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Comparing infection control and ward nurses' views of the omission of infection control activities using the Missed Nursing Care Infection Prevention and Control (MNCIPC) Survey

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Abstract

Aim: To compare the perceptions of nurses with infection control expertise and ward nurses as to what infection control activities are missed and the reasons why these activities are omitted.

Background: Infection prevention activities are viewed as important for reducing health care-acquired infections (HAIs) but are often poorly performed.

Methods: Data were collected through the Missed Nursing Care Infection Prevention and Control (MNCIPC) Survey delivered to 500 Australian nurses prior to COVID-19.

Results: Significant differences were found on the mean scores between infection control and other nurses on ten items. In eight cases, five relating to hand hygiene, infection control specialists viewed the activity as more likely to be missed. Factors viewed as having greater contribution to omission of infection control prevention were as follows: 'Patients have to share bathrooms', 'Urgent patient situation' and 'Unexpected rise in patient volume and/or acuity on the ward/unit'. Infection control nurses were more likely to highlight the role of organisational and management factors in preventing effective infection control.

Conclusions: Differences in response between nurses suggest that the extent of omission of infection control precautions may be under-estimated by ward nurses.

Implications for Nursing Management: Infection control specialists are more likely to identify organisational barriers to effective infection control than other nurses. Work demands arising from pandemic management may contribute to infection control precautions being missed.

KEYWORDS

Australia, infection control, missed care, survey

1 | INTRODUCTION

The advent of COVID-19 has bought the role of infection prevention strategies into focus. This has occurred at a time when budgetary restrictions, concerns about the impact of prolonged antibiotic use and emergence of new antibiotic resistant pathogens have governments focusing upon strategies to reduce health care-acquired infections (HAIs) (Australian Commission on Safety and Quality in Healthcare, nd). HAIs contribute to longer patient admissions, poorer clinical outcomes and higher mortality rates

and add to the fiscal burden of health care. In 2015/16, public hospitals in Australia reported 60,037 HAIs adding 18.1 days to admissions on average and adding approximately $37,500 to the cost of an admission (Australian Commission on Safety & Quality in Healthcare, 2018).

The primary means of preventing HAI is seen as 'the implementation of practices that minimise the risk of transmission of infectious agents' (Australian Government, 2010:7). The Australian Commission on Safety and Quality in Healthcare (2018:2–3) associates best practice in prevention of HAI with surveillance; the use of transmission-based precautions; access to personal protective equipment (PPE); sterilization and/or cleaning of reusable equipment; environmental cleanliness; and antimicrobial stewardship. There is evidence that clinicians perform these activities poorly or may omit them completely. This paper explores perceptions of the infection prevention and control activities that are missed and the reason why they are missed through analysis of findings from the administration of Missed Nursing Care Infection Prevention and Control (MNCIPC) Survey to Australian nurses, comparing the views of infection control nurses with other (ward) nurses. A recent study of infection control experts identified four primary reasons for failure to undertake infection prevention activities. These are as follows: factors related to the health system; organisational factors; and issues concerned with the physical environment and personal factors including motivation and awareness of these precautions (Henderson et al., 2020). Results will be explored via these categories.

1.1 | Systemic factors

Systemic factors relate to the wider health care system and may include issues of resourcing, staffing ratios and policies, and other policy initiatives, which impact on infection control practice or patient throughput and workload. Infection control specialists report that there is inadequate resourcing for infection control and prevention. There is evidence that staffing levels and nurse workload are associated with HAIs. Aitken et al. (2014) in a study of the impact of nurse staffing across nine European countries found that an increase in nurse workload by one patient was associated with an 7% increase in the likelihood of surgical patients dying within 30 days of admission. Likewise, Van et al. (2020) associated increases in nursing hours per patient day with a reduction in central line-associated bloodstream infection rates in services run by Veterans Health Administration in the United States.

