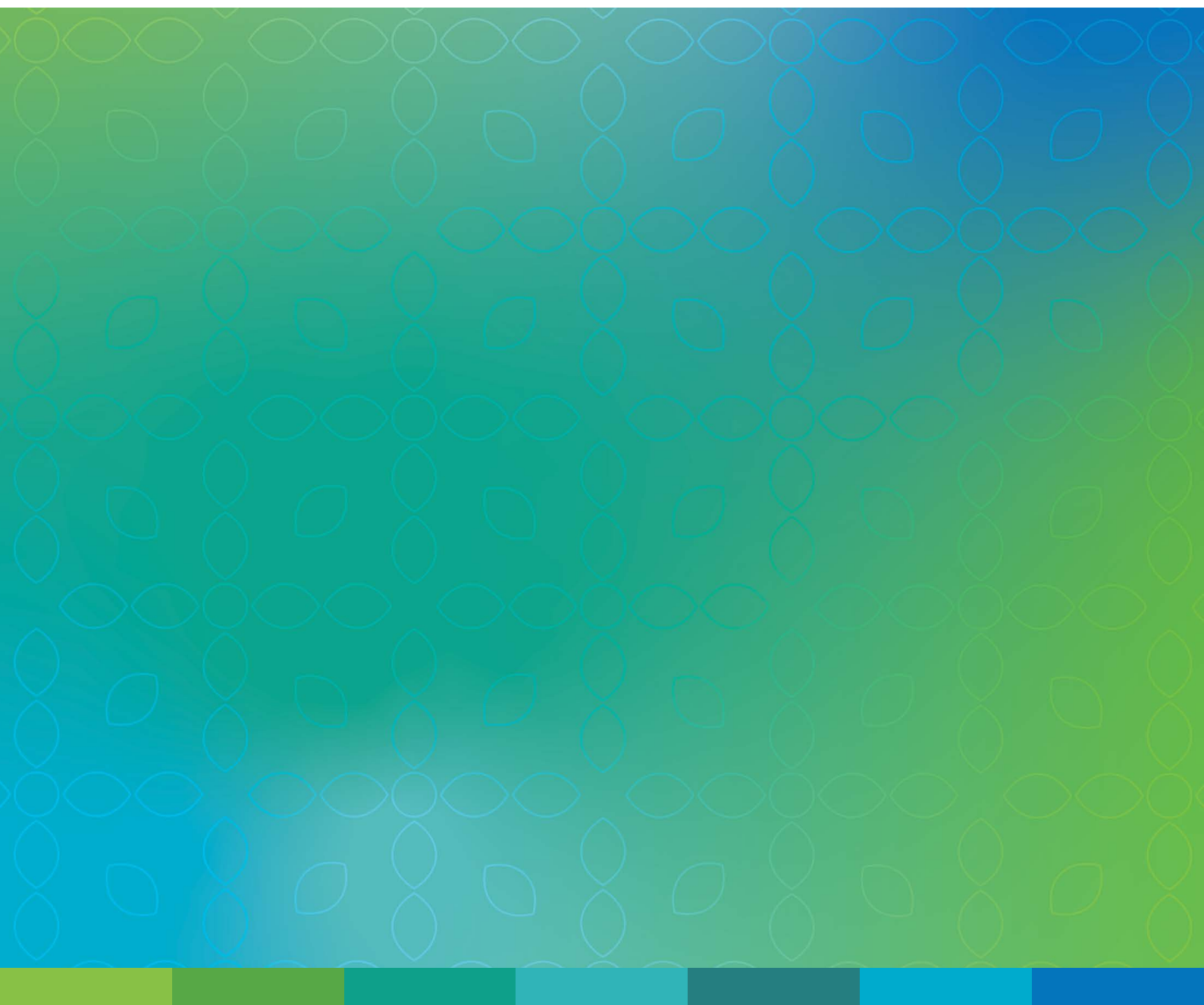




JOURNAL OF PERIOPERATIVE NURSING



Contents

Editorial – Quiet quitting: A growing concern or just a buzzword?	1
--	---

Article

Surgical nurses' perceptions of administering opioid drugs: A descriptive and cross-sectional study	3
---	---

Editorial team

Editor

Prof. Jed Duff PhD, RN, FACORN
Jed.duff@acorn.org.au

Managing Editor

Eleanor Tan

Editor Emerita

Dr Lois Hamlin DNurs, RN, FACN, FACORN

Associate Editors

Dr Paula Foran PhD, MEd, RN, FACORN
Dr Oya Gümüşkaya PhD, RN

Editorial Advisory Board

Dr Rami Aldwikat PhD, MCLinPrac, RN
Dr Salihah Asiri PhD, MSN, RN
Dr Elizabeth Brogan PhD, RN
Prof. Karen Clark-Burg PhD, MBA(Exec), RN
Dr Alana Delaforce PhD, MN, RN
Assoc. Prof. Annette Erichsen PhD, RN
Prof. Brigid Gillespie PhD, RN, FACORN
Jennifer Green MPhil(Nurs), RN
Dr Toni Hains PhD, MCLinSc (PNSA), MNPractSt, RN, FACORN
Assoc. Prof. Pat Nicholson PhD, RN, FACORN
Jo Perry MSN, RN, MACORN
Assoc. Prof. Vanessa de Brito Poveda PhD, RN
Prof. Nicholas Ralph PhD, MCLinPrac, RN
Judy Smith GradCert (Periop Nursing), RN, MACORN, MACN, MSTTI
Sharron Smyth-Demmon MCN, BEd (Prof. Hons), RN, MACN, MACORN, ACPAN
BronTaylor

Graphic design

Savanah Design

Literature reviews

Operating theatre nurses' experiences in medical emergency response: An integrative literature review	16
'My darling' – elderspeak of nurses to acute hospitalised older adults: An integrative review	24
Nursing interventions to promote safety in robotic surgery	29

Project report

Transforming pre-operative fasting practice: A nurse-led liberal fluid fasting regimen	12
--	----

Journal of Perioperative Nursing

ISSN (online): 2209-1092

Published by the Australian College of Perioperative Nurses (ACORN). Registered address: c/o BDO, Level 7, 420 King William Street, Adelaide.

Views expressed in any article are those of the contributors and not necessarily those of ACORN. The College cannot accept any responsibility for the accuracy of any of the opinions, information, errors or omissions in this journal.

Articles published in *Journal of Perioperative Nursing* are licensed under a Creative Commons Attribution License 4.0 International (CC BY 4.0) which allows authors and readers to copy, modify and distribute in any format for any purpose, including commercial use.

Ada Xie

MANP (Paediatric Nursing),
PGDip (Anaesthetic and Recovery
Nursing), RN, MACORN, MACPAN
PhD Candidate, Queensland
University of Technology

Dr Grace Xu

PhD, RN, FCENA
Queensland University of Technology;
Nurse Practitioner, Royal Brisbane and
Women's Hospital

Professor Jed Duff

PhD, RN, FACORN
Queensland University of Technology;
Chair of Nursing, Royal Brisbane and
Women's Hospital; Editor, Journal of
Perioperative Nursing
journaleditor@acorn.org.au

Quiet quitting: A growing concern or just a buzzword?

Perioperative nursing relies on engaged professionals to maintain patient safety and deliver high-quality care. Staffing is more than filling quotas – it involves understanding workplace dynamics and fostering employee engagement.

'Quiet quitting' is a term used to describe employees who disengage while performing their required tasks, and has become a growing concern in health care due to its potential impact on patient outcomes and workforce stability.

The concept of quiet quitting has gained attention in recent years, raising questions about whether it represents a new trend or a longstanding response to job dissatisfaction. During the COVID-19 pandemic many workers stayed in their jobs due to financial pressures, while in the post-pandemic period many employees have prioritised personal life over career to achieve a better work-life balance¹. Research highlights the widespread nature of quiet quitting. In the United States of America (USA), about half of employees reported being quiet quitters, with younger workers showing even higher rates². Similarly, a Greek study found that 60.9 per cent of nurses exhibited quiet quitting behaviours³. While the terminology is recent, the phenomenon aligns with the job withdrawal theory, which describes how employees psychologically disengage when they feel unable to leave an unsatisfactory job⁴. This concept suggests that disengagement is not a new issue but one that has evolved alongside workplace expectations and stressors.

Perioperative nurses are particularly vulnerable to quiet quitting due to the demanding nature of their roles, which often involve long hours, high stress and rigid hierarchical structures. A study of 909 Greek nurses identified understaffing, frequent shift rotations and limited experience as key factors driving disengagement⁵. Similarly, a Portuguese study found that poor working conditions, such as excessive

workload, low compensation, limited professional growth and an unsafe psychological environment, contribute to quiet quitting⁶. Other organisational factors contributing to quiet quitting include workplace bullying, perceived injustice, poor leadership and a toxic work culture⁷, as well as a profit-focused mentality, distrust in leadership, lack of support for professional development, and staff feelings of being undervalued, having limited autonomy and being excluded from decision-making^{2,8,9}. The complexity of perioperative nursing requires sustained mental and physical effort, making burnout and withdrawal more likely when support systems are insufficient.

The consequences of quiet quitting in perioperative nursing extend beyond the individual nurse. In addition to reduced productivity and professional development among those unwilling to take on extra tasks or exceed expectations^{6,10,11}, quiet quitting fosters a broader culture of disengagement, lowers morale¹² and undermines team cohesion and trust as well as a positive work environment¹³. The disengagement of nursing staff in work can lead to unmet patient needs, inadequate care, prolonged hospitalisation, unnecessary costs and increased patient safety risks, ultimately harming organisational productivity and reputation^{10,13}.

A major barrier to addressing quiet quitting is the disconnect between management and frontline staff. Survey studies have shown that nursing managers can only partially identify the reasons for staff withdrawal behaviours¹⁴. This is because nurse managers generally perceived workplace conditions more positively than frontline staff¹⁵ and

traditional retention methods, like exit interviews, may be unreliable as employees often withhold their true reasons to avoid conflict or secure a positive reference^{16,17}. More concerning, healthcare organisations prioritising profit have been reported to neglect employee wellbeing, with managers acting as 'bosses' rather than 'coaches' and lacking empathy, respect and care in their relationships with staff⁸. If leadership remains unaware of or dismissive toward frontline concerns, nurses may feel unheard and unsupported, leading to increased disengagement.

The prevalence of quiet quitting may be underestimated and is closely linked to turnover intention. Since quiet quitting is often concealed, it may be more widespread than reported¹⁸. Additionally, it is strongly associated with decisions to leave. Among the 60.9 per cent of nurses who engaged in quiet quitting in a Greek study, 40.9 per cent reported a high intention to leave¹⁰. While quiet quitting may be a temporary response to workplace challenges, disengaged nurses remain at a higher risk of leaving¹⁹. These findings underscore the urgent need to address quiet quitting in nursing.

Addressing quiet quitting in perioperative nursing requires proactive strategies centred on engagement. Nursing managers should identify early signs of disengagement and understand its underlying causes^{5,13,20}. Initiatives such as corporate social responsibility programs, mentoring, leadership development, childcare support and flexible work arrangements may foster a more engaged workforce². Promoting inclusive leadership and increasing job impact can also strengthen motivation and workplace connection²¹. A positive work culture – built on adequate support, sufficient resources and a motivating environment – can further prevent disengagement¹⁰. Additionally, shifting from a transactional employer–employee relationship to one rooted in gratitude, appreciation and compassionate leadership may cultivate stronger employee commitment and dedication⁸.

Fostering a culture of support, recognition and motivation within healthcare organisations can enhance workforce stability and ultimately improve patient outcomes. Identifying early signs of disengagement and implementing

targeted interventions will be essential to maintaining a resilient and motivated perioperative nursing workforce. This requires a shift from short-term workforce planning to long-term investment in job satisfaction and employee wellbeing. Strengthening organisational commitment to staff engagement can improve retention, enhance team cohesion and, most importantly, elevate the quality of patient care.

References

- Galanis P, Katsiropoula A, Vraka I, Siskou O, Konstantakopoulou O, Moisoglou I et al. The quiet quitting scale: Development and initial validation [Internet]. *AIMS Public Health*. 2023 [cited 22 Feb 2025];10(4):828–48. DOI: 10.3934/publichealth.2023055
- Liu-Lastres B, Karatepe OM, Okumus F. Combating quiet quitting: Implications for future research and practices for talent management [Internet]. *International Journal of Contemporary Hospitality Management*. 2024[cited 22 Feb 2025];36(1):13–24. DOI: 10.1108/IJCHM-08-2023-1317
- Galanis P, Katsiropoula A, Vraka I, Siskou O, Konstantakopoulou O, Katsoulas T et al. The influence of job burnout on quiet quitting among nurses: The mediating effect of job satisfaction [Internet]. *Research Square* (preprint). 2023[cited 22 Feb 2025]. DOI: 10.21203/rs.3.rs-3128881/v1
- Farrell D, Petersen JC. Commitment, absenteeism, and turnover of new employees: A longitudinal study [Internet]. *Human relations* (New York). 1984[cited 22 Feb 2025];37(8):681–92. DOI: 10.1177/001872678403700807
- Moisoglou I, Katsiropoula A, Vraka I, Kalogeropoulou M, Gallos P, Prasini I et al. Quiet quitting threatens healthcare organizations and services: Alarming evidence from a cross-sectional study with nurses in Greece [Internet]. *Research Square* (preprint). 2024[cited 22 Feb 2025]. DOI: 10.21203/rs.3.rs-4593376/v1
- Prentice C, Dominique-Ferreira S, Wang X, Tuominen J, Duarte M, Rocha H. Work-life imbalance, burning out, feeling down, I will quit, but quietly – the case of hospitality employees [Internet]. *Journal of Hospitality Marketing & Management*. 2024[cited 22 Feb 2025];34(1):24–45. DOI: 10.1080/19368623.2024.2389074
- Arar T, Çetiner N, Yurdakul G. Quiet quitting: Building a comprehensive theoretical framework [Internet]. *Journal of Academic Researches and Studies*. 2023[cited 22 Feb 2025];15(28):122–38. DOI: 10.20990/kilisibfakademik.1245216
- Mahand T, Caldwell C. Quiet quitting – causes and opportunities [Internet]. *Business and Management Research*. 2023[cited 22 Feb 2025];12(1):9–19. DOI: 10.5430/bmr.v12n1p9
- Pevce N. The concept of identifying factors of quiet quitting in organizations: An integrative literature review [Internet]. *Challenges of the Future*. 2023[cited 22 Feb 2025];2:128–47. DOI: 10.37886/ip.2023.006
- Galanis P, Moisoglou I, Malliarou M, Papathanasiou IV, Katsiropoula A, Vraka I et al. Quiet quitting among nurses increases their turnover intention: Evidence from Greece in the post-COVID-19 era [Internet]. *Healthcare*. 2023[cited 22 Feb 2025];12(1):79. DOI: 10.3390/healthcare12010079
- Molchan S, Clore C. What's going on in the workplace? The impact of quiet quitting and the great resignation in corporate America [Internet]. *Aspen Journal of Scholarly Works*. 2023[cited 22 Feb 2025];3:200–10. Available from: <https://images.aspen.edu/wp/uploads/2023/06/AJSW-2023-vol3-5.31.23-Final-TOC.pdf#page=201>
- Zhang J, Su D, Smith AP, Yang L. Reducing work withdrawal behaviors when faced with work obstacles: A three-way interaction model [Internet]. *Behav Sci* (Basel). 2023[cited 22 Feb 2025];13(11):908. DOI: 10.3390/bs13110908
- Gün İ, Balsak H, Ayhan F. Mediating effect of job burnout on the relationship between organisational support and quiet quitting in nurses [Internet]. *J Adv Nurs* (online ahead of print). 2024[cited 22 Feb 2025]. DOI: 10.1111/jan.16599
- Linhartová L. Organisational perception of employee turnover [Internet]. *Scientific papers of the University of Pardubice, Series D*. 2011[cited 22 Feb 2025];121–33. Available from: <https://hdl.handle.net/10195/42686>
- Gormley DK. Are we on the same page? Staff nurse and manager perceptions of work environment, quality of care and anticipated nurse turnover [Internet]. *J Nurs Manag*. 2011[cited 22 Feb 2025];19(1):33–40. DOI: 10.1111/j.1365-2834.2010.01163.x
- Webster J, Flint A. Exit interviews to reduce turnover amongst healthcare professionals [Internet]. *Cochrane Database Syst Rev*. 2014[cited 22 Feb 2025];2014(8):CD006620. DOI: 10.1002/14651858.CD006620.pub5
- Feinberg RA, Jeppeson N. Validity of exit interviews in retailing [Internet]. *Journal of Retailing and Consumer Services*. 2000[cited 22 Feb 2025];7(3):123–7. DOI: 10.1016/S0969-6989(99)00009-0
- Galanis P, Moisoglou I, Katsiropoula A, Malliarou M, Vraka I, Gallos P et al. Impact of workplace bullying on quiet quitting in nurses: The mediating effect of coping strategies [Internet]. *Healthcare* (Basel); 2024[cited 22 Feb 2025];12(7):797. DOI: 10.3390/healthcare12070797
- Galanis P, Moisoglou I, Papathanasiou IV, Malliarou M, Katsiropoula A, Vraka I et al. Association between organizational support and turnover intention in nurses: A systematic review and meta-analysis [Internet]. *Healthcare* (Basel); 2024[cited 22 Feb 2025];12(3):291. DOI: 10.3390/healthcare12030291
- Pratiwi PE, Stanislaus S, Pratiwi PC. The tendency of quiet quitting workers in terms of engagement and well-being at work [Internet]. *Philanthropy Journal of Psychology*. 2023[cited 22 Feb 2025];7(2):132–43. DOI: 10.26623/philanthropy.v7i2.7905
- Karrani MA, Bani-Melhem S, Mohd-Shamsudin F, Usman M, Bogan E. Quiet quitting behaviours: Investigating trigger factors and mitigation strategies through relational job design, work alienation and inclusive leadership [Internet]. *International Journal of Organizational Analysis* (ahead of print). 2024[cited 22 Feb 2025]. DOI: 10.1108/IJOA-08-2024-4748a

Authors

Assistant Professor Burçin Irmak

PhD
Ordu University, Faculty of Health Sciences, Department of Surgical Nursing, Ordu, Turkey

Professor Nurgül Bölükbaş

PhD
Ordu University, Faculty of Health Sciences, Department of Surgical Nursing, Ordu, Turkey

Elif Aslan Kılıç

BSN, RN
Ordu State Hospital, Department of General Surgery, Ordu, Turkey

Ömer Seyfi Acar

BSN, RN
Ordu State Hospital, Anesthesia and Reanimation Intensive Care Unit, Ordu, Turkey

Hatice Polat Şimşek

MSN, RN
Ordu University, Faculty of Dentistry, Department of Orthodontics, Ordu, Turkey

Muharrem Çelik

BSN, RN
Gölköy State Hospital, Department of Emergency, Ordu, Turkey

Corresponding author**Assistant Professor**

Burçin Irmak
PhD
Ordu University, Faculty of Health Sciences, Department of Surgical Nursing, Ordu, Turkey
drburcinirmak@gmail.com

This article is licensed under a Creative Commons Attribution License 4.0 International (CC BY 4.0).
DOI: 10.26550/2209-1092.1369

Surgical nurses' perceptions of administering opioid drugs: A descriptive and cross-sectional study

Abstract

Objective: This descriptive and cross-sectional study investigated how surgical nurses perceived opioid administration.

Material and methods: The sample consisted of 108 nurses from the surgical units of a state hospital in the north of Turkey. Data were collected using a nurse introduction form and the nurses' perception of administering opioids questionnaire. The data were analysed using descriptive statistical methods and Spearman's correlation test.

Results: More than half of the participants (51.9%) reported frequently administering opioid drugs. Some of the participants (15.7%) stated that they observed their patients having side effects following opioid drug administration. The three most common side effects were hypotension (46.6%), nausea (30.0%) and vomiting (11.6%). Most participants (87.9%) noted that they should know more about opioid drugs than other drug groups in order to administer them safely. There was a weak negative correlation between participants' knowledge of side effects when administering opioid drugs and their age, work experience in general, and work experience in the unit ($p < 0.05$).

Conclusion: It has been determined that surgical nurses need training in the administering of opioid group drugs. Hospitals should provide surgical nurses with in-service training in opioid administration.

Keywords: analgesics, pain, nurse, opioid administration, perception

Introduction

Everybody experiences pain at some point in their lives¹. According to the International Association for the Study of Pain (IASP), pain is defined as 'an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage'^{2,3}. Studies into the prevalence of pain in the general population have reported a range of results. A global study reported that the prevalence of pain was 27.5 per cent across 52 countries¹. In the United States of America, one in five adults experience pain⁴. In Europe, the point prevalence of chronic pain has been determined to range between 12 and 48 per cent, the six-month prevalence has been determined to range between 17.5 and 49.8 per cent, and the lifetime prevalence of pain between 12.7 and 33.7 per cent⁵. In Turkey the prevalence of pain was 80.84 per cent⁶. Studies have also been conducted into acute pain following surgery. It has

been reported that the prevalence of adult surgical patients experiencing acute pain ranges from 48 to 78 per cent⁷. Surgical patients may continue to experience pain after discharge⁸. The pooled prevalence of moderate-to-severe pain in these patients within two weeks after discharge has been reported to vary between 31 and 58 per cent⁸.

Pain impacts daily functioning, overall health and economic status. It also exerts negative physical and psychological effects^{4,9}. Individuals who experience pain often seek healthcare services⁶. Various pharmacological, non-pharmacological and interventional methods are used in pain management¹⁰. The World Health Organization recommends primarily using non-opioid analgesics for pain management, with weak opioids and strong opioids being considered respectively as pain severity increases¹¹.

Opioids are preferred for severe, acute pain management. They reduce the sensation of pain by binding to opioid

receptors in the brain, spinal cord and other parts of the body¹². The most popular forms of opioids are potent agonist drugs (oxycodone, tapentadol, buprenorphine, morphine, fentanyl) and weak agonist drugs (tramadol)¹³. However, they have various side effects – the most common are nausea, vomiting, hypotension, ileus, respiratory depression and delirium¹⁰ – and may result in addiction, tolerance and hyperalgesia when used continuously and inappropriately^{12,14,15}. Healthcare professionals can prevent those side effects to a significant extent by employing both pharmacological and nonpharmacological measures^{16–18}.

Acute post-operative pain is defined as pain that arises following tissue injury associated with surgery and that diminishes during the recovery process¹⁰. Analgesia provided by a single agent may not be effective enough to manage post-operative pain. Therefore, post-operative pain necessitates the combined use of one or more analgesic agents and analgesia methods with varying mechanisms of action, known as multimodal analgesia¹⁹.

Doctors or nurse practitioners sometimes prescribe opioids to patients in the post-operative period. For the treatment of post-operative pain, opioids should primarily be administered orally, with intravenous (IV) administration reserved for patients unable to use the oral route. Healthcare professionals should avoid the intramuscular route because absorption is unreliable and the process is painful¹⁰. Surgical nurses are responsible for administering opioids safely (the right drug, the right dose and the right route of administration) and monitoring and assessing their side effects^{10,20}. Opioid-induced ventilatory impairment (OIVI) is a condition characterised by the suppression of respiratory drive due to the effects of opioids on the central nervous system. OIVI disrupts normal respiratory rhythms, leading to hypoventilation, hypercapnia, hypoxia and respiratory arrest. This condition depends on the opioid dose, the drug's pharmacokinetics, and patient-specific risk factors, such as obstructive sleep apnoea or concurrent use of sedatives^{21,22}.

