The frequency and reasons for missed nursing care in Australian perioperative nurses: A national survey

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EMPIRICAL RESEARCH QUANTITATIVE

The frequency and reasons for missed nursing care in Australian perioperative nurses: A national survey

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Abstract

Aim: To describe Australian perioperative nurses' reported frequency and reasons for missed nursing care in the operating room.

Design: Cross-sectional online survey conducted in March–April 2022.

Methods: A census of Australian perioperative nurses who were members of a national professional body were invited to complete a survey that focussed on their reported frequency of missed nursing care and the reasons for missed nursing care in the operating room using the MISSCare Survey OR.

Results: In all, 612 perioperative nurses completed the survey. The perioperative and intraoperative nursing care tasks reported as most frequently missed included time-intensive tasks and communication with multiple surgical team members present. The most frequently reported reasons for missed care were staffing-related (e.g. staff number, skill mix, fatigue and complacency) and affected teamwork. There were no significant differences in the frequency of missed care based on perioperative nurse roles. However, there were statistically significant differences between nurse management, circulating/instrument nurses and recovery room nurses in reasons for missed care.

Conclusions: Much of the missed care that occurs in the operating room is related to communication practices and processes, which has implications for patient safety.

Implications for the Profession and/or Patient Care: Understanding the types of nursing care tasks being missed and the reasons for this missed care in the operating room may offer nurse managers deeper insights into potential strategies to address this situation.

Reporting Method: Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement.

Patient or Public Contribution: No patient or public contribution.

KEYWORDS
care left undone, clinical role, missed nursing care, perioperative

1 | BACKGROUND

Missed nursing care (MNC), defined as care that is omitted, left undone, incomplete, or delayed, can negatively impact patient outcomes, thus threatening patient safety (Kalisch et al., 2009). Over the past two decades, there has been increasing interest in MNC across various acute care environments (Chaboyer et al., 2021). The findings from several reviews suggest that MNC is a global phenomenon and that some fundamental aspects of nursing care are regularly missed (Chaboyer et al., 2021; Griffiths et al., 2018; Jones et al., 2015; Mandal et al., 2020). Moreover, MNC occurs regularly and does not appear to be based on country, type and size of hospital or clinical contexts such as general medical-surgical or ICU settings (Chaboyer et al., 2021). The prevalence and patterns of MNC are similar across developed countries. One systematic review identified the top five reported activities of care regularly missed included emotional support, care planning, care coordination, discharge planning and timeliness of care (Jones et al., 2015). In contrast, activities focusing on the physical aspects of care, such as infection control, treatment/tests/procedures, nutrition and elimination, were the least reported missed care activities. In the context of MNC, when considering the holistic nature of nursing, there are paradoxical tensions between the psychosocial and the physical care nurses provide (Albsoul et al., 2023; Jones et al., 2015).

Across all clinical settings, nurses play a critical role as gatekeepers of care, particularly in relation to patient safety (Dehghan-Nayeri et al., 2018; Kiekkas et al., 2021). They are the conduits for communication, provide coordination and are responsible for ensuring that patient care is carried out effectively and safely. These contributions are especially crucial in high-risk, high-stress environments where precise and timely care is essential, such as the operating room (OR) (Gillespie et al., 2023). The OR is a highly specialised, controlled environment where technology is omnipresent, and healthcare professionals including surgeons, anaesthetists and nurses work interdependently to provide high-quality care to patients when they are at their most vulnerable, under anaesthesia (Gillespie et al., 2018). Nurses coordinate the workflow between all members of the perioperative team, lead the surgical safety checks to verify the correct patient and surgical site, administer and cross-check intravenous medications, are responsible for maintaining the sterility of equipment and surveillance of the sterile field, and closely monitoring the patient during the intraoperative and postoperative periods. These activities are integral to maintaining patient safety in the perioperative setting, defined as the preoperative, intraoperative and post-anesthetic care periods.

