the first little while after training, there may need to be more GP assistance, however after a while this should be just up to the nurse.* (Other 2, Round 2)

Panellists additionally commented on the importance of empowerment and endorsement for the development of the PHCRN's self-efficacy beliefs. Empowerment and endorsement is not only required from other health practitioners, but also from their colleagues:

> *… nurses are resourceful, connected, caring individuals who operate naturally within an interdisciplinary team. They are often unaware of their potential role and scope though and self-limit their professional development unnecessarily. Leadership, mentors and encouragement is needed. 'Endorsement' by their medical colleagues is vital too…* (Nurse 6, Round 1)

MOTIVATION

Motivation, the next component of the COM-B framework, is another key factor in the implementation of nurse-led EMA provision. Motivation, influenced by beliefs and concerns, is,

according to the panellists, closely related to the capability of PHCRNs and the opportunities offered through support systems and funding. In terms of reflective motivation, all panellists believed in the need for nurse-led EMA provision to improve abortion access for women residing in regional and rural Victoria.

> *Appropriately trained PHC nurse-led provision of MA* [EMA], *including authority to prescribe, is the preferred model to significantly improve access to non-directive pregnancy choices counselling AND abortion services in rural areas.* (Other 3, Round 2)

However, panellists indicated that the current role identity of PHCRNs in general practice as EMA providers was still limited, and that to motivate them, more affordable and accessible professional education was essential in combination with financial incentives, as discussed in the opportunity component section.

Often mentioned automatic motivational barriers to EMA provision in regional and rural communities were the anticipation of abortion stigma and the fear of moral judgement and harassment. Panellists' concerns related to the opinions of colleagues, family, friends, and members of conservative communities as well as the fear of negative publicity and personal vilification if PHCRNs were to provide EMA services. These concerns are illustrated in the following quotes:

> *Small town mentality – some nurses would be afraid of community backlash.* (Nurse 5, Round 1)

> *While there is some concern about colleagues' response and judgement, I think it's more about community backlash and how friends and family might view them.* (Physician 7, Round 3)

Panellists reported that the motivation for nurse-led EMA provision was also influenced by procedure concerns regarding the potential lack of after-hours care and local access to surgical back-up in the case of EMA complications for women who go through a medication abortion in service poor areas. One panellist summarised these automatic motivational concerns as follows:

> *Think while time and workload are an issue, not as big as fear of stigma and uncertainty about management of complications.* (Physician 7, Round 1)

OPPORTUNITY

Implementation of a nurse-led EMA model not only depends on the capability and motivation of PHCRNs, but also on opportunity, established by environmental and social support factors that lie outside the control of the individual.[24] One major element of environmental opportunity relates to the current funding arrangement of nurse-led EMA provision. There is no specific remuneration for the time that PHCRNs spend on EMA-related services, and GP involvement therefore remains necessary to enable payment for the delivery of this service, as illustrated below:

> *Funding* [is required] – *either direct funding for nurses to provide the service or for the primary health clinics to enable the employment of nurses.* (Other 4, Round 1)

> *Unless there are financial incentives for the clinic it is hard to imagine how the service will be implemented.* (Nurse 4, Round 2)

An additional environmental opportunity factor to model implementation is to make affordable EMA education and training available for PHCRNs, either through specific funding programs or in the form of scholarships. Panellists also believed that general practices need to "be remunerated for the time when nurses attend the education" (Nurse 5, Round 1). These considerations are reflected in the following two quotes:

> *We know that a significant limitation for nurses expanding their scope is the cost of education – so if education is to be made available for them, there has to be financial support for the nurses to attend (e.g. scholarships).* (Nurse 6, Round 1)

> *Incentives for rural and regional private and community healthcare providers to up skill primary healthcare nurses to assist in the provision of medication abortion.* (Other 3, Round 2)

Some panellists favoured a scenario in which PHCRNs become fully responsible for the EMA process. This scenario, however, requires another environmental opportunity, namely that the current prescription policy in Australia needs to be addressed, as encapsulated in the quote below:

> *If nurses were able to prescribe they could be trained to provide the treatment autonomously.* (Physician 7, Round 3)

A key social opportunity factor, as reported by the panellists, is the cooperation and support of GPs for PHCRNs that want to become involved with the provision of EMA services. Indeed, GPs without an interest in women's health are not likely to engage in EMA provision, and would therefore not approve of their PHCRNs providing this service:

> *… if doctors aren't interested in providing MTOP services and the nurses in the practice have little influence on the services that are provided then…it is hard to imagine how the service will be implemented into those clinics.* (Nurse 4, Round 2)

> *As nurses are employed by GPs and are required to work within their job descriptions and practice protocols, nurses could only provide this service with approval. Nurses can be dismissed easily from a small business and you cannot insist a GP in private practice allows his employees to provide certain services.* (Nurse 5, Round 2)

Some panellists raised concerns about the lack of support from other health professionals and professional bodies, influenced by religious, ethical and personal principles. This

concern, potentially affecting opportunity, was expressed by one participant as follows:

> *Conscientious objection to abortion by individual GPs, board members or other allied health professionals working in rural and regional healthcare settings can greatly hinder provision of the service in the first place.* (Other 3, Round 1)

DISCUSSION

Over the last few decades, facilitated by government funded incentive programs, the number of nurses working in Australian general practice has increased and their role has gradually evolved.[37] Currently, the involvement of PHCRNs in care functions such as chronic disease management and smoking cessation interventions is a nation-wide accepted and supported public health strategy to improve health outcomes.[38–40] PHCRNs are also particularly well placed to deliver EMA, especially in Victoria where abortion is legalised but abortion access in underserved regions is still limited.[15] In this qualitative paper, which is part of a larger study,[40] we used the COM-B framework for a comprehensive behavioural analysis of the barriers and facilitators influencing nurse-led EMA provision implementation in the PHC setting of regional and rural Victoria. The framework helped to recognise the factors that need to change and the interventions that are most likely to be effective.

All panellist groups considered the lack of nurse EMA training, funding, support and stigma concerns to be most influential. These findings are in line with research from the US and Australia, and have been shown to be the main reason for the shortage of abortion providers in settings where abortion is legal.[2,3] A lack of EMA training options affecting the physical capability of PHCRNs to provide EMA is related to an online training model; which, although compulsory in Australia, is available to physicians only.[3] While there are multiple additional training programs and guidelines available for GPs, only a few are also accessible and suitable for PHCRNs.[42,43] Training, though, is critical, as it not only prepares health professionals for new roles, but also builds self-efficacy beliefs.[1] Effective interventions, established for example via the Victorian State Government in partnership with PHC networks, should therefore focus on the provision of affordable and accessible EMA development and training programs for PHCRNs working in regional and rural Victoria.[40] To considerably improve PHCRN uptake of EMA provision, it is additionally recommended to incorporate EMA provision training into the curricula of nurses, as well as in all other sexual and reproductive health courses for PHCRNs (and GPs).[44] Early education and exposure with abortion care will most likely result in accepting abortion provision as being part of the PHCRNs' scope of practice.[6]

To increase environmental opportunities, panellists suggested that incentives (such as scholarships) and remuneration for practices with PHCRNs attending EMA courses need to be offered. As in similar studies,[39,45] the current lack of appropriate funding for nurse-led EMA provision was recognised as a major barrier for model implementation. PHCRNs are not encouraged to autonomously provide specific services as practice remuneration will only occur if patients are seen by a GP.[46] Moreover, the private small business model of Australian general practices, with the GP being the PHCRN's employer, dictates that the nurse is required to work according to the GPs personal preferences and to generate a sustainable income.[38,46] This barrier implicates that alternative funding models should be considered to facilitate independent reimbursement for EMA services delivered by PHCRNs and to improve workplace collaboration. Legislation change, to allow abortion medication prescription by trained registered nurses, also linked to the environmental opportunity component, is required for the implementation of a fully autonomous nurse-led EMA provision model. Alternative solutions, such as the onsite storage of abortion medication, which allows PHCRNs to solitarily handle the medication according to physician's instructions, or the development of shared care models with telemedicine providers, will also give PHCRNs a more autonomous role in the EMA provision process. Another option is to grant PHCRNs a designated prescriber status, which allows them to prescribe independently, albeit under the supervision of a GP.[47,48]

Findings in relation to social opportunities indicate that successful implementation of a nurse-led EMA model not only depends on the unconditional support and approval of practice GPs, whose involvement with EMA provision is currently a prerequisite for nurse-led EMA provision, but also on the support of all involved key stakeholders on the supply-side of the service, which include educational and professional peak bodies and the Government. In the absence of an EMA-supportive GP, the PHCRN can potentially autonomously arrange, if required, eligibility-assessing pathology tests and ultrasound scans, and adequate referral to an offsite EMA provider. This practice would not only speed up the EMA process but also bypass any obstructions to referrals.[20] Support can also improve with the help of a growing body of evidence-based research on nurse-led EMA provision, evaluating effectiveness and validating the role of PHCRNs.

Consistent with previous research,[3,29] this study suggests that the ongoing stigma that surrounds abortion provision, as well as practice restrictions imposed by ideologically opposed colleagues, do influence health practitioners in their decision to provide abortion care. These factors, affecting automatic motivation and social opportunity, are specifically evident in Australia's rural and regional communities where sexual and reproductive health, including abortion, is still a highly contentious topic.[49] While negative opinions around abortion, influenced by religious and ethical beliefs, may never totally disappear, educational interventions to build

community and professional abortion knowledge can potentially decrease negative attitudes towards abortion.[50] Likewise, mechanisms need to be put in place to guarantee ongoing support and protection for EMA providers against community backlash, harassment and legal actions.

STRENGTHS AND LIMITATIONS

Discussions around the rigour of Delphi studies and the influence of bias are ongoing, especially since there is no guarantee that similar results will be obtained by a different panel of experts.[25] However, all steps were taken to ensure the results were as reliable and valid as possible given the limitations of the Delphi technique. Two characteristics of the classic Delphi approach enhanced the reliability of this study. The first relates to the anonymity of the panellists, which reduces disadvantages associated with other group communication methods, such as manipulation or intimidation to approve a particular standpoint.[26] The second characteristic is the provision of controlled feedback on agreement levels and on the results of previous rounds in the form of a structured summary. This process minimises group pressure toward conformity and allows for more comprehensively formulated individual responses.[26] The validity of the Delphi questionnaires was improved not only by conducting pre-tests prior to data collection to identify content ambiguities and technical problems, but also by ensuring a sufficiently large enough sample of a heterogeneous group of abortion experts.[51] The rigour of the deductive content analysis of the qualitative data mapped to the COM-B framework was further enhanced by the ongoing discussions among the research team.[52]

While the selection of panellists was undertaken with considerable care and the sample size was considered adequate for a Delphi study,[26] it cannot be assumed that the views of the participating experts involved resembled the views of those not participating. Furthermore, the study was undertaken in only one jurisdiction of Australia, which may limit the transferability and applicability of the findings to other settings.

CONCLUSION

A nurse-led model of EMA provision is a feasible way to improve access to equitable, affordable and safe abortion services for women residing in underserved areas. This study, however, identified that the lack of funding, affordable training opportunities, the lack of support and endorsement from other health professionals, and concerns about stigma, may deter PHCRNs from taking up EMA provision. It is only by addressing these barriers that PHCRNs can develop newly defined autonomous roles and take on new responsibilities.

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REFERENCES

1 World Health Organization (WHO). Health worker roles in providing safe abortion care and post abortion contraception. World Health Organization. Geneva. 2015.

2 Hwang AC, Koyama A, Taylor D, Henderson JT, Miller S. Advanced practice clinicians' interest in providing medical abortion: results of a California survey. *Perspect Sex Reprod Health*. 2005; 37(2): 92–7.

3 Dawson AJ, Nicolls R, Bateson D, Doab A, Estoesta J, Brassil A, et al. Medical termination of pregnancy in general practice in Australia: a descriptive-interpretive qualitative study. *Reprod Health*. 2017; 14(1): 39.

4 Shankar M, Black KI, Goldstone P, Hussainy S, Mazza D, Petersen K, et al. Access, equity and costs of induced abortion services in Australia: a cross-sectional study. *Aust N Z J Public Health*. 2017; 41(3): 309–14.

5 Berer M. Provision of abortion by mid-level providers: international policy, practice and perspectives. *Bull World Health Organ*. 2009; 87(1): 58–63.

6 Jackson CB. Expanding the pool of abortion providers: nurse–midwives, nurse practitioners, and physician assistants. *Womens Health Issues*. 2011; 21(3): S42-S3.

7 Barnard S, Kim C, Park MH, Ngo TD. Doctors or mid-level providers for abortion. *Cochrane Database Syst Rev*. Issue 7; 2015.

8 Department of Health. The practice nurse incentive program. Australian Government Department of Health. Canberra. 2012. [cited 2015 Sep 22] Available from: http://www.health.gov.au/internet/main/publishing.nsf/Content/pnip

9 Jolly R. Practice nursing in Australia. Research Paper no 10 2007–08. Department of Parliamentary Services, Parliamentary Library. 2007. Canberra.

10 Adrian A. Primary health care in Australia, a nursing and midwifery consensus view. Australian Nursing Federation. Rozelle, NSW. 2009.

11 Wakerman J, Humphreys JS, Wells R, Kuipers P, Entwistle P, Jones J. Primary health care delivery models in rural and remote Australia–a systematic review. *BMC Health Serv Res*. 2008; 8(1): 276.

12 Australian Health Practioner Regulation Agency. Approved Programs of Study. 2020. [cited 2020 Oct 28] Available from: https://www.ahpra.gov.au/Accreditation/Approved-Programs-of-Study.aspx?ref=Nurse&Type=General&div=Enrolled%20Nurse%20%28Division%202%29

13 Australian Nursing and Midwifery Federation. National practice standards for nurses in general practice. Melbourne. Australian Nursing and Midwifery Federation. 2014.

14 Australian Primary Health Care Nurses Association. Definition of primary health care nursing. South Melbourne. : Australian Primary Health Care Nurses Association. 2015. [cited 2021 Jan 19] Available from: https://www.apna.asn.au/profession/what-is-primary-health-care-nursing

15 Victorian Law Reform Commission. Law of Abortion: Final Report. Melbourne. Victorian Law Reform Commission. 2008.

16 Therapeutic Goods Administration. Registration of medicines for the medical termination of early pregnancy. Canberra. Australian Government Department of Health. 2012 [cited 2019 Sep 6] Available from: http://www.tga.gov.au/hp/information-medicines-mifepristone-gymiso.htm

17 Australian Nursing and Midwifery Federation. A snapshot of general practice nurses in Australia. Canberra. Australian Nursing and Midwifery Federation. 2011.

18 Goldstone P, Walker C, Hawtin K. Efficacy and safety of mifepristone–buccal misoprostol for early medical abortion in an Australian clinical setting. *Aust N Z J Obstet Gynaecol.* 2017; 57(3): 366–71.

19 Hulme-Chambers A, Temple-Smith M, Davidson A, Coelli L, Orr C, Tomnay JE. Australian women's experiences of a rural medical termination of pregnancy service: a qualitative study. *Sex Reprod Healthc.* 2018; 15: 23–7.

20 de Moel-Mandel C, Graham M, Taket A. Expert consensus on a nurse-led model of medication abortion provision in regional and rural Victoria, Australia: a Delphi study. *Contracept.* 2019; 100(5): 380–85

21 Royal College of Nursing. Termination of pregnancy, an RCN nursing framework. London. Royal College of Nursing. 2017.

22 de Moel-Mandel C, Graham M, A T. Snapshot of medication abortion provision in the primary health care setting of regional and rural Victoria. *Aust J Rural Health.* 2019; 27: 237–44.

23 Tomnay JE, Coelli L, Davidson A, Hulme-Chambers A, Orr C, Hocking JS. Providing accessible medical abortion services in a Victorian rural community: a description and audit of service delivery and contraception follow up. *Sex Reprod Healthc.* 2018; 16: 175–80.

24 Michie S, Van Stralen MM, West R. The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implement Sci Commun.* 2011; 6(1): 1–11.

25 Hasson F, Keeney S. Enhancing rigour in the Delphi technique research. *Technol Forecast Soc Change.* 2011; 78(9): 1695–704.

26 Hsu C-C, Sandford BA. The Delphi technique: making sense of consensus. *Pract Assess Res Evaluation.* 2007; 12(10): 1–8.

27 Keeney S, Hasson F, McKenna H. Consulting the oracle: ten lessons from using the Delphi technique in nursing research. *J Adv Nurs* 2006; 53(2): 205–12.

28 Skulmoski G, Hartman F, Krahn J. The Delphi method for graduate research. *Journal of Information Technology Education: Research.* 2007; 6(1): 1–21.

29 de Moel-Mandel C, Shelley JM. The legal and non-legal barriers to abortion access in Australia: a review of the evidence. *Eur J Contracept Reprod Health Care.* 2017; 22(2): 114–22.

30 Lane R, Halcomb E, McKenna L, Zwar N, Naccarella L, Davies GP, et al. Advancing general practice nursing in Australia: roles and responsibilities of primary healthcare organisations. *Aust Health Rev.* 2017; 41(2): 127–32.

31 McKenna L, Halcomb E, Lane R, Zwar N, Russell G. An investigation of barriers and enablers to advanced nursing roles in Australian general practice. *Collegian.* 2015; 22(2): 183–9.

32 Clibbens N, Walters S, Baird W. Delphi research: issues raised by a pilot study. *Nurse Res.* 2012; 19(2): 37–44.

33 Qualtrics. Provo, Utah. 2015.

34 Braun V, Clarke V. Using thematic analysis in psychology. *Qual. Res. Psychol.* 2006; 3(2): 77–101.

35 NVIVO qualitative data analysis software. QSR International Pty Ltd. Version 11, 2015.

36 Manojlovich M. Promoting nurses' self-efficacy: a leadership strategy to improve practice. *J Nurs Admin.* 2005; 35(5): 271–8.

37 Department of Human Services. Practice Nurse Incentive Program Guidelines. Canberra. 2017.

38 Stephen CM, Hermiz OS, Halcomb EJ, McInnes S, Zwar N. Feasibility and acceptability of a nurse-led hypertension management intervention in general practice. *Collegian.* 2018; 25(1): 33–8.

39 Halcomb EJ, Furler JS, Hermiz OS, Blackberry ID, Smith JP, Richmond RL, et al. Process evaluation of a practice nurse-led smoking cessation trial in Australian general practice: views of general practitioners and practice nurses. *Fam pract.* 2015; 32(4):468–73.

40 de Moel-Mandel C. Towards a nurse-led model of care for medication abortion provision in regional and rural Victoria [dissertation]. Burwood: Deakin University; 2018.

41 Eley DS, Patterson E, Young J, Fahey PP, Del Mar CB, Hegney DG, et al. Outcomes and opportunities: a nurse-led model of chronic disease management in Australian general practice. *Aust J Prim Health.* 2013; 19(2): 150–8.

42 Hulme-Chambers A, Clune S, Tomnay J. Medical termination of pregnancy service delivery in the context of decentralization: social and structural influences. *Int J Equity Health.* 2018; 17(1): 172.

43 Centre for Excellence in Rural Sexual Health. Becoming a prescriber. The University of Melbourne, Wangaratta. 2020. [cited 2020 Dec 16] Available from: https://www.cersh.com.au/resource-hub/info-for-practitioners/managing-service/becoming-a-prescriber/

44 Hewitt C, Cappiello J. Essential Competencies in Nursing Education for Prevention and Care Related to Unintended Pregnancy. *JOGN Nurs.* 2015; 44(1): 69–76.

45 Hegney DG, Patterson E, Eley DS, Mahomed R, Young J. The feasibility, acceptability and sustainability of nurse-led chronic disease management in Australian general practice: The perspectives of key stakeholders. *Int J Nurs Pract.* 2013; 19(1): 54–9.

46 McInnes S, Peters K, Bonney A, Halcomb E. The influence of funding models on collaboration in Australian general practice. *Aust J Prim Health.* 2017; 23(1): 31–6.