Surgical and intensive care nurses administer opioids very often^{20,23}. However, research shows that nurses know little about effective pain management and analgesia^{24–31}. Healthcare professionals should ensure that patients experience a minimum of harm and a maximum of benefit from the use of opioids³². Before administering opioids, nurses should possess adequate knowledge and accurate perceptions of drug administration to ensure effective pain management^{33–35}. Understanding how nurses perceive opioid administration can facilitate educators in revising curricula to ensure that nursing students receive comprehensive education on opioid administration and cultivate positive attitudes toward it^{36–38}. This study investigated how surgical nurses perceived opioid administration. The results are expected to contribute to the organisation of in-service trainings on the subject in hospitals by raising awareness and making comparisons between countries.

Aim

This study aimed to determine the general perceptions of surgical nurses concerning opioid administration.

Research question: How do surgical nurses perceive opioid administration?

Materials and methods

Design

The research was conducted with a descriptive and cross-sectional design. This study is presented following the STrengthening the Reporting of OBservational Studies in Epidemiology (STROBE) checklist³⁹.

Study population and sample

The study was conducted in the surgical units of a public hospital in northern Turkey between 1 May and 1 June, 2023. The study population consisted of 186 nurses from the surgical clinics (n = 98) and surgical intensive care units (ICUs) (n = 88). No sampling was performed as the goal was to recruit as many nurses as possible. The sample consisted of 108 surgical nurses who met the inclusion criteria (participation rate 58.6%) (see Figure 1). The research was conducted in seven surgical clinics (two general surgery

clinics, one cardiovascular surgery clinic, one orthopaedics clinic, one neurosurgery clinic, one urology and thoracic surgery clinic, one ear nose throat clinic and one eye diseases clinic) and five ICUs (three reanimation ICUs, one surgical ICU and one cardiovascular surgery ICU).

Inclusion and exclusion criteria

Nurses who were surgical clinic nurses or surgical ICU nurses, with at least three months of work experience and who volunteered to participate in the study were included.

Nurses who had worked in the surgical units for less than three months, were having a medical report during the research, were on annual leave during the study period or did not volunteer to participate in the study were not included.

Data collection tools

The data were collected using a nurse information form and a questionnaire about perceptions of administering opioid medications.

Nurse information form

The nurse information form was developed by the researchers^{40,41}. It consisted of eight items – three sociodemographic characteristics (age, gender and education level), three professional characteristics (unit of employment, number of years working as a nurse, number of years working in the surgical unit where they were employed at the time of the study), one about frequency of administration of opioids and one about encountering side effects.

Nurses' perception of administering opioids questionnaire

The nurses' perceptions of administering opioids (NPAO) questionnaire⁴² was developed by Guest, Sobotka, Karavasopoulou, Ward and Bantel in 2017 and adapted into Turkish in 2022 by Yilmaz and Akansel³³. The questionnaire consists of 14 items rated on a five-point Likert-type scale (1 = strongly agree, 2 = agree, 3 = undecided, 4 = disagree, 5 = strongly disagree). It has no subscales or cut-off points. The original questionnaire and its Turkish version have a Cronbach's alpha score of 0.80, which was 0.70 in the present study.

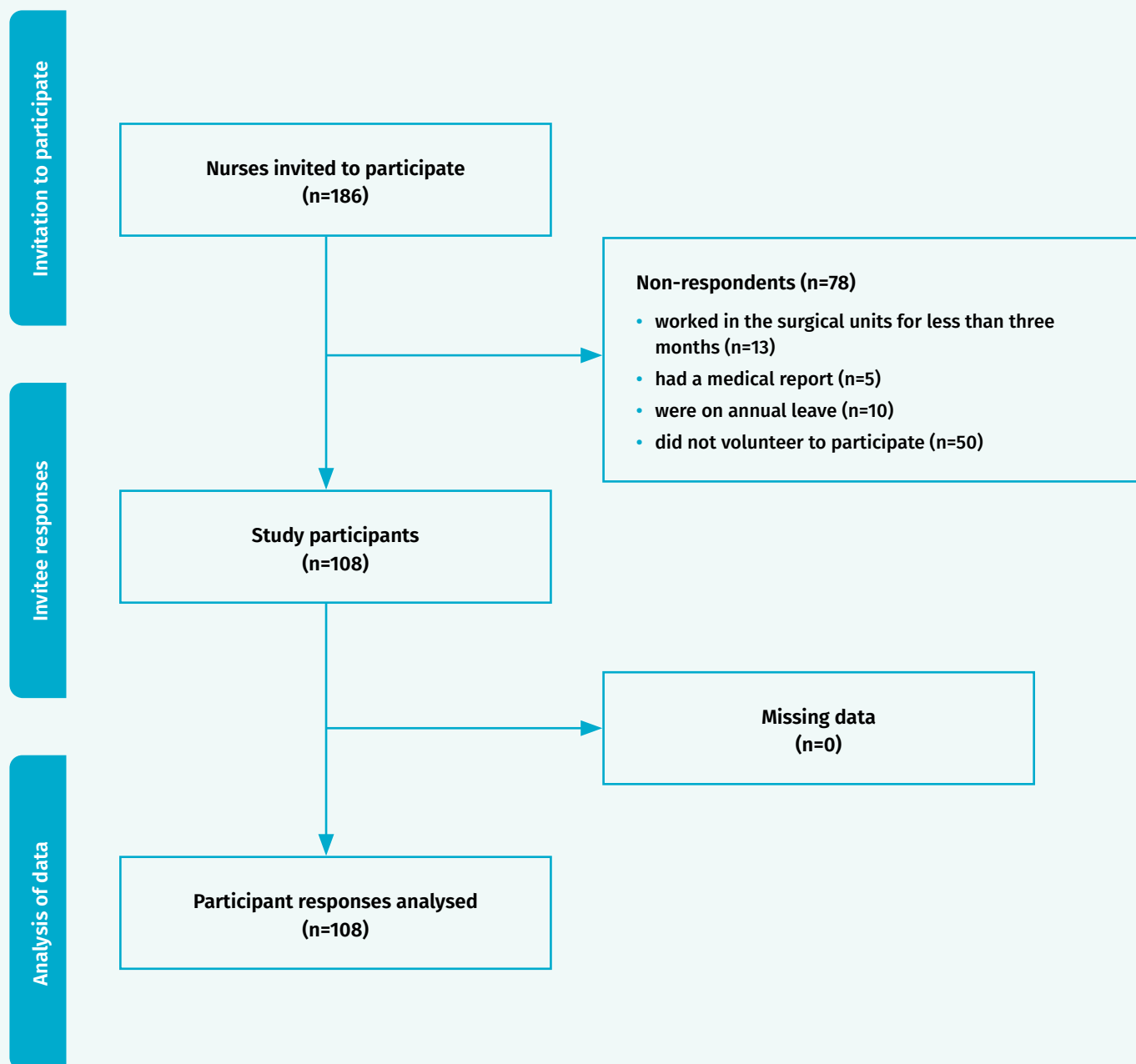


Figure 1: Flow diagram of study participants

Data collection procedures

The data were collected by the researchers between May 1 and June 1, 2023. Two of the authors (ÖSA, EAK) were working as nurses in the hospital where the study was conducted. They visited the surgical units and informed the nurses about the scope of the study. The nurses who volunteered to participate in the study were given the data collection tools in a sealed envelope. The nurses were asked to fill out the tools and

seal them in the provided envelopes for collection by the researchers at the designated time. The forms were received in sealed envelopes after being answered individually by the nurses. The envelopes were opened by researchers who were not involved in the data collection process, and data transferred to the computer anonymously. It took each participant 10 to 15 minutes to fill out the data collection tools.

Ethical considerations

The study was approved by the university's Non-Invasive Clinical Research Ethics Committee (on 17.02.2023, No. 64). Permission was obtained from the Provincial Directorate of Health (on 06.04.2023, No. E-39055495-000-211245655). Written informed consent was obtained from all participants. Each stage of the research was carried out according to the ethical principles outlined in the Declaration of Helsinki.

Table 1: Descriptive characteristics of participants (N=108)

Variables		n (%)
Age in years Mean ± standard deviation (minimum–maximum)		37.26±8.83 (22–54)
Years working in the profession Mean ± standard deviation (minimum–maximum)		14.94±9.84 (1–36)
Years working in the current ward Mean ± standard deviation (minimum–maximum)		6.43±6.01 (1–29)
Gender	female	96 (88.9)
	male	12 (11.1)
Education level	undergraduate and postgraduate	97 (89.8)
	high school and associate degree	11 (10.2)
Unit of employment	reanimation intensive care	40 (37.0)
	general surgery clinic	18 (16.7)
	cardiovascular surgery clinic	18 (16.7)
	general surgery intensive care	10 (9.3)
	orthopaedics clinic	7 (6.5)
	neurosurgery clinic	6 (5.6)
	urology and thoracic surgery clinic	5 (4.5)
	ear, nose, throat clinic and eye diseases clinic	4 (3.7)
Frequency of opioid drug administration	often	56 (51.9)
	rarely	48 (44.4)
	never	4 (3.7)
Observed side effects of opioid drugs	yes	33 (15.7)
	no	75 (84.3)
Adverse side effects observed (n=60)*	hypotension	28 (46.6)
	nausea	18 (30.0)
	vomiting	7 (11.6)
	respiratory arrest	3 (5.0)
	allergic reaction	1 (1.7)
	hallucination	1 (1.7)
	hypoxia	1 (1.7)
	bradycardia	1 (1.7)

*More than one answer could be given to the question. Percentages are taken from the answers.

Data analysis

The data were analysed using the Statistical Package for Social Sciences (SPSS 18.0) at a significance level of 0.05. Numbers, means, standard deviations, percentages and minimum and maximum values were used for descriptive data. The independent variables were sociodemographic characteristics, while the dependent variables were scale scores. Normality was tested using the Kolmogorov-Smirnov test, normal distribution curve, histogram graph, skewness and kurtosis coefficient of variation. The data were non-normally distributed because the skewness and kurtosis coefficient values did not range from +1.5 to -1.5⁴³. The Fisher exact test was used to compare percentage values. Spearman's correlation test was used to determine the differences between groups (0.00 < r < 0.25 = very weak, 0.26 < r < 0.49 = weak, 0.50 < r < 0.69 = moderate, 0.70 < r < 0.89 = high, 0.90 < r < 1.00 = very high)⁴⁴.

Results

Table 1 shows the sociodemographic characteristics of participants. Participants had a mean age of 37.26 years (±8.83). They had worked 14.94 years (±9.84) as a nurse, and 6.43 years (±6.01) in the surgical unit. Most participants were female (88.9%) with at least a bachelor degree (89.9%). Less than half of the participants (37%) worked for the reanimation ICU. More than half of the participants (51.9%) administered opioids very often. The majority of the participants (84.3%) reported observing no side effects after administering opioids. The most common side effects were hypotension (46.6%), nausea (30.0%) and vomiting (11.6%).

Table 2 shows the distribution of NPAO responses. More than half of the participants agreed or strongly agreed with items 1, 2, 3, 5, 9, 10, 12, 13 and 14. More than half of the participants disagreed or strongly disagreed with items 4 and 8. Almost half of the participants considered opioids (e.g. morphine) dangerous because they are controlled drugs and require double signing (item 7). More than a quarter of the participants associated opioids (e.g. morphine) with drug abuse or were undecided about it (item 11).

Table 3 shows the correlations between the questionnaire items and three of the participant characteristics – age, number of years they had been working as a nurse and number of years they had been working in the current ward. The number of years participants had been working in the current ward was negatively correlated ($\rho = -0.278$, $p = 0.004$) with their responses to item 7 (Opioid drugs are dangerous because they require control and double signatures). There was a negative correlation between all three characteristics and participant responses to item 10 (I know the side effects when administering opioid medications – age ($\rho = -0.286$, $p = 0.003$), number of years working in the profession ($\rho = -0.255$, $p = 0.008$), number of years working in the current ward ($\rho = -0.200$; $p = 0.038$). The number of years participants had been working in the current ward was negatively correlated ($r = -0.198$; $p = 0.040$) with their responses to item 13 (I am more concerned when administering opioid medications to patients with a history of substance abuse).

Discussion

Every year, numerous patients receive opioids to manage post-operative pain⁴⁵. Surgical and ICU nurses are responsible for administering opioids ordered by physicians. Nurses regularly assess patients for pain and respond to their calls for additional analgesics⁴⁶.

In our study of 108 surgical nurses, participant characteristics were collected via a nurse information form and participants completed the NPAO questionnaire. Questionnaire items were correlated with participant characteristics and the correlations were tested for statistical significance. Participant age, gender, number of years working in the profession and number of years working in the surgical unit were found to correlate with certain questionnaire items.

Our results showed that older participants knew less about the side effects of opioids (item 10) than their younger counterparts. It was also found that female participants knew more about the side effects of opioids than their male counterparts. Yilmaz and Akansel³³ also found that female nurses knew more about opioids than their male counterparts. This is probably due to various factors such as education level,

work experience, frequency of opioid administration and participation in in-service training programs.

Nurses with fewer years of service on the surgical unit were more likely to perceive administering opioid medications as dangerous (item 7) compared to nurses with more years of service. This is possibly because nurses with less experience working in clinical units are more concerned about administering opioids than those with more experience. Opioid safety emerged as a theme in a qualitative study of nurses conducted by Şen et al. In that study, the researchers found that more than a third of participants (12/30) believed that opioids were unsafe drugs that caused stress, and all the participants thought opioids were addictive⁴⁷. Similarly, Cooley et al.⁴⁸ found that nurses were concerned about administering opioids.

The results of our study also showed that participants with more work experience knew less about the side effects of opioids (item 10) than those with less work experience. Khetarpal et al.⁴⁹ focused on nurses with little work experience and reported that more than half of the nurses (55.5%) believed that patients could not tolerate opioids, and that most nurses (88.2%) had the misconception that patients who needed more analgesics were addicted to narcotics. Baldemir et al.⁴⁰ also investigated nurses' beliefs about opioids and reported several important findings. First, nurses had gaps in their knowledge of opioids. Second, most nurses needed more training because they were concerned about administering opioids. Third, most nurses believed that doctors should prescribe low doses of opioids due to their side effects. These results suggest that nurses are significantly concerned about the side effects of opioids. Therefore, nurses should administer opioids in a balanced manner to maximise the analgesic benefits for patients while minimising the occurrence of side effects³².

A number of studies have investigated nurses' perceptions about administering opioids to patients with a history of substance abuse. Tosunöz et al.³⁴ reported that many surgical nurses (70%) were concerned about administering opioids to patients with a history of drug abuse. Cüceler et al.⁵⁰ recommended that nurses care for substance abusers without prejudice. Cooper⁵¹ documented that

nurses believed that opioids would not work for people with a history of substance abuse and that most nurses were hesitant about administering opioids to patients addicted to opioids because they were concerned that it would cause their death. Heckroth et al.⁴⁶ presented participants with two scenarios – in one the patient was intoxicated and in the other the patient was sober – and compared nurses' concerns about opioid administration. The researchers found that most nurses were hesitant about administering opioids to patients who were under the influence of alcohol⁴⁶.

Our results showed that participants with less experience working in the surgical unit were more concerned about administering opioids to patients with a history of drug abuse than those with more experience. Nurses should treat patients with a history of opioid abuse with an eye to beneficence, do-no-harm, advocacy, patient autonomy, nursing autonomy and integrity. Nurses are ethically responsible for providing superior care to manage pain appropriately⁵².

Limitations

The study was conducted with nurses working in surgical clinics and surgical intensive care units in a single health centre. Since nurses' perceptions may change over time, the results of the research are limited to the time period in which the research was conducted. The results are sample-specific and, therefore, cannot be generalised to all nurses.

Conclusion and recommendations

Efficient management of opioids in surgical units contributes positively to both the patient and the institution. The more positive perceptions surgical nurses have about the administration of opioids, the safer they will administer them. Our results show that surgical nurses observe some side effects in their patients after administering them opioids, suggesting that they need more training on the issue. Clinics should hang posters, infographics and algorithms, and establish written protocols to inform surgical nurses about the administration of opioids. Hospitals should provide surgical nurses with in-service training in safe opioid use.

Table 2: Participant responses to nurses' perceptions of administering opioids questionnaire items (N=108)

Item	Strongly agree n (%)	Agree n (%)	Undecided n (%)	Disagree n (%)	Strongly disagree n (%)
1. The large number of new opioid drug types makes it difficult to administer drugs in this group.	11 (10.2)	33 (30.6)	33 (30.6)	27 (25.0)	4 (3.7)
2. I need more information to safely administer opioid medications (e.g. morphine) than other drug groups (blood pressure medications or insulin etc.).	28 (25.9)	67 (62.0)	6 (5.6)	6 (5.6)	1 (0.9)
3. I need to observe patients more closely when administering opioid medications (e.g. morphine) than with other drug groups (blood pressure medications or insulin, etc.).	45 (41.7)	54 (50.0)	3 (2.8)	3 (2.8)	3 (2.8)
4. Because I am afraid of administering opioid drugs (e.g. morphine), I am not willing to administer this group of drugs.	1 (0.9)	19 (17.6)	23 (21.3)	44 (40.7)	21 (19.4)
5. I am afraid of overdosing when administering opioid medications (e.g. morphine).	9 (8.3)	45 (41.7)	14 (13.0)	20 (18.5)	20 (18.5)
6. Errors in medication prescriptions are a common barrier to nurses administering opioid medications (e.g. morphine).	21 (19.4)	33 (30.6)	37 (34.3)	14 (13.0)	3 (2.8)
7. Opioid drugs (e.g. morphine) are dangerous because they require control and double signatures.	21 (19.4)	28 (25.9)	29 (26.9)	27 (25.0)	3 (2.8)
8. Nurses often associate administering opioid medications (e.g. morphine) with helping patients die.	1 (0.9)	3 (2.8)	10 (9.3)	48 (44.4)	46 (42.6)
9. Knowing about opioid medications (e.g. morphine) gives me more confidence during practice.	47 (43.5)	53 (49.1)	2 (1.9)	4 (3.7)	2 (1.9)
10. I know the side effects when administering opioid medications (e.g. morphine).	29 (26.9)	61 (56.5)	14 (13.0)	4 (3.7)	–
11. Nurses associate opioid medications (e.g. morphine) with substance abuse.	5 (4.6)	30 (27.8)	30 (27.8)	23 (21.3)	20 (18.5)
12. I do not want to make mistakes when administering opioid medications (e.g. morphine) for fear of criminal investigations.	34 (31.5)	43 (39.8)	14 (13.0)	12 (11.1)	5 (4.6)
13. I am more concerned when administering opioid medications (e.g. morphine) to patients with a history of substance abuse.	28 (25.9)	40 (37.0)	20 (18.5)	18 (16.7)	2 (1.9)
14. In order to be comfortable when administering opioid medications (e.g. morphine), I need to trust the doctor who ordered the medication.	28 (25.9)	53 (49.1)	11 (10.2)	13 (12.0)	3 (2.8)

Table 3. Correlation of participant questionnaire responses and some independent variables (N=108)

Items	Age in years	Years working in the profession	Years working in the current ward
Item 1	rho=-0.093 p=0.339	rho=0.089 p=0.359	rho=-0.177 p=0.067
item 2	rho=-0.084 p=0.388	rho=0.098 p=0.311	rho=-0.138 p=0.154
Item 3	rho=-0.060 p=0.537	rho=-0.092 p=0.343	rho=-0.115 p=0.235
Item 4	rho=0.079 p=0.419	rho=0.085 p=0.382	rho=0.33 p=0.736
Item 5	rho=0.182 p=0.059	rho=0.142 p=0.142	rho=0.124 p=0.203
Item 6	rho=-0.97 p=0.320	rho=-0.32 p=0.743	rho=0.038 p=0.694
Item 7	rho=-0.180 p=0.062	rho=0.176 p=0.069	rho=-0.278 p=0.004*
Item 8	rho=-0.010 p=0.920	rho=0.054 p=0.581	rho=-0.118 p=0.224
Item 9	rho=0.046 p=0.636	rho=0.020 p=0.835	rho=0.045 p=0.645
Item 10	rho=-0.286 p=0.003*	rho=-0.255 p=0.008*	rho=-0.200 p=0.038**
Item 11	rho=0.073 p=0.455	rho=0.039 p=0.686	rho=0.057 p=0.555
Item 12	rho=-0.182 p=0.060	rho=-0.168 p=0.082	rho=-0.113 p=0.243
Item 13	rho=-0.093 p=0.336	rho=-0.081 p=0.404	rho=-0.198 p=0.040**
Item 14	rho=-0.061 p=0.528	rho=-0.032 p=0.739	rho=-0.032 p=0.739

rho = Spearman's correlation analysis test

*p<0.01

**p<0.05

Acknowledgements

We would like to thank all the participants.

This abstract of study was presented at the 1st International Nursing Studies Congress (12-14 July 2023), as an oral presentation in Ordu, Turkey.

Author contributions: idea/concept – BI; design – BI, NB, ÖSA; supervision/consulting – NB, BI; data collection – EAK, ÖSA, HPŞ, MÇ; analysis and interpretation – BI; literature search – BI, MÇ, EAK, HPŞ, ÖSA; writing the article – BI, MÇ, EAK; critical review – NB.