Although the prevalence and patterns of MNC have been well described in many settings including neonatal ICU (Tubbs-Cooley et al., 2015), paediatric ED (Arıkan & Esenay, 2023), general medical-surgical (Albsoul et al., 2023), aged care (Andersson et al., 2022) and oncology (Dehghan-Nayeri et al., 2018), there is limited description of these elements in perioperative contexts. Two studies of MNC have been undertaken in perioperative settings, one in the intraoperative phase of care (Marsh et al., 2020) and the other in the post-anaesthetic care unit (PACU) (Kiekkas et al., 2021). However, both studies yielded mixed results in relation to the prevalence and reasons for MNC. Using the MISSCare Survey OR, Marsh et al.'s (2020) cross-sectional survey with 1693 perioperative nurses in the United States found respondent perceptions of MNC were low, .84 on a scale of 0 to 4 (0=never to 4=always). Moreover, the five most frequently reported missed care items reported by perioperative nurses were team communications before the transfer of the patient into the OR (43%), suspension of activities during time out checks (39.9%), use of isolation precautions (36.1%), use of standardised communication protocols (33.7%) and reporting of abnormal lab results (33.4%) (Marsh et al., 2020). The results of Kiekkas et al.'s (2021) cross-sectional survey, undertaken in Greece with 397 PACU nurses, suggested a high prevalence of MNC for activities such as drug preparation, administration and assessment of effectiveness, patient surveillance and assessment, and care associated with pain. The most common reasons for MNC in the PACU were a lack of staffing and increased patient volume and acuity (Kiekkas et al., 2021). While both studies were conducted in perioperative settings, neither examined the differences in MNC prevalence and patterns related to perioperative role, which may ostensibly influence the types of care activities that are most often missed.

With so few studies undertaken in perioperative settings, our understanding of MNC in the OR is limited and as a result, we do not know if it is a problem that jeopardises patient safety, as it does in other clinical areas. To the best of our knowledge, no studies of missed perioperative nursing care have been undertaken in the Australian context. Thus, gaining an understanding of the prevalence and patterns of MNC in Australian ORs is needed from a patient safety and quality perspective to better understand this potential problem and determine if corrective actions are needed. Further, little is known about MNC relative to perioperative roles (i.e. instrument/circulating, anaesthetic nurse and PACU roles). Identifying the tasks based on perioperative role where nursing care is commonly missed can help nurses and other interdisciplinary team members address care gaps and reduce the risk of patient harm. Surgery is a high-risk environment, so even minor oversights can have significant consequences for patients

What does this paper contribute to the wider global community?

- The high prevalence of missed care in the operating room is related to communication practices and processes, which may compromise patient safety.
- The most common causes for lapses in care within the operating room were staffing-related issues, which had an adverse effect on teamwork.
- While there were no differences in the frequency of missed care related to nursing roles, there were statistically significant differences between nurse management, circulating/instrument nurses and recovery room nurses in reasons for missed care.

(Cohen et al., 2020). Missed care in surgery, such as missed surgical site checks, can also contribute to suboptimal patient experiences and catastrophic outcomes, culminating in reputational harm. Therefore, an essential first step is understanding the types of nursing care tasks being missed and the reasons for this missed care in the OR. The results of this national study may be used by hospital administrators and nurse managers to develop evidence-based policies and strategies to address these gaps to ensure patient safety and quality of care.

1.1 | Study objective and questions

This study aimed to describe Australian perioperative nurses' reported frequency and reasons for missed nursing care in the OR. Subsumed in this objective are the following research questions:

1. What nursing care tasks are most frequently missed in the preoperative and intraoperative periods?
2. What are the reasons for missed care in the preoperative and intraoperative periods?
3. What are the differences in frequency and reasons for missed care among perioperative nurses based on their primary role?
4. What are the relationships between the frequency of missed care and the reasons for missed care in the preoperative and intraoperative periods?

2 | METHODS

2.1 | Design, setting and sample

The study was undertaken using a descriptive cross-sectional online survey. In 2022, a census sample of members and associate members of the Australian College of Perioperative Nurses (ACORN) who practiced in clinical roles (i.e. circulating, instrument, anaesthetic and PACU), and education and management roles across public and private sectors were invited to complete an online anonymous survey. The study excluded enrolled nurses due to differences and limitations in their scope of practice, thus they do not undertake all aspects of the perioperative nursing role, for example, they do not assist in complex surgeries or manage the care of patients in the PACU. This study is part of a larger study (Gillespie et al., 2023) that examined the predictors of missed care in the OR. To ensure rigorous reporting, the study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement (von Elm et al., 2014).