47 Department of Health and Human Services. Managing drugs in general practice clinics – key legislative requirements. Melbourne. 2015.

48 Nursing and Midwifery Board of Australia. Registered nurse and midwife prescribing – Discussion paper. Melbourne. Nursing and Midwifery Board of Australia. 2017.

49 Doran F, Hornibrook J. Barriers around access to abortion experienced by rural women in New South Wales, Australia. *Rural and remote health.* 2016; 16(1): 1–12.

50 Lipp A. Stigma in abortion care: Application to a grounded theory study. *Contemp nurse.* 2011; 37(2): 115–23.

51 Rattray J, Jones MC. Essential elements of questionnaire design and development. *J Clin Nurs.* 2007; 16(2): 234–43.

52 Alhojailan MI. Thematic analysis: A critical review of its process and evaluation. *West East Journal of Social Sciences.* 2012; 1(1): 39–47.

RESEARCH ARTICLES

Qualitative determination of occupational risks among operating room nurses

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ABSTRACT

Objective: The purpose of this study was to determine the occupational risks faced by operating room nurses, their working conditions and health problems, and the protective measures adopted.

Background: Since operating rooms are high-risk environments, the nurses working in them are exposed to correspondingly greater health risks.

Method: This qualitative descriptive study design involved 17 operating room nurses and was performed in a public hospital in Turkey. Data were collected by the author during face-to-face interviews using a semi-structured form constructed on the basis of the study aims. Theme establishment continued until new data emerged from the analysis of all interviews. Data were then subjected to qualitative content analysis.

Results: Three main themes were determined in the study, worker safety, working conditions, and training. At interview, operating room nurses reported being exposed to several occupational risks, including radiation, sharp implements, long working hours, and working standing up. They also reported experiencing, or were anxious about encountering in the future, various health problems associated with these risks. They also identified activities associated with education and protective measures as inadequate.

Discussion and conclusion: Several occupational risk factors in the operating room environment adversely affect the health of nurses working in the unit. We recommend that standards aimed at protecting against occupational risks be applied on a regular basis in order to preserve the personal health and safety of operating room staff.

Implication for nursing and health policy: Nurses are responsible for the constant care of their patients under all conditions and environments but may face the risk of compromise of their own health as a result. Training, certification, and nursing policies aimed at protecting the health of employees in clinical settings should be implemented.

What is already known about the topic? Operating room nurses are known to experience severe health problems arising from their working environment. Many nurses have to cope or live with these health problems.

What this paper adds: The study reveals the need for operating room nursing education programs. It also stresses the importance of legislation and monitoring to ensure a safe working environment for nurses in Turkey.

Key words: Employee, nurse, operating room, safety.

INTRODUCTION

Due to their different working conditions, hospitals are classified as very dangerous workplaces in terms of personnel safety under the Turkish Workplace Health and Safety Directive.[1] The International Council of Nurses also drew attention to safety at work in hospitals by announcing 'Safe Environment-Safe Employment' as the theme of nurses' week in 2006 and 'Positive Practice Environments, Quality Workplaces = Positive Patient Care' in 2007.[2] The basic aim of health and safety at work, defined as the maintenance of workers' physical, mental and social wellbeing and raising this to the highest levels, is to protect workers from harmful workplace effects and to ensure that work is performed in a comfortable and safe environment.[1,3]

By the nature of their occupations, health sector workers experience occupational health problems for reasons such as exposure to various biological, chemical and ergonomic risks arising from close contact with patients, antineoplastic agents, and iodising radiation.[1,3,4] In addition, particular concerns have been raised concerning staff health and safety due to high levels of occupational hazards faced by health staff and compensation demands.[4,5] As in all workplaces, knowledge of existing or anticipated risks, and the planning and application of preventive measures must constitute the basic approach in the operating room.[6] One of the most important and severe risks faced by health workers is needlestick and sharps injury (NSSI) reported at levels ranging between 23 and 68.5% in different studies.[1,3,4,7] Other hazards include Hepatitis HCV and HBV or Human Immunodeficiency Virus (HIV) associated with contact with patient blood or body fluids as a result of such injuries. In that context, health workers appear to be a susceptible/vulnerable occupational group in terms of exposure to occupational diseases and associated risks.[8] Essentially, all professions concerned with preserving human health and life maintain an element of stress, posing a threat to the physical and mental wellbeing of staff. However, operating room personnel have a higher risk of such injuries.[9] Operating rooms are places in which advanced and complex technological equipment and tools are used, in which diverse surgical techniques and methods are applied, and which contain several potential risks to patient and personnel health.[10,11] In addition, the operating room contains numerous potential risks, such as waste gasses, radiation, antiseptic and disinfectant materials, sterilisation equipment, latex allergy, trauma, psychosocial risks and burnout syndrome, needlestick or sharps injuries, infections, chemical dependency, medical waste, and fire hazards.[1,11,12] Studies have described this complex nature of operating rooms and increasing workloads as significant stress factors for nurses.[11,13] In addition, operating rooms are small, enclosed areas, and personnel have to work for extended periods with sharp implements and blood while making every effort to avoid errors.[4] Various studies have reported an increase in sharp-tipped or – bladed object injuries,[6] musculoskeletal system problems,[14] and psychological problems such as burnout in operating room workers,[15] in association with extended working hours and working in a standing position. Lebni et al. reported greater ergonomic and biological risks among operating room personnel, and greater lumbar disc disorder among operating room nurses.[4] Another study reported that ergonomic risks played a role in increased occupational injuries among operating room staff.[15] In addition, negligent use of items used in operating rooms such as lasers, radiographic equipment, and chemical sterilisers also lead to long-term health problems.[16] As in all workplaces, knowledge of existing or anticipated risks, and the planning and application of preventive measures must constitute the basic approach in the operating room.[17] Otherwise, unsafe/unhealthy working environments will have an adverse impact on workers' health, lower their performance, and also lead to problems with patient health. The essential step in the protection of worker health is therefore the creation of a safe and healthy work environment. There is no doubt that what workers understand by a safe and healthy working environment is one with no or little exposure to occupational risks.[1] The creation of such an environment in the operating room is very difficult, although the identification of potential biological, chemical, physical, and psychosocial risks, understanding their effects, and the adoption of preventive measures are regarded as one component.[12]

Studies involving the operating room environment have largely concentrated on patient safety.[18–20] Studies of the risks to which operating room nurses are exposed have identified work stress, workload, job satisfaction, needlestick or sharps injuries, transmission of blood and body fluids, surgical smoke, radiation, or laser hazards and musculoskeletal system symptoms, and most have focused on a single area.[14,21,22]

Previous studies from Turkey have been quantitative in nature,[3,11,17] while studies in the international literature are quantitative and generally identify a particular risk.[23–26] The present qualitative study was planned to involve all risks faced by operating room nurses by examining the working conditions and occupational exposures of these nurses in terms of personnel health, and to serve as a guide to future studies.

METHOD

STUDY DESIGN AND ETHICS

This research was designed as a qualitative descriptive study. Before the study began, written permission was obtained from the institution where the study was conducted, and ethical approval was granted by the Tekirdağ Namik Kemal University School of Medicine Non-Invasive Clinical Studies Board of Ethics (2018.141.10.06). Written and

verbal agreement to take part was also obtained from the participants.

PARTICIPANTS

The study was performed at Kirklareli Public Hospital, Turkey, between October and December 2018. The research population consisted of nurses working in the operating room clinic (n=35). The study was finally performed with 17 nurses working in the operating room for at least one year and willing to participate. The location and size of the hospital were taken into consideration in the selection of the research location.

MEASUREMENTS

A semi-structured interview form was prepared in order to identify the occupational risks faced by operating room nurses. Data were collected by an author using the in-depth interview technique at face-to-face interviews. Before data collection began, the interview form prepared by the author was first evaluated by three specialists in the field in order to establish validity and reliability. A pilot study was then carried out with five randomly selected operating room nurses who were asked to respond to open-ended questions. Following the pilot study, the requisite amendments were made to the interview form, resulting in a structured question and interview form. Interviews were held when nurses were available and felt ready for them, and in an otherwise empty room. During the interviews, data were collected from nurses with permission collected with digital voice recordings and documented. Depending on the responses given, the interviews lasted between 30 and 40 minutes.

The interview form produced a data collection tool containing 15 questions concerning nurses' descriptive characteristics (age, sex, years worked, years worked in the operating room, etc.), working conditions, occupational exposures and occupational histories. The questions, prepared in line with the existing literature concerning working conditions and occupational exposures, are given in Table 1.

QUALITATIVE DATA ANALYSIS

A qualitative content analytical approach was applied to the study data. Related concepts were collected under a specific theme. Content analysis was applied following Graneheim and Lundman, who recommended a hierarchical classification in the analysis of qualitative data.[27] The steps applied in qualitative data analysis are as follows: (1) transcription of all interviews immediately after they take place, (2) reading the entire text to understand the content, (3) arrangement and indexing of data for easy access and identification, (4) identification of meaning units and basic codes, (5) classification of the same basic codes in more comprehensive categories, (6) determining the main theme of the categories, (7) re-coding, (8) development of temporary categories, (9) the investigation of relations between categories, (10) detailing of themes, sub-themes, and categories, (11) development of the theory and the testing of that theory against the data in combination with existing information, and (12) the writing of a report containing excerpts from the original data if necessary (for example, extracts from interviews).

The transcription texts obtained by the face-to-face interview method were confirmed by operating room nurses in order to establish the validity and accuracy of the data obtained.[27]

RESULTS

Examination of the demographic characteristics of the 17 operating room nurses in the study revealed that almost all were women (94.1%, n=16), and that their mean age was 39.17±8.17 years (min=27, max=53). Mean time worked in the operating room unit was 13.58±9.17 years, and only four (23.5%) had received training before joining the operating room unit.

The analysed statements were classified under three main themes: worker safety (sub-themes occupational risks, health problems, occupational accidents, and protective measures), working conditions (sub-themes, working hours, and pay), and training (sub-themes, operating room nursing certificate, in-service training).

TABLE 1. INTERVIEW QUESTIONS

Questions
Did you receive any training before starting work in the operating room unit?
How many years have you been working in the operating room unit?
Are there preventive measures aimed at protecting your health in your working environment and standards for application directives?
What are the occupational risks to which you think you are exposed in this unit?
Do you think you are developing a health problem due to working in the operating room unit? If your response is affirmative, what do you think about the cause, and what suggestions would you make?
Are you content with your working conditions in the operating room unit (personnel safety, working conditions, salary, training, health checks, waste management, etc.)
Have you had an occupational accident in the operating room unit? If so, what was the cause of the occupational accident, and its outcome?

TABLE 2. THEMES AND SUB-THEMES

Main Themes	Sub-themes
Worker Safety	Occupational risks
	Health problems
	Occupational accidents
	Protective measures
Working Conditions	Working hours
	Wage
Training	Certificate
	In-service training

MAIN THEME: WORKER SAFETY

Subtheme one: Occupational risks

The operating room nurses interviewed particularly reported such occupational risks as radiation, chemical inhalation, sharps injuries and contagious diseases in the unit, and regarded some preventive measures as inadequate. In addition, several nurses expressed concern that working in the operating room might have an adverse impact on their health.

> *"Permeability reports for protective equipment such as neck collars and aprons used during surgical smoke procedures that should be present in the operating room, and these should be regularly checked. However, these reports are not present in the operating room, and no information is given to us about the results of these reports. I think that this is incompatible with health and safety at work and represents a risk to our health" (Interview 2).*

> *"We are exposed to radiation due to fluoroscopy use in orthopaedic, cardiology, and brain surgeries. However, I have never seen the permeability reports for protective equipment, barrier gloves, fluoroscopy aprons, and neck collars, and we do not use dosimetry. This sometimes worries me" (Interview 15).*

> *"In particular, being under constant threat of biological risks due to needlestick or sharps injuries concerns me. I think that patients should be divided into risk groups in order to protect our health" (Interview 8).*

Subtheme two: Health problems

Interviewees 4, 9, 14, and 17 reported an increase in lumbar pain and variceal problems after starting work in the unit and feared that they would therefore not be able to continue working in the unit much longer. In the context of this sub-theme, nurses frequently expressed concerns over their health status.

> *"I generally experience considerable lumbar/leg pains associated with working on foot in the same position for extended periods, and I always feel tired. In addition, the low temperature in the operating room really adversely affects our metabolism. I would prefer not to be working in this unit" (Interview 17).*

> *"I have been working in this unit for many years, and I have lumbar and cervical hernias. I have also developed a thyroid nodule this year. I attribute this to radiation exposure. I think that such health problems would be less common if protective measures were effectively applied in our unit. I do not know how I am ever going to get my health back, and this is really upsetting me and my family" (Interview 14).*

> *"One of the nurses in this unit developed an allergy to the high-level disinfectant used. Everything happened so quickly that respiratory difficulty ensued and emergency intervention was necessary. We were really frightened. I am rather stressed about working in this unit. There are a great many risks here, and we may lose our health for a variety of reasons" (Interview 9).*

> *"We become very tired since we are generally standing up all day. We frequently suffer lumbar, neck and leg pains, and these can lower our concentration. We can therefore suffer needlestick or sharps injuries. I am afraid of contracting an infectious disease" (Interview 4).*

> *"When I became pregnant four years ago I requested a transfer to another department because of exposure to radiation and anesthetic gasses. But the administration turned my request down, saying there was no other suitable unit currently available. I experienced various psychological problems because of my problems with management at that time. A change of department came about following clashes with management. However, these experiences wore me down badly, and I am very concerned for my baby's health" (Interview 12).*

Subtheme three: Work accidents

Approximately half (47%) of the nurses working in the operating room reported having had at least one work accident. The most common accidents were NSSI.

> *"I cut my finger one day due to a careless movement while handing a scalpel to a doctor. The infection control unit was informed, and my hepatitis and ELISA test results were monitored for the next three months. I was really afraid of contracting an infectious disease" (Interview 5).*

> *"One day a real emergency case arrived. We entered the emergency operating room, and the patient's fluids sprayed into my face and eyes as we were intervening. I washed myself with plenty of fluid for 10 minutes. I then had a blood test done, but thanks be to God, nothing came of it. We can catch any disease at any time here. Our working areas are really risky. A tiny cut can have irreversible consequences" (Interview 11).*

Subtheme four: Protective measures

Nurses reiterated their opinions that the protective measures in this unit were partly insufficient and their concerns that their health was under threat. We think that this in turn led to anxiety among workers.

"We undergo periodic health checks, but we still worry whether these are really adequate. There are a lot of risks in the operating room, such as gasses, wastes, radiation, work accidents, and working standing up. I wonder whether we can really protect ourselves with preventive measures. I would also like to state that I am very grateful to you for attracting both our own and the management's attention by listening to our problems one by one through such a study." (Interview 16).

"There are numerous risks here, and the conditions in the unit in terms of worker safety are unsatisfactory. As I said before, why are the reports concerning the protective materials we use for surgical smoke not in the operating room? We are exposed to radiation and chemical gasses, but there are no regular dosimetry checks or blood tests." (Interview 2).

MAIN THEME: WORKING CONDITIONS

Subtheme one: Working hours

Nurses reported that there were no specified working or resting hours for the operating room, and that there were even times when they were unable to go to eat. They also emphasised that they spent these working hours in an environment that was enclosed throughout the day, without even being able to see daylight. They therefore thought that they should be regarded as a separate group from workers in other units.

"Since the operating room is a sealed area, we are not even aware what the weather is like outside. Some cases really go on for a long time, and there are times when we cannot even go and have something to eat." (Interview 7).

"Our working system involves shift work and overtime. We work all day standing up, and there are no fixed working hours set for us. We generally cannot even go for lunch. So it would be better for our working conditions to be evaluated separately." (Interview 6).

Subtheme two: Salaries

When asked what they thought about their salaries, nurses generally described themselves as unsatisfied. They described their salaries as low in the light of the workload involved.

"In my opinion, our salaries should be increased based on our workload. I think we are paid less than many other professions, given our workload. We also have to work on official holidays. We have no rest time, and we have to spend less time with our families. We receive very little additional wage for working in this unit, and our work is not reflected in our salary." (Interview 1).

MAIN THEME: TRAINING

Subtheme one: Certification

Only one of the nurses taking part in this study held an operating room nursing certificate, and even that had been received after joining the unit. The majority of nurses started working in this area with no special training, for which reason they experienced difficulties and were even initially unaware of the occupational risks.

"I had no operating room nursing certificate when I began working in this unit. I acquired my knowledge of the operating room from colleagues already working there. However, after receiving my certificate I realised just how inadequate my knowledge was. But I am now much more confident, and it makes me happy to share what I know with colleagues." (Interview 3)

"I was given no training when I began working in this unit; but I really think that training is essential. People due to work in this unit must be aware of patient and worker safety, and comprehensive training must be provided for the establishment of minimum conditions here." (Interview 10).

"There are numerous risks here in the unit, and there is no routine working regulation. We work with numerous branches and physicians. There is a lot to know about every operation's technique, anatomy, and equipment. I think that orientation training is definitely needed." (Interview 13).

Subtheme two: In-service training

Nurses reported that in-service training programs were organised, albeit irregularly. All participants reported that training is important and requires constant repetition.

"At first I did not hold an operating room nursing certificate, and I received no orientation training. But I learned from colleagues working here in a kind of master and apprentice relationship. However, I have seen a lot of benefit from in-service training that is occasionally laid on. Training sessions are very important and must be held regularly. Otherwise, both the patient and we may come to harm." (Interview 8).

DISCUSSION

Since operating rooms are high-risk environments, the nurses working in them are exposed to correspondingly greater health risks. It is of the utmost importance to the health and safety of operating room nurses for regulations concerning their health and safety to be introduced. In the present study, and consistent with the previous literature, nurses were exposed to numerous physical (radiation etc.), biological (blood and body fluids etc.), chemical (anesthetic gasses etc.), ergonomic (excessive hours, lack of rest time), and psychological (stress, anxiety etc.) risk factors. The findings were consistent with those of various international studies, with biological agents, working conditions, and ergonomic factors representing particularly frequently reported risks.[4,6,23]

In contrast to previous studies, exposure to radiation was particularly considered in the present research. Nurses reported being exposed to radiation, particularly during

fluoroscopy, that dosimetry was not employed, and that permeability reports for the protective equipment employed were not available in the operating room. Radiation exposure is particularly high in 3D scanning, which is currently highly popular and performed in the operating room (especially in 3D pelvic scanning at 1 m in height and 39.5 µSv). This constitutes a risk for both the nurse and the patient, and it is essential that workers be given detailed information about radiation safety.[24,28] The use of protective equipment and especially compliance with radiation safety are reported to be essential in order to prevent operating room personnel exposure to radiation during *fluoroscopy*.[28] Gül et al. reported that 43.2% of operating room nurses are exposed to radiation and surgical smoke more than once a day.[11] They also reported that no radiation hazard signs were present in approximately half of operating rooms, and that 70.5% of nurses were unaware how functional the protective equipment was.[11] In addition, the equipment used for protection against radiation must be checked at least once a year for tears, holes, and thinning, and it is essential for personnel to use dosimetry.[29,30] Our findings are consistent with those of other studies, and show that radiation is widely employed and that despite its known deleterious effects, sufficient protective measures are not taken against it. In addition, a finding of inadequate protective measures against exposure to radiation further justifies the participants concern about their safety.

Another important risk factor reported by operating room nurses in this study involves accidents arising from NSSIs and associated contact with blood and body fluids. Different studies have reported greater NSSI among operating room, emergency department, and intensive care unit nurses.[22,25] However, the causes of these accidents are generally related to the working environment.[1] One study reported that the rate of needle injuries increased by 16% with every 10 hours worked.[26] Another study involving 2,031 operating room nurses from 247 hospitals in Thailand reported longer weekly working hours, personnel shortages, fatigue, starting work without appropriate training, associated lack of awareness of the dangers in the working environment, and failure to use personal protective equipment among the causes of contact with blood and body fluids. That study also reported a greater incidence of NSSI among nurses working for extended periods on foot and working overtime.[21] Our findings that nurses generally worked shifts and overtime, and spent all day working standing up are consistent with the previous literature. Our results show that nurses, despite all their intensive work and labour, are nevertheless exposed to occupational risks because of their working environment.