Time constraints arising from workload, staffing levels and skill mix have also been implicated in failure to perform infection prevention activities (Henderson et al., 2020). The impact of time is confirmed by studies with clinicians. Sadule-Rios and Aguiera (2017) conducted survey research with 47 critical care nurses to identify barriers to hand hygiene. The most cited reasons for failure to perform hand hygiene among this cohort was 'high workload and understaffing' (n = 24). The donning of PPE is also viewed as time-consuming. Yanke et al. (2015) conducted observational research into failure to complete isolation precautions in the United States. They noted full compliance with the use of PPE added to the time taken before entering the room, while in the room and upon leaving, and argue that this may be a factor in lack of compliance.

1.2 | Organisational factors

Organisational factors relate to a specific organisation and may incorporate managerial support and style, interprofessional relationships, budgetary factors and access to the technology and resources to implement infection control programmes (Henderson et al., 2020). There are several studies in which infection control professionals and/or nurse managers identify organisational barriers to infection prevention. Halton et al. (2017) surveyed Australian and New Zealand infection control prevention specialists who identified lack of leadership and organisational resistance to infection control as precipitating poor infection control practice. This is exacerbated by limited access to clinical leaders by infection preventionists. Lack of managerial support also contributes to lack of financial support and educational opportunities for infection control, lack of funding for information technology and research to monitor infection control and limited access to infection control expertise (Halton et al., 2017; Henderson et al., 2020). Ider et al. (2012) found that lack of budgetary control, limited capacity for surveillance, limited infection control knowledge and performance of competing tasks by infection control clinicians all contribute to poor infection control performance. Leadership style was identified as indirectly contributing to HAIs by Wong et al. (2013). They argue that a relational leadership style typified by a focus upon working with people to achieve common goals reduced the incidence of adverse events including HAIs through improving staff retention and a resultant increase in expertise and reducing absenteeism and poorer staff/patient ratios. Interprofessional relationships also contribute, with medical staff frequently identified as a barrier to effective infection control. This may be related to ineffective interprofessional communication (Gurses et al., 2008) and professional relations between infection control specialists who are largely nurses and medical staff. Brown et al. (2008) note that nurse subordination to medicine can lead to difficulties in challenging poor hygiene practice and the breaching of boundaries established by nursing managers. Shah et al. (2015) in a study of British health care workers found that senior medical staff may consider themselves as independent practitioners who are not subject to hospital policies.

1.3 | Environmental factors

Environmental factors relate to features of the physical environment and may include ward layout including availability of single rooms

for patients, availability of sinks and access to PPE (Henderson et al., 2020). Park et al. (2020) explored the relationship between proportion of private rooms and incidence of health-acquired MRSA (HA-MRSA) in Texas and found that there were 0.8% fewer HA-MRSA infections for each 1% increase in private rooms as a proportion of all rooms. Randle and Clarke (2010) view lack of facilities including side rooms as a barrier to implementation of the code of hygiene, which establishes guidelines for infection prevention in the UK. Chagpar et al. (2010) found that infection control practice was often inhibited by poor access to hand basins and PPE impacting on perceptions that hand hygiene could add to workflow. 'Difficulty accessing sink locations' was also identified as a barrier to hand hygiene by 22 of 47 critical care nurses working in Florida hospitals (Sadule-Rios & Aguiera, 2017).

1.4 | Personal factors

Personal factors relate to the motivation, beliefs and knowledge of the individual nurse about infection control. Smiddy et al. (2015) conducted a systematic literature review of clinician's compliance with hand hygiene. They identified two major themes relating to *motivation* and *perception of work environment*. Motivation to perform hand hygiene was impacted by organisational factors such as managerial and peer support for hand hygiene and role modelling by senior staff; by the prioritization of tasks and perceived risk to the patient; self-protection; and visual cues. Staff perceptions of work environment incorporate access to resources; knowledge; auditing and the feedback of results; and organisational culture. The prioritization of tasks was also identified by Shah et al. (2015) who found that while respondents were aware of infection precautions, competing demands were often given higher priority due to workload demands. This finding is in line with research by Patterson et al. (2011) who found that when resources are limited or if demand is unpredictable, nurses give priority to actions that address imminent clinical concerns over other tasks.