2.2 | Measures and data collection

The online survey was designed to collect data based on perioperative nurses' demographic information, missed nursing care during preoperative and intraoperative procedures, and reasons for missed care using the MISSCare Survey OR (Kalisch et al., 2021). Due to the sensitive nature of reporting their experiences with missed care in the OR, we ensured the survey was able to be completed anonymously. The survey items used in this study consisted of 55 questions. For demographics, respondents were asked questions regarding their age, sex, place of residence, clinical role, work experience and education. The online survey was hosted in the Research Electronic Data Capture (REDCap) data management system (Harris et al., 2019). The survey was available and active for a total of 6 weeks between March and April 2022. The ACORN contacted potential respondents on the research team's behalf using their member list email distribution, sending three invitation emails, sent fortnightly to increase participant response rates. Having the ACORN distribute the survey link via email to OR nurses who were members of the college across Australia afforded access to our target sample, and lends credibility to the research, potentially increasing the likelihood of participant engagement.

2.3 | The MISSCare Survey OR

This measure covers the preoperative and intraoperative periods of perioperative care and includes two parts. Part A is focused on the frequency of the missed care. It contains 32 items and 5 subscales for the preoperative (2 subscales covering legal [6 items] and preparation [11 items]) and intraoperative periods (3 subscales including safety [6 items], communication [6 items] and closing routine [3 items]). Response options for the preoperative and intraoperative care items include *never*, *rarely missed*, *occasionally missed*, *frequently missed*, *always missed* and *not applicable*. Due to the nature of the items included in the frequency of missed nursing scale, we added the option *prefer not to respond* to help explain any data that may be missing, not at random. Part B contains reasons for this missed care reported in Part A (Kalisch et al., 2021; Kalisch & Williams, 2009; Marsh et al., 2020). It has four subscales and includes staffing [4 items], urgency [3 items], materials [2 items] and teamwork [8 items]. Response options for the reasons for missed care items include *not a reason for missed care*, *minor reason*, *moderate reason* and *significant reason*. We also added a *not applicable* response option for respondents who felt they could not answer based on their role or experience. These response sets were also recoded, so higher scores indicated the item was frequently perceived as missed in the preoperative and intraoperative periods, as well as higher scores indicating agreement that the reason presented was a significant reason care was missed. Items indicating the response option, not applicable and prefer not to respond were recoded as missing data for analysis purposes.

2.4 | Data analyses

Survey data was exported from REDCap into SPSS version 28 (IBM Corp.) for data cleaning. The types of descriptive analyses included

frequencies of numbers and percentages used for categorical variables (e.g. sex, nursing and role), and means and standard deviation or medians and IQR for continuous variables (e.g. age, years of experience in the operating room and MISSCare Survey OR subscales) depending on normality. We also calculated subscale and Part A and Part B scores along with Cronbach's alpha to examine the internal consistency of the subscales in our sample. Missing data were not imputed. Similar to Marsh et al. (2020), we report the number of nurses who reported each item in Part A (perioperative and interoperative periods) as occasional, frequently or always missed. One-way ANOVA was used to identify the differences in frequency of missed care and reasons for missed care based on nurses' reported OR role. To examine the relationship between frequency of missed care and the reasons for missed care, Spearman's Rho correlations were calculated. Where appropriate, we report the results listwise (except for correlations that use pairwise) and indicate our total number of cases available for each analysis.

2.5 | Ethical considerations

Following the ACORN's endorsement to distribute the survey link to members, ethical approval was provided by the authors' university's human ethics committee (HREC Griffith University reference number 2021/774). Once respondents clicked onto the survey link in the email, they were directed to an information sheet and were asked to provide informed consent. Participants had to provide informed consent before items were available to complete.