One of the most important findings of this study involves operating room nurses' anxieties concerning severe health problems or occupational disease due to exposure to any occupational risk. Several of the nurses in this study reported having various health problems because of their work (such as musculoskeletal diseases, allergies, needlestick or sharps injuries, infections, and psychological problems) or else feared that they might contract a health problem or occupational disease at any time. For example, one participant reported a needlestick injury in one emergency case and feared catching a disease at any moment. In a study from Iran, Fathi et al. noted that a greater incidence of sharp-edged object injuries in operating room workers was an expected finding.[23] Another study of operating room personnel in Egypt emphasised that insufficiently applied safe injection procedures lead to a greater prevalence of NSSI.[6] One study of health workers infected with hepatitis B reported that 37% of participants had developed that infection following NSSI or contact with risky material.[31] We think that a high risk of transmission and inadequate safety precautions increase operating room nurses' anxieties about contracting a health problem. Foda et al. reported a greater incidence of needlestick injuries among operating room nurses with long working hours and lacking experience and training.[6] Both the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO) have reported the need for safe injection procedures to be adapted for operating rooms in order to protect against needlestick injuries. Consistent with the present research, previous studies have found that safe injection procedures are not adequately applied.[4,6] We think that the insecurity caused by the high risk of transmission in both the present and other studies, and the lack of standardisation in terms of actions to be taken following transmission (reporting, immunisation, and monitoring) cause increased anxiety over the contraction of health problems among operating room nurses. These concerns among health workers about the increasing risk of transmission will inevitably worsen with the COVID-19 pandemic. Health workers on the front line have been the occupational group with the highest risk of contagion during the COVID-19 pandemic. The risk of COVID-19 infection, which is particularly transmitted by respiratory secretions, is reported to be higher for nurses in the operating room, an area with particularly infectious characteristics.[32]

Operating room nurses in this study also complained of lower back/foot pains. Studies of musculoskeletal system disorders in nurses have observed a higher prevalence of lumbar hernia in nurses than in other health workers.[22,33] Aydın et al. determined musculoskeletal system problems in as many as 84% of operating room nurses, and emphasised that these were at risk in terms of body posture.[14] Although working environment risks are inevitable, health problems can be reduced if protective measures are applied appropriately and regularly in line with the standards set out by law and in the relevant directives.

Factors such as occupational risks, working standing up, excessive hours, and insufficient rest time are reported to increase nurses' stress levels and workload and to reduce their job satisfaction levels.[10,34] In the present study, nurses

reported being unable to go for lunch because of their workloads, to be unable to set aside sufficient time for their families, and therefore being discontented with their working hours, and even being unwilling to work in the unit any longer. One cross-sectional descriptive study of 96 operating room nurses in Finland reported that operating rooms are stressful and complex environments, that a workplace culture needs to be established within the unit, and that nurses' stress levels are directly correlated with their job satisfaction. That study also identified greater workload stress in operating room nurses.[10] Several different studies have similarly emphasised that factors such as adverse physical environmental conditions, inadequate materials and personnel, workload, and work stress all increase burnout levels.[22,34–36] Additionally, the lack of a satisfactory salary reflecting the service provided also has an adverse impact on job satisfaction.

One important point particularly noted by one operating nurse in this study concerned working during pregnancy. That participant reported being unwilling to work in the operating room during pregnancy for reasons of fetal health and having requested to work in a different unit, although this had initially been declined. Although the majority of nurses are women, studies concerning pregnancy are limited.[37–39] Studies of the occupational risks faced by pregnant midwives and nurses have reported that ward changes are necessary in order to minimise teratogenic and fetotoxic risks and hazardous conditions in units such as oncology, radiology, and the operating room.[37–39] Studies have also reported that chemicals such as anaesthetic gasses and drugs, and cases of pregestational infertility, spontaneous abortus, preterm birth, and low birth weight babies are more common in the operating room.[1,39] In addition, greater spontaneous abortus has been reported in nurses who work extended periods working standing up and overtime.[37,38] Pregnancy is a uniquely special time in a woman's life and must be considered from the perspective of the health of the next generation. We think that our findings show that policies for protecting hospital worker health are inadequate.

International Labor Organization (ILO) Nursing Personnel Convention 149 concerning staff working conditions and advisory recommendation No 157 advise a 40-hour working week, a working day of 8–12 hours, a weekly uninterrupted rest period of 36–48 hours, and an uninterrupted period of at least 12 hours between shifts.[40] However, studies from Turkey, which is not one of the 38 signatory countries, report that nurses work 16–24 h shifts and more than 45 h a week.[22,37] We think that excessive working hours, which may be attributed to personnel shortages, can only be rectified with the employment of sufficient numbers of qualified staff.

Our research showed that unit-specific health screening was not performed regularly/routinely. Yet ILO Convention No. 149 emphasises the importance of regular health examinations for health workers and of protecting personnel health. Our finding identifies a significant obstacle to early diagnosis and treatment.

The operating nurses interviewed in the present study stated that they held no operating room nursing certificates before joining the unit, and most also received no orientation training. We also determined that in-service training programs were not held regularly. Some nurses in this study also possessed insufficient knowledge when they began working in the unit, and in-house training programs were not regularly arranged. Nurses also reported that their knowledge levels increased after instruction, and that education was of very great importance. Yet the Turkish Ministry of Health In-Service Training Decree (No. 185 dated 2009) and the Occupational Safety and Health Administration Recommended Practices for Safety and Health Programs Education and Training (OSHA, 2016) both explicitly state that newly beginning and existing personnel should both receive training concerning occupational risks and protective measures.[41,42] Receipt of appropriate training and registration with the Nursing and Midwifery Council in the UK, or equivalent institutions in other countries, is required to become an operating room nurse in Europe, but no special education is required in Turkey. Although there is a 96-hour operating room nursing course in Turkey, the fact that it is not essential to have completed this to work in the operating room is a major educational deficiency. However, since various different types of surgeries are performed in operating rooms, staff need to be given new and updated information. Studies confirm that operations are constantly being modified by new technological methods, for which reason, information must constantly be updated [4,23,43], and that refresher training supported by simulations, video techniques, robotics and teletype applications is essential in order to increase the professional sufficiency of such education.[23,43–45] Tanaka et al. described a lack of sufficient knowledge in the operating team as an important source of conflict.[46] Operating room nurses in Sweden reported that they required complementary information in the preoperative period in addition to their initial training, and that if they were not properly informed concerning procedures and applications it was impossible to prepare themselves properly, for which reason refresher training was essential.[43] Different studies have described the emphasised training sessions in particular as of the greatest importance to personnel health and safety, and that these need to be provided at each stage (before starting work, during work, after an occupational accident, and periodically). It must not be forgotten that health workers may encounter a potential risk of any kind at any moment. The COVID-19 pandemic being experienced across the world has once again shown the importance of education and awareness if personnel are to protect themselves, and that health problems will occur if the requisite precautions are not adopted. Current health problems and protective measures should now be added to training and education.

CONCLUSION

This qualitative study performed to determine the occupational risks facing operating room nurses showed that nurses were particularly exposed to radiation, NSSI, and biological and ergonomic risks, and that they experienced a range of health problems. We also determined that protective measures and occupation training against occupational risks were not provided regularly. Risk factors were identified in this study, but no analysis was made concerning which factor resulted in greater risk. More extensive studies with larger samples may be recommended to determine risk coefficients among factors and to permit generalisation.

Although there are several standards aimed at protecting the health and safety of all workers, in Turkey and internationally, there are no special practice standards for operating rooms. It is of great importance in terms of protecting worker health for both domestic regulations and ILO recommendations regarding occupational risks, protective measures, working hours, salaries, etc. to be adopted and applied. Operating room nurses are at serious risk. Administrators must therefore monitor whether or not protective measure standards are being applied. Moreover, health personnel must be given continuous training regarding the operating room if worker health is to be protected. Personnel training and perioperative care procedures need to be updated in light of new health problems as these are identified.

Nurses must be provided with material and psychological support in order to reduce the occupational risks, heavy workload, and work stress levels and to improve the working conditions of operating room nurses.

LIMITATIONS OF STUDY

The principal limitation of this study is that since it was performed with operating nurses in a single public hospital, the results cannot be generalised. Individual interviews allowed us to obtain in-depth insights into the different reported factors and their interactions but did not provide a broad picture. The interview method does not allow the sharing and comparison of perceptions that occurs during the interactions typical of focus groups.

CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

REFERENCES

1 Bilir B. Occupational Health and Safety. Güneş Tıp Kitapevleri. Ankara. 2016.

2 International Council of Nurses (ICN). Positive Practice Environments: Quality Workplaces = Quality Patient Care: Information and Action Tool Kit. [cited 2019 Apr 4] Available from: http://www.icn.ch/images/stories/documents/publications/ind/indkit2007.pdf

3 Çelikkalp Ü, Saraçoğlu GV, Keloğlu G, Bilgiç Ş. The assessment of work places of nurses on occupational safety [Turkish]. *TAF Prev Med Bull.* 2016; 15(5): 408–13.

4 Lebni JY, Azar FA, Sharma M, Zangeneh A, Kianipour N, Azizi SA, et al. Factors affecting occupational hazards among operating room personnel at hospitals affiliated in Western Iran: a cross-sectional study. *J Public Health (Berl.).* 2020; [in press]

5 Ndejjo R, Musinguzi G, Xiaozhong Y, Esther B, Musoke D, Wang JS, Halage AA, Whalen C, Bazeyo W, Williams P, Ssempebwa J. Occupational Health Hazards among Healthcare Workers in Kampala, Uganda. *J Environ Public Health.* 2015; 1–9.

6 Tawfik Foda NM, Mohamed Elshaer NS, Mohamed Sultan YS. Safe injection procedures, injection practices, and needlestick injuries among health care workers in operating rooms. *Alexandria J Med.* 2018; 54(1): 85–92.

7 Çelikkalp Ü, Dilek F. Factors affecting the occupational accident rates among nurses. *Rev Esc Enferm* USP. 2019; 53: e03524.

8 Al-aslami RA, Elshamy FM, Maamar EM, Shannaq AY, Dallak AE, Alroduni AA. Knowledge and awareness towards occupational hazards and preventive measures among students and dentists in Jazan dental college, Saudi Arabia. *Open Access Maced J Med Sci.* 2018; 6(9): 1722–26.

9 Edmund E. Analysis of occupational hazards and safety of workers in selected working environments within Enugu metropolis. *J Environ Analyt Toxicol.* 2015; 5(6): 1–6.

10 Eskola S, Roos M, McCormack B, Slater P, Hahtela N, Suominen T. Workplace culture among operating room nurses. *J Nurs Manag.* 2016; 24(6): 725–34.

11 Gül A, Andsoy, I, Görücü R, Özen B. Examination of operating staff's practice about scopy use and safety [Turkish]. *Balikesir Health Sciences Journal.* 2019; 8(1): 1–6.

12 Eti Aslan, Kan Öntürk F. Safe operating room environment; biological, chemical, physical and psychosocial risks, effects and precautions [Turkish]. *Maltepe Üniversitesi Hemşirelik Bilim ve Sanatı Dergisi.* 2011; 4(11): 133–40.

13 Önder G, Aybas M, Önder E. Determining the precedence order of the factors influencing nurses' stress level using multi criteria decision making techniques. *Optimum Ekonomi ve Yönetim Bilimleri Dergisi.* 2014; 1(1): 1–15.

14 Aydın Sayılan A, Öztekin SD. Operating room nurses' working posture and its predictors in hospital [Turkish]. *Gümüşhane University Journal of Health Sciences,* 2018; 7(1): 23.

15 Mahmoudifar Y, Seyedamini B. Ergonomic relationship during work in nursing staff of intensive care unit with operating room. *Int Arch Health Sci.* 2017; 4(2): 42–7.

16 Lin LY, Juan CW. A systematic review of the literature: risk factors and strategies for occupational hazards in hospitals. *Chinese J Occup Med.* 2015; 22(2): 71–88.

17 Andsoy I. Topic that must be known by surgical team: what are the risks of fire in operating rooms? How to establish fire security [Turkish]. TAF *Prev Med Bull.* 2013; 12(4): 449–54.

18 Kapıkıran G, Bülbüloğlu S, Eti Aslan F. Patient safety, patient safety culture, medical errors and adverse events in the operating room. *Journal of Health and Nursing Management*. 2018; 5(2): 132–40.

19 Jung JJ, Elfassy J, Jüni P, Grantcharov T. Adverse events in the operating room: definitions, prevalence, and characteristics. a systematic review. *World J Surg*. 2019; 43(396): 1–14.

20 Schwendimann R, Blatter C, Lüthy M, Mohr G, Girard T, Batzer S, et al. Adherence to the WHO surgical safety checklist: an observational study in a Swiss academic center. *Patient Saf Surg*. 2019; 13(14): 1–6.

21 Kasatpibal N, Whitney JD, Katechanok S, Ngamsakulrat S, Malairungsakul B, Sirikulsathean P, et al. Practices and impacts post-exposure to blood and body fluid in operating room nurses: a cross-sectional study. *Int J Nurs Stud*. 2016; 57: 39–47.

22 Uğurlu Z, Karahan A, Ünlü H, Abbasoğlu A, Özhan Elbaş N, Avcı Işık S, et al. The effects of workload and working conditions on operating room nurses and technicians. *Workplace Health Saf*. 2015; 63(9): 399–407.

23 Fathi Y, Barati M, Zandiyeh M, Bashirian S. Prediction of preventive behaviors of the needlestick injuries during surgery among operating room personnel: application of the health belief model. *Int J Occup Environ Med*. 2017; 8(4): 232–40.

24 Querido FM, De Brito Poveda V. Exposure of nursing staff to radiation in the operating room: a descriptive study. *Rev Sobecc Sao Paulo*. 2015; 20(1): 2–8.

25 Chiou ST, Chiang N, Wu CH, Chien LY. Health issues among nurses in Taiwanese hospitals; national survey. *Int J Nurs Stud*. 2013; 50(10): 1377–84.

26 Clark SP. Hospital work environments, nurse characteristics, and sharps injuries. *Am J Infect Control*. 2007; 35(5): 302–9.

27 Graneheim UH, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurs Educ Today*. 2004; 24(2): 105–12.

28 Schuetze K, Kraus M, Eickhoff A, Gebhard F, Richter PH. Radiation exposure for intraoperative 3D scans in a hybrid operating room: how to reduce radiation exposure for the surgical team. *Int J Comput Assist Radiol Surg*. 2018; 13(8): 1291–300.

29 Kaplan DJ, Patel JN, Liporace FA, Yoon RS. Intraoperative radiation safety in orthopaedics: a review of the ALARA (as low as reasonably achievable) principle. *Patient Saf Surg*. 2016; 10: 27.

30 Gökharman FD, Aydın S, Koşar PN. Need to know about radiation safety vocationally. *Sağlık Bilimleri Dergisi*. 2016; 7(2): 35–40.

31 Deisamhammer S, Radon K, Nowak D, Reichert J. Needlestick injuries during medical training. *J Hosp Infect*. 2006; 63(3): 263–67.

32 Chen X, Shang Y, Yao S, Liu R, Liu H. Perioperative care provider's considerations in managing patients with the COVID-19 Infections. *Transl Perioper Pain Med*. 2020; 7(2): 216–24.

33 Ribeiro T, Serranheira F, Loureiro H. Work related musculoskeletal disorders in primary health care nurses. *Appl Nurs Res*. 2017; 33: 72–7.

34 Atefi N, Abdullah KL, Wong LP. Job satisfaction of Malaysian registered nurses: a qualitative study. *Nurse Crit Care*. 2014; 21(1): 8–17.

35 Martin DM. Nurse fatigue and shift length: a pilot study. *Nurs Econ*. 2015; 33(2): 81–7.

36 Öcal D, Kürklu S, Tekin K. Determining the stress and motivation levels of the nurses working at the surgery clinics of a training and research hospital. *Health Care Acad J*. 2015; 2(3): 147–54.

37 Çelikkalp Ü, Yorulmaz F. The effect of occupational risk factors on pregnancy and newborn infants of pregnant midwives and nurses in Turkey: a prospective Study. *Int J Caring Sci*. 2017; 10(2): 690–703.

38 Lawson CC, Rocheleau CM, Whelan EA, Hibert EN, Grajewski B, Spiegelman D, et al. Occupational factors and risk of preterm birth in nurses. *Am J Obstet Gynecol*. 2009; 200(1): 51–8.

39 Lawson CC, Rocheleau CM, Whelan EA, Lividoti Hibert EN, Grajewski B, Spiegelman D, et al. Occupational exposures among nurses and risk of spontaneous abortion. *Am J Obstet Gynecol*. 2012; 206(4): 327.e.1–8.

40 International Labour Office (ILO), ILO Nursing Personnel Convention No.149, Recognize their contribution Address their needs. 2005. [cited 2019 May 5] Available from: https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---sector/documents/publication/wcms_508335.pdf

41 Ministry of Health In-Service Training Regulation, Turkey [Turkish]. 2009. [cited 2019 May 21] Available from: https://kms.kaysis.gov.tr/Home/Goster/60244

42 Occupational Safety and Health Administration (OSHA). Recommended practices for safety and health programs. education and training. 2016. [cited 2019 May 21] Available from: https://www.osha.gov/shpguidelines/education-training.html

43 Sandelin A, Kalman S, Gustafsson BA. Prerequisites for safe intraoperative nursing care and teamwork: operating theatre nurses' perspectives: a qualitative interview study. *Clin Nurs*. 2019; 28: 2635–43.

44 Zhaoa X, Cong L. Effect of problem and scripting-based learning combining wearable technology on orthopedic operating room nurses' learning outcomes. *Nurse Educ Today*. 2019; 73: 13–6.

45 Park EW, Lee H, Yun EK. Development and evaluation of a quick response code–based nursing education program for operating and recovery room nurses. *Comput Inform Nurs*. 2019; 37(11): 599–605.

46 Tanaka P, Hasan N, Tseng A, Tran C, Macario A, Harris I. Assessing the workplace culture and learning climate in the inpatient operating room suite at an academic medical center. *J Surg Educ*. 2019; 76(3): 644–51.

RESEARCH ARTICLES

Documenting patient risk and nursing interventions: record audit

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ABSTRACT

Objective: The aim was to explore and compare documentation of the nursing process for patient safety in two nursing documentation systems: paper and digital records.

Background: The 'nursing process' (assessment, planning, intervention, and evaluation) is recommended by professional nursing registration and health service accreditation bodies as a key component of understanding nurses' clinical reasoning. Nurses' responsibility for patient safety must be supported by comprehensive documentation practices.

Study design and methods: A retrospective audit of twenty clinical care records (N = 20) randomly selected from a single acute medical ward at a tertiary hospital in Australia; ten from a digital trial that replicated selected paper forms and ten paper records as controls. The audit was conducted by two nurse researchers using a purpose built data extraction tool.

Results: Patient age, gender and primary diagnoses were similar for the digital and paper care records. Documentation of the full nursing process was low in both record types, and comprehensiveness of nursing documentation was similar across the paper and digital records. Compared to the paper documents, the digital documents were more often rated as 'complete' ($p<0.05$). Documentation of risk to skin integrity ($p<0.05$) and evidence of completed nursing interventions to address risks were more frequent ($p<0.05$) in digital records.

Discussion: The findings of this study highlight an important gap in comprehensive documentation of the nursing process that supports and informs the clinical reasoning of nurses for patient safety. Improvements in digital documents reflect future opportunity to enhance the quality of nurse documentation using technology specific strategies such as prompts, visualisation and nudge.