Conflict of interest and funding statement

The authors have declared no competing interests with respect to the research, authorship and publication of this article.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

1. Zimmer Z, Fraser K, Grol-Prokopczyk H, Zajacova A. A global study of pain prevalence across 52 countries: Examining the role of country-level contextual factors [Internet]. Pain. 2022[cited 2024 Jun 27];163(9):1740–50. DOI: 10.1097/j.pain.0000000000002557
2. The International Association for the Study of Pain (IASP). (2024, 17 December). IASP Terminology [Internet]. Washington: IASP; 2011 [cited 2024 Dec 17]. Available from: www.iasp-pain.org/resources/terminology.
3. Raja SN, Carr DB, Cohen M, Finnerup NB, Flor H, Gibson S, Keefe FJ et al. The revised International Association for the Study of Pain definition of pain: Concepts, challenges and compromises [Internet]. Pain. 2020[cited 2024 Dec 17];161(9):1976–82. DOI: 10.1097/j.pain.0000000000001939
4. Rikard SM, Strahan AE, Schmit KM, Guy GP Jr. Chronic pain among adults – United States, 2019–2021 [Internet]. 2023[cited 2024 Dec 17];72(15):379–85. DOI: 10.15585/mmwr.mm7215a1
5. Rometsch C, Martin A, Junne F, Cosci F. Chronic pain in European adult populations: A systematic review of prevalence and associated clinical features [Internet]. Pain. 2024[cited 2024 Dec 17]. DOI: 10.1097/j.pain.0000000000003406
6. Eti Aslan F, Çınar F. Prevalence of pain in adult population in Türkiye [Internet]. Agri. 2023[cited 2024 Jun 27];35(2):83–95. DOI: 10.14744/agri.2022.26086
7. Gregory J, McGowan L. An examination of the prevalence of acute pain for hospitalised adult patients: A systematic review [Internet]. J Clin Nurs. 2016[cited 2024 Dec 17];25(5-6):583–98. DOI: 10.1111/jocn.13094
8. Park R, Mohiuddin M, Arellano R, Pogatzki-Zahn E, Klar G, Gilron I. Prevalence of postoperative pain after hospital discharge: Systematic review and meta-analysis [Internet]. Pain Rep. 2023[cited 2024 Dec 17];8(3):e1075. DOI: 10.1097/PR9.0000000000001075
9. Mills SEE, Nicolson KP, Smith BH. Chronic pain: A review of its epidemiology and associated factors in population-based studies [Internet]. Br J Anaesth. 2019[cited 2024 Jun 27];123(2):e273–83. DOI: 10.1016/j.bja.2019.03.023

10. Reisli R, Akkaya ÖT, Arıcan Ş, Can ÖS, Çetingök H, Güleç MS et al. Akut postoperatif ağrının farmakolojik tedavisi: Türk Algoloji-Ağrı Derneği klinik uygulama kılavuzu [Pharmacologic treatment of acute postoperative pain: A clinical practice guideline of The Turkish Society of Algology] [Internet]. Agri [Pain]. 2021[cited 2024 Jun 27];33(Suppl 1):1–51. DOI: 10.14744/agri.2021.60243
11. Anekar AA, Hendrix JM, Cascella M. WHO Analgesic Ladder [Internet]. Treasure Island: StatPearls Publishing; 2024 [Updated 2023 Apr 23, cited 2024 Jan 27]. Available from: www.ncbi.nlm.nih.gov/books/NBK554435
12. Subedi M, Bajaj S, Kumar MS, Yc M. An overview of tramadol and its usage in pain management and future perspective [Internet]. Biomed Pharmacother. 2019[cited 2024 Jun 27];111:443–51. DOI: 10.1016/j.biopha.2018.12.085
13. Ün B, Pekmezemek A, Kalay B, Özü Ö, Seçilmiş A. Bir opioid olan tramadolün farmakolojik etkileri [Pharmacological effects of tramadol, an opioid] [Internet]. Arşiv Kaynak Tarama Dergisi [Archives Medical Review Journal]. 2023[cited 2024 Jun 27];32(4), 206–14. DOI: 10.17827/aktd.1305162
14. Barr LF, Boss MJ, Mazzeffi MA, Taylor BS, Salenger R. Postoperative multimodal analgesia in cardiac surgery [Internet]. Crit Care Clin. 2020[cited 2024 Jun 27];36(4):631–51. DOI: 10.1016/j.ccc.2020.06.003
15. Zhang Q, Ren Y, Mo Y, Guo P, Liao P, Luo Y et al. Inhibiting Hv1 channel in peripheral sensory neurons attenuates chronic inflammatory pain and opioid side effects [Internet]. Cell Res. 2022[cited 2024 Jun 27];32(5):461–76. DOI: 10.1038/s41422-022-00616-y
16. Buchmueller TC, Carey C. The effect of prescription drug monitoring programs on opioid utilization in medicare [Internet]. American Economic Journal: Economic Policy. 2018[cited 2024 Jun 27];10(1):77–112. DOI: 10.1257/pol.20160094
17. Jungquist CR, Quinlan-Colwell A, Vallerand A, Carlisle HL, Cooney M, Dempsey SJ et al. American society for pain management nursing guidelines on monitoring for opioid-induced advancing sedation and respiratory depression: Revisions [Internet]. Pain Manag Nurs. 2020[cited 2024 Jun 27];21(1):7–25. DOI: 10.1016/j.pmn.2019.06.007
18. Yıldırım D, Can G. Opioid ilaç kullanan hastalarda gelişen konstipasyonun yönetimi [Opioid-induced constipation management] [Internet]. BAUN Sağ Bil Derg [BAUN Health Sci J]. 2019[cited 2024 Jun 27];8(1): 27–32. Available from: <https://dergipark.org.tr/en/pub/balikesirsbd/issue/44009/474858>
19. Ak ES. Ürolojik cerrahi sonrası ağrı yönetiminde güncel yaklaşımlar [Current approaches in pain management after urologic surgery] [Internet]. Anadolu Hemşirelik ve Sağlık Bilimleri Dergisi [Journal of Anatolia Nursing and Health Sciences]. 2020[cited 2024 Jun 27];23(4), 546–51. DOI: 10.17049/ataunihem.559052
20. Kiyat İ. Günübirlilik cerrahi sonrası ağrı yönetiminde hemşirelik yaklaşımı [Nursing approach in pain management after daily surgery] [Internet]. Adnan Menderes Üniversitesi Sağlık Bilimleri Fakültesi Dergisi [Journal of Adnan Menderes University Health Sciences Faculty]. 2021[cited 2024 Jun 27];5(2): 412–21. DOI: 10.46237/amusbfd.738738
21. Pattullo GG. Clinical implications of opioid-induced ventilatory impairment [Internet]. Anaesth Intensive Care. 2022[cited 2024 Dec 17];50(1-2):52–67. DOI: 10.1177/0310057X211070292
22. Macintyre PE, Loadman JA, Scott DA. Opioids, ventilation and acute pain management [Internet]. Anaesth Intensive Care. 2011[cited 2024 Dec 17];39(4):545–58. DOI: 10.1177/0310057X1103900405
23. Hancı V, Özbilgin Ş, Yurtlu S, Arça DÖ, Gökmen N, Arkan A. Pain therapy and regional analgesia in patients in the intensive care unit: A survey study [Internet]. Turk J Intensive Care. 2022[cited 2024 Jun 27];20(4):172–85. DOI: 10.4274/tybd.galenos.2021.14041
24. Adams SM, Varaei S, Jalalinia F. Nurses' knowledge and attitude towards postoperative pain management in Ghana. Pain Res Manag. 2020[cited 2024 Jun 27];2020:4893707. DOI: 10.1155/2020/4893707
25. Admass BA, Endalew NS, Tawuye HY, Mersha AT. Knowledge and attitude of Ethiopian oncology nurses about cancer pain management: National survey [Internet]. Cancer Manag Res. 2020[cited 2024 Jun 27];12:9045–55. DOI: 10.2147/CMAR.S261172
26. Akpolat R, Şişman H, Alptekin D, Gökçe E, Gezer D, Arslan S. Ameliyat sonrası ağrıya yaklaşımların değerlendirilmesi [Evaluation of approaches to pain after surgery] [Internet]. Çukurova Med J. 2021[cited 2024 Jun 27];46(2):670–6. DOI: 10.17826/cumj.898769
27. Alkhatib GS, Al Qadire M, Alshraideh JA. Pain management knowledge and attitudes of healthcare professionals in primary medical centers [Internet]. Pain Manag Nurs. 2020[cited 2024 Jun 27];21(3):265–70. DOI: 10.1016/j.pmn.2019.08.008
28. Khalil H, Mashaqbeh M. Areas of knowledge deficit and misconceptions regarding pain among Jordanian nurses [Internet]. Pain Manag Nurs. 2019[cited 2024 Jun 27];20(6):649–55. DOI: 10.1016/j.pmn.2019.02.010
29. Nguyen AT, Dang AK, Nguyen HTT, Nguyen TX, Nguyen TN, Nguyen TT et al. Assessing knowledge and attitudes regarding pain management among nurses working in a geriatric hospital in Vietnam [Internet]. J Multidiscip Healthc. 2021[cited 2024 Jun 27];14:799–807. DOI: 10.2147/JMDH.S285044
30. Peng NH, Lee MC, Su WL, Lee CH, Chen CH, Chang YC et al. Knowledge, attitudes and practices of neonatal professionals regarding pain management [Internet]. Eur J Pediatr. 2021[cited 2024 Jun 27];180(1):99–107. DOI: 10.1007/s00431-020-03718-0
31. Ülgen H, Tüfekci FG. The effect of pain management education on nurses' pain knowledge and attitudes [Internet]. Pain Manag Nurs. 2024[cited 2024 Jun 27];25(3):e186–91. DOI: 10.1016/j.pmn.2023.12.011
32. Akın E. Klinik ağrı yönetiminde hemşirenin etik yükümlülüğü [Ethical obligation of nursing in clinical pain management] [Internet]. Türkiye Klinikleri J Med Ethics. 2020[cited 2024 Jun 27];28(1), 128–33. DOI: 10.5336/mdethic.2019-66191
33. Yılmaz İ, Akansel N. The Turkish form of psychometric properties of opioids questionnaire [Internet]. Agri. 2022[cited 2024 Jun 27];34(2):117–30. DOI: 10.14744/agri.2021.01033
34. Tosunöz İK, Yurtseven Ş, Doğan SD. Perceptions of nurses regarding opioid administration: A cross-sectional study [Internet]. Pain Manag Nur. 2024[cited 2024 Dec 17];25(4):363–8. DOI: 10.1016/j.pmn.2024.02.013
35. Kurak D, Ateş B, Aygün D. Dispne tedavisinde güvenli opioid kullanımı ve bakımı [Safe opioid use and care in dyspnea] [Internet]. Yoğun Bakım Hemşireliği Dergisi [J Intensive Care Nursing]. 2023[cited 2024 Jun 27];27(1): 34–44.
36. Germossa GN, Sjetne IS, Hellesø R. The impact of an in-service educational program on nurses' knowledge and attitudes regarding pain management in an Ethiopian University Hospital [Internet]. Front Public Health. 2018 [cited 2024 Jun 27];6:229. DOI: 10.3389/fpubh.2018.00229
37. Yapıcı G, Ayyıldız T. çocuk servislerinde çalışan hemşirelere ağrı değerlendirmesine yönelik verilen eğitimin etkisi: Yarı deneysel çalışma [The effect of training on pain assessment in children for nurses working in child services: Semi-experimental study] [Internet]. Yüksek İhtisas Üniversitesi Sağlık Bilimleri Dergisi [Yüksek İhtisas University Journal of Health Sciences]. 2023[cited 2024 Jun 27];4(1):1–6. DOI: 10.51261/yiu.2023.00056
38. Salim NA, Tuffaha MG, Brant JM. Impact of a pain management program on nurses' knowledge and attitude toward pain in United Arab Emirates: Experimental-four Solomon group design [Internet]. Appl Nurs Res. 2020[cited 2024 Jun 27];54:151314. DOI: 10.1016/j.apnr.2020.151314
39. Cuschieri S. The STROBE guidelines [Internet]. Saudi J Anaesth. 2019[cited 2024 Dec 17];13(Suppl 1):S31–4. DOI: 10.4103/sja.sja_543_18
40. Baldemir R, Akçaboy EY, Noyan Ö, Çelik Ş, Akçaboy ZN. Hemşirelerin opioid kullanımına yönelik tutumları [Nurses attitudes toward opioid using] [Internet]. Bozok Tıp Dergisi [Bozok Medical Journal]. 2019[cited 2024 Jun 27];9(4):6–14. Available from: <https://dergipark.org.tr/tr/download/article-file/905015>
41. Çolpan E, Andsoy II. Cerrahi hemşirelerin ameliyat sonrası ağrı kontrolünde multimodal analjeziye yönelik bilgileri ile yordayıcı faktörlerin belirlenmesi [Determination of surgical nurse's knowledge and predictors towards multimodal analgesia for controlling postoperative pain] [Internet]. Online Türk Sağlık Bilimleri Dergisi [Online Turkish Journal of Health Sciences]. 2022[cited 2024 Jun 27];7(4), 526–31. DOI: 10.26453/otjhs.1038541
42. Guest C, Sobotka F, Karavasopoulou A, Ward S, Bantel C. Nurses and opioids: Results of a binational survey on mental models regarding opioid administration in hospitals [Internet]. J Pain Res. 2017[cited 2024 Jun 27];10:481–93. DOI: 10.2147/JPR.S127939

43. Tabachnick BG, Fidell LS. Using multivariate statistics [Internet]. Boston MA: Pearson; 2013; 497–516. Available from: https://hispl.htmi.ch/pluginfile.php/77114/mod_resource/content/0/Using%20Multivariate%20Statistics%20%28Tabachnick%20and%20Fidell%29.pdf
44. Coşansu G. Research process, practice and criticism in nursing. In: Erdoğan S, Nahcivan N, Esin MN, editors. Analysis and interpretation of data. Ankara: Nobel Medical Bookstores; 2014, p. 271.
45. Clarke HA, Manoo V, Pearsall EA, Goel A, Feinberg A, Weinrib A et al. Consensus statement for the prescription of pain medication at discharge after elective adult surgery [Internet]. Can J Pain. 2020[cited 2024 Jun 27];4(1):67–85. DOI: 10.1080/24740527.2020.1724775
46. Heckroth A, Pludra V, Johannssen C, Guest C, Wiedermann F, Bantel C. The influence of personal values and patient intoxication on nurses concerns about opioids: Results of a prospective cross-sectional multi-centre study [Internet]. Br J Pain. 2021[cited 2024 Jun 27];15(1):40–53. DOI: 10.1177/2049463719880333
47. Şen S, Usta E, Aygün D. Attitudes of surgical nurses toward postoperative opioid use: A qualitative study [Internet]. J Human Science. 2020[cited 2024 Jun 27]; 17(3): 911–20. DOI: 10.14687/jhs.v17i3.5977
48. Cooley R, Venkatachalam AM, Aguilera V, Olson DM, Stutzman SE. A qualitative study of nurses' perceptions of narcotic administration after subarachnoid hemorrhage [Internet]. Pain Manag Nurs. 2022[cited 2024 Jun 27];23(2):151–7. DOI: 10.1016/j.pmn.2021.03.008
49. Khetarpal M, Dubey R, Dey S, Arora P. Evaluation of knowledge, attitude and practices of nurses regarding pain management [Internet]. Indian J Pain. 2021[cited 2024 Jun 27];35(3):228–34. DOI: 10.4103/ijpn.ijpn_52_21
50. Cüceler S, Yılmaz M, Türkleş S. Madde bağımlısı bireylerin yaşadığı psikososyal sorunlar, uygulanan kanıt temelli müdahaleler ve hemşireliğin rolü [Psychosocial problems experienced by substance addicts, implemented evidence based interventions and the role of nursing] [Internet]. J Dependence. 2022[cited 2024 Jun 27];23(1):105–10. DOI: 10.51982/bagimli.958710
51. Cooper LA. Ethics of narcotic pain management in substance use disorder recovery [Internet]. The Journal for Nurse Practitioners. 2016[cited 2024 Jun 27];12(10): e415–8. DOI: 10.1016/j.nurpra.2016.06.014
52. American Nurses Association (ANA). The opioid epidemic: The evolving role of nursing [Internet]. Silver Spring: ANA; 2018 [cited 2024 Jun 27]. Available from: www.ncsbn.org/public-files/2018_ANA_Opioid_Epidemic.pdf

Author

Jinseok Kim

MCN(Education), BN, RN
Clinical Nurse Educator in Operating
Theatres and Perioperative Services,
Sydney and Sydney Eye Hospital
urbanrkw@gmail.com

Transforming pre-operative fasting practice: A nurse-led liberal fluid fasting regimen

Abstract

Introduction: Traditional pre-operative fasting practice often involves extended periods without fluids, and can be a source of discomfort and anxiety for patients. This can lead to negative experiences and potentially contribute to complications. Evidence suggests that these practices may not be necessary to minimise the risk of pulmonary aspiration during surgery. This quality improvement project implemented a nurse-led liberal fluid fasting regimen for pre-operative patients. The aim was to improve patient comfort and wellbeing while maintaining safety.

Process: Utilising the 'knowledge-to-action' framework for implementation science, the project implemented a nurse-led liberal fluid fasting regimen. This involved reviewing relevant literature, developing the regimen, educating staff and addressing potential barriers. Monitoring and evaluation included tracking adverse events and collecting surveys. The project ensures sustainability through ongoing staff training and observational audits.

Outcomes: The project demonstrated the safety of the regimen, with no reported cases of pulmonary aspiration or other serious adverse events. Statistically significant outcomes were observed in changes in nurses' perceptions of patient wellbeing ($p < 0.001$), reduction in clinical signs and symptoms of dehydration ($p < 0.001$) and patients' reports of emotional distress related to waiting times ($p < 0.001$).

Discussion: The project has not only addressed longstanding challenges in pre-operative fluid fasting practices but has also set a new standard for patient-centred care. It has demonstrated effectiveness in achieving a delicate balance between patient safety and enhanced comfort while fostering a culture of compassionate care provision, placing patient wellbeing at the forefront. This evidence-based approach offers a patient-centred alternative to traditional fasting practices and has the potential to be adopted by other healthcare facilities seeking to improve patient experience and streamline pre-operative care.

Keywords: nurse-led, pre-operative, liberal, pre-operative fluid, clear fluid, fasting

Identified problem

Pulmonary aspiration, although rare, remains a significant risk in anaesthesia practice, with seven fatalities reported in Australia between 2015 and 2017¹. Adherence to fasting guidelines is crucial to reduce stomach contents and acidity, thereby lowering aspiration risks². Regulatory bodies such as the Agency for Clinical Innovation (ACI) and the Australian and New Zealand College of Anaesthetists (ANZCA) recommend fasting from food up to six hours and fluids up to two hours before surgery¹³.

However, the author has identified daily challenges faced by anaesthetists and pre-operative patients, including

inconsistent communication by healthcare professionals leading to varied patient comprehension and adherence to fasting guidelines. The unpredictable nature of surgical schedules exacerbates this issue⁴, resulting in unnecessarily prolonged fluid fasting, which negatively impacts patients' wellbeing⁵.

Prolonged fasting increases the risk of adverse events related to dehydration⁶, particularly in vulnerable populations like the elderly and paediatric patients⁷, who are more susceptible to post-operative delirium⁸. Research indicates that prolonged fasting can worsen post-operative complications, due to an increased metabolic response⁹, while patients commonly report discomforts

including thirst, hunger, nausea and weakness¹⁰.

Local data reveals a wide range of actual fasting durations among patients, from two to twelve hours, suggesting disparities in understanding and adhering to fasting instructions. On average, emergency surgery patients, whose fasting instructions come from referring physicians, fasted longer suggesting a gap in patient education. This disparity highlights the need for improved practices across healthcare providers to ensure consistent adherence to fasting guidelines. Addressing these challenges requires a collaborative effort to establish and implement an improved pre-operative fasting regimen.

Proposed solution

Nurses, as patient advocates, strive to ensure safe fasting practices that minimise discomfort. However, current inconsistencies in fasting information and adherence to guidelines create challenges in achieving this balance. Therefore, the author proposes a solution that addresses these concerns – a nurse-led liberal fluid fasting regimen. Adult patients are encouraged to consume 200ml of clear fluids per hour, while paediatric patients can drink 3ml of clear fluids per kilogram per hour. Acceptable options include water, ice chips, apple juice, black coffee or plain tea without milk. In the perioperative unit, the nurse will explain this regimen and encourage patients to drink their chosen clear fluids. This evidence-based and patient-centred approach addresses the inconsistencies in current practices and promotes patient autonomy while ensuring safe care. It allows nurses to prioritise patient comfort while mitigating aspiration risk. Ultimately, this project report not only promotes a positive and supportive patient experience but also has the potential to improve post-operative outcomes.

This liberal regimen aligns with recent research findings that question the traditional fluid fasting guidelines. Studies suggest that extended periods of fluid fasting do not necessarily reduce the volume or acidity of gastric content, nor do they lower aspiration risk^{5,11}. Conversely, shorter fasting periods do not result in larger residual gastric volumes¹¹. Studies investigating gastric emptying

rates in healthy patients support this argument, demonstrating rapid and exponential gastric emptying after clear fluid intake^{12–14}.

Moreover, orthopaedic trauma centres in Scotland have adopted a more liberal approach, allowing patients to sip small amounts of water until surgery⁷. This approach has been proven successful and has been adopted in over 50 hospitals across the United Kingdom and internationally since 2021⁷. Checketts⁷ reported that the number of adverse events has not risen in over 12 000 patients despite this change. Additionally, a large-scale study by Marsman et al.¹⁵ demonstrated a reduction in post-operative complications with a liberal drinking regimen. Similarly, a study by Harnett et al.⁴ supports this liberal drinking regimen for elective caesarean surgery patients, demonstrating its non-inferiority to the fully fasting regimen.

Project plan

The project employed the ‘knowledge-to-action’ framework by Graham et al.¹⁶ for implementation science. A literature review was conducted, to synthesise existing research, and supplemented by an analysis of clinical data to assess safety and effectiveness. This process revealed a problem –fluid fasting times within the author’s hospital varied from two to twelve hours. To address this inconsistency, a new regimen was developed, advocating for patients to consume small amounts of clear fluids until transfer to the operating theatre.

Moving into the adaptation phase, the project involved developing and pitching a proposal, identifying potential collaborators and securing buy-ins. Anticipated barriers to implementation were considered, including management indifference, staff knowledge gaps and logistical challenges. Strategies to overcome these barriers included contextualising the intervention, highlighting evidence-based benefits and emphasising the patient-centred approach.

Subsequently, the project focused on selecting, tailoring and implementing change, with effective stakeholder engagement being deemed imperative. This engagement included all

perioperative leadership team members, consultant and trainee anaesthetists, and surgeons. Educational sessions were conducted for nursing and medical staff to ensure comprehensive understanding of and adherence to the new regimen. Clear communication channels and readily available resources were established to facilitate seamless implementation and ongoing support. Informative posters detailing the regimen, specifically for nurses, aided in reinforcing key messages.

Moreover, monitoring mechanisms were established to track staff attendance at education sessions, assess knowledge retention and monitor any adverse events resulting from the regimen. The project engaged the Clinical Practice Improvement Unit for clinical governance oversight. Evaluation was conducted with research ethics approval, involving quantitative data collection from medical records (primary outcome measurement: analysis of adverse events and incidents). Secondary outcome measurement involved a survey to evaluate perceptions of nursing staff and patient experiences, with both outcomes measured at two months, six months and one year post-implementation.

Finally, sustainability measures were implemented, including regimen integration into new staff training, regular compliance audits, annual refresher training and knowledge dissemination to other hospitals within the local health district.

Project successes

Decreased number of clinical emergency response system calls

The project successfully achieved its primary goal of minimising adverse events. During the implementation period, there were no reported cases of pulmonary aspiration or other serious adverse events. Analysis of medical records revealed a 16 per cent decrease in the number of perioperative clinical emergency response system (CERS) calls compared to the pre-implementation period. Additionally, there was a 26 per cent reduction of hypotension events. Notably, there were significant reductions in hypoglycaemia and ketonaemia events,

with decreases of 75 per cent and 83 per cent, respectively. Although the sample size is small, these findings suggest that the regimen did not compromise patient safety. Figure 1 shows the pre-operative, post-operative and total number of perioperative CERS calls, and figure 2 shows the breakdown of the reasons for the CERS calls.

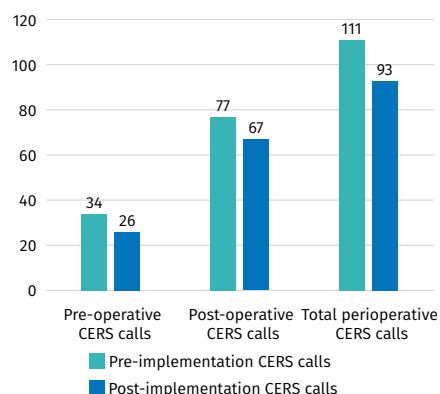


Figure 1: Perioperative CERS calls

Improved nurse perception and patient experience

The survey was completed by 16 of 21 nurses (76% response rate) with an average of 14.5 years of experience. Statistical analysis using paired samples t-tests revealed a slight increase in confidence in patient education delivery post-implementation ($p = 0.054$). Statistically significant changes were observed in nurses' perceptions of patient wellbeing ($p < 0.001$), indicating reduced concern about potential dehydration complications. Moreover, there was a statistically significant reduction in clinical signs and symptoms

of dehydration ($p < 0.001$) and patients' reports of emotional distress related to waiting times ($p < 0.001$), suggesting the regimen improved patient physical and emotional conditions. Furthermore, data showed a significant increase in patient adherence to the regimen, and a decrease in the need for patient re-education regarding the fasting instructions.