3 | RESULTS

3.1 | Sample characteristics

A total of 847 invited perioperative nurses responded to the online survey. However, after data cleaning and removing the responses that did not have usable data, a total of 612 (72.3%) cases were retained. All Australian states were represented, with the majority being from Australia's larger states of Queensland ($n=122$, 20.3%), New South Wales ($n=132$, 21.9%) and Victoria ($n=136$, 22.6%). Respondents' age ranged from 21 to 75 years, (Mean = 46.0, SD = 11.4) and reported working in the operating room environment for an average of 18.6 years (SD = 11.6), with their experience ranging from 1 to 57 years. A summary of the sample descriptives is presented in Table 1.

Addressing research question 1, Table 2 summarises the top 11 missed care nursing items in the preoperative and intraoperative periods reported by a minimum of 30% of respondents where nursing care was missed either *occasionally*, *frequently* or *always*. By far, most of these items fell into the communication subscale (34.2% to 68.5% of respondents).

Table 3 summarises the top 15 reasons for missed care reported by a minimum of 40% of respondents, addressing research question 2. The most frequently reported reasons for missed care related to items in the Staffing Levels (43.5% to 68% of respondents) and Teamwork (40.4% to 66.4% of respondents) subscales. Appendix S2 detail the full results including the means and standard deviations for all items in the Frequency of missed care and Reasons for missed care scales.

TABLE 1 Sample demographics.

Characteristic	Sample	*n*	%
Sex	539		
Female		497	92.2
Male		42	7.8
Primary role	545		
Circulating/instrument nurse		309	56.7
Post-anaesthetic recovery unit		43	7.9
Anaesthetic nurse		92	16.9
First surgical assistant (RN)		7	1.3
Multiple roles, all-rounder		19	3.5
Management		43	7.9
Educator		29	5.3
Qualifications	540		
RN Certificate/Diploma		146	27.0
Bachelor's degree in nursing (BSN)		248	45.9
Bachelor's degree outside of nursing		24	4.4
Master's degree (MSN) or higher in nursing		89	16.5
Master's degree or higher outside of nursing		26	4.8
Doctorate		7	1.3

TABLE 2 Frequency of missed care items based on a minimum of 30% of respondents.

Item number	Subscale	Item	N	*n* (%) reported occasionally, frequently or always missed
4	Legal	Surgical consent included all the correct details of the planned surgical procedure	611	203 (33.2)
6	Legal	Current history and patient assessment is complete and dated prior to going to the operating room	604	251 (41.0)
7	Preparation	Abnormal lab work is reported	596	272 (44.4)
13	Preparation	Isolation precautions are implemented for infectious diseases	611	226 (36.9)
17	Preparation	Essential information is communicated among surgical team members prior to the transfer of patient to the operating room	610	283 (46.2)
24	Communication	Non-urgent activities are suspended during the surgical time out	612	346 (56.5)
25	Communication	Surgical time out takes place in the operating room with the entire surgical team	611	251 (41.0)
26	Communication	Team members questions or concerns are resolved before the incision is made	605	216 (35.3)
27	Communication	The team waits 3 min for alcohol preps to dry	604	419 (68.5)
28	Communication	A standardised communication tool is used during clinical handover	605	209 (34.2)
29	Communication	Essential information is communicated at change of staffing: breaks, lunch and shift change	608	272 (44.4)

Table 4 reports the results of the MISSCare Survey OR Part A and B subscales, along with their internal consistency. The frequency of missed care and the reasons for missed care, as indicated by the mean scores of the five subscales of Part A, showed that the overall reported prevalence of missed care was low. The average total score for the frequency of missed care in both the preoperative and intraoperative periods was 63.3 (SD = 17.5, range 23 to 153), with Cronbach's alphas ranging from .78 to .87 (acceptable to good) across domains.

Regarding the four subscales of Part B, mean scores for the reasons for missed care indicated that there was variability in agreement for what constituted a reason for missed care in the OR. The average total score for the reasons for missed care reported was 42.8 (SD = 10.7, range 5 to 68), with Cronbach's alphas ranging from .73 to .92 across domains (Table 4).