Conclusion: This research identifies that both paper and digital systems of hospital documentation may fail to capture and communicate the clinical reasoning of nurses. Digital systems have the potential to improve capture of the clinical reasoning and nursing process.

What is already known about the topic?

- Professional registration and healthcare accreditation bodies recommend nurses' clinical decision making is underpinned by processes of assessment, planning, intervention and evaluation.
- Poor capture of nurses' clinical decision making in their documentation has negative consequences for the continuity, quality and safety of care; including inadequate detection of deterioration and escalation of care.

- Electronic systems are expected to enhance capture of nurse decision making in documentation.

What this paper adds:
- Nurses' clinical reasoning was poorly captured in both paper and digital documentation systems.
- Nurses documented their intervention responses to identified patient risks more often in the digital system compared to paper records.
- Digital systems offer an opportunity to proactively nudge nurses towards improved documentation of nursing processes.

Key words: Nursing administration; nursing; nursing informatics; documentation in the organisation of care; behavioural economics

OBJECTIVE

The implementation of digital nurse documentation systems into hospitals provides opportunities to optimise and fundamentally redesign communication about nurses' clinical reasoning processes, integrate data, and create smarter workflows. A common goal is to enhance the quality and relevance of nurse documentation of care delivery to meet National Safety and Quality Health Service Standards while simultaneously enhancing care quality and reducing the amount time nurses spend on activities that do not add value and administrative compliance.[1] There is a need for the design and implementation of digital systems be informed by nursing theory and a strong understanding of the nursing process in order to fit nursing workflows. To achieve this, it is important to explore if and how the transfer of nursing forms to digital health information systems can accurately capture the clinical reasoning of nurses and reflect nursing work. The objective of this study was therefore to describe the documentation of the nursing process in terms of quality and completeness using paper and digital nurse documentation systems in an acute medical ward in Australia.

BACKGROUND

Within the acute hospital care sector nurses are the professional group who most frequently document patient risk screening, assessment and care delivery. Previous research suggests nursing documentation has frequent gaps or inconsistencies, and can be difficult to locate and interpret, thereby contributing to patient safety errors or harm.[2] There is little evidence to suggest digital nor paper health records adequately support the documentation needs of the nursing profession, and this is a common and international problem.[3] Failure to capture the clinical reasoning of nurses in their documentation creates flow-on effects for the continuity, quality, and safety of care.[4] For example, it has been demonstrated that poor quality nurse care plans create opportunities for errors of both omission and commission.[5] Further, gaps in documentation of patient vital signs can lead to inadequate detection of deterioration and escalation of care.[6] Little is known about how 'fit for purpose' digital nursing records are as the usability of digital documentation systems can be conflated with user satisfaction.[7] This poses a challenge for the developers of digital documentation systems and suggests that specific measures of 'fit for purpose' should be used. There are also contextual challenges associated with the development and deployment of systems to support effective nurse documentation in different care settings. For example, digital system developers may attempt to accommodate the clinical needs of nurses, but encounter administrative, institutional or policy barriers. These barriers can result in the replication of problems experienced with the existing, often inadequate, paper-based records.[8,9]

The nursing profession is guided by processes of clinical reasoning used to make decisions in practice which are consistent with patient choice and current best evidence about healthcare.[10] 'Clinical reasoning' and 'clinical decision making' are underpinned by a cycle of 'assessment, diagnosis, planning, intervention and evaluation', referred to as the 'nursing process'.[11] This decision-making framework is used by nurses in daily practice, and often cited in key registration competencies and hospital accreditation requirements.[12,13] Structured capture and communication of the clinical reasoning of nurses through the nursing process has been used to link nursing work to reduced hospital length of stay, reduced mortality and improved quality of life for hospitalised patients.[14,15] Hadij suggested that when digital records were adapted to capture nursing data and terminology, nurses' acceptance of the system improved (≥ 25%).[16] In contrast, a system unable to capture and communicate nursing processes can force nurses to create 'workarounds' which involve documentation outside of the formal system.[17,18] These workarounds reflect a failure of the documentation system to accurately reflect the nursing process and support nurses' work. In addition to service and care inefficiencies the authors argue that such workarounds prevent organisational learning about nursing work,[19,20] the long-term consequences of which are negative impacts on the quality and safety of patient care.[21] Bail et al. argued that workarounds are more likely to occur when the original co-designed system is subverted to meet the needs of the institution rather than the clinician.[18] For these reasons it is

important to explore if digital health information systems accurately reflect and capture the clinical reasoning of nurses prior to their implementation.

METHODS

The study was a retrospective cohort study using audit of nursing documentation recorded in patient medical records during and after the trial of a novel digital nurse documentation system. The setting was a single acute medical ward of a tertiary hospital located in a capital city in Australia. Approximately 85% of the nurses working on the ward were registered nurses, with a small proportion of enrolled nurses.

PARTICIPANTS

Twenty patient care records were randomly sampled at two time points: (1) during the trial of a digital nursing documentation system (10 records between March and April 2017); and (2) records from the following year after completion of the trial, when use of usual paper records had resumed (10 records in April 2018). The 20 patient records audited were selected using a random number generator applied to Time 1 during the trial of electronic documents (10 records) and Time 2 at the same time in the following year to avoid potential bias related to seasonal variation and allow sufficient time for washout of any ongoing effect of the digital system. This sample size was consistent with a previous study examining nursing documentation,[22] and was expected to provide enough data for a rich representation of the complexity of nursing documentation while ensuring manageability of data collection and accuracy of analysis.

INTERVENTION

The Australian-based technology piloted in this project was designed with the specific goal of supporting quality and safe nursing practice, reducing administrative burdens of nursing documentation and thereby releasing time for better nursing care. The technology had previously been through several cycles of iterative design testing in a laboratory, using simulation and in different 'real world' clinical settings.[18,23–27] The health information technology platform was accessed by point-of-care large touch screen devices with adjustable arms affixed to the wall at each patient bedside, based on preferences made by nurses in previous studies. Prior to implementation, the health information system provider engaged with internal stakeholders including representatives of the hospital executive, Clinical Nurse Consultants (CNCs) (regarded as experts in the clinical specialty), senior nursing staff in the organisation, and a nursing information technology system expert about design of the system. These stakeholders convened a steering group, a clinical working group, and a technical working group that informed the scope and range of nursing documentation that would be migrated from the existing paper-based system to the digital system, as well as the implementation strategy and response to emerging challenges. Key decisions made by these groups included: installation on a 26-bed medical ward; eight nurses trained as 'super-users' to support other staff and test the technology; a four week pilot duration; selection of 11 (out of 55) commonly used paper forms related to core nursing care activities to be converted into electronic format for use in the system; use of a hybrid 'paper-lite' documentation process whereby existing paper files were used for medication administration, record writing and any nursing assessments outside of the 11 selected digitised forms. The 11 selected forms were only available on the electronic system for the duration of the study, and it was specified that for system-wide continuity the electronic forms replicated the appearance of pre-existing paper documents.

ETHICS

This study was approved by a Hospital and University Human Research Ethics Committee (reference number ETH.6.16.112).

DATA COLLECTION PROCEDURE

Data were extracted by two researchers, one an academic nurse researcher and the other an experienced clinical nurse. Demographic data were collected from the patient hospital label and discharge summary. To provide homogeneity, only nursing notes recorded up to 48 hours following the first recorded nursing entry (i.e. admission) were reviewed for data extraction. The full patient record was examined for documentation of nursing activities including observation charts, clinical progress notes, nursing care plans, the patient care and accountability plan and the patient journal. All nursing documentation (paper and/or digital) that provided enough information for the rater to understand the care provided were used for data extraction; illegible or unclear entries were excluded.

MEASURES

The items in the purpose developed data extraction tool (Table 1) were derived from tools previously used to examine documentation of the nursing process and the nursing management of factors contributing to common preventable harms.[22,28–31] Quality and completeness of documentation of the nursing process were defined by (1) the comprehensiveness of documentation to capture all four steps of the nursing process; (2) individualisation of care through the comprehensive documentation of patient risk assessment, planning, interventions and evaluation performed by nurses, and the inclusion of components expected for delivering holistic patient care such as the patient's social situation, coping, beliefs, information from significant others or hobbies. The items extracted from the clinical record are presented in Table 1.

TABLE 1: EXTRACTION ITEMS FOR CLINICAL AUDIT OF DOCUMENTATION FOR NURSING PROCESS

Code (patient record unique code)
Stage of the research (digital/case or usual/control)
Date of first nursing entry
Patient age (pt. label)
Patient sex (pt. label)
Primary discharge diagnosis (discharge summary)
1. Nursing assessment
1.1 Actual situation leading to hospitalisation
1.2 Anxiety and worries related to hospitalisation
1.3 Social situation and living environment
1.4 Coping with actual situation/illness
1.5 Beliefs and attitudes related to hospitalisation
1.6 Information of the patient and relatives/significant others about the situation
1.7 Intimacy
1.8 Hobbies, activities
1.9 Significant others-contact person
1.10 Assessment identifies a risk
1.10.1 Skin Integrity/Pressure injury
1.10.2 Continence
1.10.3 Assessment for clinical deterioration (MEWS)^
1.10.4 Nutrition
1.10.5 Cognitive impairment (delirium/dementia)
1.10.6 Mobility/Falls
1.10.7 Medication risks (A-PINCH)^^
1.10.8 Pain
1.11 Relevant nursing priorities
1.12 Field notes
1.12 Each entry is clearly authored
1.13 The documentation is legible (includes only approved abbreviations)
1.15 All nursing statements provide sufficient information for the reader to be sure about the care provided
Code of risk identified in assessment
Brief description of risk
Location of nurse identification of risk
2. Planning
2.1 Nursing problem is documented
2.2. Aetiology/contributing factors are documented (primary causes)
2.3 Signs and symptoms are documented
2.4 Contributing factors and symptoms are consistent – correctly interpreted
2.5 A nursing goal corresponds to the nursing problem
2.6 A nursing plan to meet the goal is documented
3. Interventions
3.1 Count of nursing interventions named
3.2. Count of nursing intervention documented as completed
3.3 Name the nursing interventions
4. Outcomes
4.1 Update of care plan each day/or when change identified
4.2 The nursing outcome describes if there is a change in patient symptoms/risk
4.2 Nursing outcome is documented for the risk
4.3 There is a relationship between the nursing problem, intervention and outcome

^MEWS – Modified Early Warning Scale, used in conjunction with the observation and measurement of vital signs to trigger escalation of clinical and medical support in relation to patient deterioration.
^^A-PINCH (a group of medicines that should universally be considered as high-risk. These medicines include anti-infective agents, anti-Psychotics, Potassium, Insulin, Narcotics and sedative agents, Chemotherapy and Heparin and other anticoagulants).

All data extracted for the audit were relevant to nursing care on an acute medical inpatient ward, expected to be evident in both written and digital forms, and relevant to nurses' roles in risk management and harm prevention. The extracted items (Table 1) were collated into two groups: (1) *'Assessment'* included the information gathered on patient admission and identification of individual risks; and (2) *'Planning and Nurse Intervention'* included naming the nursing problems addressed during the admission, interventions identified in the nursing care plan, interventions documented as being delivered, and documented evaluation of patient outcomes within the selected timeframe. For the purpose of this study, measures were calculated to examine:

(1) Comprehensiveness: scored by rating each element of the nursing care plan as 0=not documented; 1=partially documented (incomplete) and 2=comprehensively documented. Sum scores were calculated for each group using the ratings for all the '*Assessment*' (n=20) and '*Planning and nurse interventions*' (n=57) items extracted from the nursing documentation, with possible scores between 0–40 and 0–24 respectively.

(2) Individualisation: measured using a count of the number of documented patient safety risk assessments, the number of interventions performed by nurses to address each identified risk, and a count of the number of elements included in the holistic patient care content in relation to 1–9 in 1) '*Assessment*'.

DATA QUALITY

Prior to data extraction, data reliability was enhanced by two independent researchers using the data extraction tool to examine the same records until acceptable (100%) inter-rater agreement was established. In addition, decision rules were created (Table 2) and used to ensure consistency of extraction. For example, only nursing notes documented during the first 48 hours of each patient record were examined to mitigate potential for bias associated with the variable length of stay. While this timeframe provided consistency in nurse documentation, it limited opportunity for data capture of nurse documentation about evaluation of intervention impact and patient outcomes. Transparency of data capture was supported by field notes kept by the data extractors to provide an audit trail and ensure consistency during data extraction and analysis. Content validity of the data extraction tools was derived from previous validation reported in the literature,[22,28–31] and face validity from review by three expert members of the research team.

TABLE 2: RULES FOR DATA EXTRACTION

Review the first 48 hours from the first recorded nursing entry
The assessment component is completed once for each patient
Demographic data was collected for each patient from patient label and discharge summary
Use only documents used for evaluation of the nursing process are: • Patient care and accountability plan (paper or digital); • Patient journal, nurse activities (digital); • Patient progress notes (paper); • Only authorised abbreviations for the facility are used.
All nursing statements provide sufficient information for the reader to be sure about the care provided.
The planning intervention is completed for each risk/deficit identified (this may result in more than one care plan evaluated for each patient)

DATA ANALYSIS

All data were collated, coded, and imported into SPSS Version 24™ for analysis. Frequencies and distributions were examined using descriptive statistics. Continuous variables were analysed using independent samples t-tests, and categorical or non-normal variables were analysed using non-parametric tests including Chi-square and Mann Whitney-U test to examine for differences in documentation between the digital and paper nursing documents.

RESULTS

The characteristics of the patient subjects (see Table 2) were similar in age (digital M=62.4, SD=16.3 vs paper M=64, SD=21.5, $p>0.05$) and gender (digital 30% male vs paper 60% male, $p>0.05$) across the two groups. The primary discharge diagnosis was varied in both groups, as expected for a medical ward. From the 20 records, 57 nurse care plans specific to the needs identified by nurses for each patient (digital 29 vs paper 30) were available for analysis (Table 3).

Examination of the distributions of 'comprehensiveness scores' calculated from the extracted audit data for overall nurse documentation revealed low mean scores (Table 4) indicating overall poor documentation of the nursing process in both groups.

Comparison of nurse documentation comprehensiveness scores for the digital and paper documents using independent samples t-test revealed no significant difference in nurse documentation of *Assessment*, (digital, M=11, SD3.8 vs paper M=9, SD2.3; t(18)=1.59; p=.13) or *Planning and nurse intervention* (digital M=11, SD3.8 vs paper M=9, SD2.3; t(57)=.1419; p=.89). However, further visual examination of patterns in the data revealed trends in the comprehensiveness score data suggesting higher scores for all assessment items in the digital system when compared to the paper documents.

TABLE 3: DEMOGRAPHICS OF 'DIGITAL/CASE' AND 'PAPER/CONTROL' SAMPLES

Code	Stage of the research (Digital or Paper)	Age (yrs)	Sex	Primary discharge diagnosis (discharge summary)	Care plans evaluated
1	Digital	51	M	Left pleural effusion	1
2	Digital	67	M	For lymph node biopsy	2
3	Digital	67	F	Urinary Tract Infection	2
4	Digital	87	F	Infective endocarditis	1
5	Digital	55	F	Right upper lobe cavitating pneumonia	1
6	Digital	66	M	Metastatic oesophageal cancer	6
7	Digital	29	F	Viral Upper Respiratory Infection	3
8	Digital	72	F	Abdominal pain and fever related to Peritoneal Dialysis infection	4
9	Digital	52	F	Wound ooze post Total Knee Replacement	4
10	Digital	78	F	Confusion and headaches	4
11	Paper	89	M	Pneumonia	4
12	Paper	34	F	Syncope for Investigation	2
13	Paper	78	M	Abdominal pain for Investigation	2
14	Paper	72	F	Multi trauma transfer from Japan	1
15	Paper	20	F	Infective exacerbation Cystic Fibrosis	2
16	Paper	68	M	Urinary Tract Infection	3
17	Paper	70	F	Delirium background Korsakoff's dementia	3
18	Paper	76	M	Recurrent malignant pleural effusion	5
19	Paper	56	M	Percutaneous Endoscopic Gastrostomy insertion	5
20	Paper	77	M	Gastrointestinal bleed	3

TABLE 4: DISTRIBUTIONS OF SCORES FOR COMPREHENSIVE NURSE DOCUMENTATION

	Possible range (Min-Max)	Actual Range (Min-Max)	Mean	SD
Assessment	0–40	4–16	10.01	3.07
Digital		4–16	11.10	3.48
Paper		5–13	9.00	2.30
Planning and nurse interventions	0–20	2–16	6.67	3.34
Digital		2–16	6.70	3.63
Paper		2–15	6.60	3.10

Examination of scores for individual assessment items revealed the digital records more often included detail of risk assessment (p=0.01); specifically, assessment of skin integrity (p=0.06), medication risk (p=0.09), and the situation leading to hospitalisation (p=0.01) were documented more often in digital compared to paper documents. Components of 'holistic care' such as anxiety, social situation, coping, beliefs, information from significant others or hobbies were not included in either record type, despite these being data collection items included on both forms.

Analysis of trends in the nurse documentation of *Planning and nurse intervention* items similarly suggested comprehensive nurse documentation more frequently occurred in the digital documents compared to paper documents, but these differences were non-significant. While the average number of nursing interventions named in the digital care plans (M=3.17, SD=3.89) was similar to the paper documents (M=2.2, SD=2.08), t(42.5)=1.19; p=0.24, there was a significant difference in the number of nursing interventions documented as completed in the digital (M=3.14, SD3.9) compared to paper documents (M=1.2, SD1.2), t(33.3)=2.589; p=.01 (Table 5).

TABLE 5: FREQUENCY OF COMPREHENSIVE NURSE DOCUMENTATION OF PLANNING, INTERVENTIONS AND OUTCOME

	Digital (n=29)	Paper (n=30)	p
2. Planning			
2.1 Nursing problem is documented	5	0	0.17
2.2. Aetiology/contributing factors are documented (primary causes)	4	1	0.15
2.3 Signs and symptoms are documented	5	3	0.42
2.4 Contributing factors and symptoms are consistent- correctly interpreted	1	7	0.31
2.5 A nursing goal corresponds to the nursing problem	0	0	
2.6 A nursing plan to meet the goal is documented	1	0	.31
3. Interventions			
3.1 Count of nursing interventions named	3.17 (3.89)	2.2 (2.01)	.23
3.2. Count of nursing intervention documented as completed	3.14 (3.9)	1.2 (1.2)	0.01*
4. Outcomes			
4.1 Update of care plan each day/or when change identified	0	0	
4.2 The nursing outcome describes if there is a change in patient symptoms/risk	3	1	0.28
4.2 Nursing outcome is documented for the risk	5	2	0.21
4.3 There is a relationship between the nursing problem, intervention and outcome	3	1	0.29

*p<0.05

DISCUSSION

The findings of this study highlight an important gap in comprehensive documentation of the nursing process that supports and informs the clinical reasoning of nurses. In this study, similar to previous studies, consistent gaps in documentation of the nursing process were evident in both paper and digital nursing documentation.[2] Overall, the documentation of assessment and interventions was more comprehensive than planning and evaluation. There was some indication that the overall documentation of the nursing process was better in the digital documents compared to the paper documents, but this improvement was not significant.

Specific aspects of nursing care, such as completed interventions and assessment of risk, were more frequently documented in the digital record. It is possible that this was due to the processes for how care was documented, for example, digital records were contemporaneous whereas paper documentation was usually completed at the end of a shift when care would be summarised such as "*pressure area care was attended*". Therefore, the frequency of such an intervention over the course of a shift was often not evident in the paper record. This finding highlights some common pitfalls in traditional nurse workflows that can be mitigated by new workflows associated with implementation of digital records such as avoiding the replication of data often evident across multiple paper forms,[18] and replacing the practice

of retrospectively documenting patient care at the end of a shift with contemporaneous recordkeeping. Traditional practices that encouraged the use of global statements about the interventions provided during a shift in an end-of-shift report, meant the researchers were unable to extract detail about the nursing process.