Nursing staff praised the clarity and effectiveness of the regimen, highlighting its positive impact on patient comfort and pre-operative experience. Survey responses mentioned positive feedback from patients ($n = 6$), reduced instances of hunger-related aggression ($n = 5$) and decreased patient anxiety and stress levels ($n = 5$). Notably, the need for intravenous interventions due to hypoglycaemia ($n = 4$) and dehydration ($n = 3$) also decreased. These findings suggest that the regimen not only improved patient experience but also streamlined nursing care practices. Table 1 (see page 15) shows the results of paired samples t-tests for perceptions of nursing staff and patient experiences before and after the regimen was implemented.

Opportunities for improvement

The initial implementation phase highlighted the importance of ongoing communication and education efforts.

Knowledge gaps

During the implementation phase some medical professionals expressed concerns about the safety of the liberal fluid fasting regimen, with one medical professional

mentioning potential risks associated with caffeinated beverages. This highlights the need for targeted education to address knowledge gaps and misconceptions regarding the new regimen. Disseminating evidence-based information and guidelines to all medical professionals can ensure a clear understanding of the benefits and safety of liberal fluid fasting.

Patient education

Pre-existing beliefs and past experiences sometimes made patients hesitant to follow the new regimen. The project will develop robust patient education materials delivered through a multimedia approach to address these concerns. These resources will emphasise the safety and benefits of the regimen for patient comfort and wellbeing, directly addressing common myths and anxieties patients may have.

Stakeholder input

Finally, the project will continue to gather feedback from clinicians, patients and caregivers. This ongoing process will be crucial for identifying and addressing any emerging challenges, ensuring the continued success of the program.

Recommendations

The project has not only addressed longstanding challenges in pre-operative fluid fasting practices but has also set a new standard for patient-centred care. It has achieved a delicate balance between patient safety and enhanced comfort while fostering a culture of compassionate care provision, placing patient wellbeing at the forefront. Health-care facilities seeking to improve their pre-operative fasting practices are encouraged to consider adopting a similar evidence-based approach, tailored to their specific context. The demonstrated benefits of this approach in enhancing patient comfort and safety are evident in the author's facility and should be mirrored in yours.

Conflict of interest and funding statement

The author has declared no competing interests with respect to the research, authorship and publication of this article.

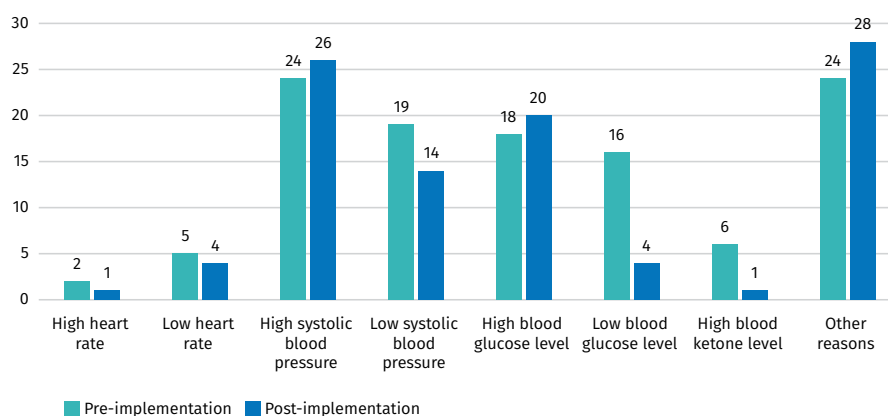


Figure 2: Breakdown of reasons for CERS calls

Table 1: Pre- and post-implementation paired samples t-test (N = 16)

Pairs	Paired differences				t	df	Significance	
	Mean	SD	SEM	95% CI of the MD			One-sided p	Two-sided p
1. Confidence in patient education (pre- and post-implementation)	-0.375	0.719	0.180	-0.758–0.008	-2.087	15	0.027	0.054
2. Level of patient understanding (pre- and post-implementation)	0.438	1.315	0.329	-0.263–1.138	1.331	15	0.102	0.203
3. Concern for patient health (pre- and post-implementation)	1.938	1.482	0.370	1.148–2.727	5.230	15	<0.001	<0.001
4. Showing clinical signs and symptoms (pre- and post-implementation)	1.813	1.167	0.292	1.191–2.434	6.211	15	<0.001	<0.001
5. Showing emotional discomfort (pre- and post-implementation)	2.250	1.065	0.266	1.683–2.817	8.454	15	<0.001	<0.001

t = test statistic, df = degrees of freedom, SD = standard deviation, SEM = standard error of mean, CI = confidence interval, MD = difference in means

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

1. Safety of anaesthesia: A review of anaesthesia-related mortality reporting in Australia and New Zealand 2015–2017 [Internet]. Melbourne: ANZCA; 2021 [cited 2024 Sep 5]. Available from: [https://www.anzca.edu.au/getContentAsset/9ec13653-fe57-4288-96db-ae789eae4a8f/80feb437-d24d-46b8-a858-4a2a28b9b970/Safety-of-Anaesthesia-report-\(2015-2017\).PDF?language=en&view=1](https://www.anzca.edu.au/getContentAsset/9ec13653-fe57-4288-96db-ae789eae4a8f/80feb437-d24d-46b8-a858-4a2a28b9b970/Safety-of-Anaesthesia-report-(2015-2017).PDF?language=en&view=1)
2. Joshi GP, Abdelmalak BB, Weigel WA, Harbell MW, Kuo CI, Soriano SG et al. 2023 American Society of Anesthesiologists practice guidelines for preoperative fasting: Carbohydrate-containing clear liquids with or without protein, chewing gum, and pediatric fasting duration—a modular update of the 2017 American Society of Anesthesiologists practice guidelines for preoperative fasting [Internet]. Anesthesiology. 2023[cited 2024 Sep 5];138(2):132–51. DOI: 10.1097/ALN.0000000000004381
3. Agency for Clinical Innovation (ACI). Pre-operative fasting in NSW public hospitals. Sydney: ACI; 2016.
4. Harnett C, Connors J, Kelly S, Tan T, Howle R. Evaluation of the 'sip til send' regimen before elective caesarean delivery using bedside gastric ultrasound: A paired cohort pragmatic study [Internet]. Eur J Anaesthesiol. 2023[cited 2024 Sep 5];41(2):129–35. DOI: 10.1097/EJA.0000000000001926
5. Zeraatkar D, Shanthanna H, Mbuagbaw L, Morgan RL, Reddy D, Couban R et al. Preoperative fasting for prevention of perioperative complications in adults [Internet]. Cochrane Database of Systematic Reviews. 2020(10) [cited 2024 Sep 5]. DOI: 10.1002/14651858.CD013772
6. Morrison CE, Ritchie-McLean S, Jha A, Mythen M. Two hours too long: Time to review fasting guidelines for clear fluids [Internet]. Br J Anaesth. 2020[cited 2024 Sep 5];124(4):363–6. DOI: 10.1016/j.bja.2019.11.036
7. Checketts MR. Fluid fasting before surgery: the ultimate example of medical sophistry? [Internet] Anaesthesia. 2023[cited 2024 Sep 5];78(2):147–9. DOI: 10.1111/anae.15925. Epub 2022 Dec 8
8. Khanna P, Saini K, Sinha R, Nisa N, Kumar S, Maitra S. Correlation between duration of preoperative fasting and emergence delirium in pediatric patients undergoing ophthalmic examination under anesthesia: A prospective observational study [Internet]. Pediatr Anaesth. 2018[cited 2024 Sep 5];28(6):547–51. DOI: 10.1111/pan.13381
9. Zhou G, Zhu F, An Y, Qin L, Lv J, Zhao X et al. Prolonged preoperative fasting and prognosis in critically ill gastrointestinal surgery patients [Internet]. Asia Pac J Clin Nutr. 2020[cited 2024 Sep 5];29(1):41–7. DOI: 10.6133/apjcn.202003_29(1).0006
10. Van Noort HHJ, Lamers CR, Vermeulen H, Huisman-de Waal G, Witteman BJM. Patient education regarding fasting recommendations to shorten fasting times in patients undergoing esophagogastroduodenoscopy: A controlled pilot study [Internet]. Gastroenterol Nurs. 2022[cited 2024 Sep 5];45(5):342–53. DOI: 10.1097/SGA.0000000000000678
11. Aschkenasy G, Leder O, Pardes R, Nir EA, Shteyer E, Orlanski-Meyer E et al. Preoperative clear fluid fasting and endoscopy-measured gastric fluid volume in children [Internet]. Paediatr Anaesth. 2023[cited 2024 Sep 5];33(7):532–8. DOI: 10.1111/pan.14662
12. Beck CE, Chandrakumar T, Sümpelmann R, Nickel K, Keil O, Heiderich S et al. Ultrasound assessment of gastric emptying time after intake of clear fluids in children scheduled for general anesthesia: A prospective observational study [Internet]. Pediatr Anaesth. 2020[cited 2024 Sep 5];30(12):1384–9. DOI: 10.1111/pan.14029
13. Grimm M, Aude P, Feldmüller M, Keßler R, Scheuch E, Tzvetkov MV et al. Comparing the gastric emptying of 240 mL and 20 mL water by MRI and caffeine salivary tracer technique [Internet]. Eur J Pharm Biopharm. 2023;184:150–8. DOI: 10.1016/j.ejpb.2023.01.021
14. Taye S, Mohammed S, Bhatia P, Kumar M, Chhabra S, Kumar R et al. Gastric emptying time of two different quantities of clear fluids in children: A double-blinded randomized controlled study [Internet]. Pediatric Anesthesia. 2021;31(11):1187–93. DOI: 10.1111/pan.14261
15. Marsman M, Kappen TH, Vernooij LM, van der Hout EC, van Waes JA, van Klei WA. Association of a liberal fasting policy of clear fluids before surgery with fasting duration and patient well-being and safety [Internet]. JAMA surgery. 2023;158(3):254–63. DOI: 10.1001/jamasurg.2022.5867
16. Graham ID, Logan J, Harrison MB, Straus SE, Tetroe J, Caswell W et al. Lost in knowledge translation: Time for a map? [Internet] J Contin Educ Health Prof. 2006;26(1):13–24. DOI: 10.1002/chp.47

Authors

Dr Jutharat Attawet

Swinburne University of Technology

Dr Penny Sweeting

Charles Darwin University

Elaine Correia Moll

University of Technology Sydney

Dr Kim M Caudwell

Charles Darwin University

Corresponding author

Dr Jutharat Attawet

Swinburne University of Technology

jattawet@swin.edu.au

Operating theatre nurses' experiences in medical emergency response: An integrative literature review

Abstract

Aims: This study aims to review the experiences of instrument and circulating nurses in responding to intra-operative medical emergencies.

Background: The operating theatre is a complex environment where surgical procedures are performed by surgical teams who are often required to adapt to rapidly changing circumstances. Although most surgeries are uneventful, medical emergencies can occur. Instrument and circulating nurses play pivotal roles in patient safety during the intra-operative phase. However, research into their experiences dealing with medical emergencies is limited, highlighting the need for a better understanding of their perspectives and identifying areas where additional training and support may be required.

Design: An integrative review.

Methods: We conducted an electronic literature search in Medline, CINAHL, Scopus, Science Direct and PubMed databases. Three reviewers independently screened, extracted data and assessed quality, using Joanna Briggs Institute software to facilitate the process. We followed the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines for reporting.

Results: Three studies were included, but they did not explicitly address instrument and circulating nurses' experiences during intra-operative medical emergencies. Instead, they discussed these nurses' involvement in such emergencies, emphasising their mental preparation and the importance of effective communication and coordination within the team. The overall team's experience influenced how medical emergencies were managed.

Conclusions: The experiences of instrument and circulating nurses during intra-operative medical emergencies remain underexplored in the literature. While some research examines surgical adverse events, there is a gap in assessing these nurses' confidence and competence in such events. Non-technical skills are crucial, but the interplay with technical skills remains unexplored.

Keywords: emergency, medical emergency, instrument nurse, circulating nurse, perioperative nurse, operating theatre

Introduction

The operating theatre (OT) is a complex environment where surgical procedures are performed, and teams must be dynamic in response to challenging and often fast-changing situations¹. For the most part, surgical procedures are performed without incident, but medical emergencies requiring resuscitation and sometimes intra-operative cardiopulmonary resuscitation (CPR) do occur². These events can occur

at any point throughout a patient's perioperative journey.

There are three distinct stages of the perioperative journey – pre-operative, intra-operative and post-operative³. Perioperative nurses, which include anaesthetic nurses, instrument nurses, circulating nurses and Post Anaesthesia Care Unit (PACU) nurses, play a vital role in each stage and have different roles and responsibilities⁴. During the intra-operative phase or surgical intervention, instrument and circulating

nurses are responsible for the surgical fields and assisting the surgeon while collaborating with other team members to achieve optimal patient care⁴. These nurses typically anticipate care with the surgical team, supply instruments, check accountable items and consistently monitor the intra-operative environment and the aseptic status of the sterile team using their 'surgical conscience'³.

Also during the intra-operative stage, circulating and instrument nurses play a crucial role in maintaining patient safety and responding to medical emergencies^{5,6}. In their qualitative study of perioperative nurses in the United Kingdom (UK), McGarry et al.⁵ found that maintaining patient safety was a high priority for perioperative nurses. In their quality improvement study, Caruso et al.⁶ highlighted that while the roles and responsibilities of code blue responders were unclear in the OT, the constant availability of the instrument and/or circulating nurse and OT nurse positions in the OT made them an integral part of the medical emergency response team.

Circulating and instrument nurses therefore employ a combination of technical and non-technical skills, including communication, preparing emergency equipment, managing the sterile field and situational awareness, to help manage a medical emergency⁷. Specific tasks assigned to instrument and circulating nurses during a medical emergency included activating the emergency response, performing chest compressions, assisting with peripheral lines and documentation⁶.

Despite the dearth of research into the roles and responsibilities of OT nurses, and imprecise definitions and nomenclature⁵, it is evident that these nurses are integral to managing medical emergencies in the OT which requires a combination of specific technical and non-technical skills. For instance, at a minimum, technical skills would include basic life support skills and knowledge of emergency protocols. However, while instrument and circulating nurses may indeed possess these skills, their primary role is the maintenance of a sterile field and providing support for the surgical team³. Because other nurses, such as recovery and anaesthetic nurses⁴, may play a more visible role in managing

medical emergencies there may be a perception that instrument and circulating nurses do not have responsibility in the context of a medical emergency. Indeed, most of the literature focuses on instrument and circulating nurses' roles during surgery and their non-technical skills during adverse events, and research examining instrument and circulating nurses' experiences managing medical emergencies is limited. Consequently, instrument and circulating nurses may not receive adequate support and training for their roles and responsibilities during medical emergencies.

To address this gap, we reviewed the literature to understand the experiences of instrument and circulating nurses in intra-operative medical emergencies and to identify areas where further training and support may be needed.

Methods

A five-stage integrative literature review approach was adopted in this study, incorporating problem identification, literature search, data evaluation, data analysis and presentation⁸. This approach has been used extensively to enhance the rigour of the review process in nursing and features in similar integrative reviews⁹.

Literature search

An extensive literature search was conducted in June 2024. The databases searched included Medline (EBSCO), CINAHL (EBSCO), Scopus, Science Direct and PubMed. We also manually searched Google Scholar and the reference lists of relevant articles. The search included qualitative and quantitative primary and secondary studies published in English between the years 2013 and 2024. The identified keywords were 'perioperative nurses', 'theatre nurses', 'scrub', 'scout', 'instrument nurses', 'circulating nurses', 'emergency', 'medical emergency', 'code blue', 'rapid response', 'deterioration', 'perioperative', 'operating theatre' and 'operating room'. Key terms were also searched using Medical Subject Headings (MeSH) terms. During the search process, consideration was given to the diverse terminology used, synonyms and the spelling of keywords.

Inclusion and exclusion criteria

This review included studies focused on the medical emergency experiences of perioperative nurses, particularly instrument and circulating nurses. Any studies that solely investigated medical emergency experiences of anaesthetic nurses, PACU nurses, surgeons and other healthcare workers were excluded. Any studies that included medical emergencies in other departments, apart from the OT, were excluded. (see the decision tree in Supplement 1).

Data screening and extraction

Joanna Briggs Institute (JBI) software (JBI Sumri) was used for study selection and extraction. The initial search identified 1351 titles from databases. Another four articles from references and citations that were seemingly relevant were retrieved and assessed for inclusion. We excluded duplicated (n = 104) entries, leaving 1251 titles. The title, abstract and whole text were assessed against the inclusion and exclusion decision tree (see Supplement 1). The titles, abstracts and full texts of articles were independently screened for potential eligibility by the first and second authors. Disagreements were solved by discussion. A third author was available to reach a majority if a consensus could not be reached. A total of 1248 articles were reasonably removed, with three articles remaining. Figure 1 presents the search procedure and outcomes.

Data were extracted from each included study independently by the third author, generating a summary table that captured author, year published, study design, method, sampling approach, subjects' country of origin and key findings. The data extraction process was reviewed and checked by the first and second authors for consistency. Any discrepancies were discussed until consensus was reached. Once complete, a summary table of the findings was generated (see Supplement 2).

Data evaluation

The three articles were appraised for quality using the JBI assessment and review instruments¹⁰. The first and second authors performed the article appraisal independently. Any disagreements were discussed and resolved. Supplement 3 details the evaluation of these articles.

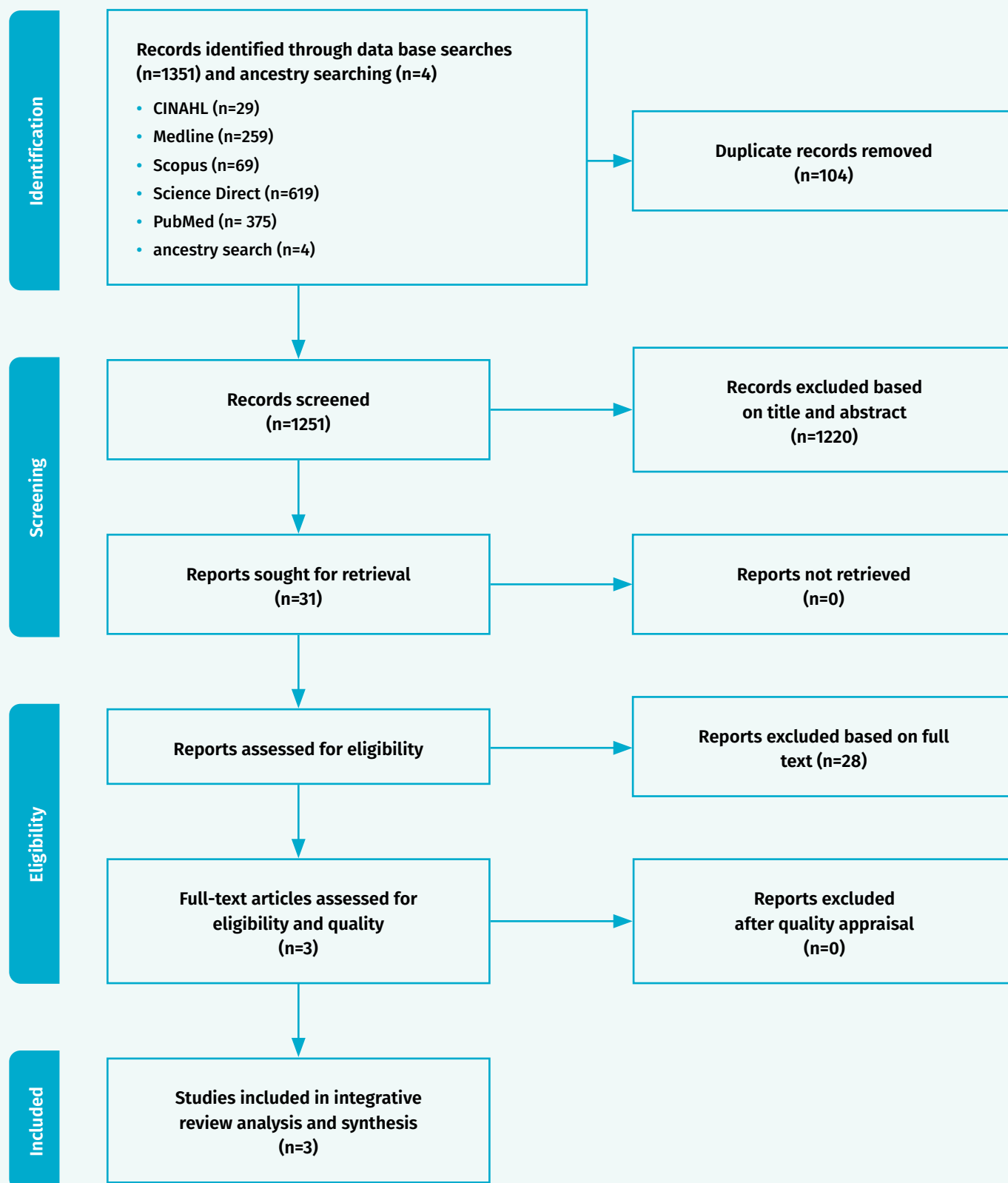


Figure 1: PRISMA flow diagram of search procedure and outcomes

Due to the low number of articles that met the inclusion criteria, it was decided to include all three articles in the review.

Data analysis

Data analysis was facilitated by Nvivo 12. The results of the experiences of instrument and circulating nurses in managing or responding to medical emergencies were analysed using thematic analysis¹¹. Data were analysed individually by the first, second and third authors, and then triangulated. Data were coded and categorised into groups and themes to answer the research question. All authors reviewed the themes and discussed if there were any ambiguities. All authors resolved any disagreements of data analysis through discussion and consensus.

Researchers referred to the primary source, as needed, to verify context and help clarify the subthemes. A master list was generated, and the researchers determined the final placement of each subtheme into a theme. The researchers then synthesised each theme's essential elements and conclusions into an integrated summation. Themes and subthemes were generated from the findings that reflected the review's aims.

Results

The three reviewed studies were conducted in China, the UK and Sweden. There was a total of 377 OT nurses – 361 in China, 12 in the UK and four in Sweden. The studies from the UK and Sweden identified OT nurses as instrument and circulating nurses, while the study from China did not specify the nurses' roles. The terms used for OT nurses in this reviewed study refer to instrument and circulating nurses.

Three themes emerged from data analysis – management in medical emergency, support, and impact on individuals. Subthemes were also identified under each theme (see Table 1).