To answer research question 3, results of a one-way ANOVA indicated that there were no statistical differences between the reported frequency of missed care for the preoperative, or intraoperative periods based on reported nursing role F (5, 525) = 1.51, p = .187, eta^2 = .14. Mean total scores for the frequency of MNC by OR role is illustrated in Figure 1. The total reasons for missed care differed according to OR role F (5, 521) = 2.78, p = .017, eta^2 = .26. Perioperative nurses in management roles reported fewer reasons for missed care when compared to recovery room nurses (mean difference = −7.35, standard error 2.38, p = .032, 95% CI = −14.37 to −.33) and when compared to circulating/instrument nurses (mean difference = −6.30, standard error 1.79, p = .007, 95% CI = −11.58 to −1.02). No other significant differences in reasons between roles were found, with trends shown in Figure 2.

The correlations between the missed nursing care frequency subscales and reasons for missed care subscales were all statistically significant (p < .01), though they ranged from weak to moderate in strength (rho: .12 to .35). The full results are presented in Appendix S2. Table 5 presents a sub-analysis of the results based on comparing the Frequency of missed care subscales to the Reasons for missed care subscales, addressing research question 4. In terms of Frequency of missed care, the subscale Staffing Levels shared the strongest relationship with the Reasons for missed care subscale, Teamwork.

4 | DISCUSSION

In this Australian survey of over 600 perioperative nurses from all states and territories, 41%–68% of the sample reported MNC. The subscales of Preparation and Communication were the most reported areas of MNC with the most reported reasons being in the subscales of Staffing, and Teamwork. While there was no relationship between perioperative role and frequency of MNC, perioperative nurses working in managerial roles reported fewer reasons for MNC compared with nurses in circulating /instrument roles. These findings establish a 'baseline' understanding of the extent to which MNC is reported and serves as a reference for future intervention studies, allowing researchers to track changes in reported MNC over time.

TABLE 3 Reasons for missed care items based on a minimum of 40% of respondents.

Item number	Subscale	Item	*N*	*n* (%) reported reasons for MNC
1	Staffing	Inadequate number or skill mix of staff	579	394 (68.0)
2	Urgency	Urgent clinical situations (e.g. a patient's condition worsening)	560	301 (53.8)
3	Urgency	Unexpected changes in planned surgical procedure	574	265 (46.2)
4	Urgency	Unexpected rise in patient volume and/or acuity	563	283 (50.3)
5	Staffing	Inadequate number of ancillary staff to help open cases and clean rooms	551	287 (52.1)
6	Materials	Supplies, equipment or instruments unavailable for surgical procedure	570	267 (46.8)
7	Materials	Supplies, equipment or instruments not available when needed	571	271 (47.5)
8	Staffing	Lack of assistance from surgical team members	568	247 (43.5)
9	Staffing	Lack of support from management	570	319 (56.0)
10	Teamwork	Lack of competent skill set for case	570	332 (58.2)
11	Teamwork	Tension and/or communication breakdowns with nursing personnel on surgical team	569	233 (40.9)
14	Teamwork	Lack of flexibility of surgical team members	572	231 (40.4)
15	Teamwork	Fatigue and/or exhaustion of team members	572	380 (66.4)
16	Teamwork	Interruptions during case: pager, phone calls and unnecessary conversations	571	324 (56.7)
17	Teamwork	Staff complacency	573	299 (52.2)

TABLE 4 Missed care subscale summary and internal consistency.

Subscale	*N*	Possible score range	Score range	Mean	SD	Item number	Cronbach's alpha
Part A: Frequency of missed care in the OR							
Legal	608	0–30	5–30	11.8	3.8	6	.78
Preparation	599	0–55	8–53	22.4	6.7	11	.83
Safety	605	0–30	1–36	9.2	3.6	6	.87
Communication	602	0–30	3–30	15.1	4.8	6	.83
Closing routine	609	0–15	0–15	4.8	2.0	3	.81
Preoperative total score	565	0–85	14–81	33.7	9.5	17	.89
Intraoperative total score	586	0–75	4–72	29.0	8.9	15	.90
Missed nursing care frequency total	584	0–160	23–153	63.3	17.5	32	.94
Part B: Reasons for missed care in the OR							
Urgency	566	0–12	0–12	7.4	2.5	3	.73
Staffing levels	572	0–16	2–16	10.4	3.2	4	.74
Materials	575	0–8	0–8	5.0	1.8	2	.92
Teamwork	564	0–32	0–32	19.9	5.5	8	.86
Reasons for missed nursing care total	549	0–68	5–68	42.8	10.7	17	.90