Omissions of patient-specific information, such as psychosocial assessment and the patient's experience of care were observed in this study, in both the digital and paper formats, are of concern. High-quality care is dependent on individualised care,[32] particularly for complex medical patients with multiple care needs.[33] Digital systems provide the opportunity to respond to the needs of this population by capturing the complexity of the nursing work needed to respond to changing risk profiles and specific needs of each hospitalised patient.[32,33] Healthcare organisations, registration boards and accreditation bodies emphasise the delivery of person-centred care.[12–13] However, this research highlights that work processes and systems of documentation may reinforce failures to comprehensively document nursing processes. The implementation of digital systems should be viewed as an opportunity to address multiple failures in both nurse workflows and paper records, by proactively nudging towards desired behaviours.[32, 37–38]

'Nudges' commonly used in healthcare practices include the order of information gathering by prompting some options that are presented visually first or using a common option to accept as a default.[35,36] Emerging "Nudge Units" have been shown to aid health services by the intentional structuring of choice presentations to increase the frequency of evidence-informed choices.[35, 36, 39] Increasingly, work is occurring with nursing practice to recognise and consciously develop nudge tactics that are most effective.[37] For example, Ostrovsky implemented a program to guide nurses through a systematic patient review and physical exam,[40] a falls risk protocol, and other assessments with software-based behavioural "nudges" used to suggest most appropriate (evidence-informed) and immediate nursing interventions to minimise errors and improve speed of data entry. Their findings confirmed that nurse participants found the nudge system improved their likelihood of identifying patient complications, lowered error rates by encouraging real-time documentation, and the system was found to improve nurse documentation comprehensiveness and clarity.[40] Our findings revealed similar trends that suggest using nudges such as automatic care plan suggestions may be effective to improve nurse documentation; however, the small sample makes it difficult to draw conclusive comments. There is a need to determine if and how different nudges, including those embedded in the structures of paper or electronic health records can be used to improve nurses' documentation of clinical care.[41]

Conversely, concerns that 'nudging' practice may reinforce passive 'task orientated' documentation are evident in the literature[32] particularly if electronic documentation mimics the high burden of paper documentation. Ensuring digital systems enable individualisation tailored to patient needs is key.[40] Careful electronic system development can effectively draw on nurses' judgement and use nudges to guide effective decision-making process (assessment, diagnosis, planning, intervention and evaluation) that is evidence-informed and specific to patient needs. For these reasons it is critical to develop a comprehensive body of evidence about the relationship between nurse documentation, the realities of clinical work, and desirable clinical behaviours.

LIMITATIONS

Strategies used to minimise the risk for potentially confounding factors to impact the study data included data extraction from patients admitted to the same ward to minimise influence of different ward culture, staff and patient type; also, records from the same time of year were used to minimise possible seasonal influences. Limitations of this study relate to the small sample size, the specific context in which it was undertaken, and the considerable amount of missing data in both paper and digital patient records; a well acknowledged common problem impacting previous examinations of nursing documentation.[2] In this study that evaluated the documentation available in care records, some paper and digital documents could not be located for audit, hence were assumed to be lost or misplaced. Unfamiliarity and implementation challenges related to introduction and testing of the digital system may have impacted the quality of nurse documentation in the digital records during the pilot. Most notably, some operational decisions meant that the majority (6/8) of trained super users were redeployed to other wards; there was a 31% increase in the number of patients admitted to the ward during the technology pilot period; and average patient length of stay decreased by four days during that period.[18]

CONCLUSION

This study found poor documentation of the nursing process for clinical reasoning in both paper and digital systems. The study highlights that replication of paper forms into digital platforms may not be ideal as it can perpetuate poor workflows, gaps and duplication, and can exacerbate pre-existing problems. We identified that some elements of nurse documentation were better in the digital system, most notably the completion of nursing interventions in response to the assessment of risk. This finding suggests digital systems offer promise, but further research is needed to ensure that nursing theory underpins design of digital health systems for nursing documentation to be 'fit for purpose'.

IMPLICATIONS FOR RESEARCH, POLICY, AND PRACTICE

Nurses are expected to provide comprehensive records of patient care in hospitals. It is critical that nursing documentation captures the clinical reasoning of nurses to support effective nursing workflows. This study reveals that the nursing process, that underpins nurses' clinical reasoning, is poorly captured in current documentation systems.

Implementation of digital records provides an opportunity to achieve goals of comprehensive documentation; however, the findings of this study suggest more work is needed to optimise the transfer of nurse documentation to electronic nursing documentation. Strategies to fill gaps related to the application and evidence of nursing theory in electronic nursing documentation may include adoption of a nationally accepted standardised nursing language; consistent teaching and use of the nursing process in clinical practice; and nurse involvement at all stages of digital system design. Future development to transition and optimise nursing documentation in electronic systems should be informed by nursing theory to address these gaps.

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CONFLICTS OF INTEREST

As part of the funding agreement, the joint funders were able to review manuscript content prior to submission but were unable to withhold consent for publication or demand any changes.

REFERENCES

1 Australian Commission on Safety and Quality in Health Care (ACSQHC). National safety and quality health service standards: second edition. Australian Commission on Safety and Quality in Health Care. Sydney, NSW. 2017. [cited 2021 Jan 20] Available from: https://www.safetyandquality.gov.au/publications-and-resources/resource-library/national-safety-and-quality-health-service-standards-second-edition

2 Charalambous L, Goldberg S. 'Gaps, mishaps and overlaps' Nursing documentation: how does it affect care? *J Res Nurs.* 2016; 21(8), 638–48. Available from: https://doi.org/10.1177/1744987116678900.

3 Topaz M, Ronquillo C, Peltonen LM, Pruinelli L, Sarmiento RF, Badger MK, et al. Nurse informaticians report low satisfaction and multi-level concerns with electronic health records: results from an international survey. *AMIA Annu Symp Proc.* 2016; 2016(2016–2025).

4 Clancy L, Happell B. Being accountable or filling in forms: managers and clinicians' views about communicating risk. *Perspect Psychiatr Care.* 2017; 53(1): 38–46. Available from: https://doi.org/10.1111/ppc.12135.

5 Cho E, Lee NJ, Kim EY, Kim S, Lee K, Park KO, et al. Nurse staffing level and overtime associated with patient safety, quality of care, and care left undone in hospitals: a cross-sectional study. *Int J Nurs Stud.* 2016; 60: 263–71. Available from: https://doi.org/10.1016/j.ijnurstu.2016.05.009.

6 Considine J, Trotter C, Currey J. Nurses' documentation of physiological observations in three acute care settings. *J Clin Nurs.* 2016; 25(1–2), 134–43. Available from: https://doi.org/10.1111/jocn.13010.

7 Kovinen T, Lammintakanen J. The success of a management information system in health care – a case study from Finland. *Int J Med Inform.* 2013; 82(2), 90–7. Available from: https://doi.org/10.1016/j.ijmedinf.2012.05.00.

8 Bruylands M, Paans W, Hediger H, Muller-Staub M. Effects on the quality of the nursing care process through an educational program and the use of electronic nursing documentation. *Int J Nurs Know.* 2013; 24(3), 163–70. Available from: https://doi.org/10.1111/j.2047–3095.2013.01248.x.

9 Wang N, Hailey D, Yu P. Quality of nursing documentation and approaches to its evaluation: a mixed-method systematic review. *J Adv Nurs.* 2011; 67(9), 1858–75. Available from: https://doi.org/10.1111/j.1365–2648.2011.05634.x.

10 Levett-Jones T, Hoffman K, Dempsey J, Jeong SYS, Noble D, Norton CA, et al. The 'five rights' of clinical reasoning: an educational model to enhance nursing students' ability to identify and manage clinically 'at risk' patients. *Nurse Educ Today.* 2010; 30(6): 515–20. Available from: https://doi.org/10.1016/j.nedt.2009.10.020.

11 Cashin A, Heartfield M, Bryce J, Devey L, Buckley T, Cox D, et al. Standards for practice for registered nurses in Australia. *Collegian.* 2017; 24(3): 255–66. Available from: https://doi.org/10.1016/j.colegn.2016.03.002.

12 Australian Commission on Safety and Quality in Health Care (ACSQHC). Australian safety and quality framework for health care: putting the framework into action: getting started. 2011. [cited 2020 Feb 1] Available from: https://www.safetyandquality.gov.au/wp-content/uploads/2011/01/ASQFHC-Guide-Healthcare-team.pdf.

13 Nursing and Midwifery Board of Australia (NMBA). Registered nurse standards of practice. 2016. [cited 2020 Feb 1] Available from: https://www.nursingmidwiferyboard.gov.au/codes-guidelines-statements/professional-standards/registered-nurse-standards-for-practice.aspx

14 Paans W, Muller-Staub, M, Krijnen WP. Outcome calculations based on nursing documentation in the first generation of electronic health records in the Netherlands. *Stud Health Technol Inform.* 2016; 225: 457–60. Available from: https://doi.org/10.1111/j.1365–2648.2010.05302.x.

15 Sanson G, Vellone E, Kangasniemi M, Alvaro R, D'Agostino F. Impact of nursing diagnoses on patient and organisational outcomes: a systematic literature review. *J Clin Nurs,* 2017; 26(23–24): 3764–83. Available from: https://doi.org/10.1111/jocn.13717.

16 Hadji B, Martin G, Dupuis I, Campoy E, Degoulet P. 14 years longitudinal evaluation of clinical information systems acceptance: the HEGP case. *Int J Med Inform.* 2016; 86: 20–9. Available from: https://doi.org/10.1016/j.ijmedinf.2015.11.016.

17 Boonen M, Rankin J, Vosman F, Niemeijer AJH. Nurses' knowledge and deliberations crucial to Barcoded Medication Administration technology in a Dutch hospital: discovering nurses' agency inside ruling. *Health.* 2018; 1363459318800155. Available from: https://doi.org/10.1177/1363459318800155.

18 Bail K, Merrick E, Redley B, Gibson J, Davey R, Currie M. "Blind leading the blind": qualitative evaluation of unanticipated difficulties during nurse testing of a hospital health information system. *Collegian.* 2019; 27: 82–8. Available from: https://doi.org/10.1016/j.colegn.2019.03.004.

19 Bossen C, Jensen LG, Udsen FW. Evaluation of a comprehensive EHR based on the DeLone and McLean model for IS success: approach, results, and success factors. *Int J Med Inform.* 2013; 82(10): 940–53. Available from: https://doi.org/10.1016/j.ijmedinf.2013.05.010.

20 Nykanen P, Kaipio J, Kuusisto A. Evaluation of the national nursing model and four nursing documentation systems in Finland – Lessons learned and directions for the future. *Int J Med Inform.* 2012; 81(8): 507–20. Available from: https://doi.org/10.1016/j.ijmedinf.2012.02.003.

21 Rathert C, Williams ES, Lawrence ER, Halbesleben JRB. Emotional exhaustion and workarounds in acute care: cross sectional tests of a theoretical framework. *Int J Nurs Stud.* 2012; 49(8): 969–77. Available from: https://doi.org/10.1016/j.ijnurstu.2012.02.011.

22 Paans W, Sermeus W, Nieweg RM, Van der Schans CP. D-Catch instrument: development and psychometric testing of a measurement instrument for nursing documentation in hospitals. *J Adv Nurs.* 2010; 66(6):1388–1400. Available from: https://doi.org/10.1111/j.1365–2648.2010.05302.x.

23 Botti M, Redley B, Nguyen L, Coleman K, Wickramasinghe N. Optimizing safety, fidelity and usability of an intelligent clinical support tool (ICST) for acute hospital care: an Australian case study using a multi-method Delphi process. *Stud Health Technol Inform.* 2015; 216: 912. Available from: https://europepmc.org/article/med/26262214

24 Deloitte Access Economics. Economic benefits of SmartWard. 2014. Canberra: Deloitte. [cited 2021 Jan 20] Available from https://www2.deloitte.com/au/en/pages/economics/articles/economic-benefits-smartward.html

25 Kent B. SmartWard development: evaluation of technology within simulated nursing settings. Melbourne: Deakin University. 2012.

24. Kent B, Redley B, Wickramasinghe N, Nguyen L, Taylor NJ, Moghimi H, et al. Exploring nurses' reactions to a novel technology to support acute health care delivery. *J Clin Nurs.* 2015; 24(15–16): 2340–51. Available from: https://doi.org/10.1111/jocn.12881.

25 Bail K, Davey R, Currie M, Gibson J, Merrick E, Redley B. Implementation pilot of a novel electronic bedside nursing chart: a mixed-method case study. *Aust Health Rev.* 2020; 44: 672–76. Available from: https://doi.org/10.1071/AH18231.

26 Mueller-Staub M, Lunney M, Odenbreit M, Needham I, Lavin MA, Van Achterberg T. Development of an instrument to measure the quality of documented nursing diagnoses, interventions and outcomes: the Q-DIO. *J Clin Nurs.* 2009; 18(7): 1027–37. Available from: https://doi.org/10.1111/j.1365–2702.2008.02603.x.

27 Mueller-Staub M. Preparing nurses to use standardized nursing language in the electronic health record. *Stud Health Technol Inform.* 2009; 146: 337–41. Available from: https://doi.org/10.3233/978–1-60750–024–7-337.

28 Mueller-Staub M, Lunney M, Lavin MA, Needham I, Odenbreit M, Van Achterberg T. Psychometric properties of Q-DIO, an instrument to measure the quality of documented nursing diagnoses, interventions and outcomes. *Pflege.* 2010; 23(2): 119–28. Available from: https://doi.org/10.1024/1012–5302/a000024.

29 Wang N, Bjorvell C, Hailey D, Yu P. Development of the quality of Australian Nursing Documentation in Aged Care (QANDAC) instrument to assess paper-based and electronic resident records. *Australas J Ageing.* 2014; 33(4): E18-E24. Available from: https://doi.org/10.1111/ajag.12072.

30 Redley B, Baker T. Have you SCAND MMe Please? A framework to prevent harm during acute hospitalisation of older persons: a retrospective audit. *J Clin Nurs.* 2018; 28(3–4): 560–74. Available from: https://doi.org/10.1111/jocn.14650.

31 Broderick MC, Coffey A. Person-centred care in nursing documentation. *Int J Older People Nurs.* 2013; 8(4): 309–18. Available from: https://doi.org/10.1111/opn.12012.

32 Jedwab RM, Chalmers C, Dobroff N, Redley B. Measuring nursing benefits of an electronic medical record system: a scoping review. *Collegian.* 2019; 26(5): 562–82. Available from: https://doi.org/10.1016/j.colegn.2019.01.003.

33 Redley B, Raggatt M. Use of standard risk screening and assessment forms to prevent harm to older people in Australian hospitals: a mixed methods study. *BMJ Qual Saf.* 2017; 26(9): 704–13. Available from: https://doi.org/10.1136/bmjqs-2016–005867.

34 Vaughn VM, Linder JA. Thoughtless design of the electronic health record drives overuse, but purposeful design can nudge improved patient care. *BMJ Qual Saf.* 2018; 27(8): 583–86. Available from: https://doi.org/10.1136/bmjqs-2017–007578.

35 Michie S. Behaviour change beyond nudge. London University College: London. 2015

36 Patel MS, Volpp KG, Asch DA. Nudge units to improve the delivery of health care. *N Engl J Med.* 2018; 378(3): 214. Available from: https://doi.org/10.1056/NEJMp1712984.

37 Mlakar T, Mihelic Zajec A, Jevsnik M. Use of a nudge tool for improving hand hygiene in a nursing team in home for elderly people – case study. *Int J Sanitary Engineering Res.* 2017; 11(1): 33–46. Available from: https://repozitorij.uni-lj.si/Dokument.php?id=124923&lang=slv

38 Ostrovsky Y, Buttaro TM, Diamond J, Hayes JJI. Technology and dynamic pathways: how to improve nursing care, documentation, and efficiency. *Iproceedings.* 2016; 2(1): e31. Available from: https://doi.org/10.2196/iproc.6158.

39 Halpern SD. Using default options and other nudges to improve critical care. *Crit Care Med.* 2018; 46(3): 460–64. Available from: https://doi.org/10.1097/CCM.0000000000002898.

40 Karkkainen O, Bondas T, Eriksson K. Documentation of individualized patient care: a qualitative metasynthesis. *Nurs Ethics.* 2005; 12(2): 123–32. Available from: https://doi.org/10.1191/0969733005ne769oa.

RESEARCH ARTICLES

An audit of obesity data and concordance with diagnostic coding for patients admitted to Western Australian Country Health Service hospitals

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ABSTRACT

Objective: Accurate patient obesity data can be used to identify and mitigate patient manual handling risks to healthcare staff. This study investigates the accuracy of patient obesity data within the Western Australian Country Health Service (WACHS) and examines factors potentially affecting obesity data accuracy.

Background: Risk of injuries to healthcare staff are increasing due to rising patient obesity. Consistent increases in the prevalence of obesity in Australia have been recorded since 1995 and Australian obesity projections predict that 42% of the population will be obese in 2035. To manage the increased risks of injuries to healthcare workers due to obese patient management, accurate healthcare data relating to patient obesity is required.

Design: Researchers examined records of patients admitted to WACHS hospitals with Type II Diabetes, which has confirmed links with obesity. Manual data extraction and comparison of obesity related data within patient medical records and electronic patient admission data was conducted to determine accuracy.

Results: Analysis of the patient data examination demonstrated poor recording of weight (67%), height (24%) and Body Mass Index (BMI) when weight and height measurements were recorded (10%). Poor obesity data accuracy was also determined by low sensitivity results (40%), high false negative results (60%) and a Cohen's kappa value of 0.44.

Discussion: The sensitivity result demonstrates that only 40% of obese patients were coded as obese when obesity is recorded in their medical files, and the false negative result demonstrates that where obesity notations were present in medical files, 60% of these cases were incorrectly coded as 'normal weighted'. There was only moderate agreement between the occurrences of coded obesity and the recorded obese patient notations in the medical files.

Conclusion: Further research is required to inform enhancements to improve obesity recording and coding accuracy, which will increase the collection of reliable obesity data that could be used to reduce obese patient handling risks to nurses and other healthcare staff.

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What is already known about the topic?

- Increasing Australian population obesity rates have been previously demonstrated, this increase corresponds with increasing numbers of obese patients being admitted into hospitals.
- Healthcare staff who care for obese patients are at increased risk of injuries when conducting patient handling tasks.

What this paper adds:

- A model to measure obesity accuracy utilising 14 data accuracy indicators was used, revealing poor obesity data accuracy and poor completeness of obesity data.
- Completeness of obesity data is influenced by time demands and workload of clinicians, breadth of clinical recording requirements, lack of organisational direction for the need of obesity data, and challenges in obtaining height measurements of patients who are mobility impaired, bed-ridden or unable to stand.
- Complete and accurate obesity data collections will result in increased ability to mitigate safety risks to healthcare staff who manage obese patients and may improve healthcare funding accuracy.

Keywords: Obesity, obese, patient handling, coding, administrative data.

INTRODUCTION

Increased risk of injuries to healthcare staff due to rising patient obesity is creating challenges for Australian healthcare organisations. Despite some Australian hospitals implementing 'no lift' policies, staff continue to experience musculoskeletal injuries due to obese (bariatric) patient handling requirements, particularly those staff who work in country or rural locations and the ageing healthcare workforce. Due to these injuries, which may affect both a worker's long term ability to perform work tasks and their home lifestyle, healthcare organisations are increasingly being affected by high insurance premiums and demands to improve staff safety.