Theme 1: Management in a medical emergency

Medical emergency events

A medical emergency is a sudden and unexpected medical situation that requires immediate attention and intervention to prevent serious

Table 1: Themes and subthemes identified from data analysis

Themes	Subthemes
1. Management in a medical emergency	• Medical emergency events • Communication and coordination • Preparation and planning • Problem-solving and adapting
2. Support	• Team • Staff experience
3. Impact on individuals	• Impact • Learning/gaining

harm, disability or death. In the OT setting, medical emergencies such as cardiac arrest are rare but sometimes catastrophic if not managed correctly¹². In one study, over half of the medical events in the OT were related to surgical incidents, such as wrong-site surgery and retained foreign objects, rather than medical emergencies¹³. Interestingly, this study also extended the term surgical incident to include a patient's death in theatre¹³.

In this review, instrument and circulating nurses experienced medical emergency events during the intra-operative period, including critical situations, such as sudden changes in patient conditions and sudden patient death, and unexpected issues such as equipment-related problems. Although the literature claims that medical emergency is rare, the study by Wang and colleagues¹⁴ reported that 33.5 per cent of instrument and circulating nurses experienced a patient's sudden death from changing conditions on the operating table.

Communication and coordination

In managing the medical emergency, instrument and circulating nurses believed communication was a well-functioning system to create safe care¹. Instrument and circulating nurses often communicated with the team to gain support and prioritise their tasks. Receiving the same information drove effective team functioning.

Communication and coordination were identified as critical for managing challenging situations. Instrument and circulating nurses described being familiar with the team and coordinating effectively

as providing security. Staff found communication more difficult in larger teams and teams not well socialised. Instrument and circulating nurses perceived communication to be more critical in these situations to promote coordination of care. In less integrated or larger teams, there is potential that things are 'missed' where there is a lack of effective communication¹. Communication and coordination were important both within the OT and with outside personnel and departments. Staff identified the importance of communicating with outside departments to access resources, personnel, equipment and emergency support¹.

Communication also impacted instrument and circulating nurses after the medical emergency. A lack of communication was believed to contribute to the ongoing adverse effects of a surgical incident. Instrument and circulating nurses described that a lack of communication after the event lead to increased stress and fear for future job prospects¹³. Instrument and circulating nurses also described feelings of suspicion towards other OT personnel when there was a communication vacuum, believing that instrument nurses were unnecessarily blamed for adverse events in the OT¹³.

Preparation and planning

Self-preparation is used by instrument and circulating nurses before surgical procedures to prevent medical emergencies and adverse events. Self-preparation appeared to also be used as a mental preparation technique for the surgery. Instrument and circulating nurses self-prepared and shared the plan among the surgical team based on the

patient's need and the type of surgery to create 'a mental model'¹. Instrument and circulating nurses described that the mental model always had multiple plans for unexpected events to give peace of mind and create safe care.

The instrument and circulating nurses' preparation also required them to consider not only patient factors but also the needs and experience of the surgeon and surgical team. Instrument and circulating nurses prepared to be more vigilant during procedures with unfamiliar teams or junior OT personnel. Planning and prioritisation were based on the expected course of the surgical procedure, anticipated potential complications and subsequent management strategies. Instrument and circulating nurses appear to recognise the importance of preparing to maximise safe patient care in the OT¹.

Problem-solving and adapting

Instrument and circulating nurses used policies, procedures and standardised tools, such as surgical checklists, guidelines and index cards, to help them prepare for surgical procedures and adapt to adverse events. Adhering to procedures and guidelines helped to reduce interruptions and disruptions; however, when unexpected events occurred, instrument and circulating nurses identified that priorities would need to change and practices adapted to the situation. For example, instrument and circulating nurses prioritised lifesaving interventions over ensuring sterility¹. Instrument and circulating nurses use their problem-solving skills by assessing the risks against the benefits and adapting to the situation. The mental model created before the surgical procedure was adapted and followed to solve or manage medical emergencies¹.

Theme 2: Support

Team

Resources are essential to support instrument and circulating nurses in managing medical emergencies. Support from their team is perceived as a resource nurses draw on for the provision of safe care. Instrument and circulating nurses coordinate with their team to prepare and share the plan in order to prevent unexpected issues. Team support appears especially relevant when instrument and

circulating nurses raise concerns about a change in a patient's condition, and familiarity with the team provides a sense of security in a medical emergency.

Understanding each team member's role and responsibility in and outside the OT helps instrument and circulating nurses to manage changing situations. Knowing each member's responsibilities and strengths meant they could be called upon to help with specific critical events in the OT¹. While instrument and circulating nurses sought help from team members within the OT, they also leveraged team members outside the OT to seek support and access additional resources¹.

Staff experience

The experience of instrument and circulating nurses impacted the perceived ability of the team to respond to emergencies. Instrument and circulating nurses described that nurses with more experience had better situational awareness and anticipation of what would happen, and a more holistic view of the surgical process¹. Instrument and circulating nurses identified that experience helped them speak up when problems were identified, make decisions and follow a plan of action. If other team members in the OT were less experienced, this was described as an increased need for critical thinking responsibilities of the instrument and circulating nurses¹.

Theme 3: Impact on individuals

Impact

Instrument and circulating nurses reported that medical emergency events had personal and professional impacts. These included burnout, emotional exhaustion, depersonalisation and low personal accomplishment^{13,14}. Serou et al.¹³ reported that the short-term impact included loss of confidence, depression, sickness and worrying about career progression. Long-term impacts involved losing trust and confidence in other health professionals, becoming overly cautious and contributing to confusion and miscommunication within the team.

A patient's sudden death in the OT was found to be the most distressing event for instrument and circulating nurses, and often impacted on their mental

and physical wellbeing in the short and long term¹⁴.

Learning/gaining

Instrument and circulating nurses reported they gained experience from medical emergency events and reflected on their practice. Incidents in the OT sometimes positively impacted instrument and circulating nurses, contributing to professional and personal growth. One nurse described learning to be more attentive and cautious and developing a better sense of role expectations¹³. Learning from intra-operative adverse events was facilitated by reflection and group discussion with other team members¹.

Discussion

In this review, we sought to understand the experiences of instrument and circulating nurses in managing or responding to medical emergencies in the OT. While our search revealed abundant literature on their role in managing adverse events, we could not find any research explicitly addressing our research aim. The three studies included in the review, however, did contain elements related to the experience of instrument and circulating nurses during medical emergencies, adding that they often mentally prepared themselves, creating a 'mental model' to prevent unexpected and adverse events before and during surgical procedures. The planning and sharing of information with the surgical team appears vital to their preparations.

The mental model concept has been simplified from cognitive processes to help humans recognise the environment around them to reduce uncertainty¹⁵. In healthcare, the mental model concept was further developed and introduced as a 'shared mental model' in the mid-2000s for teamwork training¹⁶. The shared mental model has been successfully used as a coordinating mechanism that facilitates good teamwork behaviour¹⁷. Although the context of teamwork and collaboration has been frequently discussed in healthcare, the 'shared mental model' concept is not commonly mentioned¹⁷. Our study has indicated that surgical teams use shared mental models to help prepare for surgical adverse

events and emergencies. Instrument and circulating nurses created a mental model that was then shared with other members of the surgical team prior to surgery. Sharing of the mental model helped with team collaboration and guided problem-solving when facing medical emergency or intra-operative incidents.

Communication was highlighted in the studies as necessary for preventing and preparing for emergencies and incidents. Indeed, communication is a recognised skill for the mental model development process. The theory of relational coordination recognises that communication plays a crucial role in coordinating tasks, which has been observed to enhance the quality of treatment and ensure the safety of patients¹⁸. The importance of communication in emergencies is also highlighted by the Australian and New Zealand Resuscitation Council (ANZCOR) Guidelines that provide guidance for healthcare professionals faced with scenarios that require emergent care¹⁹.

Our review found that instrument and circulating nurses demonstrated proactive and intuitive communication by collaboratively sharing plans and objectives with the broader surgical team. They emphasised the importance of addressing emergent issues prior to and during the surgery list. Theoretically, this type of relational coordination is characterised by teams working on shared goals, problem-solving without blame and working with mutual respect for everyone's skills and contributions²⁰. These types of collaboration and communication patterns have been identified in a team performing a lengthy surgical procedure or involving a high degree of complexity²⁰.

In contrast, our review found that proactive and intuitive communication has been implemented by instrument and circulating nurses for self-preparation to create the shared mental model regardless of the complexities of surgical procedures. Although this indicates that instrument and circulating nurses are often proactive and strategic in their response to preparing for and managing medical emergencies, one study found that instrument and circulating nurses sometimes felt blamed when an intra-operative incident occurred²¹. This study,

conducted in Australia showed that the experience of being blamed can lead to feelings of incompetence, which could reduce confidence, which could reduce confidence²¹. However, our study could not identify instrument and circulating nurses' skill competency or confidence in managing or responding to medical emergencies due to limited evidence.

Even though our findings underscore the importance of communication within relational coordination, none of the studies explored the experiences of instrument and circulating nurses during medical emergencies. The exploration of not only non-technical skills, like communication and coordination, but also the technical skills exhibited during medical emergencies remains largely unexplored among this group. Although there have been studies showing that in situ simulation training can improve technical skills and increase the confidence of individuals and teams in managing medical emergencies²¹, further exploration of the actual experience of instrument and circulating nurses is needed to understand their insight and customise their education and training.

Strengths and limitations

One of the strengths of this study was the adoption of an integrative review methodology to develop a more holistic understanding of the phenomenon of interest. We included all types of research designs in our search strategy to ensure a comprehensive and reliable approach²³. Furthermore, a robust process was undertaken for each step in the project, and a comprehensive search strategy was employed to identify relevant literature. Another strength of this study was using researchers in different project stages. The independent search, screening and analysis of articles by multiple authors ensured the reliability and robustness of the process.

While this project has several strengths, the limitations need to be noted. Firstly, although there was a large number of studies in the perioperative nursing field, there was a limited number of investigations into instrument and circulating nurses' experiences in medical emergencies, and this affected the number of included studies for analysis. Consequently, our results may be limited

in explaining instrument and circulating nurses' experience during medical emergencies. However, ultimately, the study provides evidence of a gap in our understanding of this phenomenon that needs to be addressed.

Implications for nursing practice

The experiences of instrument and circulating nurses during medical emergencies in the OT represent a critical yet understudied aspect of perioperative care. While existing literature has delved into surgical adverse events more broadly, it notably lacks a focused exploration of the confidence and competence of these essential nursing roles. This gap underscores the necessity for a well-rounded understanding within the literature, especially as these nurses are pivotal in managing complex and high-stakes situations that require both technical and non-technical skills.

Recognising the unique challenges these nurses face during medical emergencies, there is a clear need for comprehensive training and educational programs specifically tailored to enhance their skills and confidence. These programs should not only refresh foundational skills but also deepen their expertise in emergency response techniques, addressing the direct demands of the intra-operative environment.

To effectively prepare these nurses for the unpredictable nature of surgical emergencies, educational programs must incorporate advanced simulations. These simulations should mirror the high-pressure scenarios they might encounter, complete with unexpected medical complications that require quick, informed decision-making. Such immersive training is crucial for developing keen situational awareness, enabling nurses to navigate the fast-paced OT environment effectively.

The training must also emphasise the development of both technical skills, such as advanced life support (ALS) and precise management of surgical equipment during crises, and non-technical skills including communication, leadership and teamwork. These competencies are essential for ensuring effective coordination with surgeons, anaesthetists

and other OT staff during emergencies, thus enhancing the overall team response and patient safety.

Moreover, it is important to establish ongoing education programs to keep nurses abreast of the latest medical procedures, technologies and safety protocols. Regular workshops and refresher courses are vital for maintaining high competency levels and bolstering nurses' confidence in their abilities to manage any situation that arises.

Creating a supportive learning environment is equally important. Training programs should foster an atmosphere where nurses feel encouraged to discuss past experiences, share challenges and explore successful strategies for managing medical emergencies. Promoting a culture of continuous learning and open communication will not only boost the confidence of these nurses but also enhance their competence in managing intra-operative emergencies.

This paper advocates for future research to further investigate the experiences of perioperative nurses, who are crucial members of the surgical team, especially in scenarios such as intra-operative cardiac arrest. Such research is likely to shed light on potential improvements in education and training program gaps, supporting the development of both technical and non-technical skills that are critical for the effective management of intra-operative emergencies. This focused inquiry will enhance our understanding and support the advancement of nursing practices in the OT, ultimately leading to better patient outcomes and more empowered nursing professionals.

Conclusion

This review highlights the pivotal role of instrument and circulating nurses in managing intra-operative medical emergencies, emphasising their unique contributions and the challenges they face. Despite their critical involvement, there is a notable gap in research specifically addressing their experiences and the interplay of their technical and non-technical skills during such events. The findings underscore the need for targeted training programs that enhance both skill sets, incorporating advanced

simulations and continuous education to improve preparedness and confidence.

Conflict of interest and funding statement

The authors have declared no competing interests with respect to the research, authorship and publication of this article.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of generative AI and AI-assisted technologies in the writing process

The research team declares there was no artificial intelligence nor AI assisted technology used during any point of this study.

References

1. Göras C, Nilsson U, Ekstedt M, Unbeck M, Ehrenberg A. Managing complexity in the operating room: a group interview study [Internet]. BMC Health Serv Res. 2020[cited 2023 Sep 4];20(1):440. DOI:10.1186/s12913-020-05192-8
2. Bainbridge D, Martin J, Arango M, Cheng D (Evidence-based Peri-operative Clinical Outcomes Research (EpiCOR) Group). Perioperative and anaesthetic-related mortality in developed and developing countries: a systematic review and meta-analysis [Internet]. Lancet. 2012[cited 2023 Sep 4];380(9847):1075–81. DOI: 10.1016/S0140-6736(12)60990-8
3. Minty-Walker C, Donohoe PL, Hadlow SE, Wilson NJ. Perioperative nursing. In: Wilson NJ, Lewis P, Hunt L, Whitehead L, editors. Nursing in Australia. Abingdon-on-Thames: Routledge; 2021, pp. 67–77.
4. Australian College of Perioperative Nurse Ltd (ACORN). The new ACORN standards: 2023 professional practice standards for perioperative nurses (PPSPN) for individuals. Adelaide: ACORN; 2023.
5. McGarry JR, Pope C, Green SM. Perioperative nursing: Maintaining momentum and staying safe [Internet]. J Res Nurs. 2018[cited 2023 Sep 4];23(8):727–739. DOI: 10.1177/1744987118808835
6. Caruso TJ, Rama A, Knight LJ, Gonzales R, Munshy F, Darling C et al. Operating room codes redefined: A highly reliable model integrating the core hospital code team [Internet]. Pediatr Qual Saf. 2019[cited 2023 Sep 4];4(3): e-172. DOI: 10.1097/pq9.0000000000000172
7. Kang E, Gillespie BM, Massey D. What are the non-technical skills used by scrub nurses? An integrative review. Journal of Perioperative Nursing in Australia. 2014;27(4):16–25.
8. Whittemore R, Knafl K. The integrative review: Updated methodology [Internet]. J Adv Nurs. 2005[cited 2023 Sep 4];52(5):546–53. DOI:10.1111/j.1365-2648.2005.03621.x
9. Hopia H, Latvala E, Liimatainen L. Reviewing the methodology of an integrative review [Internet]. Scand J Caring Sci. 2016[cited 2023 Sep 4];30(4):662–9. DOI:10.1111/scs.12327
10. Joanna Briggs Institute (JBI). Checklist for qualitative research [Internet]. Adelaide: JBI; 2017 [cited 2023 Sep 4]. Available from: https://jbi.global/sites/default/files/2019-05/JBI_Critical_Appraisal-Checklist_for_Qualitative_Research2017_0.pdf
11. Vaismoradi M, Turunen H, Bondas T. Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study [Internet]. Nurs Health Sci. 2013[cited 2023 Sep 4];15(3):398–405. DOI: 10.1111/nhs.12048
12. Goswami S, Brady JE, Jordan DA, Li G. Intraoperative cardiac arrests in adults undergoing noncardiac surgery: incidence, risk factors, and survival outcome [Internet]. Anesthesiology. 2012[cited 2023 Sep 4];117(5):1018–26. DOI:10.1097/ALN.0b013e31827005e9
13. Serou N, Slight SP, Husband AK, Forrest SP, Slight RD. Surgical incidents and their impact on operating theatre staff: Qualitative study [Internet]. BJS Open. Mar 5 2021[cited 2023 Sep 4];5(2). DOI:10.1093/bjsopen/zraa007
14. Wang J, Mao F, Wu L, et al. Work-related potential traumatic events and job burnout among operating room nurses: Independent effect, cumulative risk, and latent class approaches [Internet]. J Adv Nurs. 2022[cited 2023 Sep 4];78(7):2042–54. DOI:10.1111/jan.15114
15. Klimoski R, Mohammed S. Team mental model: Construct or metaphor? [Internet]. J Manag. 1994[cited 2023 Sep 4];20(2):403–37. DOI: 10.1177/0149206394020000
16. Alonso A, Baker DP, Holtzman A, Day R, King H, Toomey L et al. Reducing medical error in the military health system: How can team training help? [Internet]. Hum Resour Manag Rev. 2006[cited 2023 Sep 4];16(3):396–415. DOI: 10.1016/j.hrmr.2006.05.006
17. McComb S, Simpson V. The concept of shared mental models in healthcare collaboration [Internet]. J Adv Nurs. 2014[cited 2023 Sep 4];70(7):1479–88. DOI: 10.1111/jan.12307
18. Gittel JH. New directions for relational coordination theory [Internet]. In: Spreitzer GM, Cameron KS, editors. The Oxford Handbook of Positive Organizational Scholarship. Oxford: Oxford University Press; 2012 [cited 2023 Sep 4]. DOI: 10.1093/oxfordhb/9780199734610.013.0030
19. Australian and New Zealand Committee on Resuscitation (ANZCOR). Education and Implementation [Internet]. Melbourne: ANZCOR; n.d. [cited 2023 Sep 4]. Available from: <https://www.anzcor.org/home/education-and-implementation/>
20. Tørring B, Gittel JH, Laursen M, Rasmussen BS, Sørensen EE. Communication and relationship dynamics in surgical teams in the operating room: An ethnographic study [Internet]. BMC Health Serv Res. 2019[cited 2023 Sep 4];19(1):528. DOI:10.1186/s12913-019-4362-0

21. Hutchinson M, Wilkes L, Jackson D, Vickers MH. Integrating individual, work group and organizational factors: Testing a multidimensional model of bullying in the nursing workplace [Internet]. *J Nursi Manag*. 2010[cited 2023 Sep 4];18(2):173–81. DOI: 10.1111/j.1365-2834.2009.01035.x
22. Wu G, Podlinski L, Wang C, Dunn D, Buldo D, Mazza B et al. Intraoperative code blue: Improving teamwork and code response through interprofessional, in situ simulation [Internet]. *Jt Comm J Qual Patient Saf*. 2022[cited 2023 Sep 4];48(12):665–73. DOI: <https://doi.org/10.1016/j.jcjq.2022.08.011>
23. Dholand S, Taylor A, Meyer S, Scott M. Conducting integrative reviews: A guide for novice nursing researchers [Internet]. *J Res Nurs*. 2021[cited 2023 Sep 4];26(5):427–38. DOI: 10.1177/1744987121997907

Operating theatre nurses' experiences in medical emergency response: An integrative literature review

Supplement 1: Decision tree for including or excluding studies for review

1. Language

Inclusion: English

Yes
(included)



No
(excluded)



Exclusion: Non-English

2. Study design/type

Inclusion: qualitative, quantitative, mixed-method, case study and systematic review

Yes
(included)



No
(excluded)



Exclusion: expert reviews/opinions, policy, protocol or checklist for the procedure

3. Participants

Inclusion: perioperative nurses, instrument and circulating nurses

Yes
(included)



No
(excluded)



Exclusion: nurses who are not in the perioperative field

4. Phenomenon of interest

Inclusion: medical emergency experience/perception of instrument and circulating nurses

Yes
(included)

Uncertain

No
(excluded)



Exclusion: articles not related to the medical emergency e.g. code blue in the perioperative area, experiences of the medical team who are not instrument and circulating nurses

This article: Include

Exclude

Uncertain

Reason:

Supplement 2: Data extraction table

Authors (year) Country	Study design and methods for data collection and analysis	Phenomena of interest	Setting/ context/culture	Participant characteristics (sample size)	Description of main results
Wang et al. ¹ (2022) China	Multisite cross-sectional study that used stratified sampling to select participants. Cities in Shandong Province were divided into four tiers based on level of economic development, then two tertiary hospitals were randomly selected (using random number tables) from all tertiary hospitals in cities in each tier. To be included, participants had to be: 1. operating theatre (OT) nurses with Chinese nursing qualifications 2. employed as hospital staff 3. willing to participate. Paper questionnaire surveys were conducted in four hospitals and web-based surveys were conducted in the other four hospitals.	To explore and compare the strength of associations between work-related potential traumatic events and burnout among operating theatre nurses based on three different approaches.	OT nurses from eight tertiary comprehensive hospitals across seven cities in Shandong Province in China.	OT nurses in Shandong Province, China. (N = 361)	Specific traumatic events (e.g. sudden patient death, bullying and ostracism by colleagues) were independently associated with an increased risk of burnout. Work-related potential traumatic events had a cumulative effect on burnout, whereby OT nurses exposed to cumulative potential traumatic events carried a higher risk for burnout than others. The 'multiple work-related potential traumatic events' pattern derived by latent class analysis was related to an increased risk of high depersonalisation.
Serou et al. ² (2021) United Kingdom	Qualitative study that conducted face-to-face, semistructured interviews with a range of professionals and across different surgical specialties. Participants were recruited through purposeful and snowball sampling. All interviews were audio recorded, transcribed verbatim and analysed using an inductive thematic approach which involved reading and re-reading the transcripts, assigning preliminary codes and searching for patterns and themes within the codes, with the aid of NVivo 12 software. These emerging themes were discussed with the wider research team to gain their input.	Exploration of personal and professional impact on operating theatre professionals of surgical events (wrong-site surgery, retained foreign body and wrong implant prostheses).	Operating theatre staff from different surgical specialties across five teaching hospital sites, within one large National Health Service Trust that provides multispecialty surgical procedures including emergency and major trauma. Potential participants, identified through investigation records of surgical incidents, were invited to participate, and posters promoting the study were displayed on Trust noticeboards.	45 participants: • 8 surgeons • 8 anaesthetists • 12 theatre scrub nurses • 9 operating department practitioners • 8 healthcare assistants All participants described incidents that could be considered moderate in severity.	Three overarching themes emerged: 1. personal and professional impact 2. impact of the investigation process 3. positive consequences or impact. Participants recalled experiencing negative emotions following surgical incidents that depended on the severity of the incident, patient outcomes and the support that staff received. A culture of blame, inadequate support and lack of a clear and transparent investigative process appeared to worsen impact.