4.1 | Frequency of missed care in the OR

Across both the preoperative and intraoperative periods, our sample reported that MNC occurred in relation to tasks in the preparation (e.g. communication of essential information) and communication (e.g. suspension of non-urgent tasks during time out) subscales. The top perioperative and intraoperative nursing care tasks reported to be most frequently missed included activities that required time to complete or communication with multiple surgical team members present. Breakdowns in communication

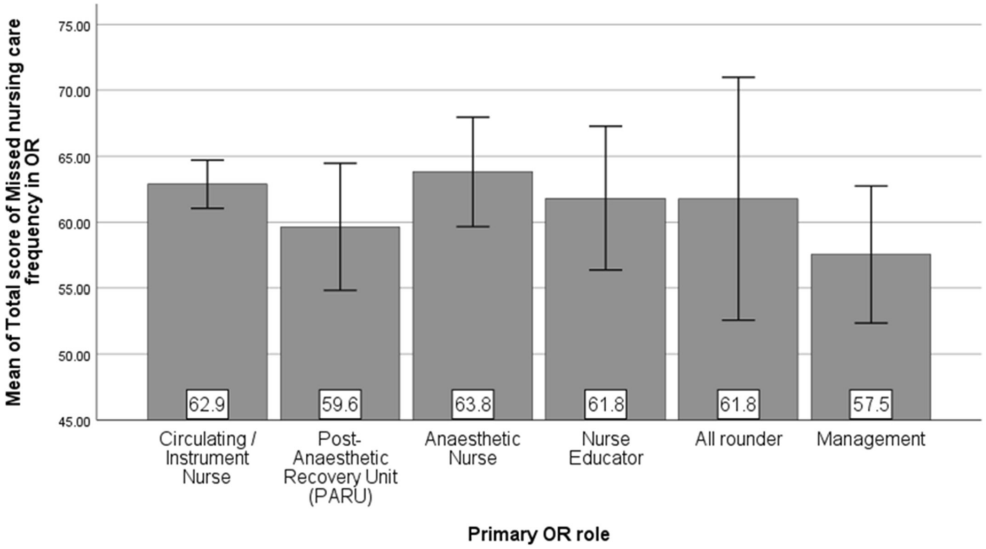

FIGURE 1 Reported frequency of missed care in the OR by primary role (group means are reported within the bars and error bars represent 95% confidence intervals).

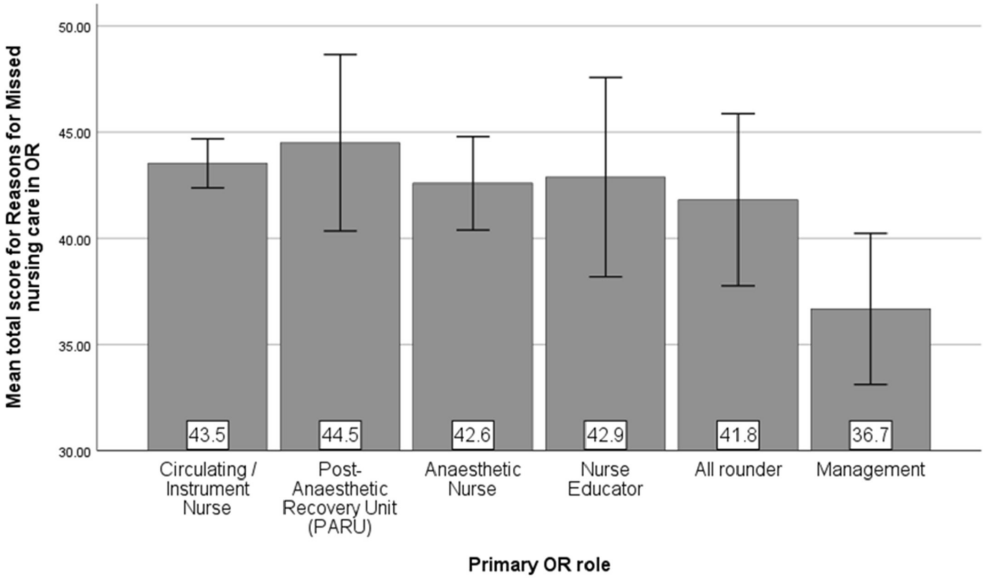

FIGURE 2 Reported frequency for reasons for missed care in the OR by primary role (group means are reported within the bars and error bars represent 95% confidence intervals).