The high prevalence of obesity within the Australian community is well documented, with the Australian Bureau of Statistics' (ABS) National Health Survey 2017–18 revealing that 31.3% of Australians aged 18 years and over were obese,[1] and 35.6% were overweight. Consistent increases in the prevalence of obesity rates in Australia have been recorded since the ABS commenced collecting obesity data in 1995, from 18.7% in 1995, 24.4% in 2007–08 to 31.3% in 2017–18.[1–3] More disturbingly, Australian obesity projections predict that in 2035, 42% of the population will be obese.[4] This data demonstrates continuing risks for healthcare workers due to the population obesity prevalence increase and increases in obese patients requiring hospital admissions.[5–8]

Accurate healthcare data relating to patient obesity is required to manage the increased risks of injuries to healthcare workers due to obese patient management. Healthcare organisations may have difficulties in designing and implementing evidence-based proactive risk management approaches due to lack of relevant data. Absence of obesity data may cause either ignorance of this risk or cause organisations to rely on anecdotal evidence of the risks. Seigal & Ruoff promote the use of data to reduce organisational risks, assist organisational decision making ability and develop strategic direction and action plans to meet organisational needs.[9] Similarly, Stanfill et al. assert that the need for data and data analysis in healthcare has never been bigger,[10] and accurate coding and reporting of health diagnosis and conditions has become more crucial as healthcare data requirements have advanced.

In hospital environments, weight, BMI scores and/or notations of obesity are routinely captured for many healthcare requirements and are either manually or electronically recorded in patient files. Many Australian healthcare organisations are currently transitioning to the adoption of electronic health records, however a variety of methods of recording patient information is currently being used including the use of manual patient files, electronic records or hybrid models that involve manual files being scanned into patient admission databases. When patients are discharged from hospital, their admission records are analysed by clinical coding staff who assign up to 50 diagnosis codes to the patient electronic record. Obesity is coded when the condition is clinically observed and impacts the patient's management during their hospital admission by either requiring the commencement, alteration or adjustment of therapeutic treatment; requiring additional diagnostic procedures and/or requiring increased clinical care and/or monitoring. Diagnosis coding is undertaken according to the Australian Coding Standards 9th Edition as defined by the ACCD.[11] The Australian Coding Standards is a tool used by clinical coding staff that standardises code definitions and is used to ensure data consistency and integrity across all Australian health service providers.

Identifying obese patient admissions, and the related injury risks to healthcare workers who manage obese patients, is especially important for healthcare organisations in country or rural locations, as obesity rates are generally higher in country locations than metropolitan locations.[14] In order to identify these risks in country hospital locations, an examination of obesity data accuracy is required. The

Western Australian Country Health Service (WACHS) was selected for this study as it is the largest country (rural) health system in Australia, which provides an extensive range of health services across an area of 2.53 million square kilometres for an estimated population of 531,000 people.

Accuracy of obesity coding data has been examined in several international studies such as Martin et al. and Quan et al. which assessed variability between obesity coding and manual chart reviews,[12,13] and both studies found large variances between the chart review results and clinical coding data. McClean, Cross and Reed conducted a pilot study into the accuracy of obese patient admission data recorded by the Western Australian Country Health Service in 2017,[15] which revealed poor recording of weight (59%), height (15%) and Body Mass Index (BMI) when weight and height measurements were recorded (8%). Poor obesity data accuracy was also determined by low sensitivity results (41%) and high false negative results (59%). The sensitivity result demonstrated that, where obesity was recorded in patient files, only 41% were coded as obese. The obesity accuracy analysis methods used in the pilot study were successful and the study demonstrated a requirement for further analysis that may be able to inform enhancements to improve obesity recording and coding accuracy.

AIM

This research aims to determine if obese patient admission data recorded by WACHS provides sufficient accuracy to be used to implement risk mitigation strategies for nurses and other healthcare staff performing obese patient handling tasks.

METHOD

DESIGN AND SETTING

This study employed a retrospective audit of WACHS Patient Admission data and a manual examination of medical records at four WACHS regional hospitals (Sites A, B, C and D). The hospitals were selected as they are larger health campuses in four different regions of Western Australia, and therefore are more likely to capture variations in rural obesity rates. The study examines the inclusion or absence of manual obesity notations, electronic obesity codes, weight, height and BMI recording. The application of BMI to measure obesity in this study was selected due to BMI being widely accepted as a reliable, inexpensive and efficient method of obesity measurement.[16] In this study obesity is defined as a BMI equal to, or more than 30 kg/m,^{2} which is in agreement with previous literature examining bariatric coding and ACCD definitions of obesity.[5,11,13,18] The World Health Organization (WHO) defines the BMI calculation methodology as a person's weight in kilograms divided by the square of the person's height in metres (kg/m^2).[17]

The study was approved by the Edith Cowan University (ECU) Human Research Ethics Committee, the WACHS Human Research Ethics Committee, the WACHS Research Governance Office and the WACHS Chief Executive.

PATIENT CHARACTERISTICS

De-identified patient admission data from the WebPAS®, TOPAS® and HCare® data administration systems was provided to the researchers by a WACHS Health Information Manager (HIM). The patient admission data inclusion criteria comprised of records for patients who were admitted to hospital for five days or more and discharged between 1 July 2015 and 30 June 2017, patients who were over the age of 18 at the time of hospital admission, and who had principal or additional diagnosis of "diabetes mellitus", which includes Type II diabetes. Diagnoses of Type II diabetes was selected as an inclusion criterion as it has a confirmed link with obesity.[19,20] Records of patients who were admitted to hospital more than once in the audit period were included.

The data excluded records of patient boarders such as palliative care, and patients who use other health services such as outpatient treatments. Patients who had diagnosis terms of Type 1 Diabetes Mellitus, Family history of diabetes mellitus, Pre-existing diabetes mellitus, Type 1, or 'in pregnancy' were also excluded from the data. These exclusions were selected due to palliative care and outpatient services not conforming to the research focus of examining patient admission to hospitals, lack of confirmed links between obesity and Type 1 diabetes, and pregnancy-related diabetes being a potentially temporary condition.

PROCEDURE

The examination of obesity coding was conducted by identification of obesity codes within the selected patient records that met the inclusion criteria. The principal and additional diagnosis codes relating to obesity as defined by the Australian Coding Standards 9th Edition are:[11]

- E66 – Obesity;
- E66.0 – Obesity due to excess calories;
- E66.1 – Drug induced obesity;
- E66.2 – Extreme obesity with alveolar hypoventilation;
- E66.8 – Other obesity;
- E66.9 – Obesity, unspecified; and
- U78.1 – Endocrine, nutritional and metabolic diseases – obesity

WACHS Health Information Managers determined patients and their corresponding episodes (admission and discharge dates) that fell within the study inclusion criteria. A manual examination of the medical files was then conducted to examine the inclusion or absence of obesity recording, and weight, height and BMI recording. Sections of the medical files examined included but were not limited to Emergency

Department notes, nursing admission screening tools, handover/interim care plans, progress notes, medication charts, anaesthetic records, insulin charts, malnutrition screening tools, dietetics assessments, fluid balance charts, perioperative pathway forms and discharge summaries. The principal researcher undertook training on medical file examination techniques before the manual file examination to ensure sound data extraction methods were met.

DATA ANALYSIS

A comparative assessment was conducted against the medical file data and the occurrence of principal and additional diagnosis codes relating to obesity, being the E66 coding suite and U78.1 additional diagnosis code. Seven quantitative techniques were utilised to examine the accuracy of the patient admission data compared with medical file reviews: sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), false negative rates, false positive rates and Cohen's Kappa values. This analysis methodology is commonly used in clinical examinations of interventions and comparisons, and is supported by several clinical research projects, including Lee et al. and Ho et al.[21,22] Seven additional methods of quantitative analysis were also applied: percentage coded as obese, weight recorded, height recorded, BMI calculated, height and weight recorded with no BMI, obesity or BMI notations recorded and obesity or BMI notations recorded but height and weight not recorded.

Measuring sensitivity determined the degree of obesity recording in the patient admission data when it was first present in the medical files, while specificity measured the absence of obesity conditions in the patient admission data if the condition is absent in the medical files. Accuracy of the clinical coding of obesity-related conditions was examined by the analysis of PPVs and NPVs. Negative predictive value firstly examines the absence of obesity coding and then examines the absence of obesity notations in medical files, conversely positive predictive value firstly examines the cases that were coded as obese and then examines the occurrences of obesity notations in medical files. Cohen's Kappa values determined the agreement between the patient admission data and the medical file data.

RESULTS

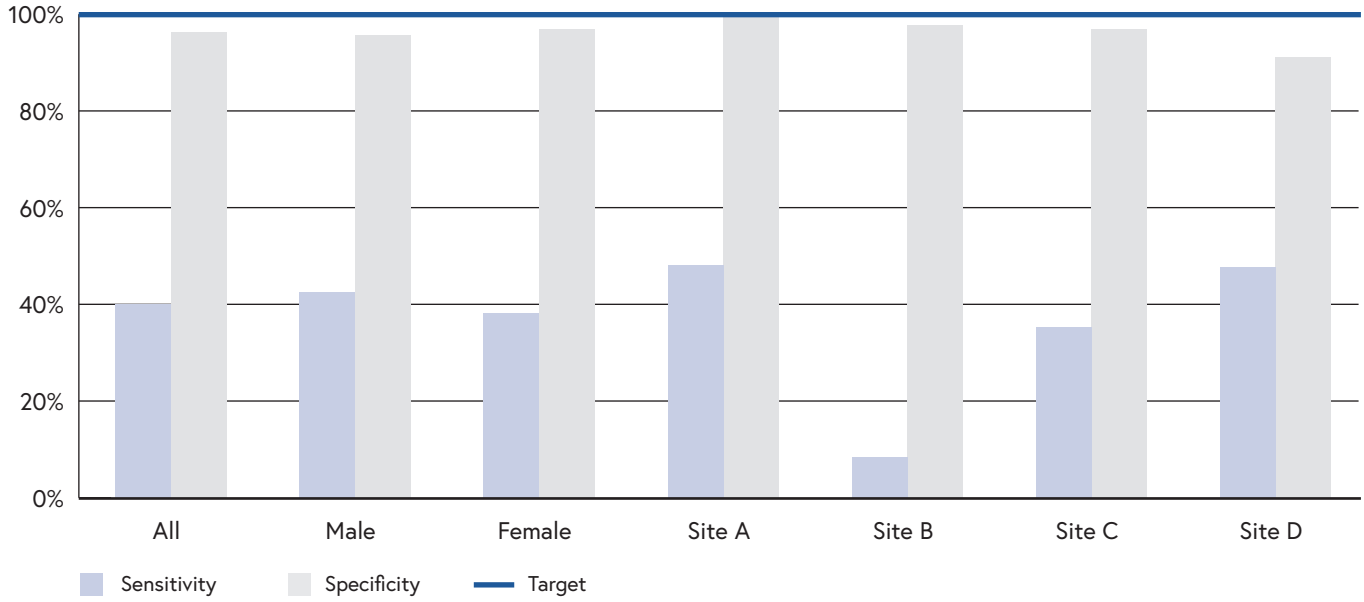
The summary of the results of the statistical analysis of obesity data accuracy indicators is shown in Table 1.

The study included 590 records consisting of those of 297 males (50.3%) and 293 females (49.7%) aged between 18 and 98 years. Obesity was coded in 10.8% of all patients, with weight being recorded in 67.3% of all patients and height being recorded in 24.1% of patients. BMI was calculated in 10.8% of all patients, and of the patients who had height and weight recorded, 62% of patients did not have BMI recorded. Obesity or BMI notations were recorded in 19.4% of all patients, however 9.3% of obesity or BMI notations were not supported by height or weight records.

Analysis of average sensitivity and specificity between obesity coding and obesity recordings in medical files resulted in 40 and 96.2% respectively. Analysis of average negative predictive values and positive predictive value resulted in 86.9 and 71.8% respectively. The average false positive outcome was 3.8%, while the average false negative outcome

TABLE 1: WACHS PATIENT ADMISSION OBESITY ACCURACY AND INTER-RATER RELIABILITY ANALYSIS

	All	Male	Female	Site A	Site B	Site C	Site D
Records within research criteria	847	422	425	209	199	219	220
Records audited	590	297	293	166	100	158	166
Coded as obese (n, %)	64 (10.8%)	31 (10.4%)	33 (11.3%)	14 (8.4%)	3 (3.0%)	16 (10.1%)	31 (18.67%)
Weight recorded	397 (67.3%)	190 (64.0%)	207 (70.6%)	94 (56.6%)	70 (70.0%)	100 (63.3%)	133 (80.1%)
Height recorded	142 (24.1%)	63 (21.2%)	79 (26.6%)	21 (12.6%)	9 (9.0%)	33 (20.1%)	79 (47.6%)
BMI calculated	64 (10.8%)	20 (6.7%)	44 (15.0%	10 (6.0%)	7 (7.0%)	19 (12.0%)	28 (16.9%)
Height and weight recorded, no BMI	88 (62.0%)	44 (69.8%)	44 (55.7%)	12 (57.1%)	8 (88.8%)	14 (42.4%)	54 (68.3%)
Obesity or BMI notations recorded	115 (19.4%)	47 (15.8%)	68 (23.2%)	27 (16.2%)	12 (12.0%)	34 (21.5%)	42 (25.3%)
Obesity or BMI notations recorded but height and weight not recorded	55 (9.3%)	23 (7.7%)	32 (10.9%)	21 (12.6%)	11 11.0%)	12 (7.5%)	11 (6.6%)
Sensitivity	40.0%	42.6%	38.2%	48.1%	8.3%	35.3%	47.6%
Specificity	96.2%	95.6%	96.9%	99.3%	97.7%	96.8%	91.1%
NPV	86.9%	89.9%	83.9%	90.8%	88.6%	84.5%	83.7%
PPV	71.8%	64.5%	78.8%	92.9%	33.3%	75.0%	64.5%
False positive	3.8%	4.4%	3.1%	0.7%	2.3%	3.2%	8.9%
False negative	60.0%	57.4%	61.8%	51.9%	91.7%	64.7%	52.4%
Kappa	0.44	0.44	0.43	0.59	0.09	0.40	0.42



GRAPH 1: WACHS OBESITY DATA SENSITIVITY AND SPECIFICITY

was 60%. The average Cohen's kappa value was 0.44. Graph 1 displays the sensitivity and specificity results, and includes an aspirational specificity and sensitivity targets established by the study authors of 100% in order to support enhanced obesity coding accuracy.

As a result of patient records being archived in offsite locations due to limited hospital storage, patient records being used on hospital wards or in outpatient departments due to ongoing treatment, patients records being utilised for clinical coding or limitations of researcher availability (as discussed in limitations section), 257 records were unable to be examined.

DISCUSSION

Generally, poor obesity accuracy of the patient admission data was demonstrated in the comparative data analysis of obese patient coding and obesity recordings in medical files. Low average sensitivity results (40%), high average false negative results (60%) and the Cohen's kappa value of 0.44 all support findings of poor accuracy of the obese patient admission data. The sensitivity result demonstrates that, where obesity was recorded in patient files, only 40% were coded as obese, similarly the average false negative result of 60% demonstrated that of all cases that should have been coded as obese due to the inclusion of obesity calculations or notations in the medical files, 60% of these cases were incorrectly coded as 'normal weighted'. Cohen's kappa value demonstrates correlation between occurrences of coded obesity and the recorded obese patient notations in the medical files, with the closer the result value is to one, the higher the correlation. The study's average Cohen's kappa value result of 0.44 demonstrated only moderate agreement. The positive predictive value of 71.8% did however demonstrate moderate levels of accuracy when clinical coding staff are coding obesity and there is evidence of obesity in the clinical file records.

Conversely, high accuracy of coding non-obese patients was demonstrated by the high average specificity result (96.2%), and high average negative predictive values (86.9%). The specificity result demonstrated that where there are no obesity notations recorded, clinical coders are correctly coding these patients as normal weighted in 96.2% of all occurrences. Similarly, the average negative predictive value result of 86.9% demonstrated that of all 'normal weighted' coded patients, 86.9% of these patients did not have obesity notations recorded in medical files.

There was poor completeness of weight, height and BMI measurement data in patient files (67.3, 24.1 and 10.8% respectively). While scales to measure patient weight are commonly available in healthcare organisations, equipment to measure patient height is often lacking which could contribute to the low recording of patient height, which negatively impacts clinician ability to conduct BMI calculations. Wall mounted and calibrated height measurement tools should be readily available in hospital wards to measure patient height. For patients who are mobility impaired, bed-ridden or unable to stand due to their health conditions, healthcare workers may be challenged to obtain height data, an essential measurement used in BMI calculations that translate to obesity coding. Several evidence-based methods of obtaining reliable height measurements from bone measurements are available, such as the Ulna length method, Demi-span method or knee height method. These methods provide accurate estimates of stature in normally proportioned adults, and clinicians should be trained in the use of these alternate height measurement techniques.[23–25]

Poor completeness of weight, height and BMI data may also be due to time demands and workload of clinicians, breadth of total clinical recording requirements, and lack of organisational direction for the need of this data. Galinski, Hudock & Streit highlight that approximately 75% of morbidly obese patients have at least one co-morbid condition.[5] The immediate focus of both doctors and nurses is the treatment of the condition causing the patient to be admitted. This concentrated focus on the health condition(s) causing hospital admission is also mirrored in coding practices, where primary health conditions are coded in the first instance, as they are important indicators for health condition data and funding provision by the Western Australian government.

Stanfill et al. asserts that data recording and analysis in healthcare has increased substantially over time,[10] and high data collection requirements that healthcare organisations place on their clinicians may affect their prioritisation of obesity data recording. In addition to the competing data priorities, lack of clinician awareness of the importance and use of obesity data for clinical, safety and funding purposes are likely contributors to the absence of obesity data and notations in files of obese patients. Insufficient organisational prioritisation of obesity data recording and use of the data itself, and related lack of auditing of the obesity data recording, may also be a factor that further influences low obesity data recording. As healthcare organisations progress to electronic patient records, consideration should be given to mandatory recording fields for patient height and weight, automated BMI calculations, and indicators or 'file flags' for patients who are obese and require additional patient care measures.

The requirement for obesity codes to be added to the coding data set in an 'opt in' data approach is likely to be an additional contributing factor that will affect obesity coding accuracy. If obesity is not coded, the default data position indicates 'normal weighted'. Another challenge to obesity data accuracy is requirements within the Australian Coding Standards 9th Edition for coders to only code patients as obese if a BMI score is provided or a clinical notation detailing patient obesity is explicitly recorded. Currently, if weight and height are available within the medical record, coders are not able to calculate and code BMI. In practice, however, weight, height and BMI recording itself is low. Even when weight and height is recorded in the patient's medical file, in 62% of these instances the measurements are not translated to a BMI calculation by the clinician.

Furthermore, clinical notes which indicate a high BMI has been observed (such as ↑ BMI) are not deemed to be sufficient detail to be coded. While the data challenges do not impact the clinical treatment of obese patients, they do affect an organisation's ability to proactively manage obese patient handling risks by the identification of current risks and predicting the extent of future risks. The ability for clinical coders to use height, weight and BMI scores to code obesity, and the resulting impact on obesity data accuracy should be explored further. Again, with the adoption of electronic patient records, mandatory recording of height and weight, automated BMI calculations, and a check box field that indicates an impact to clinical care may be worthy of further examination.

It appears that a degree of obesity notations by clinical staff are likely due to visible observations of obesity. Within the examined medical files, there were 115 instances of BMI or obesity notations recorded in the clinical notes, of which 55 records were not supported by a recorded patient weight or height. Of the 115 records with obesity notations, only 64 medical files contained BMI scores. Furthermore, visual obesity identification may be affected by obesity normalisation due to increased prevalence of both obese patient presentations within the healthcare setting and in the community. As a result of continually rising prevalence of obesity in Australia, society's acceptance of heavier body weights as 'normal' is also increasing, such as described by Maynard and others.[26] Therefore, a clinician's visual assessment may underestimate BMI. While clinical notations of obesity are important, these are likely to be subjective observations and should be supported by measured weight, height and BMI data.