Failure to undertake infection control precaution is often viewed as arising from lack of knowledge about infection prevention. Jackson et al. (2014) found that perception of level of risk to patients, peer pressure, perception of one's practice and motivation may result in infection precautions being missed despite level of knowledge. Level of personal risk was also a factor in a study by Jackson and Griffith (2014) who found nurses were more likely to take precautions when encountering body fluids or situations perceived to be dirty. Russell et al. (2018) who surveyed 359 home health care nurses also found no association between knowledge of infection control precautions and compliance with these precautions, although nurses with infection control certification were significantly more likely to report compliance with precautions. They found a significant positive association between positive attitudes towards infection prevention and self-reported compliance with precautions, suggesting that attitude is more important than knowledge.

2 | METHODS

2.1 | Aim

This paper reports results from Australian respondents to the Missed Nursing Care Infection Prevention and Control (MNCIPC) Survey, which measures nurses' perceptions of what infection control activities are routinely missed and the reasons why these activities are not performed. A second aim is to compare the perceptions of nurses working in infection control roles and nurses working in other roles to determine differences in perceptions.

2.2 | Data collection

Data for this study were collected through the Missed Nursing Care Infection Prevention and Control (MNCIPC) Survey administered in late 2019 prior to COVID-19. This tool was developed by Henderson, Blackman, Willis and Roderick to explore the failure to perform infection control activities through the lens of missed or rationed care (Henderson et al., 2020). Lam (2011) developed a survey to explore performance of infection control activities. The MNCIP Survey incorporates a measure of activities missed and reasons for why these activities are missed. Missed care has been defined by Kalisch et al. (2009:1,510) as 'required [nursing] patient care that is omitted (either in part or in whole) or delayed'. Kalisch and Williams (2009) identify three primary antecedents to missed nursing care: lack of human resources (e.g., number and skill mix of staff, work intensity and lack of time), lack of material resources and communication breakdown.

The MNCIPC tool consists of three sections. Part A provides background and other demographic information about the respondents. Section B (37 items) identifies infection control activities that may be missed and asks participants to identify how frequently they believe these activities are missed. Items are scored on a scale of 1 to 5 where 1 is 'never missed' and 5 is 'always missed'. Section C (24 items) asks the respondents to indicate why care might be missed with items rated on a scale of 1 to 4 where 1 is 'not important' and 4 'very important'. Section C concludes with two open question allowing respondents to (1) provide any additional reasons for omission of infection control activities and (2) any comments they wish to make about omitted infection control. These questions were included to identify causes of missed care not identified in the survey and/or to clarify causes that were included. The survey was developed replicating the methods utilized by Kalisch in developing previous MISSCARE surveys (Kalisch & Williams, 2009; Kalisch et al., 2014). Items were developed through a review of literature and eleven interviews with respondents with infection control expertise recruited through the Australian College of Infection Prevention and Control (Henderson et al., 2020). These data informed the development of a draft survey, which was trialled with a small group of infection control experts who provided written feedback. The

feedback was incorporated into the final draft of the survey, which was then delivered online.

Participants were recruited through advertisements in the electronic newsletters of two organisations: the Australian College of Infection Prevention and Control (ACIPC) and the Australian College of Nursing (ACN). Recruitment through ACIPC provided access to nurses with expertise in infection control, while recruitment through the ACN enabled access to nurses without specific expertise in infection control. The survey was undertaken by 500 respondents (see Table 1).