TABLE 5 Relationship between frequencies of MNC and their reasons.

Subscales	Urgency	Staffing levels	Materials	Teamwork	Reasons for MNC total
Legal	.22**	.27**	.20**	.30**	.32**
Preparation	.25**	.29**	.23**	.31**	.34**
Safety	.12**	.19**	.16**	.25**	.24**
Communication	.18**	.33**	.18**	.34**	.35**
Closing routine	.13**	.14**	.16**	.21**	.21**
Frequency of MNC total	.23**	.30**	.21**	.34**	.35**

Abbreviation: MNC, missed nursing care.

**Spearman's Rho correlation is significant at the .01 level (2-tailed).

and teamwork are common risk factors for unintended events (Anderson & Watt, 2020). The literature is replete with examples of the impacts of communication failures in surgery between interprofessional team members, from extending the length of surgery (Gillespie et al., 2012), retained surgical items, to wrong patient and wrong procedure events (Hempel et al., 2015). Clearly, when team communications are compromised, patient safety is jeopardised.

4.2 | Reasons for missed care in the OR

Across the preoperative and intraoperative periods, at least 40% of OR nurses reported the most common reasons for MNC were inadequate staffing, poor team communications (e.g. transfer of essential information, time out and change of staffing), and teamwork (e.g. tension among team members, lack of flexibility and increased fatigue). Inadequate staffing has been linked to MNC in numerous other studies, for examples see (Bragadóttir et al., 2020; Griffiths et al., 2018; Lake et al., 2020) and has also been shown to compromise patient safety (Aiken et al., 2014; Ball et al., 2016). The findings of two recent systematic reviews (He et al., 2022; Monalisa et al., 2023) support an association between communication and poor/ineffective teamwork between nurses and physicians. The results of numerous other studies undertaken in perioperative and other high-risk settings suggest that miscommunications threaten patient safety (Gillespie et al., 2017), and may culminate in serious adverse events such as wrong site surgery (Nwosu, 2015). Although the safety movement has led to the implementation of training programs for teamwork and communication skills, there is still room for further improvement in this area.

Interestingly, our findings indicate that for reported missed care around communication, staffing levels and teamwork share the strongest relationship. The results of previous research in MNC (He et al., 2022; Kiekkas et al., 2021) support our results. Staff shortages potentially result in nurses prioritising critical tasks over other tasks that may be considered non-essential. It is also plausible that low staffing levels also impinge on nurses' and other team members' ability to communicate effectively (He et al., 2022), resulting in tensions and misunderstandings between team members. Importantly, both staffing and teamwork are amenable to interventions that can be implemented at the departmental and individual/team levels, respectively.

4.3 | OR nurse role

There were no significant differences in the frequency of MNC based on nursing roles. However as expected, 'all-rounder' nurses (i.e. instrument /circulating/anaesthetic/PACU roles) providing direct clinical care are exposed to, and report, higher frequencies of MNC compared to the other roles. Additionally, we found notable differences in the reasons for MNC based on perioperative role. Again, nurses working in management roles reported lower scores based on the reasons for MNC. Conceivably, nurses in management roles are focussed on non-clinical activities undertaken away from the bedside. The results of Liu et al.'s. (2018) survey of 1542 Chinese nurses providing direct patient care suggest that having more clinical tasks to complete is associated with a higher frequency of reported MNC. Therefore, unsafe care can occur because of excessive workload (Liu et al., 2018; Tubbs-Cooley et al., 2015). Nevertheless, the prevalence and reasons for MNC are multifaceted and influenced by a confluence of factors (Chaboyer et al., 2021; Griffiths et al., 2018; Jones et al., 2015), including nursing role (Ball et al., 2016; Bragadóttir et al., 2020).