Authors (year) Country	Study design and methods for data collection and analysis	Phenomena of interest	Setting/ context/culture	Participant characteristics (sample size)	Description of main results
Goras et al. ³ (2020) Sweden	Qualitative explorative design using group interviews of three professional groups – surgeons, OT nurses and registered nurse anaesthetists (RNAs). One interview session for each profession except for OT nurses for which two separate interviews were performed. The audio-taped interviews were transcribed verbatim and analysed by inductive qualitative content analysis focussing on the manifest content.	Preparedness and adaptability of the OT team to deal with adverse events to create safe care in the OT, exploring how complexity is managed as expressed by OT nurses, anaesthetics nurses and surgeons.	Interviews were conducted in two central OT departments at one county hospital and one local county hospital in mid-Sweden. The central OT department at both hospitals served both acute and elective surgical and orthopaedic patients; the OT department at the county hospital also served gynaecological patients. Teams in Swedish OTs commonly comprise six different professionals: 1. OT nurse 2. operating surgeon 3. assisting surgeon 4. circulating nurse (commonly a licensed practical nurse) 5. anaesthetist 6. RNA. In Sweden, RNAs are allowed to maintain anaesthesia with direct or indirect supervision from the anaesthetist.	17 participants (mean age 54 years, mean length of experience 22 years): • 4 OT nurses (all female, mean age (and range) 52 (37–61), mean experience (and range) 27 (9–38) • 8 surgeons (3 female and 5 male, mean age (and range) 51 (34–67), mean experience (and range) 16 (0–34) • 5 RNAs (2 female, 3 male) mean age (and range) 59 (49–66), mean experience (and range) 22 (15–36).	The findings revealed three generic categories of ways to create safe care in the OT: 1. preconditions and resources 2. planning and preparing for the expected and unexpected 3. adapting to the unexpected. In each category, one sub-category emerged that was common to all three professions, respectively: 1. coordinating and reaffirming information 2. creating a plan for the patient and undergoing mental preparation 3. prioritising and solving upcoming problems.

Supplement 3: Appraisal of articles

Checklist item ⁴	Wang et al.	Serou et al.	Goras et al.
1. Is there congruity between the stated philosophical perspective and the research methodology?	Yes	Unclear	Unclear
2. Is there congruity between the research methodology and the research question or objectives?	Yes	Yes	Yes
3. Is there congruity between the research methodology and the methods used to collect data?	Yes	Yes	Yes
4. Is there congruity between the research methodology and the representation and analysis of data?	Yes	Yes	Yes
5. Is there congruity between the research methodology and the interpretation of results?	Yes	Yes	Yes
6. Is there a statement locating the researcher culturally or theoretically?	Yes	Yes	Yes
7. Is the influence of the researcher on the research, and vice-versa, addressed?	Yes	No	Yes
8. Are participants, and their voices, adequately represented?	Yes	Yes	Yes
9. Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	Yes	Yes	Yes
10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	Yes	Yes	Yes
Quality	100%	80%	90%

Supplement references

1. Wang J, Mao F, Wu L, et al. Work-related potential traumatic events and job burnout among operating room nurses: Independent effect, cumulative risk, and latent class approaches [Internet]. J Adv Nurs. 2022[cited 2023 Sep 4];78(7):2042–54. DOI:10.1111/jan.15114
2. Serou N, Slight SP, Husband AK, Forrest SP, Slight RD. Surgical incidents and their impact on operating theatre staff: Qualitative study [Internet]. BJS Open. Mar 5 2021[cited 2023 Sep 4];5(2). DOI:10.1093/bjsopen/zraa007
3. Göras C, Nilsson U, Ekstedt M, Unbeck M, Ehrenberg A. Managing complexity in the operating room: a group interview study [Internet]. BMC Health Serv Res. 2020[cited 2023 Sep 4];20(1):440. DOI:10.1186/s12913-020-05192-8
4. Joanna Briggs Institute (JBI). Checklist for qualitative research [Internet]. Adelaide: JBI; 2017 [cited 2023 Sep 4]. Available from: https://jbi.global/sites/default/files/2019-05/JBI_Critical_Appraisal-Checklist_for_Qualitative_Research2017_0.pdf

Authors

Ellen Murphy

MCN(Primary Health), BN,
GradCertClinNurs (Acute care nursing),
GradDipClinNurs (Primary Health)

Dr Paula Foran

PhD, RN, FACORN, FACPAN, MACN

Corresponding author

Ellen Murphy

emurphy5@utas.edu.au

'My darling' – elderspeak of nurses to acute hospitalised older adults: An integrative review

Abstract

Introduction: As the population ages, older adults will become a larger special interest group requiring perioperative care. It is therefore vital that we provide an appropriate environment for our older adult perioperative and acute care patients to feel comfortable and safe. Ageism may be defined as a prejudice by one group toward another age group, and the way that many patients are spoken to in health care (elderspeak) would be defined as an 'interpersonal ageist practice'. Interpersonal ageism in the form of elderspeak is rife in the nursing care of older adults in all areas of health care and has adverse effects in most instances, particularly in those with a cognitive impairment who exhibit greater rejection of care behaviours in response. This integrative literature review explores the concept of elderspeak and its theoretical underpinnings and will provide some recommendations for mitigation of this practice in the future care of our older patients.

Review methods: A comprehensive literature search was conducted using CINAHL, EBSCO and Scopus databases. Search terms used included 'aged', 'elderspeak', 'infantilising communication' and 'patronising communication'. Boolean operators, wildcards, subject headings, keywords and the 'cite forward' function in Scopus were used to filter articles and ensure more contemporary research was not omitted.

Discussion: Born out of ageism, elderspeak manifests in well-meaning but misdirected communication overaccommodations in intergenerational interactions. These patronising overaccommodations are often received negatively by cognitively impaired older patients leading to rejection of care and subsequent difficulty in meeting the medical and psychological needs of these patients. This review highlights the frequency with which this practice occurs, the impact upon patients, theoretical underpinnings of the concept and interventions shown to both reduce the use of elderspeak by nurses and rejection of care behaviours by cognitively impaired older patients.

Conclusion: Though reports are mixed as to whether elderspeak is a harmful or helpful practice, most literature condemns the practice as an ageist act that leads to adverse effects in patients, particularly those with a cognitive impairment. Educational interventions have shown substantial promise in reducing ageist attitudes and elderspeak in nursing staff internationally but to strengthen confidence, research in the Australian setting would be required.

Keywords: elderspeak, ageism, intergenerational communication, nursing practice, cognitive impairment

Introduction

Our population is aging, thus older adults – those more than 65 years old – will become a larger special interest group requiring specialised perioperative care. Also, as new medical innovations extend life expectancy and the baby boomer generation ages, the issue of ageism and its adverse sequelae have become a worldwide concern¹.

Ageism is a relatively recent concept and has been defined, by Pulitzer Prize winning gerontologist Robert Butler², as 'prejudice by one group toward other age groups.' Expanding on this definition, Butler introduced the concept of stereotyping, whereby cognitive structures guide inferences and behaviour towards a certain group of people³.

There is a litany of ways ageism towards older adults manifests in the health care setting, including clinical deprioritisation and exclusion from medical trials⁴. However, this paper will focus on the interpersonal ageist practice of elderspeak. The aim of this integrative review is to explore elderspeak, as a manifestation of interpersonal ageism in the nursing care of acute hospitalised older adults, and to address the question 'What is elderspeak, where did it come from and what can we do about it?'

Schnabel et al.⁵ characterise the practice of elderspeak as linguistic and paralinguistic adjustments made by the speaker (usually younger) to accommodate for stereotypical perceived communication needs in the older adult hearer. These adjustments can include exaggerated prosody or melodic aspects of speech, juvenile lexical choices or 'baby talk', simplified sentence structure and inappropriate use of terms of endearment or diminutives¹.

The impact of elderspeak on the patient is fiercely debated but the bulk of the literature condemns its use, particularly in the care of the cognitively impaired older adult where elderspeak is associated with more likely and more severe rejection of care behaviours^{6,7}. There is an unfortunate paucity in contemporary Australian literature on this phenomenon in the acute hospital setting; as a result, this review explores mostly international literature and includes research based in residential care facilities.

Methods

This integrative review was guided by Whittemore and Knafl's method for integrative reviews⁸ and answered the question 'What is elderspeak, where did it come from and what can we do about it?'

Different types of scholarly literature, using different methodologies including qualitative, quantitative and mixed methods research, were selected for their ability to answer the question posed. A comprehensive search strategy for this integrative review involved the use of Boolean operators, wildcards, subject headings and keywords across several nursing and health science databases including CINAHL, EBSCO and Scopus. MeSH (Medical Subject

Headings) were used for 'aged' but the remaining search terms including 'elderspeak', 'infantilising communication' and 'patronising communication' were left as keywords as no subject heading existed for these. The first search was conducted in CINAHL using 'Aged AND (Elderspeak OR infantilising communication OR infantilizing communication OR patronising communication OR patronizing communication)' yielding 27 results.

No age limit was used to capture germinal literature as well as to allow citing forward of older papers. Selected articles were included if published in the English language. Exclusion criteria included literature published in a language other than English and research without an explicit nursing focus. Though the acute hospital nursing care of older adults is the focus of this integrative review, some studies involving nursing homes were included to add context and to strengthen areas where there is a scarcity of acute hospital-based studies. Australian literature was sought in the primary instance, though due to topic paucity international literature was included if originating from a location with a similar health care and ageism landscape to Australia.

Quality appraisal

Literature found using the above search strategy was appraised with the 6S Pyramid, developed by Dicenso, Bayley and Haynes⁹. Preference was given to literature towards the top of the 6S Pyramid as these are highly synthesised and have an excellent methodological quality. Following this process, the EQUATOR (Enhancing the QUALity and Transparency Of health Research) network checklists for each study type were used to further appraise and critique the literature.

Results

Using the above search strategy, and after reviewing and excluding ineligible papers, a total of 11 primary research articles were deemed eligible for inclusion in this integrative review – four quantitative studies, four qualitative studies, two mixed-method studies and one cluster randomised control trial. In addition, due to the scarcity of primary articles, nine reviews and one piece of grey literature

were also included. Geographically, the primary literature originated from the United States of America (4), the United Kingdom (2), Germany (1), Australia (1), Austria (1), Norway (1) and South Korea (1).

Discussion

Discussion surrounding this topic will be presented under the following three themes that emerged from the literature: 'features, frequency and forces of elderspeak in nursing', 'origins of elderspeak and ageism – theoretical underpinnings and attitudes towards the hospitalised older adult in nursing' and 'future implications and strategies to mitigate elderspeak in the nursing care of the hospitalised older adult'.

Features, frequency and forces of elderspeak in nursing

Elderspeak is an infantilising type of speech register that occurs within intergenerational communication, undermining meaningful conversation, suggesting an intimate parent-child relationship and reinforcing power differentials already pervasive in health care⁵. First coined by Cohen and Faulkner¹⁰, elderspeak presents as a number of linguistic and paralinguistic adjustments to speaking in a misdirected and ageist attempt to accommodate to the perceived needs of the older adult hearer^{3,5}. These can include overly juvenile expressions, exaggerated prosody, terms of endearment or diminutives inappropriate to the situation (e.g. 'lovely'), collective pronoun substitution (e.g. 'our' instead of 'your') and tag questions (e.g. 'you're ready for your surgery now, aren't you?'). The use of elderspeak not only impacts the quality of the person-centred interaction but can also increase the likelihood of others perceiving older adults as incompetent or dependent³.

Perhaps contributing to the already rife culture of paternalism in institutional settings, elderspeak is a common phenomenon in the nursing care of older adults⁵. Emphasising how frequently elderspeak is used in health care, a quantitative study (n = 114) by Schnabel et al.⁵, in which interactions were observed across acute geriatric and acute general medicine wards in Germany, found that tag questions, collective pronoun

substitutions and baby talk were used by nurses at least once in the majority of interactions with patients. Testing this assertion, Shaw et al.⁶ conducted a cross-sectional quantitative study observing care interactions between 56 nurses and 16 hospitalised patients living with dementia (PLWD). This study showed that, when accounting for all communication states across the ten hours and 47 minutes of cumulative care, elderspeak was used 11.7 per cent (SD = 10.4%) of the time⁶. Although this study had a small sample size, Shaw et al.¹¹ demonstrated that this effect is reproducible in their recent mixed-methods study that replicated care encounters in a simulation environment with ten of the 56 nurses from the earlier study, finding that the frequency of elderspeak was comparable to the naturalistic setting.

Unsurprisingly, Schnabel et al.⁵ found that when caring for patients with a functional impairment nurses are more likely to use diminutives, simplified syntax, slower speech patterns and simplified lexicon. Though their sample is not nursing specific, Cassidy and Ojeda's¹² quantitative descriptive study supports the assertion of Schnabel et al. that functional impairment may lead to inaccurate assumptions about a person's mental agency, manifesting in elderspeak. Cassidy and Ojeda¹² observed that individuals attribute lower mental agency to older adults living in nursing homes than those residing independently (n = 179, p < 0.001).

Although Schnabel et al.⁵ observed that decreased functional status was a greater predictor of elderspeak than cognitive status (p = 0.001), they noted that the use of elderspeak may be particularly harmful to those with a cognitive impairment. This can be further explained by Shaw et al.⁶ who argued that elderspeak, as a depersonalising communication practice, is in direct contravention of person-centred care. The type of interpersonal care that respects individuality and selfhood is especially vital for those with declining cognition who, according to Kitwood¹³ in his seminal work on person-centred dementia care, often rely on reassurance from others to uphold their sense of self. It is therefore not surprising that elderspeak elicits a negative response from the older adult hearer and is associated with an increase

in neuropsychiatric symptoms, rejection of care and poorer treatment outcomes in patients with a cognitive impairment^{5,6}.

As a type of reactive aggression, rejection of care occurs in patients with a cognitive impairment and involves the patient actively or passively opposing the medically necessary efforts of the caregiver⁶. Of the observed care encounters in the, albeit small, cross-sectional quantitative study by Shaw et al.⁶, rejection of care was exhibited in 48.9 per cent of care encounters between hospitalised patients living with dementia and nurses (n = 16 and n = 56, respectively). It was calculated that, when excluding other confounders, a ten per cent reduction in the amount of elderspeak used by nursing staff accounted for a 77 per cent reduction in probability of rejection of care (OR = 0.23, CI = 0.03–0.68) and a 16 per cent reduction in severity of rejection of care (e^{β} = 0.84, 95%; CI = 0.73, 0.96)⁶.

Williams et al.⁷ reported similar results in their quantitative study of elderspeak in nursing homes. Following an educational intervention, it was observed with statistical significance (p < 0.001) that every percentage point decrease in elderspeak was linked to a 0.43 per cent reduction in resistance to or rejection of care⁷. However, these results must be viewed with some caution as this study and education program was in a nursing home so might have limited generalisability in the acute hospital setting. Nonetheless, these statistically significant findings suggest that reducing the practice of elderspeak results in a decrease in frequency and severity of resistance to care in PLWD in residential care.

In contrast, in their qualitative study of PLWD (n = 43) Bridgstock et al.¹⁴ observed that terms of endearment, regarded as a form of elderspeak¹⁵, aided in communication with PLWD. Bridgstock et al.¹⁴ hypothesise that terms of endearment mitigate communication with PLWD in certain contexts where there might be a threat of loss of face. Politeness Theory¹⁶ argues that conversational partners in any interaction work together to maintain face, including using accommodating speech. For example, Bridgstock et al.¹⁴ reported that terms of endearment were successfully used on two occasions

where a healthcare practitioner asked for clarification from a PLWD when their statement was misheard. Requesting clarification may draw attention to lack of shared understanding between the PLWD and the healthcare practitioner and threaten a loss of face¹⁴ but on these occasions terms of endearment were used to successfully maintain face during the conversation. However, Bridgstock et al.¹⁴ conceded that on some occasions in the study, particularly when the PLWD was receiving an unwanted but medically necessary intervention, terms of endearment did not aid communication, and one participant rejected the endearment 'sweetheart' outright. Though elderspeak has the potential to foster cooperation between PLWD and healthcare practitioners in some contexts, the potential adverse effects of a blanket approach to this depersonalising speech pattern may not justify the alleged benefits. This should be a key consideration for future experimental research, particularly in the acute hospital setting.

Origins of elderspeak and ageism – theoretical underpinnings and attitudes towards the hospitalised older adult in nursing

It is widely accepted in theoretical and germinal literature on ageing that implicit ageism underpins the often well-intentioned practice of elderspeak within the healthcare setting¹⁵. As theorised by Butler², ageism manifests in stereotypes which guide inferences about the way individuals from different groups may act. Discrimination is the physical manifestation of stereotyping, and describes behaviours guided by inappropriate inferences about another group of people³. The World Health Organization's landmark 'Global report on ageism'³ poses that, in the case of the older adult, stereotypes can be either negative (e.g. older adults are frail and incompetent) or positive (e.g. older adults are friendly and cute) but are similarly inaccurate and potentially harmful.

Ageist attitudes can be understood through the lens of Terror Management Theory¹⁷ which posits that the presence of older adults prompts a human existential awareness of the inevitability

of death and aging, and this awareness generates anxiety, negative reactions and an aversion to older adults¹. The existential threat posed by older adults and the ensuing ageism, complements Allport's Intergroup Threat Theory¹⁸ where a perceived threat from another group motivates discrimination. In the case of ageism, the threat posed to the worldview that prioritises youth and vitality caused by the presence of older adults may explain discriminatory feelings and behaviours towards this group¹⁹. In their concept analysis, Hammouri et al.¹ draw these theories together to define ageism in the nursing context as 'any kind of stereotype, prejudice or discrimination against or to the benefit of older adult patients that is implicitly or explicitly practiced by the nurse and leads to actual or perceived (direct or indirect) decrease in the quality of health care provided'.

The attitudes that nurses have towards the care of older adults, was highlighted by Higgins et al.²⁰ in their qualitative descriptive study of nurses' attitudes towards older patients within acute medical and surgical wards in an Australian teaching hospital. Though dated and having a small sample size ($n = 9$), pervasive themes emerged of stereotyping, marginalising and oppressing older patients²⁰. This aligns with an international cross-sectional qualitative study by Lampersberger et al.²¹ that shows some nurses have a tendency to label patients as having a dementia if they require more care or take a prolonged time to do something. Indeed, Schnabel et al.⁵ reported a statistically significant correlation between negativity of age stereotypes and higher use of collective pronoun substitution ($p = 0.029$) and tag questions ($p = 0.037$).

The Communication Predicament of Aging (CPA) model developed by Ryan et al.²² is derived from the Communication Accommodation Theory whereby a speaker will alter the content and delivery of their speech based on the needs of their conversational partner to facilitate comprehension¹⁵. In contrast to the Communication Accommodation Theory, the CPA model poses that implicit ageism in the speaker can place emphasis on age- or disability-related visual cues in the hearer, leading the speaker to overaccommodate their speech with an

older adult²². This overaccommodation is an attempt to facilitate comprehension in the older adult hearer and results in elderspeak using oversimplified, exaggerated or juvenile speech patterns¹⁵. Contrary to the often positive intentions of the speaker, elderspeak is frequently perceived negatively by the older adult, limiting the quality of the interaction and any future interactions¹⁵.

Building upon the CPA model was the model of Patronising Talk which suggests that elderspeak exists on a care-control continuum²³. This model poses that elderspeak contains both caring and controlling dimensions, whereby requests can be conveyed with an appearance of caring²³. Shaw and Gordon¹⁵ speculate that this balance between care and control is particularly relevant in the healthcare setting where rapport must be established while maintaining some degree of control over medical interventions. Bridgstock et al.¹⁴ theorise that elderspeak is a form of mitigation, where speech is modified to reduce the negative effects of the speech content. For example, the harshness of medical instructions can be softened with the use of diminutives or collective pronoun substitution¹⁴. Thus, elderspeak is the manifestation of implicit ageist attitudes and, though well-intentioned, is generally perceived negatively by the older adult, particularly those with a cognitive impairment who exhibit responsive rejection of care behaviours¹³.

Future implications and strategies to mitigate elderspeak in the nursing care of the hospitalised older adult

In order to mitigate the harmful effects of ageism, which underpin the practice of elderspeak, the World Health Organization recommends a multifactorial approach involving education, research to increase the evidence-base, intergenerational interventions, policy and law³. In this review, only the first two strategies will be discussed – education and increasing the evidence-base.

Williams et al.⁷ demonstrated a marked and sustained decrease in elderspeak and resistance to care in cognitively impaired residents in their cluster randomised control trial involving 29 staff and 27 PLWD following an educational Changing Talk (CHAT) intervention for nursing home staff.

This involved training sessions, improving staff awareness of the negative effects of elderspeak and supervised practice in effective communication strategies⁷. While the results of this study are promising, the trial was in a nursing home, had a small sample size and involved staff who were predominantly white and female; therefore, the results cannot be directly generalised to the acute hospital setting. Replication of this study in the Australian hospital setting with a more diverse sample would help strengthen confidence in the CHAT intervention as a strategy to reduce elderspeak and resistance to care in patients with cognitive impairment.

Similarly, a mixed-methods study in South Korea by Kang et al.²⁴ ($n = 48$) found that education had a positive result on acute care nursing staff knowledge and attitudes towards cognitive impaired older adults. As previously mentioned, collective pronoun substitution and tag questions have been found to increase with negative age stereotyping. Kang et al.²⁴ reported an improvement in nursing staff attitudes towards cognitively impaired older adults following the education program which suggests a possible simultaneous but untested reduction in elderspeak.

The cross-sectional nature of many studies investigating ageism and elderspeak, makes it difficult to ascertain causality of ageist attitudes, impacts of ageism and mitigating strategies. Randomised control trials would be more effective for assessing causation²⁵ and could be carried out in the Australian, acute hospital setting. This would strengthen the previous international research findings related to elderspeak, the impact of ageist practices and the efficacy of mitigating strategies. Local research studies would also inform steps toward the cessation of this ageist practice in Australia.

Conclusion

This integrative review has defined and explained the concept of elderspeak in nursing, discussed origins of elderspeak and ageism, revealed the frequency with which this practice occurs and looked at future implications and mitigating strategies.

The conclusions drawn in the available literature on this topic are mixed but,

in general, the overaccommodation in speech frequently employed by nurses caring for the elderly is viewed as a harmful interpersonal ageist practice affecting older adult patients in the acute hospital setting.

While often well-intentioned, the practice of elderspeak emerges from ageist attitudes that attribute reduced mental agency to older adults. This is a harmful and inaccurate generalisation that is largely given a negative reception and may compromise patient care, particularly in those with a cognitive impairment like dementia who require greater personalised care that recognises and upholds selfhood. International educational initiatives have shown that through improving nurses' attitudes towards cognitively impaired older adults, elderspeak and resistance to care are reduced in this cohort.

However, there is a paucity of contemporary Australian research on this topic. It is therefore a recommendation of this integrative review that research within the Australian acute hospital setting be conducted on not only the practice of elderspeak but also the use of international nursing education initiatives as a potential mitigating strategy for ageist attitudes, elderspeak and resistance to care in patients with a cognitive impairment.

As our population ages, and more older Australians will require surgery, this research will be vital to ensure we can provide an appropriate environment for our older adult perioperative and acute care patients to feel comfortable and safe.

Conflict of interest and funding statement

The authors have declared no competing interests with respect to the research, authorship and publication of this article.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Acknowledgement

This paper was submitted to the University of Tasmania as part fulfilment of subject CNA803, Advanced Clinical Nursing Practice, for the Master of Clinical Nursing (Primary Health). The author

sincerely wishes to thank Dr Paula Foran, unit coordinator, for her guidance throughout the master's course and work in preparing this paper for publication.