Finally, lack of obesity records and coded data has healthcare funding implications. All diagnosis codes are processed through a series of calculations including Diagnosis-related Groups (DRGs) and National Weighted Activity Units (NWAUs) that result in hospital funding for the patient service that is determined by the Activity Based Funding (ABF) system. If treatment is provided for obese patients where patient care is affected by the obesity condition, lack of obesity recording or coding will result in these factors not being included in the funding calculations. For example, this will mean that instances of change in patient care such as increased staffing requirements for lifting, turning or toileting of obese patients, use of bariatric equipment, increases in anaesthetic or medication doses, change in rehabilitation approaches, and change in clinical risk categories for obese maternity patients will not be included in the funding calculations. The impact on healthcare funding due to lack of obesity coding or coding inaccuracy should also be explored further.

LIMITATIONS

Examining the clinical methods of obtaining the data contained within patient files and the accuracy of this data is outside of the scope of the research study. The data within patient files is recorded by trained clinical staff and is considered to be the gold standard for analysis and comparison. Due to the distance between WACHS hospitals and associated travel requirements for researchers to attend

rural hospital locations to conduct manual file examinations, it is acknowledged that a limitation of this study is researcher availability. While the data collection provided valid results, increased data collections may be required to inform future research which will require increased researcher availability. The ongoing adoption of electronic health records by healthcare organisations will likely allow researchers to manually review patient files at central locations, which may reduce this limitation in the future. An additional limitation due to researcher availability was the inclusion of patients only with Type II Diabetes. As diabetes is strongly linked to obesity, rates of obesity coding in the patient administrative data may be higher than in the general population. Expanding the patient inclusion criteria will allow an examination of obesity recording accuracy of the general patient population.

CONCLUSION

Healthcare organisations have a legal obligation under Occupational Safety and Health/Work Health and Safety legislation to ensure safe workplaces are provided to employees who manage obese patients. Anecdotal awareness of increased obese patient admissions and corresponding increased risks of injuries to healthcare staff are acknowledged by healthcare executives, nursing staff and Occupational Health and Safety staff, however the ability for healthcare organisations to identify obese patient admission trends and adopt risk management approaches is impacted by low obese patient admission coding accuracy, particularly in the areas of sensitivity and false negatives.

IMPLICATIONS FOR RESEARCH, POLICY AND PRACTICE

Enhanced methods to record BMI and obesity should be considered, including mandatory recording of weight and height and progressing organisational movement to electronic healthcare records. Automated BMI calculations and user-friendly methods to indicate patient care impacts of obesity will assist clinicians to easily record obesity data and simplify obesity coding, which will increase obesity data accuracy. Until full adoption of electronic health records, healthcare organisations should promote the importance of obesity data and increase clinical staff awareness of the requirement for improved height, weight and BMI recording, and the potential use of this data for non-clinical uses such as obese patient handling risk mitigation. The impact of current obesity coding processes should be examined, particularly the absence of obesity recording resulting in the default data coding position indicating 'normal weighted'. Furthermore, investigation of alternative coding methods to obtain obesity recordings should be conducted such as allowing clinical coders the ability to determine BMI categories if height and weight measurements are available in medical files.

CONFLICT OF INTEREST

The authors of this paper declare no conflict of interest.

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REFERENCES

1 Australian Bureau of Statistics (ABS). National health survey: first results, 2017–18 (cat. no. 4364.0.55.001). Australian Bureau of Statistics. Canberra. 2019. [cited 2019 Nov 16] Available from: https://www.abs.gov.au/statistics/health/health-conditions-and-risks/national-health-survey-first-results/latest-release

2 Australian Bureau of Statistics (ABS). National health survey: first results, 1995 (cat. no. 4392.0). Australian Bureau of Statistics. Canberra. 1996. [cited 2019 Nov 16]. Available from: https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4392.0Main+Features11995?OpenDocument

3 Australian Bureau of Statistics (ABS). Overweight and obesity in adults in Australia: a snapshot, 2007–08 (cat. no. 4842.0.55.001). Canberra. 2011. [cited 2019 Nov 18] Available from: https://www.abs.gov.au/ausstats/abs@.nsf/mf/4842.0.55.001/

4 Walls HL, Magliano DJ, Stevenson CE, Backholer K, Mannan HR, Shaw JE, et al. Projected progression of the prevalence of obesity in Australia. *Obesity*. 2012; 20(4): 872–78. Available from: https://doi.org/10.1038/oby.2010.338

5 Galinsky T, Hudock S, Streit J. Addressing the need for research on bariatric patient handling. *Rehabil Nurs* . 2010; 35(6): 242–47. Available from: https://doi.org/10.1002/j.2048–7940.2010.tb00054.x

6 Muir M, Archer-Heese G, McLean D, Bodnar S, Rock B. Handling of the bariatric patient in critical care: a case study of lessons learned. *Crit Care Nurs Clin North Am.* 2007; 19(2): 223–40. Available from: https://doi.org/10.1016/j.ccell.2007.02.010

7 Australian National Preventative Health Agency (ANPHA). Obesity: Prevalence trends in Australia. Sydney. 2014 [cited 2016 Nov 14]; Available from: http://sydney.edu.au/medicine/research/units/boden/ANPHA%20Obesity%20Prevalence%20Trends.pdf

8 Pieracci F, Barie P, Pomp A. Critical care of the bariatric patient. *Crit Care Med.* 2006; 34(6): 1796–1804. Available from: https://doi.org/10.1097/01.CCM.0000217216.84983.0A

9 Seigal D, Ruoff G. Data as a catalyst for change: Stories from the frontlines. *J Healthc Risk Manag.* 2015; 34(3):18–25. Available from: https://doi-org.ezproxy.ecu.edu.au/10.1002/jhrm.21161

10 Stanfill MH, Williams M, Fenton SH, Jenders RA, Hersh WR. A systematic literature review of automated clinical coding and classification systems. *J Am Med Inform Assoc.* 2010; 17(6): 646–51.

11 Australian Consortium for Classification Development. Australian Coding Standard 9th Edition. New South Wales. 2015. Available on request by ACCD https://www.accd.net.au

12 Martin B, Chen G, Graham M, Quan H. Coding of obesity in administrative hospital discharge abstract data: accuracy and impact for future research studies. *BMC Health Serv Res.* 2014; 14(70): 1–8. Available from: https://link.springer.com/article/10.1186/1472–6963–14–70

13 Quan H, Li B, Saunders D, Parsons GA, Nilsson CI, Alibhai A, et al. Assessing validity of ICD-9-CM and ICD-10 administrative data in recording clinical conditions in a unique dually coded database. *Health Serv Res.* 2008; 43(4): 1424–41. Available from: https://doi-org.ezproxy.ecu.edu.au/10.1111/j.1475–6773.2007.00822.x

14 Australian Bureau of Statistics (ABS). Overweight and obesity in adults, Australia, 2004–05 (cat. no. 4719.0).Canberra. 2008. [cited 2017 Oct 8]. Available from http://www.abs.gov.au/ausstats/abs@.nsf/mf/4719.0/.

15 McClean K, Cross M, Reed S. Accuracy of obese patient admission data recorded by the Western Australian Country Health Service: A pilot study. *J Health Saf Environ.* 2019; 35(1):107–17.

16 Lemay CA, Cashman SB, Savageau JA, Reidy PA. Effect of a low-cost intervention on recording body mass index in patients' records. *J Nurs Scholarsh.* 2004; 36(4): 312–15. Available from https://doi-org.ezproxy.ecu.edu.au/10.1111/j.1547–5069.2004.04057.x

17 World Health Organization. Preventing and managing the global epidemic: WHO obesity technical report series 894. Geneva. 2000. [cited 2018 May 1]. Available from http://www.who.int/iris/handle/10665/42330.

18 Grant P, Lipscomb D. Diagnosis of obesity and clinical implications. *Pract Diabetes Int.* 2008; 25(9): 376. Available from https://doi-org.ezproxy.ecu.edu.au/10.1002/pdi.1313

19 American Society for Metabolic and Bariatric Surgery. Fact sheet: Obesity in America. *American Society for Metabolic and Bariatric Surgery.* Florida. 2013. [cited 2016 Mar 16]. Available from https://asmbs.org/app/uploads/2014/06/Obesity-in-America-1.pdf

20 Medical Research Council United Kingdom. Diabetes: facts and stats. *Diabetes UK.* London. 2015. [cited 2016 Mar 21] Available from https://www.mrc.ac.uk/documents/pdf/diabetes-uk-facts-and-stats-june-2015

21 Lee YYC, Roberts CL, Young J, Dobbins T. Using hospital discharge data to identify incident pregnancy-associated cancers: a validation study. *BMC Pregnancy Childbirth.* 2013; 13(37): 1–6. Available from https://link.springer.com/article/10.1186/1471–2393–13–37

22 Ho ML, Lawrence N, Van Walraven C, Manuel D, Keely E, Malcolm J, et al. The accuracy of using integrated electronic health care data to identify patients with undiagnosed diabetes mellitus. *J Eval Clin Pract.* 2012; 18(3): 606–11. Available from https://doi.org/10.1111/j.1365–2753.2011.01633.x

23 Han TS, Lean ME. Lower leg length as an index of stature in adults. *Int J Obes Relat Metab Disord.* 1996; 20(1): 21–7. Available from https://pubmed.ncbi.nlm.nih.gov/8788318/

24 Hickson M, Frost G. A comparison of three methods for estimating height in the acutely ill elderly population. *J Hum Nutr Diet.* 2003; 16(1): 13–20. Available from: https://doi.org/10.1046/j.1365–277x.2003.00416.x

25 Jarzem PF, Gledhill RB. Predicting height from arm measurements. *J Pediatr Orthop.* 1993; 13(6): 761–65. Available from: https://doi.org/10.1097/01241398–199311000–00014

26 Maynard LM, Serdula MK, Galuska DA, Gillespie C, Mokdad, AH. Secular trends in desired weight of adults. *Int J Obes.* 2006; 30(9):1375–81. Available from https://search-proquest-com.ezproxy.ecu.edu.au/docview/219271488

RESEARCH ARTICLES

Inpatient falls prevention: state-wide survey to identify variability in Western Australian hospitals

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ABSTRACT

Objective: A point prevalence survey was conducted across Western Australia to monitor adherence to evidence-based practices to prevent falls in hospitals.

Study design and methods: A state-wide point prevalence survey of patients and their medical records was conducted across 20 hospitals, over 17 days during May 2014. The survey determined rates of: provision of verbal information to patients; completion of a falls risk screening tool and age based cognitive testing. Univariate and multivariate logistic regression was utilised to determine key risks and opportunities to improve.

Results: Information was collected from 2,720 patients. The provision of verbal information to prevent falls, as recalled by patients was 60% (hospital range 35–88%). This was significantly higher for patients with a stay of six or more days or involved in rehabilitation care. Perinatal women were three times less likely to be provided with verbal falls prevention information. A falls risk screening tool was completed for 82% of patients (range 28–98%). Perinatal women, and both adult and paediatric patients compared to older adults, were significantly less likely to have a complete falls risk screening tool. Thirty seven percent of patients within the recommended age ranges had cognitive testing (range 0–87%). Short-term patients and those not involved in rehabilitation, were significantly less likely to have been tested.

Discussion: The survey identified differences in patient care and supporting processes across all hospitals. The results have highlighted areas for improvement.

Conclusion: There were wide variations across all the hospitals in the provision of falls information, completion of falls risk screening tools and cognitive testing. At significant risk of missing out on falls prevention strategies were short stay patients and perinatal women. Five hospitals had significantly low rates of cognitive testing, indicating a hospital-wide issue rather than specific patient cohorts. Subsequently, the importance of ensuring that falls prevention strategies are conducted is vital to reduce preventable inpatient falls in all care settings.

Implications for research, policy and practice:

- This was the first state-wide point prevalence study in WA and it has informed the need for further research into the implication of falls risk inpatients.
- It was found that falls risk assessment was not conducted for each patient who met the screening criteria. A review of the criteria, and practicability to carry out the assessment may need to be further investigated to determine if the practice should be refined.

What is already known about the topic?
- Falls in hospitals are a frequent and largely considered preventable health concern.
- Falls that occur in hospitals are associated with an increased length of stay and use of health resources.

What this paper adds:
- This paper offers a comprehensive insight into the variation in hospital falls prevention strategies, from a state-wide perspective. It also identifies perinatal women as a high-risk group who are missing out on falls prevention strategies despite having the potential to fall.
- It also gives an insight to health services that not all at risk patients are being screened and those screened are not screened early in their inpatient stay which can be a risk to both patient and staff.

Keywords: Patient, falls, accidental falls, prevention, surveys, hospitals, risk assessment/methods

INTRODUCTION

Falls in hospitals are a frequent and largely considered preventable health concern. Falls that occur in hospitals are associated with an increased length of stay and use of health resources.[1–3] In Australia, in 2015–16, about 34,000 episodes of care reported a fall that occurred in a health service, at a rate of 3.2 per 1,000 separations. In the same year, Western Australia had falls resulting in patient harm at rates of 5.0 per 1,000 episodes (in public hospitals) and 1.5 (in private hospitals).[4] As the risk of falls increases with age, appropriate falls prevention strategies will need to be implemented, to prevent inpatient falls within a hospital setting, as Australia's population is ageing.

Systematic reviews have shown that risk factors for falls in hospital patients are multivariate and there is limited evidence to support any one intervention. Therefore, interventions targeting multiple risk factors can reduce falls in hospitals.[5,6] In Australia, the assessment and management of inpatient falls is governed by evidenced-based guidelines.[2,7]

Western Australia has a population of over 2.5 million people, across 2.6 million km^2, and the majority live in metropolitan areas. Rather than relying on voluntary falls incident reporting and sporadic limited audits, this study aimed to obtain state-wide prevalence estimates of falls prevention strategies, to identify hospitals and risk factors that required further improvements.

METHOD

The study received ethics approval from the Department of Health, Human Research Ethics Committee (#12/2014).

PARTICIPATION

Hospitals were included in the falls survey if they had at least 40 acute and/or subacute beds and admitted public patients. Accordingly, 14 metropolitan and six regional hospitals throughout the state were included in the study, conducted over 17 days in May 2014. Participants included multiday-stay public inpatients from acute and subacute wards in the hospital. Exclusions: dialysis patients, mental health wards, newborns, hospital in the home, and day surgery/procedure patients due to lack of documentation required to participate, or variability in patient behaviour.

AUDIT TOOL AND DATA COLLECTION

Qualitative and quantitative data were collected by over 400 surveyors who attended educational sessions and passed a competency test. Each audit was conducted by a hospital-based clinician with an external surveyor.

Survey teams examined medical records for each eligible patient. The survey assessed compliance with the latest guidelines to reduce falls: provision of verbal information to patients; completion of a falls risk screening tool; and age-based cognitive testing (falls prevention strategies).

Univariate and multivariate logistic regression analyses were used to determine if hospitals or significant factors affected the probability of patients receiving falls prevention strategies.

DATA ANALYSIS

The rates and ranges for each fall prevention strategy performed at each hospital were calculated. Data was supplemented through data linkage to obtain previous admissions and diagnoses, socio-economic status obtained from the Australian Bureau of Statistics and hospital accessibility.

Univariate analysis was used to calculate the association between the patient characteristics (eg. age, gender, rurality, Indigenous status, hospital location) and the probability of receiving a falls prevention strategy. Multiple regression analysis was undertaken for the probability of receiving a test at a participating hospital.

Odds ratios (ORs) were obtained from the models to compare outcomes against the reference hospital (hospital 11 – with the largest group of audited patients). Attributable burden was calculated for an annual basis to estimate the number of patients potentially affected by any significant factors.

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FINDINGS

PARTICIPANTS

Information was collected from 2,720 patients. Similar numbers of male and female patients participated.

FALLS INFORMATION PROVIDED TO PATIENTS

Patients were asked if they had been involved in discussions about ways to prevent falls in hospital. Of the 2,720 patients, 560 patients (20%) were unavailable to answer at the time (e.g. cognitive impairment, dementia, on day leave from the hospital) and 30 patients (1.1%) had no documented response to the question.

Of those able to answer, 60% of patients (1,276 patients) recalled having received information on falls prevention, ranging from 33–87% across 20 hospitals (Table 1, Figure 1).

TABLE 1: PERCENTAGE OF PATIENTS WHO WERE PROVIDED WITH VERBAL INFORMATION ON FALLS PREVENTION.

Provision of verbal information on falls prevention	Count	Percent
No	854	40.1
Yes	1,276	59.9
Total	**2,130**	**100**

Patients with a length of stay of six or more days were significantly more likely to have been provided with falls prevention information than patients with a lower length of stay, OR 1.8 (95% CI: 1.5–2.2). Similarly, patients categorised as having care involving rehabilitation were significantly more likely to have been provided with verbal falls prevention information than those without this care type, OR = 1.8 a

(CI:1.4–2.3). The odds of a patient with a principal diagnosis of single spontaneous delivery (eg. perinatal women) were three times lower than for patients without this diagnosis, OR 0.3 (CI:0.2–0.6), Table 2.

The multivariate logistic model was used to determine if any hospitals were outliers. After adjusting for variations in patient type and complexity, the probability of a patient being provided with verbal information regarding falls prevention was no greater or lower than the odds of a patient in the reference hospital 11 (medium sized metropolitan hospital).

The estimated burden attributable for each significant risk factor was calculated. This calculates the estimated annual change in the number of individuals when the risk factor is absent from the population. For example, the annual number of patients not provided with falls information would be 1,925 perinatal women.

FALLS RISK SCREENING TOOL

Screening identifies patients at risk of falling or suffering serious harm from falls, and identifies activities to mitigate the risk. Overall the state mean percentage of patients who had been risk assessed for falls with a screening tool was 82%. There were various risk screening tools used across the state (Table 3). Seven hospitals had significantly higher rates of

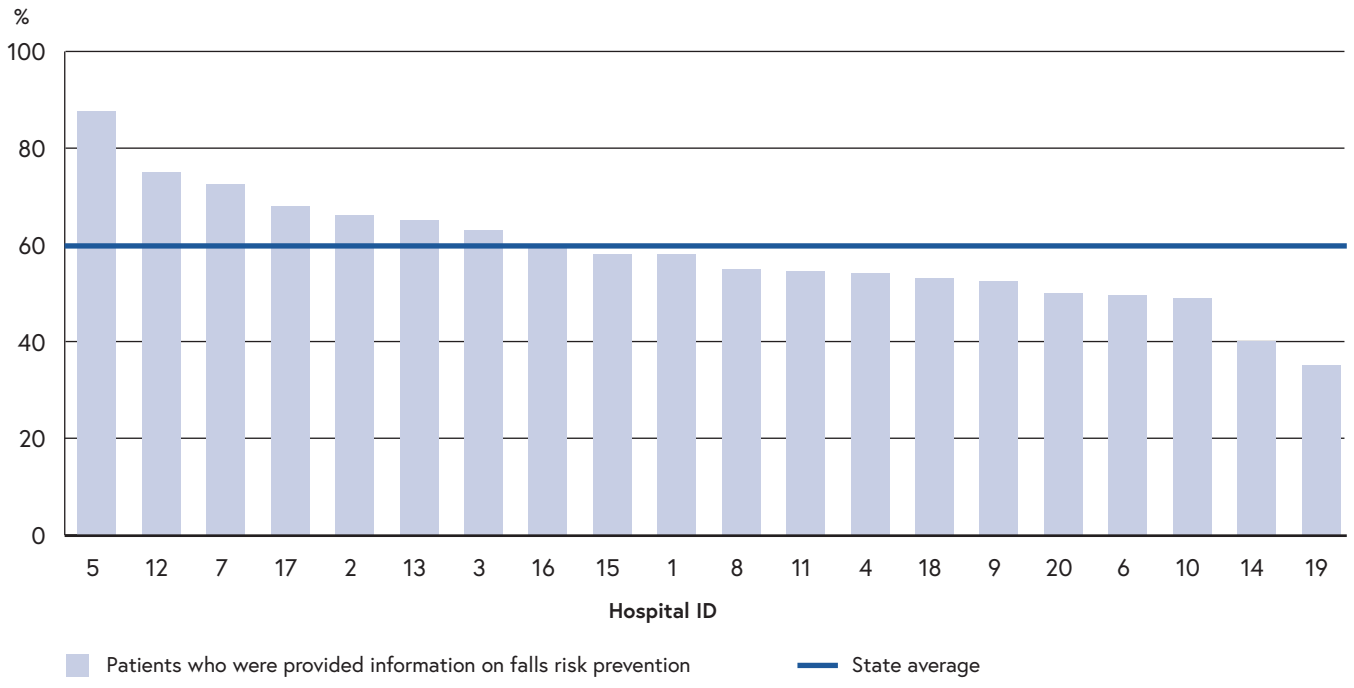

FIGURE 1: PERCENTAGE OF PATIENTS WHO WERE PROVIDED WITH VERBAL INFORMATION ON FALLS PREVENTION BY HOSPITAL

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TABLE 2: ODDS RATIOS OF THE PROBABILITY OF A PATIENT BEING PROVIDED WITH VERBAL INFORMATION ON FALLS PREVENTION

Patient Characteristic	Reference Group	Adjusted OR (lower and upper confidence intervals)	Change in the number of patients with the outcome	Annual change in the number of patients with the outcome	Annual change as a percentage of the estimated annual number of patients with the risk factor
Length of Stay 6+ days	Length of Stay 0–5 days	1.862 (1.542, 2.249)	–117 (–153, –83)	–1,842 (–2,397, –1306)	–14 (–18, –10)
Past principal diagnosis of rehabilitation	–	1.756 (1.358, 2.271)	–43 (–61, –23)	–924 (–1,309, –492)	–12 (–17, –6)
Current principal diagnosis of single spontaneous delivery	–	0.326 (0.184, 0.575)	16 (8, 23)	1,925 (990, 2,741)	26 (13, 37)

using falls screening tools than the mean and five hospitals were significantly lower (Figure 2).