4.4 | Strengths and limitations

We acknowledge this study has some strengths and limitations. First, the study is primarily descriptive, with a low response rate. That is, over 5500 nurses were contacted through the College and only 612 cases were retained for analysis. However, that all states in Australia, all surgical specialities and OR types (e.g. outpatients, inpatient, adult and paediatric), were represented, is a study strength. Second, this study used self-report measures, which may give rise to social desirability and recall biases. To mitigate this possibility, anonymity was provided to ensure that respondents could be candid in their responses, with the options 'not applicable' and 'I prefer not to respond' in relation to frequency of MNC, available. We included these response options to ensure respondents could report these perceptions and to minimise missing data in the data set. Given the paucity of research undertaken in the OR about MNC, this study was primarily a descriptive exploratory study, and therefore we did not calculate an a priori sample size for the ANOVA. A post hoc analysis indicates that for the frequency of missed care, our sample size achieved a power of 66%, and the effect size obtained was small (.14) rather than medium (.25, as originally estimated), so to estimate a difference of frequency of missed care based on nursing role, 1015 participants would be needed. Therefore, a type 1 error is possible. However, for the reasons for missed care, we had a medium effect size and obtained 99% power with our current sample size and no concerns for this ANOVA. Finally, there were unequal group sizes in the ANOVA as most nurses were circulating/instrument (over 50%), thus, there was less representation in the other OR roles. Yet, the proportion of circulating/instrument nurses reflects the distribution of roles in many ORs across Australia, is an adequate representation of work profiles.

4.5 | Implications

In the OR, nurses typically practice in an interdisciplinary context, thus the need for effective communication among team members. Moreover, surgeon preference and the capricious surgical

environment is often characterised by or subject to, rapid or unexpected changes in patient status (Cohen et al., 2020) that may influence why some tasks may be missed. This may necessitate that nurses' priorities shift to accommodate changes in patient status or the surgeon's decision to use a different approach to the one originally planned. Nonetheless, because of professional hierarchy, there may be a tendency for nurses to prioritise the more medical aspects of care (Tørring et al., 2019). That is, prioritising care based on medical information and directives rather than focussing on fostering meaningful connections with surgical patients. Arguably, practicing in clinical environments that are historically dominated by a biomedical model limits the extent to which nurses can fulfil the psychosocial and caring aspects of clinical practice that contribute to patients' psychological wellbeing.

A key reason for MNC in the OR reported by our sample related to teamwork, which influences the effectiveness of interprofessional communications. Good communication is essential for coordination, collaboration, information exchange, role clarification, vigilance (Kang et al., 2014; van Dalen et al., 2022) and ultimately—error reduction. Therefore, it is essential to implement team building strategies that strengthen teamwork and improve communication among surgical team members (Cohen et al., 2020). National bodies such as the Australian Commission on Safety and Quality in Health Care (ACSQHC), the National Institute for Health and Care Excellence Guidelines, and the US Joint Commission have targeted the use of effective communication practices in healthcare organisations in relation to clinical handovers/communication of critical information. For instance, in its standard, *Communicating for Safety*, the ACSQHC recommends implementing structured team training programs such as TeamSTEPPS (Dahl et al., 2017) and Pass-the-Baton (Gillespie et al., 2019), to enhance or improve team communications.

5 | CONCLUSIONS

Missed nursing care in practice may be inevitable but understanding what aspects of care are commonly missed and the reasons for this in the OR, is a first critical step in identifying strategies to mitigate the impact of MNC on patient safety. We found a high prevalence of MNC related to communication practices and processes—this important finding is concerning when considering that communication failures compromise patient safety in surgery. However, it also highlights a real opportunity to proactively train OR staff in teamwork and communication.

AUTHOR CONTRIBUTIONS

All authors have agreed on the final version and meet at least one of the following criteria (recommended by the ICMJE [http://www.icmje.org/recommendations/]): (1) substantial contributions to conception and design, acquisition of data or analysis and interpretation of data; (2) drafting the article or revising it critically for important intellectual content.

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CONFLICT OF INTEREST STATEMENT

The authors declare they have no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the results of this study are not available as data sharing has not been approved by the Human Research Ethics Committee.

STATISTICS

The authors have checked to make sure that our submission conforms as applicable to the Journal''s statistical guidelines. The statistics were checked prior to submission by an expert statistician, Lukman Thalib, lthalibqu@gmail.com.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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