References

- Hammouri A, Taani MH, Ellis J. Ageism in the nursing care of older adults: A concept analysis [Internet]. *ANS Adv Nurs Sci*. 2023[cited 2024 Nov 21];46(4):441–54. DOI: 10.1097/ANS.0000000000000472
- Butler RN. Age-Is-ism: Another form of bigotry [Internet]. *Gerontologist*. 1969[cited 2024 Nov 21];9(4_Part_1):243–6. DOI: 10.1093/geront/9.4_Part_1.243
- World Health Organization (WHO). Global report on ageism [Internet]. Geneva: WHO; 2021 [cited 2024 Nov 21]. Available from: <https://www.who.int/teams/social-determinants-of-health/demographic-change-and-healthy-ageing/combating-ageism/global-report-on-ageism>
- Skirbekk H, Nortvedt P. Inadequate treatment for elderly patients: Professional norms and tight budgets could cause 'ageism' in hospitals [Internet]. *Health Care Anal*. 2014[cited 2024 Nov 21];22(2):192–201. DOI: 10.1007/s10728-012-0207-2
- Schnabel E-L, Wahl H-W, Streib C, Schmidt T. Elderspeak in acute hospitals? The role of context, cognitive and functional impairment [Internet]. *Res Aging*. 2020[cited 2024 Nov 21];43(9–10):416–27. DOI: 10.1177/0164027520949090
- Shaw CA, Ward C, Gordon J, Williams KN, Herr K. Elderspeak communication and pain severity as modifiable factors to rejection of care in hospital dementia care [Internet]. *J Am Geriatr Soc*. 2022[cited 2024 Nov 21];70(8):2258–68. DOI: 10.1111/jgs.17910
- Williams KN, Perkhounkova Y, Herman R, Bossen A. A communication intervention to reduce resistiveness in dementia care: A cluster randomized controlled trial [Internet]. *Gerontologist*. 2017[cited 2024 Nov 21];57(4):707–18. DOI: 10.1093/geront/gnw047
- Whittemore R, Knafl K. The integrative review: Updated methodology [Internet]. *J Adv Nurs*. 2005[cited 2024 Nov 21];52(5):546–53. DOI:10.1111/j.1365-2648.2005.03621.x
- Dicenso A, Bayley L, Haynes RB. Accessing pre-appraised evidence: Fine-tuning the 5S model into a 6S model [Internet]. *Evid Based Nurs*. 2009[cited 2024 Nov 21];12(4):99–101. DOI: 10.1136/ebn.12.4.99-b
- Cohen G, Faulkner D. Does 'elderspeak' work? The effect of intonation and stress on comprehension and recall of spoken discourse in old age [Internet]. *Language & Communication*. 1986[cited 2024 Nov 21];6(1):91–8. DOI: 10.1016/0271-5309(86)90008-X
- Shaw CA, Knox K, Bair H, Watkinson E, Weeks D, Jackson L. Is elderspeak communication in simulated hospital dementia care congruent to communication in actual patient care? A mixed-methods pilot study [Internet]. *J Clin Nurs*. 2024[cited 2024 Nov 21];33(8):3089–100. DOI: 10.1111/jocn.17207
- Cassidy BS, Ojeda JT. Contextual effects on attributing minds to older adults [Internet]. *CRESP*. 2024[cited 2024 Nov 21];6. DOI: 10.1016/j.cresp.2024.100195
- Kitwood T. Dementia reconsidered: The person comes first. Milton Keynes: Open University Press; 1997.
- Bridgstock L, Pilnick A, Goldberg S, Harwood RH. 'Alright my lovely': The use of terms of endearment as a mitigation device in the care of people living with dementia in the acute hospital environment [Internet]. *Health (London)*. 2024;13634593241238856. DOI: 10.1177/13634593241238856
- Shaw CA, Gordon JK. Understanding E=elderspeak: An evolutionary concept analysis [Internet]. *Innov Aging*. 2021[cited 2024 Nov 21];5(3):igab023. DOI: 10.1093/geroni/igab023
- Brown P, Levinson SC. Politeness: Some universals in language usage. Cambridge: Cambridge University Press; 1987.
- Greenberg J, Pyszczynski T, Solomon S. The causes and consequences of a need for self-esteem: A terror management theory. In: Baumeister RF, editor. *Public self and private self*. New York: Springer New York; 1986, pp. 189–212.
- Allport GW. The nature of prejudice. Oxford: Addison-Wesley; 1954.
- Drury L, Abrams D, Swift HJ, Lamont RA, Gerocova K. Can caring create prejudice? an investigation of positive and negative intergenerational contact in care settings and the generalisation of blatant and subtle age prejudice to other older people [Internet]. *J Community Appl Soc Psychol*. 2017[cited 2024 Nov 21];27(1):65–82. DOI: 10.1002/casp.2294
- Higgins I, Van Der Riet P, Slater L, Peek C. The negative attitudes of nurses towards older patients in the acute hospital setting: A qualitative descriptive study [Internet]. *Contemp Nurse*. 2007[cited 2024 Nov 21];26(2):225–37. DOI: 10.5172/conu.2007.26.2.225
- Lampersberger LM, Schüttengruber G, Lohrmann C, Großschädl F. The supreme discipline of nursing: A qualitative content analysis of nurses' opinions on caring for people eighty years of age and older [Internet]. *Heliyon*. 2024[cited 2024 Nov 21];10(5):e26877. DOI: 10.1016/j.heliyon.2024.e26877
- Ryan EB, Hummert ML, Boich LH. Communication predicaments of aging: Patronizing behavior toward older adults [Internet]. *J Lang Soc Psychol*. 1995[cited 2024 Nov 21];14(1–2):144–66. DOI: 10.1177/0261927X9514100
- Hummert ML, Shaner JL. Patronizing speech to the elderly as a function of stereotyping [Internet]. *Commun Stu*. 1994[cited 2024 Nov 21];45(2):145–58. DOI: 10.1080/10510979409368419
- Kang Y, Moyle W, Cooke M, O'Dwyer ST. An educational programme to improve acute care nurses' knowledge, attitudes and family caregiver involvement in care of people with cognitive impairment [Internet]. *Scand J Caring Sci*. 2017[cited 2024 Nov 21];31(3):631–40. DOI: 10.1111/scs.12377
- Webb P, Bain C, Page A. Essential epidemiology: An introduction for students and health professionals. Fourth edition. Cambridge: Cambridge University Press; 2020.

Authors

Sara Morais Pires

Lisbon School of Nursing, Lisbon
Nursing Research, Innovation and
Development Centre

Ana Rita Maurício

Lisbon School of Nursing, Lisbon
Nursing Research, Innovation and
Development Centre

Lúcia Jerónimo

Lisbon School of Nursing, Lisbon
Nursing Research, Innovation and
Development Centre

Bruno Teixeira

Ordem Terceira Hospital

Ana Ramos

Lisbon School of Nursing, Lisbon
Nursing Research, Innovation and
Development Centre

Idalina Gomes

Lisbon School of Nursing, Lisbon
Nursing Research, Innovation and
Development Centre

Eunice Sá

Lisbon School of Nursing, Lisbon
Nursing Research, Innovation and
Development Centre

Corresponding author

Sara Morais Pires

Lisbon School of Nursing, Lisbon
Nursing Research, Innovation and
Development Centre
sarapires@esel.pt

Nursing interventions to promote safety in robotic surgery: A systematic literature review

Abstract

Introduction: The use of robotic surgery has revolutionised surgical procedures, offering benefits such as less blood loss, faster recovery and fewer post-operative complications. However, the increase in surgical time and technical challenges impose the need for systematic perioperative nursing interventions to guarantee patient safety and the efficiency of the process.

Aim: To systematise the nursing interventions in the pre-, intra- and post-operative phases of robotic surgery that generate safety in the perioperative period.

Method: Systematic literature review using the Joanna Briggs Collaboration methodology and the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) extension. The MEDLINE, CINAHL, LILACS, SCOPUS and Cochrane Library databases were searched and 16 primary and secondary studies published between January 2014 and May 2024 were included. The data were extracted and analysed independently by two reviewers.

Results: Nursing interventions in the pre-operative phase were characterised by rigorous technical preparation, effective communication and the use of checklists. In the intra-operative phase, team communication and coordination, proper patient positioning and the use of support surfaces were crucial. In the post-operative phase, continuous monitoring, pain management, self-care training and emotional and educational support were identified as fundamental.

Conclusion: Nursing interventions play a crucial role in the safety and effectiveness of perioperative care in robotic surgery. Continuous training, technological adaptation and the use of systematic approaches are essential to maximise the benefits of this technology, as well as promoting patient safety and wellbeing.

Keywords: robotic surgery, nursing care, perioperative nursing, safety, systematic review.

Introduction

Continuing technological advances and the laparoscopic revolution of the 1980s promote the use of less invasive traditional approaches and new techniques, such as modern robot-assisted surgery^{1,2}. The first DaVinci robot was introduced in London in 2001³ and now, just 24 years later, robots are increasingly being used in various specialties. The use of robots is central to the new technological surgical environment, driving new horizons for humanity and constant evolution beneficial to health care.

The operating theatre is a complex environment, and the increasing

integration of new technologies is a challenge for perioperative nursing. This requires the development of new skills and procedures to ensure a safe environment for patients undergoing robotic surgery. Existing studies have highlighted the importance of this area, pointing to the need for continuous training of the professionals involved^{4,5}.

Robotic surgery, being a differentiated and innovative procedure, requires trained professionals both in the technical, scientific aspects and in the practice of the procedures performed⁶. It represents technological evolution in the medical field and has allowed for greater precision and efficiency in surgical procedures^{6,7}.

Robotic surgery offers numerous advantages and contributes to increased surgical safety and efficiency by enabling more controlled and stable movements, thereby minimising human error. It enables highly technical procedures that would be challenging or impossible with conventional surgical methods. There is evidence that robotic platforms provide superior visualisation through stereoscopic imaging, allowing for greater precision in tissue dissection and suturing. Additionally, robotic systems eliminate hand tremors and allow for scaled movements, enabling surgeons to perform delicate procedures with enhanced accuracy. Robotic surgery also accelerates post-operative recovery by decreasing surgical trauma and bleeding⁷. These technological advancements expand the scope of minimally invasive surgery, reducing patient trauma, minimising complications and shortening hospital stays, thereby revolutionising surgical practice across multiple specialties¹².

Concerns about robotic surgery predominantly focus on the increase in surgical time, although the gains in recovery times and the benefits of robotic techniques in more complex surgeries may counterbalance this disadvantage⁸.

Specific nursing interventions have been developed to maximise the safety, efficiency and quality of care provided to patients undergoing robotic surgery^{5,9,10}. In turn, some authors argue that perioperative nurses need to undergo continuous training to keep up with technological developments¹¹. The impact of this innovative technology has the potential to bring about transformative clinical improvements¹², and perioperative nurses are one of the main players in coordinating all robotic surgery¹³.

It is essential to prepare, train and update health professionals, especially perioperative nurses, to provide the specific support that a robotics programme requires¹⁴. Perioperative nurses carry out interventions such as safely positioning the client, checking and confirming the sterilisation of re-usable equipment and the surgical field, handling the robot and solving any problems that may arise during surgery^{4,5},

as well as improving the quality of care, reducing costs and promoting efficiency in management¹⁴.

Research shows that perioperative nurses act from the beginning to the end of the procedure. They not only prepare the robot for the surgical procedure but also prepare the patient and assist the surgeon who will operate the robot⁴⁻⁶; therefore, there is a clear need for education and training for nurses who work with robotic surgery, in order to promote safe and effective care¹⁵.

The aim of this review is to identify which nursing interventions practiced during the perioperative period promote safe care, effectively contributing to the quality of nursing care in this context.

Methods

This systematic literature review was conducted using the method proposed by the Joanna Briggs Collaboration^{16,17} and written in accordance with the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR)¹⁸.

The methods proposed by the Joanna Briggs Collaboration have been widely used and recognised in multiple areas of knowledge and by experienced reviewers, representing a primary approach to support decision-making based on the best available evidence¹⁹.

The PRISMA-ScR was developed in 2018 and provides a reporting checklist for this specific type of review and is consistent with that proposed by the Joanna Briggs Collaboration²⁰. Overall, the steps that should be followed are: formulating the review question, defining inclusion and exclusion criteria, locating studies through searching, selecting studies for inclusion, and extracting, analysing and synthesising the data from relevant studies²⁰. The protocol for this systematic review was previously published on the PROSPERO platform, with registration identification CRD42024548448.

Review question

The guiding question of this review was: What are the nursing interventions that promote safety in robotic surgery?

Inclusion and exclusion criteria

Primary and secondary studies and studies conducted in Portuguese, English and Spanish were included. A time limit of ten years was set, from January 2014 to May 2024, in order to integrate the most recent evidence. Studies that did not address robotic surgery or that consisted of editorials, letters to the editor, books, book chapters, guidelines, expert opinion articles, conference proceedings and abstracts were excluded.

Search strategy

This review used a three-stage search strategy. An initial search limited to MEDLINE (PubMed) and CINAHL (EBSCO) was carried out to identify articles about the topic. The text words contained in the titles and abstracts of the relevant articles, and the indexed terms used to describe the articles, were used to develop a preliminary search strategy.

Subsequently, a definitive strategy was formally proposed for each of the databases included, and the strategy was adjusted based on the lexicons and specificities of each one (see Table 1). A combination of controlled and non-controlled descriptors was used to maximise the search and take into account the available evidence. The controlled descriptors were selected from the Medical Subject Headings (MeSH), Health Sciences Descriptors (DeCs) and CINAHL headings. The databases included were MEDLINE (via PubMed) and CINAHL (via EBSCO), LILACS, Scopus and the Cochrane Library.

Finally, in a third phase, the reference lists of the articles included in the review were analysed to include potentially relevant studies.

A pilot process of initial analysis was conducted independently by both reviewers, based on 25 titles and abstracts. The results of the analysis were compared and discussed, while allowing for changes to the eligibility criteria to ensure that both reviewers agreed. In accordance with Peters et al.²⁰, this pilot process continued until at least 75 per cent agreement was reached between the reviewers.

Table 1: Search strategy applied to each database

Database	Research strategy
LILACS	(robotic surgery*) OR (robotic surgical) OR (robotic-assisted) OR (robotic*) OR (RAS) OR (robotic surgical) AND (nurse*) OR (nursing) AND (perioperative) OR (operating room)
MEDLINE	“robotic surgical procedures”[MeSH Terms] OR “robotics”[MeSH Terms] OR “robotic surgery”[Title/Abstract] OR “surgical robot”[Title/Abstract] OR “robotic surgeries”[Title/Abstract] OR “robotics surgical”[Title/Abstract] OR “robotic-assisted”[Title/Abstract] OR “robotically assisted”[Title/Abstract] OR “robotic”[Title/Abstract] OR “robotics”[Title/Abstract] OR “robot-assisted”[Title/Abstract] OR “RAS”[Title/Abstract] AND “nurses”[MeSH Terms] OR “nursing”[MeSH Terms] OR “nurse”[Title/Abstract] OR “nursing”[Title/Abstract] AND “perioperative period”[MeSH Terms] OR “perioperative care”[MeSH Terms] OR “perioperative nursing”[MeSH Terms] OR “surgical procedures, operative”[MeSH Terms] OR “operating rooms”[MeSH Terms] OR “surgery”[MeSH Subheading] OR “perioperative”[Title/Abstract] OR “surgery”[Title/Abstract] OR “surgeries”[Title/Abstract] OR “operating room”[Title/Abstract] OR “operating theatre”[Title/Abstract]
CINAHL	(MH “Robotic Surgical Procedures”) OR “robotic surgical” OR (MH “Robotics”) OR “robotics” OR “robotic surgery” OR “surgical robot” OR “robotic surgeries” OR “robotics surgical” OR “robotic-assisted” OR “robotically assisted” OR “robotic” OR “robot-assisted” OR “RAS”) AND (MH “Nurses”) OR “nurses” OR “nursing” OR “nurse”) AND (MH “Perioperative Care”) OR (MH “Perioperative Nurses”) OR (MH “Perioperative Nursing”) OR “PERIOPERATIVE” OR “SURGERY” OR (MH “Surgery, Operative”) OR “SURGERY, OPERATIVE” OR “OPERATING ROOM” OR (MH “Operating Rooms”)
Scopus	(TITLE-ABS-KEY (“robotic surgery”) OR TITLE-ABS-KEY (“Surgical robot”) OR TITLE-ABS-KEY (“robotic surgeries”) OR TITLE-ABS-KEY (“robotics surgical”) OR TITLE-ABS-KEY (“robotic-assisted”) OR TITLE-ABS-KEY (“robotically assisted”) OR TITLE-ABS-KEY (robotic*) OR TITLE-ABS-KEY (ras) AND TITLE-ABS-KEY (nursing) OR TITLE-ABS-KEY (nurse*) AND TITLE-ABS-KEY (perioperative) OR TITLE-ABS-KEY (“operating room”) OR TITLE-ABS-KEY (“surgical procedures”) OR TITLE-ABS-KEY (“surgical procedures, operative”) OR TITLE-ABS-KEY (surgir*))
Cochrane Library	(robotic surgery*) OR (robotic surgical) OR (robotic-assisted) OR (robotic*) OR (RAS) OR (robotic surgical) AND (nurse*) OR (nursing) AND (perioperative) OR (operating room)

The full texts of the included articles that potentially met the inclusion criteria were assessed based on the PICO (population, Intervention, control, outcome) framework²⁰ with:

- **population** being perioperative nurses providing care in robotic surgery
- **intervention** being the nursing interventions
- **control** being usual care
- **outcome** being promotion of safety in robotic surgery.

The study selection and review process were operationalised using

Rayyan® (Qatar Computing Research Institute, Doha, Qatar) and duplicates were removed.

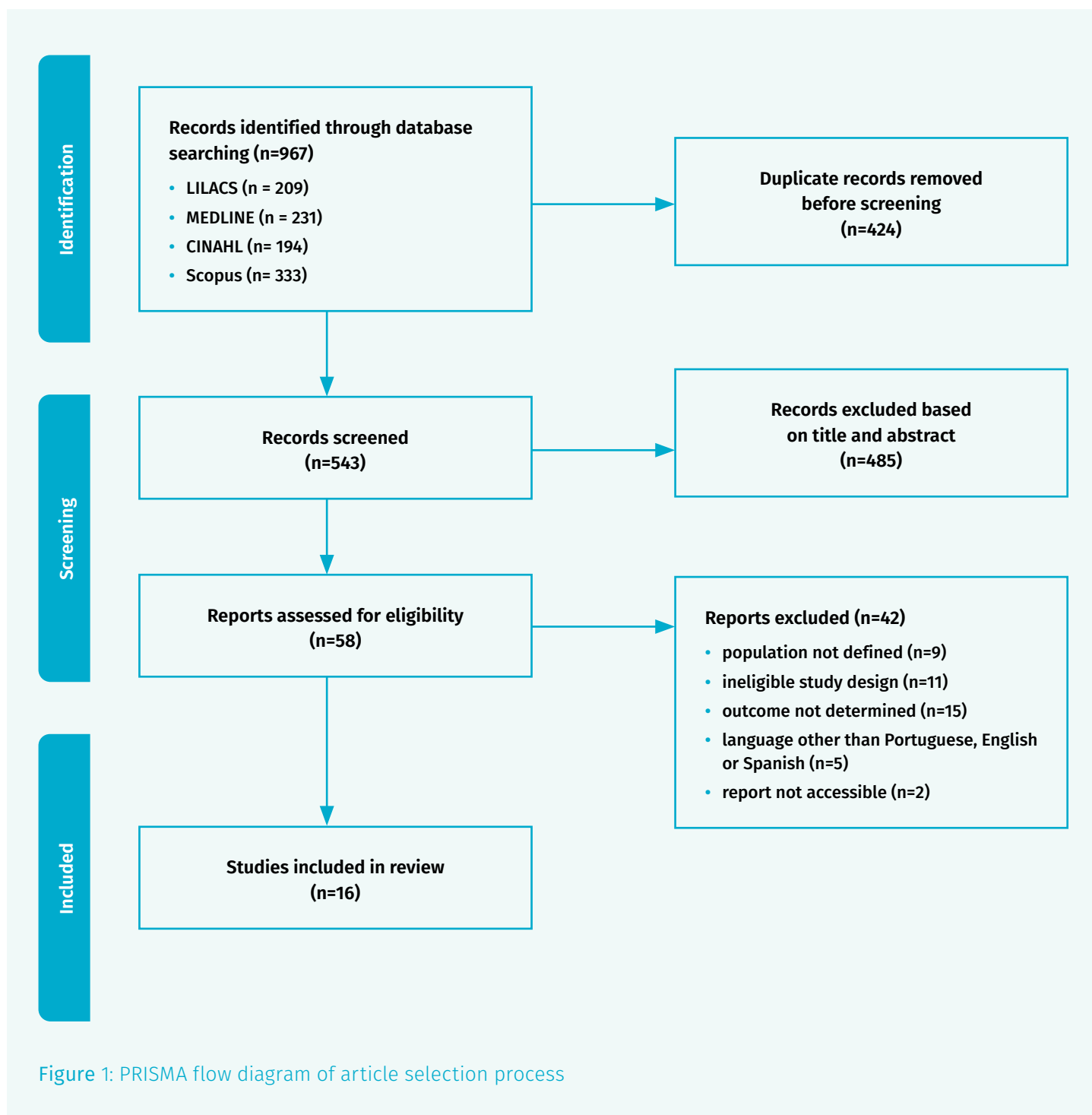
Study selection

Initially, 967 studies were identified in the selected databases. After removing duplicates, the full text was analysed by two independent reviewers in order to ensure the quality of this stage. The assessment of whether or not to include the study in the current review was based on reading the title and abstract. Disagreements between the two reviewers were resolved with the participation of a

third reviewer. The full texts of selected articles were assessed to ensure that the inclusion criteria were met. Among the reasons for excluding the studies were: population not defined, study typology, outcome not determined and language not considered. A PRISMA-ScR flowchart is presented in Figure 1.

Data extraction and synthesis

Data from the 16 studies included in the review was extracted by two independent reviewers using a data extraction tool developed by the reviewers.



Methodological quality assessment

The methodological quality of the included studies was assessed using the Critical Appraisal Checklist for Systematic Reviews and Research Syntheses, developed by the Joanna Briggs Institute (JBI)²¹. This tool was applied by two independent reviewers to ensure that the studies met strict criteria for validity and methodological reliability. Only studies that met more than 80 per cent of the criteria with 'yes' answers were included, ensuring high methodological quality and minimising potential bias.

This evaluation method allowed a careful analysis of the quality of the studies and contributed to the formulation of evidence-based recommendations, with an emphasis on the importance of promoting future studies with greater methodological rigour to strengthen the evidence base in the area of nursing interventions in robotic surgeries.

Results

At the end of the search of the electronic databases, 967 articles were identified, of which 424 were automatically removed by Rayyan® for being duplicates. Subsequently, two reviewers independently read the title and abstract of 543 reports. Of these, 58 were selected to be read in full and any disagreement between the reviewers was discussed, or a third reviewer was asked to evaluate them, until a consensus was reached. At the end of the selection process, 16 studies were selected to make up the systematic review.

The reviewed articles were subjected to a descriptive analysis, as summarised in Table 2. The nursing interventions that promote the safety of people undergoing robotic surgery were identified and organised into the three phases that make up the perioperative period.

Discussion

After analysing the evidence, nursing interventions emerged that demonstrate the complexity and technical-scientific rigour that characterises robotic surgery. These interventions each belong to a distinct phase of the perioperative period – pre-operative, intra-operative or post-operative.