Once adjusted for variations in patient type and complexity, the following were significantly less likely to have been risk assessed with a falls risk screening tool: adults compared to older adults, paediatrics compared to older adults, and perinatal women.

Based on the risk assessment scores, 1,161 (56.7%) patients were classified as at risk of falling. 47 (2.3%) patients had missing information.

TABLE 3: FALLS RISK SCREENING TOOL USED

Falls risk screening tool used	Count	Percent
Falls Risk Assessment and Management (FRAMP)	74	2.72
Falls Risk Management Tool (FRMT)	1,653	60.77
Hospital-specific tool A	154	5.66
Hospital-specific tool B	85	3.13
Hospital-specific tool C	79	2.90
WACHS Falls Risk Management Tool	166	6.10
No tool present	495	18.20
Missing	14	0.51
Total	**2,720**	**100**

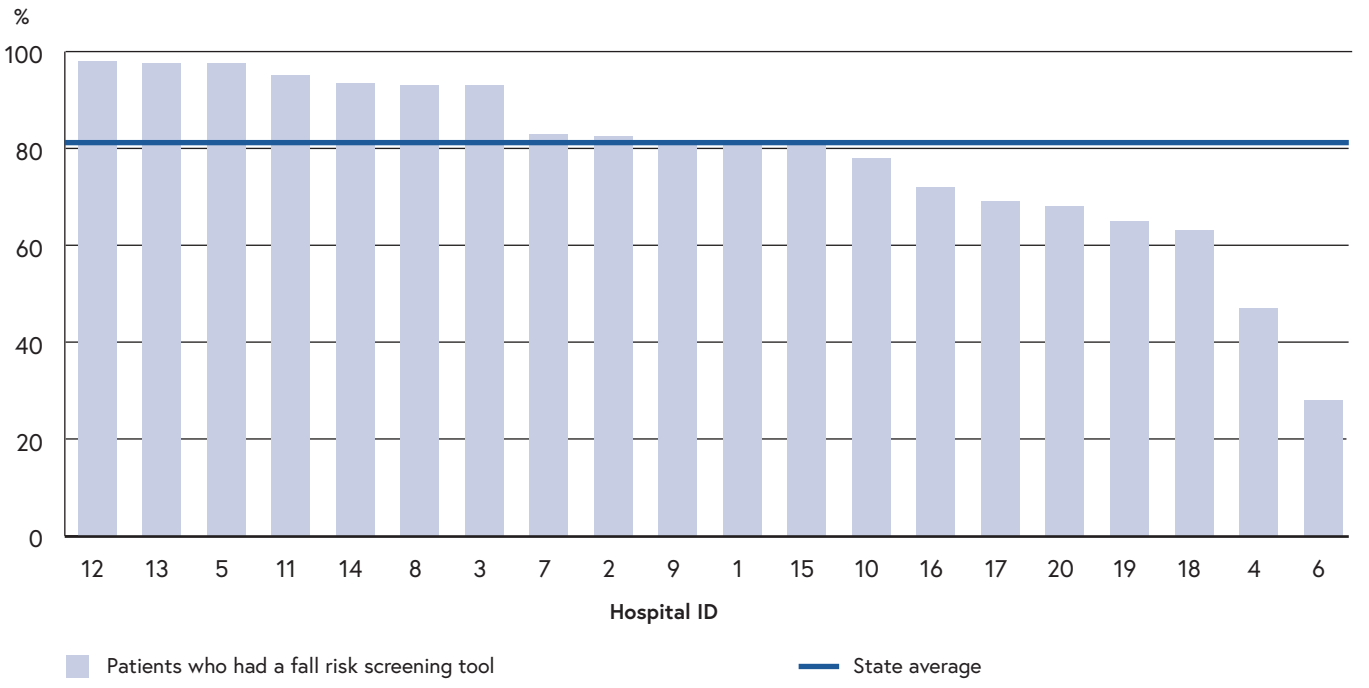

FIGURE 2: PERCENTAGE OF PATIENTS IN EACH HOSPITAL WHO HAD BEEN RISK ASSESSED FOR FALLS WITH A SCREENING TOOL.

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COGNITIVE IMPAIRMENT SCREENING

Completion of cognitive impairment screening was captured in the survey. The cohort included all non-Aboriginal patients aged 65 years or older (1,383 patients) and all Aboriginal patients aged 45 years and older (61 patients). Five patients did not have documented responses to the questions, therefore the final cohort consisted of 1,439 patients. There was a range of cognitive tools used across the state. Table 4 shows the distribution of the tools used. Five hundred and twenty-nine patients had documented evidence of cognitive testing.

The state mean percentage of patients with documented cognitive testing was 36.7% across all hospitals. There were three hospitals with no documented evidence of cognitive testing (Figure 3).

TABLE 4: COGNITIVE TESTING TOOL USED

Cognitive testing tools used	Count	Percent
Abbreviated Mental Test 4	169	11.70
Abbreviated Mental Test Score	119	8.24
Mini Mental State Examination	118	8.17
Rowland Universal Dementia Assessment Scale	8	0.55
Other cognitive test	115	7.96
No evidence of testing	910	63.02
Total	**1,439**	**100**

To determine if any hospitals were outliers, using multivariate logistic regression, short-term patients and patients not involved in rehabilitation procedures were significantly less likely to have been provided with cognitive testing. After adjusting for these factors, five hospitals had significantly lower rates of testing compared to the reference hospital 11, and three hospitals performed significantly more cognitive testing.

DISCUSSION

The survey identified differences in patient care and supporting processes across all hospitals. The results have highlighted areas for improvement.

Falls prevention information was provided to many patients (60%), although wide variations existed across different hospitals (35–88%). This is consistent with other studies, such as Stoeckle et al. and Stephenson et al., where the rates were reported as low as 30%.[8,9]

Falls information provision was higher in some hospitals; although not significant once patient type and complexity were accounted for. Short-term patients, patients not involved in rehabilitation care and perinatal women were identified as significantly missing out on this information. Multivariable logistic regression identified that targeted interventions for these groups (over 20,000 patients annually) would increase the provision of falls information rates, rather than targeting specific hospitals. These patient groups may be perceived to have a higher probability of being more mobile and agile and therefore less likely to

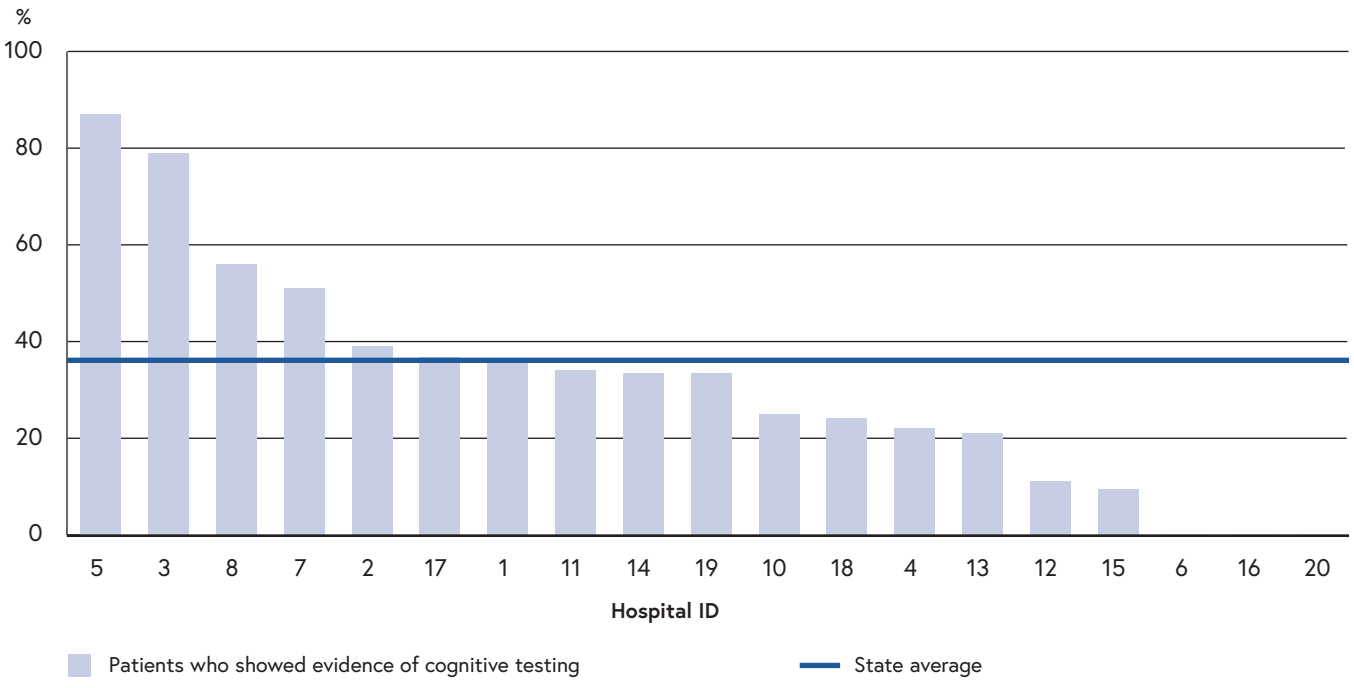

FIGURE 3: PERCENTAGE OF PATIENTS WITH DOCUMENTED EVIDENCE OF COGNITIVE TESTING

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require the information, even though they have the potential to fall. Long stay patients were identified as having a higher risk of falls consistent with the literature.[10–12]

Hospitals should also consider multiple and less resource intensive strategies to educate patients and carers, such as providing information on hospital TV channels and handouts such as Patient First resources,[13] rather than only providing verbal information. Almis et al. and Schoberer et al. reinforce the need to involve carers and families in falls prevention strategies and in the development of educational materials.[10,14] For older adults, a study suggested that falls prevention education should focus more on the positive benefits of improving balance, to improve compliance and prevent unintentionally patronising patients.[15]

Compliance with using a falls risk screening tool was high in this audit overall (82%, range 28–98%). This is consistent with other studies.[8,9] Adult, paediatric and birthing patients were less likely to have had a falls risk assessment tool compared to older adults. While there is the perception that older adults are more likely to fall, younger patients are also at risk and some epidemiology studies of falls in hospitals have found the highest rates of falls were not in the older adult population.[11,16,17] Table 3 identifies the many different screening tools used. In order to facilitate the incorporation of best practice guidelines, following the survey a standardised Falls Risk Assessment and Management Plan (FRAMP) was developed for use in the general adult population.[5] The FRAMP centralises and simplifies core requirements into one form and guides staff through the essential screening, assessment and management processes.[5]

Birthing patients have a short-term increased risk of falling and generic falls risk tools do not always capture them.[11] Falls prevention strategies need to address the unique characteristics of the different patient groups and should consider using more appropriate risk assessment tools, such as the Post Epidural Fall Risk Assessment Score (PEFRAS).[11]

The state mean percentage of patients with documented evidence of cognitive testing was 37% across all hospitals. This is consistent with other studies.[18] Five hospitals had significantly low rates of cognitive testing, indicating a hospital-wide issue to be addressed rather than specific patient cohorts.

The literature cites that cognitive impairment increases the frequency of patient falls. Incorporating early delirium recognition and management in a falls prevention program in the acute care setting is highly recommended.[19–23]

Since the survey was conducted, hospitals received individualised results. Local strategies have since been introduced including greater awareness campaigns, development of patient information resources, and a state-wide falls network for sharing of information and education resources. Targeted information to increase cognitive testing has also been promoted alongside national standards focusing on falls and cognitive impairment.[24]

The survey represents evidence that was available on the day of the survey. Limitations of the study include: data was collected from a large number of surveyors recruited across WA Health with varying levels of clinical and audit experience. To mitigate this, a number of data verification steps were applied both on the day and during the data entry, including entries being double checked.

The number of patients included from some of the participating hospitals was statistically small and patient groups differed substantially on a number of important characteristics including age, presenting conditions and severity of illness across hospitals. Subsequently, comparison of results at the individual hospital level was generally not appropriate but has been included in some areas as a guide to the differences in results between hospitals.

CONCLUSION

The overall prevalence of falls prevention advice and risk assessment were within the expected range compared with national estimates. The analysis of compliance with the use of a falls risk assessment tool and the provision of falls prevention information to patients has revealed several areas of clinical practice which if targeted could result in decreased falls.

Amongst hospitals there were wide variations in the provision of falls information, falls risk screening tools and cognitive testing. Patients in rehabilitation care, older adults, and long stay patients were significantly more likely to have falls prevention strategies provided. At significant risk of missing out on falls prevention strategies were short stay patients and perinatal women, which may benefit from further research. Five hospitals had significantly low rates of cognitive testing, indicating a hospital-wide issue to be addressed rather than specific patient cohorts.

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REFERENCES

1 Morello RT, Barker AL, Watts JJ, Haines T, Zavarsek SS, Hill KD, et al. The extra resource burden of in-hospital falls: a cost of falls study. *Med J Aust.* 2015; 203(9): 367e1-e8. Available from: https://doi.org/10.5694/mja15.00296

2 Australian Commission on Safety and Quality in Health Care (ACSQHC). Preventing falls and harm from falls – fact sheet. Australian Commission on Safety and Quality in Health Care. Sydney. 2010. [cited 2019 May 10] Available from: https://www.safetyandquality.gov.au/wp-content/uploads/2012/01/NSQHS-Standards-Fact-Sheet-Standard-10.pdf

3 Hill KD, Vu M, Walsh W. Falls in the acute hospital setting -- impact on resource utilization. *Aust Health Rev.* 2007; 31(3): 471–77

4 Australian Institute of Health and Welfare (AIHW). Australia's health. Australian Institute of Health and Welfare. Canberra, ACT. 2018. [cited 2019 May 1] Available from: https://www.aihw.gov.au/reports/australias-health/australias-health-2018/contents/table-of-contents

5 Western Australian Department of Health. Development of falls risk assessment and management plan. Western Australian Department of Health. Perth, WA. 2015.[cited 2019 Jun 1] Available from: https://ww2.health.wa.gov.au/~/media/Files/Corporate/general%20documents/falls/PDF/Dev-of-FRAMP.pdf

6 Butcher, L. The no-fall zone. *Hosp Health Netw.* 2013. 87(6): 26–30.

7 Australian Commission on Safety and Quality in Health Care (ACSQHC). Preventing falls and harm from falls in older people: best practice guidelines for Australian hospitals. Australian Commission on Safety and Quality in Health Care. Sydney. 2009. [cited 2019 May 7] Available from: https://www.safetyandquality.gov.au/wp-content/uploads/2009/01/Guidelines-HOSP.pdf

8 Stoeckle A, Iseler JI, Havey R, Aebersold C. Catching quality before it falls: preventing falls and injuries in the adult emergency department. *J Emerg Nurs.* 2019; 45(3): 257–64. Available from: https://doi.org/10.1016/j.jen.2018.08.001

9 Stephenson M, McArthur A, Giles K, Lockwood C, Aromataris E, Pearson A. Prevention of falls in acute hospital settings: a multi-site audit and best practice implementation project. *Int J Qual Health Care.* 2016; 28(1): 92–98.

10 Almis H, Bucak IH, Konca C,Turgut M. Risk factors related to caregivers in hospitalized children's falls. *J Pediatr Nurs.* 2017; 32: 3–7.

11 Lockwood S, Anderson K. Postpartum safety: a patient-centered approach to fall prevention. *MCN Am J Matern Child Nurs.* 2013; 38(1): 15–18.

12 Simpson KR. Patient falls in the perinatal setting. *MCN Am J Matern Child Nurs.* 2010; 35(6): 364.

13 Western Australian Department of Health. Patient first resources. Western Australian Department of Health. 2020. [cited 2020 May 20] Available from: https://healthywa.wa.gov.au/Articles/F_I/Going-to-hospital

14 Schoberer D, Breimaier HE, Mandl M, Halfens RJG, Lohrmann C. Involving the consumers: an exploration of users' and caregivers' needs and expectations on a fall prevention brochure: a qualitative study. *Geriatr Nurs.* 2016; 37(3): 207–14.

15 Yardley L, Donovan-Hall M, Francis K, Todd C. Older people's views of advice about falls prevention: a qualitative study. *Health Educ Res.* 2006; 21(4): 508–17.

16 Anderson DC, Postler TS, and Dam TT. Epidemiology of hospital system patient falls: a retrospective analysis. *Am J Med Qual.* 2016; 31(5): 423–28.

17 Dionyssiotis Y. Analyzing the problem of falls among older people. *Int J Gen Med.* 2012; 5: 805–13.

18 Blackwood JA. Screening for Cognitive Impairment as a Part of Falls Risk Assessment in Physical Therapist Practice. *J Geriatr Phy Ther.* 2017; 40(4): 197–203.

19 Sillner AY, Holle CH, Rudolph JL. The overlap between falls and delirium in hospitalized older adults: a systematic review. *Clin Geriatr Med.* 2019; 35(2): 221–36.

20 Ambrose AF, Paul G, Hausdorff JM. Risk factors for falls among older adults: a review of the literature. *Maturitas.* 2013; 75(1): 51 -61.

21 National Institute for Health and Care Excellence. Clinical Guideline CG161: Falls in older people: assessing risk and prevention. 2013. [cited 2020 28 Feb] Available from https://www.nice.org.uk/guidance/cg161/chapter/1-Recommendations#preventing-falls-in-older-people-during-a-hospital-stay-2

22 Muir SW, Gopaul K, Montero Odasso MM. The role of cognitive impairment in fall risk among older adults: a systematic review and meta-analysis. *Age Ageing.* 2012; 41(3): 299–308.

23 Lakatos BE, Capasso V, Mitchell MT, Kilroy SM, Lussier-Cushing M, et al. Falls in the general hospital: association with delirium, advanced age, and specific surgical procedures. *Psychosomatics.* 2009; 50(3): 218–26.

24 Australian Commission on Safety and Quality in Health Care (ACSQHC). National safety and quality health service standards user guide for health service organisations providing care for patients with cognitive impairment or at risk of delirium. 2019. [cited 2019 June 7] Available from: https://www.safetyandquality.gov.au/our-work/cognitive-impairment/better-way-to-care/