Pre-operative interventions

Evidence shows that nurses put patient safety first, even when they face challenges or experience work-related overload, and look for opportunities to learn about robotic surgery²⁶. Studies highlight the importance of standardised training and the development of systematic assessments to prepare nursing staff²²⁻²³. Simulation training of the nursing team, using realistic scenarios, allows critical thinking to be developed which enables assessment of the singularities and specificities of the surgical procedure and the patient in order to choose the best course of action³².

Research also points to the importance of continuous training and rigorous technical preparation on the part of nurses²⁵. In addition, effective communication and familiarity with robotic equipment are crucial to surgical safety²²⁻²³.

With regard to preparing the equipment before surgery, nurses check that the instruments are working properly, check the electrical and carbon dioxide connections and position the robot appropriately; this preparation helps to prevent complications during the intra-operative period^{23,26}. The evidence also suggests that checking the robot the day before surgery and on the day itself, before and after surgery, is crucial to ensure that the equipment is working properly and to prevent emergencies related to system failure²⁶.

As far as nursing care is concerned, a detailed pre-operative assessment of the patient as well as discussion of possible side effects and clarification of doubts with the patient are important to reduce patient anxiety and improve patient cooperation during the procedure^{24,34}. Research also refers to the use of safe surgery checklists to ensure that all procedures are followed in a uniform and systematic way²⁷.

Intra-operative interventions

Different types of robotic surgeries present unique challenges that influence the roles and responsibilities of perioperative nurses. This review identified several key robotic procedures, including urological (prostatectomy, nephrectomy)^{23,24}, gynaecological

(hysterectomy, myomectomy)²⁵, thoracic (lung resections, mediastinal mass excision)²⁸, colorectal (colectomy, rectal resection)³¹ and general abdominal surgeries (hernia repair, cholecystectomy)^{27,32}. Nurses must be proficient in troubleshooting robotic systems, ensuring sterility, preventing positioning-related injuries and anticipating intra-operative challenges unique to each specialty^{23-25,32}.

In the context of robotic surgery, communication plays a critical role in ensuring the success and efficiency of surgical procedures²². Communication is particularly critical in robotic surgery compared to traditional surgical methods because robotic surgery involves advanced technology with complex instruments, and effective communication is necessary to ensure that all team members understand how to operate the equipment, troubleshoot issues and respond to unexpected events³⁰.

During the intra-operative phase, effective communication and continuous technical support are essential. Research emphasises the importance of effective communication, both verbal and non-verbal, in order to coordinate complex actions and guarantee patient safety²². The presence of inexperienced nurses can negatively affect team functioning and increase the incidence of adverse events²⁹; therefore, adopting systematic approaches to integrating new team members is essential. Research also suggests that adapting communications and managing the robotic system can optimise workflow and minimise errors^{23,31}.

Robotic surgery brings new responsibilities to perioperative nurses, such as preparing the necessary materials, connecting and checking all connections to the chargers and ensuring that the robot is positioned correctly²³. Connecting, calibrating and handling the robot correctly have also been identified as important, as well as being prepared for emergency undocking procedures²⁸. These responsibilities require nurses to acquire technological competence²³. Nurses have reported both positive feelings, such as enthusiasm and fascination for the technology, and negative feelings, such as stress and anxiety mainly due to the lack of experience and the high responsibilities

Table 2: Summary of nursing interventions to promote safety in robotic surgery identified from the included studies (n = 16)

Perioperative phase	Nursing intervention	Evidence	Reference
Pre-operative phase	Staff training and education	Standardised training and detailed assessments to prepare the team.	Tiferes et al. (2018) ²² Celik et al. (2023) ²³
	Effective communication	Importance of effective communication and familiarity with the robot.	Tiferes et al. (2018) ²² Schuessler et al. (2019) ²⁴
	Patient education	Pre-operative education to reduce anxiety and improve co-operation.	Schuessler et al. (2019) ²⁴
	Rigorous technical preparation	Ongoing training and detailed technical preparation of the patient and the system.	Porto and Catal (2021) ²⁵
	Checking equipment	Checking the robot the day before and on the day of surgery to ensure proper functioning.	Kang et al. (2016) ²⁶
	Safe surgery checklists	Checklists to ensure that all procedures are followed uniformly.	Vitoriano et al. (2023) ²⁷
	Adapting to technology	Adaptation to robotic surgery technology and clear definition of tasks and responsibilities.	Celik et al. (2023) ²³
Intra-operative phase	Effective communication	Importance of verbal and non-verbal communication in coordinating complex actions.	Tiferes et al. (2018) ²²
	Patient positioning	Connecting, calibrating and handling the robot correctly, being prepared for emergency undocking.	Møller et al. (2023) ²⁸
	Integrating new members	Systematic approaches to integrating new team members and minimising adverse events.	Schiff et al. (2016) ²⁹
	Adaptation of communications and robotic system management	Optimisation of workflow and minimisation of errors.	Celik et al. (2024) ³⁰ Gillespie et al. (2020) ³¹
	Support and protection surfaces	Use of viscoelastic polymer gel and pyramidal foam support surfaces to protect pressure points.	Ângelo et al. (2020) ³² Ângelo et al. (2017) ³³
	Peripheral injury prevention	Assessing risk factors, using padded support surfaces to prevent injuries during positioning.	Bjoro et al. (2023) ³⁶ Bjoro et al. (2020) ³⁷
	Visual assessment and body alignment	Visual assessment of skin and bony prominences, body alignment during surgery.	Ângelo et al. (2020) ³²
	Realistic simulation	Simulation training for the interdisciplinary team in surgical positioning.	Ângelo et al. (2020) ³³
Post-operative phase	Continuous monitoring	Monitoring of vital parameters and regular pain assessment.	Tiferes et al. (2018) ²²
	Pain management	Specific pain management interventions, such as the appropriate administration of analgesia and non-pharmacological techniques.	Silva et al. (2021) ³⁴
	Self-care training	Addressing deficits in self-care and sexual domains, pelvic floor exercises to improve quality of life.	Silva et al. (2021) ³⁴
	Continuing education and patient support	Providing support to and receiving feedback from patients to ensure effective adaptation and recovery.	Porto and Catal (2021) ²⁵
	Improved working conditions	Clear definition of nurses' responsibilities and improving working conditions to increase job satisfaction.	Uslu et al. (2019) ³⁵

associated with the use of expensive and complex equipment³⁰.

The most common injuries are related to patient positioning and research highlights the importance of positioning patients appropriately for the type of surgery and protecting pressure points²⁶ and that operating room nurses take responsibility for positioning in order to prevent injury²⁶. Factors that increase the risk of peripheral injuries in patients include being in the same position for a prolonged period, high body mass index, comorbidities and remaining anaesthetised for a long time as well as being placed in certain positions³⁷.

Patient positioning in robotic surgery presents unique challenges due to the fixed nature of robotic arms. Once engaged, repositioning the patient is difficult, increasing the risk of pressure injuries and nerve damage. Prolonged procedures further exacerbate these risks, making pre-operative planning and intra-operative vigilance essential. Nurses use strategies such as using viscoelastic supports, continuous monitoring and ergonomic adjustments to help mitigate these issues^{24,28,32}. Viscoelastic polymer gel supports and pyramidal foam support surfaces are used for fixing the chest and protecting pressure points during surgical positioning^{32,33}. In addition to using suitable devices for this surgical modality, nurses inspect the skin and bony prominences, respect anatomical body alignment and document any changes in skin integrity in the information system³³.

Perioperative nurses play a fundamental role in robotic surgery by ensuring the seamless operation of complex surgical systems. Studies emphasise their role in maintaining patient safety, optimising workflow and contributing to successful surgical outcomes^{24,28,29}. Their responsibilities include equipment preparation, instrument management, troubleshooting robotic malfunctions and maintaining sterility, all of which directly impact the efficiency and safety of procedures^{22,23,25}. The complexity of robotic procedures demands continuous education and advanced technical skills, reinforcing the indispensable role of perioperative nurses in supporting these cutting-edge surgeries^{27,32}.

Perioperative nurses also ensure compliance with surgical protocols, facilitate team coordination and help prevent complications through vigilant monitoring and rapid response to intra-operative challenges. They relay critical information between the console surgeon and bedside assistants, ensuring that instructions are executed accurately and efficiently. This level of coordination is essential in robotic procedures where the primary surgeon is physically removed from the patient, making perioperative nurses indispensable in maintaining workflow and preventing errors^{29,31}.

Post-operative interventions

In the post-operative phase, nursing interventions aim to identify and manage complications, promote comfort and facilitate rehabilitation. The main post-operative interventions that emerge from the available evidence are monitoring and managing pain, promoting self-care and providing strategies to enhance sexual health, continuing education and patient support.

Continuous monitoring of pain and effective pain management are crucial for patient recovery after robotic surgery. Nurses monitor vital parameters and carry out regular pain assessment which are essential for quickly identifying and treating any complications²². In addition, nurses provide specific pain control interventions, such as the appropriate administration of analgesia and the use of non-pharmacological techniques, which are fundamental to improving patient comfort³⁴.

Post-operative rehabilitation also involves enabling patients to resume their daily activities and take care of themselves. Education about self-care practices and ongoing assistance are essential for a successful recovery³¹. Furthermore, addressing deficits in self-care and providing training in strategies to enhance sexual function, for example pelvic floor exercises, are recommended to improve the patient's quality of life³⁴. The reference to 'sexual health' specifically pertains to genito-urinary robotic procedures, such as prostate and gynecological surgeries, where post-operative sexual function can be affected. Nurses address sexual health through patient education, rehabilitation strategies and counselling which is crucial

for improving quality of life following these surgeries³⁴.

Ongoing support for and feedback from patients is necessary to ensure effective adaptation and recovery; ongoing education about post-operative care and rehabilitation should be an integral part of the discharge process²⁵. A lack of clarity about nurses' roles and poor working conditions can lead to professional dissatisfaction and conflicts in the workplace, which can negatively affect post-operative care³⁵.

Limitations

The methodological limitations of this study highlight the importance of carefully considering the heterogeneity of the included studies, the potential for selection and publication bias and the need for larger and more diverse samples. Also, time and language limitations could be a limitation of this systematic review. To strengthen future research, it is crucial to address these methodological aspects by applying rigorous bias control practices and ensuring adequate follow-up to capture the long-term effects of interventions.

Conclusion

The studies included in this review show the complexity and importance of nursing interventions in the different phases of robotic surgery. From pre-operative care through the intra-operative phase to the post-operative period, nurses play a vital role in ensuring the safety and effectiveness of procedures. Effective communication, adequate training and clear roles are essential to the success of nursing interventions. Implementing systematic approaches and improving working conditions are necessary to increase the quality of care as well as nurses' job satisfaction.

Implications

This study has important implications for both nursing practice and research. For nursing practice, it suggests improvements in nurses' preparation, communication, pain management and continuing education, as well as the implementation of checklists to ensure the safety and effectiveness of procedures. For research, it emphasises the need for longitudinal studies, the

exploration of confounding factors, the diversification of study contexts and the promotion of interdisciplinarity, providing a solid basis for future research and more effective clinical practices in the area of robotic surgery.

Conflict of interest and funding statement

The authors have declared no competing interests with respect to the research, authorship and publication of this article.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

- Fosch-Villaronga E, Drukarch H. Accounting for diversity in robot design, testbeds and safety standardization [Internet]. *Int J of Soc Robotics*. 2023[cited 2024 Jun 19];15:1871–89. DOI: 10.1007/s12369-023-00974-6
- George EI, Brand TC, LaPorta A, Marescaux J, Satava RM. Origins of robotic surgery: From skepticism to standard of care [Internet]. *JSLs*. 2018[cited 2024 Jun 19];22(4):1–14. DOI: 10.4293/JSLs.2018.00039
- Lam K, Clarke J, Purkayastha S, Kinross JM. Uptake and accessibility of surgical robotics in England [Internet]. *Int J Med Robot*. 2021[cited 2024 Jun 19];17(1):1–7. DOI: 10.1002/rcs.2174
- Wasielewski A. Guideline implementation: Minimally invasive surgery, Part 1 [Internet]. *AORN J*. 2017[cited 2024 Jun 19];106(1):50–9. DOI: 10.1016/j.aorn.2017.04.017
- Carlos G, Saulan M. Robotic emergencies: Are you prepared for a disaster? [Internet]. *AORN J*. 2018[cited 2024 Jun 19];108(5):493–501. DOI: 10.1002/aorn.12393
- Knudsen JE, Ghaffar U, Ma R, Hung AJ. Clinical applications of artificial intelligence in robotic surgery [Internet]. *J Robot Surg*. 2024[cited 2024 Jun 19];18(1):102. DOI: 10.1007/s11701-024-01867-0
- Café E. O Alcance da inovação tecnológica: O exemplo da cirurgia robótica [The reach of technological innovation: The example of robotic surgery]. *Revista Científica Hospital Santa Izabel* [Scientific Journal Hospital Santa Izabel]. 2022[cited 2024 Jun 19];6(1):1–2. DOI: 10.35753/rchsi.v6i1.243
- Meneses R, Matos LC, Eleuterio T, Fassarell, CS, Pinheiro DS, Benjamim G. Perfil de saúde hospitalar dos pacientes submetidos à cirurgia robótica: estudo retrospectivo observacional [Hospital health profile of patients undergoing robotic surgery: A retrospective observational study] [Internet]. *Research, Society and Development*. 2021[cited 2024 Jun 19];10(3). DOI: 10.33448/rsd-v10i3.13092
- Redondo-Sáenz D, Cortés-Salas C, Parrales-Mora M. Perioperative nursing role in robotic surgery: An integrative review [Internet]. *J Perianesth Nurs*. 2023[cited 2024 Jun 19];38(4):636–41. DOI: 10.1016/j.jopan.2022.11.001
- Castro K, Ribeiro W, Constantino G, Jeronimo J, Acioli M, Silva I. Benefícios da cirurgia robótica sob a ótica da enfermagem: Revisão integrativa [Benefits of robotic surgery from a nursing perspective: An integrative review] [Internet]. *Revista Ibero-Americana de Humanidades, Ciências e Educação* [Ibero-American Journal of Humanities, Sciences and Education]. 2024[cited 2024 Jun 19];10(3). DOI: 10.51891/rease.v10i3.13310
- Servaty R, Kersten A, Brukamp K, Möhler R, Mueller M. Implementation of robotic devices in nursing care – barriers and facilitators: An integrative review [Internet]. *BMJ Open*. 2020[cited 2024 Jun 19];10(9):e038650. DOI: 10.1136/bmjopen-2020-038650
- Ashrafi H, Clancy O, Grover V, Darzi A. The evolution of robotic surgery: Surgical and anaesthetic aspects [Internet]. *Br J Anaesth*. 2017[cited 2024 Jun 19];119(suppl 1):72–84. DOI: 10.1093/bja/aex383
- Martins R, Trevilato D, Jost M, Caregnato R. Nursing performance in robotic surgeries: An integrative review. *Rev Bras Enferm* [Internet]. 2019[cited 2024 Jun 19];72(3):795–800. DOI: 10.1590/0034-7167-2018-0426
- Pinto EV, Lunardi LS, Treviso P, Botene D. Atuação do enfermeiro na cirurgia robótica: Desafios e perspectivas [Nurse role in robotic surgery: challenges and prospects] [Internet]. *Revista SOBECC* [Journal of Brazilian Association of Nurses in Surgical Centers, Anesthetic Recovery and Material and Sterilization Centers]. 2018[cited 2024 Jun 19];23(1):43–51. DOI: 10.5327/Z1414-4425201800010008
- Moloney R, Coffey A, Coffey JC, Brien BO. Nurses' perceptions and experiences of robotic assisted surgery (RAS): An integrative review [Internet]. *Nurse Educ Pract*. 2023[cited 2024 Jun 19];71:103724. DOI: 10.1016/j.nepr.2023.103724
- Peters MDJ, Godfrey CM, Khalil H, McInerney P, Parker D, Soares CB. Guidance for conducting systematic scoping reviews [Internet]. *Int J Evid Based Healthc*. 2015[cited 2024 Jun 19];13(3):141–6. DOI: 10.1097/XEB.0000000000000050
- Peters MDJ, Marnie C, Tricco AC, Pollock D, Munn Z, Alexander L et al. Updated methodological guidance for the conduct of scoping reviews [Internet]. *JBI Evid Synth*. 2020[cited 2024 Jun 19];18(10):2119–26. DOI: 10.1124/jbies-20-00167
- Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D et al. PRISMA extension for scoping reviews (PRISMA-ScR): Checklist and explanation [Internet]. *Ann Intern Med*. 2018[cited 2024 Jun 19];169(7):467–73. DOI: 10.7326/M18-0850
- Khalil H, Bennett M, Godfrey C, McInerney P, Munn Z, Peters M. Evaluation of the JBI scoping reviews methodology by current users [Internet]. *Int J Evid Based Healthc*. 2020[cited 2024 Jun 19];18(1):95–100. DOI: 10.1097/XEB.0000000000000202
- Peters MDJ, Godfrey C, McInerney P, Munn Z, Tricco AC, Khalil H. Scoping reviews. In: Aromataris E, Lockwood C, Porritt K, Pilla B, Jordan Z editors. *JBI Manual for evidence synthesis* [Internet]. Adelaide: JBI; 2020[cited 2024 Jun 19]. Available from: [synthesismanual.jbi.global](https://www.jbi.global/synthesismanual.jbi.global). DOI: 10.46658/JBIMES-24-09
- Joanna Briggs Institute (JBI). Critical appraisal checklist for systematic reviews and research syntheses [Internet]. Adelaide: JBI; 2017[cited 2024 Jun 19]. Available from: [jbi.global/critical-appraisal-tools](https://www.jbi.global/critical-appraisal-tools)
- Tiferes J, Hussein AA, Bisantz A, Higginbotham DJ, Sharif M, Kozlowski J et al. Are gestures worth a thousand words? Verbal and nonverbal communication during robot-assisted surgery [Internet]. *Appl Ergon*. 2019[cited 2024 Jun 19]; 78:251–62. DOI: 10.1016/j.apergo.2018.02.015
- Celik SS, Koken ZO, Canda AE, Esen T. Experiences of perioperative nurses with robotic-assisted surgery: A systematic review of qualitative studies [Internet]. *J Robot Surg*. 2023[cited 2024 Jun 19];17:785–95. DOI: 10.1007/s11701-022-01511-9
- Schuessler Z, Stiles A, Mancuso P. Perceptions and experiences of perioperative nurses and nurse anesthetists in robotic-assisted surgery [Internet]. *J Clin Nurs*. 2019[cited 2024 Jun 19];29(1–2), 60–74. DOI: 10.1111/jocn.15053
- Porto C, Catal E. A comparative study of the opinions, experiences and individual innovativeness characteristics of operating room nurses on robotic surgery [Internet]. *J Adv Nurs*. 2021[cited 2024 Jun 19];77(12):4755–67. DOI: 10.1111/jan.15020

26. Kang MJ, De Gagn, JC, Kang HS. Perioperative nurses' work experience with robotic surgery: A focus group study [Internet]. *Comput Inform Nurs*. 2016[cited 2024 Jun 19];34(4):152–8. DOI:10.1097/CIN.0000000000000224
27. Vitoriano L, Bridi A, Silva O, Silva C, Louro T, Machado D. Sistematização da assistência de enfermagem perioperatória na cirurgia robótica: validação de instrument [Systematisation of perioperative nursing care in robotic surgery: Instrument validation [Internet]. *Rev Bras Enferm [Brazilian Journal of Nursing]*. 2023[cited 2024 Jun 19];76(4):1–8. DOI: 10.1590/0034-7167-2022-0666pt
28. Møller L, Hertz P, Grande U, Aukdal J, Fredensborg B, Kristensen H et al. Identifying curriculum content for operating room nurses involved in robotic-assisted surgery: A Delphi study [Internet]. *Surg Endosc*. 2023[cited 2024 Jun 19];37(4):2729–48. DOI: 10.1007/s00464-022-09751-4
29. Schiff L, Tsafir Z, Aoun J, Taylor A, Theoharis E, Eisenstein D. Quality of communication in robotic surgery and surgical outcomes [Internet]. *JSLs*. 2016[cited 2024 Jun 19];20(3): e2016.00026. DOI: 10.4293/JSLs.2016.00026
30. Çelik S, Tunçbilek Z, Sariköse S, Topaktas G, Canda A. Roles, experience and views of nurses working in robotic surgery settings: A mixed methods study [Internet]. *J Periop Pract*. 2024[cited 2024 Jun 19];34(7–8):248–56. DOI: 10.1177/17504589241231100
31. Gillespie BM, Gillespie J, Boorman RJ, Granqvist K, Stranne J, Erichsen-Andersson A. The impact of robotic-assisted surgery on team performance: A systematic mixed studies review [Internet]. *Human Factors*. 2021[cited 2024 Jun 19];63(8):1352–79. DOI: 10.1177/0018720820928624
32. da Silva Ângelo C, da Silva EAL, da Souza, A, de Bonfim IM, Joaquim EH, de Pinho Apezato ML. Posicionamento cirúrgico em cirurgia robótica pediátrica: Relato de experiência [Surgical positioning in pediatric robotic surgery: Experience report] [Internet]. *Revista SOBECC [Journal of Brazilian Association of Nurses in Surgical Centers, Anesthetic Recovery and Material and Sterilization Centers]*. 2020[cited 2024 Jun 19];25(2):120–3. DOI: 10.5327/Z1414-4425202000020009
33. da Silva Ângelo C, de Meira Pachioni CF, Joaquim EH, da Silva EAL, dos Santos GG, Bonfim IM et al. Efetividade do protocolo prevenção de lesões de pele em cirurgias urológicas robóticas [Effectiveness of the protocol for the prevention of skin lesions in robotic urological surgeries] [Internet]. *Revista SOBECC [Journal of Brazilian Association of Nurses in Surgical Centers, Anesthetic Recovery and Material and Sterilization Centers]*. 2017[cited 2024 Jun 19];22(3):152–60. DOI: 10.5327/z1414-4425201700030006
34. da Silva MN, Scherer AB, de Oliveira Makiyama AC, Sary DLZ, D'Almeida Miranda FM, Kalinke LP. Recomendações de enfermagem para o cuidado em cirurgias oncológicas robóticas: revisão de escopo [Nursing care recommendations for robotic cancer surgeries: A scoping review] [Internet]. *Revista SOBECC [Journal of Brazilian Association of Nurses in Surgical Centers, Anesthetic Recovery and Material and Sterilization Centers]*. 2022[cited 2024 Jun 19];26(4). DOI: 10.5327/Z1414-4425202100040009
35. Uslu Y, Altınbaş Y, Özeran T, van Giersbergen MY. The process of nurse adaptation to robotic surgery: A qualitative study [Internet]. *Int J Med Robot*. 2019[cited 2024 Jun 19];15(4):e-1996. DOI: 10.1002/rcs.1996
36. Bjørro B, Mykkeltveit I, Rustøen T, Altinbas BC, Røise O, Betsen SB. Intraoperative peripheral nerve injury related to the lithotomy positioning with step Trendelenburg in patients undergoing robotic-assisted laparoscopy surgery: A Systematic review [Internet]. *J Adv Nurs*. 2020[cited 2024 Jun 19];76(2):490–503. DOI: 10.1111/jan.14271
37. Bjørro B, Ballestad I, Rustøen T, Fosmark MH, Bentsen SB. Positioning patients for robotic-assisted surgery: A qualitative study of operating room nurses' experiences [Internet]. *Nurs Open*. 2023[cited 2024 Jun 19];10(2):469–78. DOI: 10.1002/nop2.1312