2.3 | Data analysis

2.3.1 | Quantitative data

Quantitative data were analysed using SPSS Statistics version 25. Descriptive statistics were used to compare respondents across selected demographic characteristics and to analyse the quantitative data on how frequently tasks are missed and why. Both the survey item and nurse respondent reliabilities were checked using the Rasch analysis and revealed very acceptable fit indices at 7.7 (reliability of 0.97) and 4.28 (reliability 0.95), respectively. These indices confirm that the survey items operate well individually and collectively, in estimating nursing staff's consensus (Bond & Fox, 2015; Boone & Vale, 2014). The chi-squares and *t* tests were conducted to determine whether there were significant differences in the demographic characteristics of the two groups and the tasks perceived as missed and reasons for missed care by respondents identifying as having a specific infection control role and those who do not.

TABLE 1 Comparison of the demographic characteristics of infection control specialist and other nurses

	Infection control specialists	Other nurses
Gender		
Female	192 (93.2%)	261 (89.7%)
Male	14 (6.8%)	30 (10.3%)
Age		
Under 45 years	44 (21.5%)	84 (29.5%)
45 and over	161 (78.5%)	201 (70.5%)*
Highest education qualification		
Enrolled nurse	9 (4.5%)	12 (4.3%)
Registered nurse (no degree)	25 (12.5%)	19 (6.8%)
Degree	43 (21.5%)	93 (33.1%)
Postgraduate	123 (61.5%)	157 (55.7%)*
Time spent in current workplace		
5 years or less	80 (38.8%)	134 (46.4%)
More than 5 years	126 (61.2%)	155 (53.6%)
Attendance at in-service education on infection control		
Yes	175 (90.7%)	254 (89.8%)
No	18 (9.3%)	29 (10.2%)
University qualifications in infection control		
Yes	91 (50.8%)	14 (5.6%)
No	88 (49.2%)	235 (94.4%)**

*$p \leq .05$
**$p \leq .001$

2.3.2 | Qualitative data

The qualitative data were drawn from responses to an open-ended question: 'Are there other reasons why infection control activities are missed?' These data were analysed using qualitative content analysis (Mayring, 2014). Qualitative content analysis involves thematic coding using systematic rules and quantification to determine the importance and generalizability of the themes. In this case, coding was undertaken inductively by two researchers working independently. Data were read for statements addressing the causes of missed care. Each response was allocated a descriptor. Where more than one reason was offered within a response, multiple descriptors were allocated. The descriptors were then divided into four themes: systemic factors, organisational factors, environmental and access issues and personal factors, and were collated to determine the most frequently occurring issues.

2.4 | Ethics

Ethics approval for this project was obtained through the Flinders University Social and Behavioural Research Ethics Committee.

3 | RESULTS

3.1 | Quantitative data

Table 1 compares key demographic characteristics of the sample undertaking the survey. In keeping with workforce composition, the majority of respondents were female (91.2%). Most respondents were employed as registered nurses or midwives (93.6%), and the majority had worked in their current workplace for more than 5 years (56.8%). Statistically significant differences were noted between the two groups of respondents in relation to age and education but not in relation to years within that workplace. The infection control specialists were older and better educated than the other nurses ($p \leq .05$). They were also significantly more likely to hold tertiary qualifications in infection prevention ($p \leq .001$). No significant differences were evident in rates of attendance at in-service infection control education sessions with 90.1% of all respondents indicating that they had attended.

Table 2 provides mean scores for the perception of frequency that infection control activities are missed, comparing scores for nurses employed in infection control roles and those who are not.

TABLE 2 Comparison of means and standard deviations for infection control and other nursing staff for likelihood of an infection control activity being missed

	Infection control role	No infection control role	All respondents
Hand hygiene is performed before touching a patient	3.17 ± 0.84	2.84 ± 1.02	2.98* ± 0.96
Hand hygiene is performed before a procedure is undertaken	2.65 ± 0.91	2.07 ± 1.09	2.30** ± 1.06
Hand hygiene is performed after a procedure has been performed	2.43 ± 0.86	2.12 ± 1.06	2.25* ± 0.99
Hand hygiene is performed after touching a patient	2.92 ± 0.92	2.65 ± 1.12	2.76*** ± 1.05
Hand hygiene is completed before drug administration	3.33 ± 1.11	3.08 ± 1.28	3.19 ± 1.19
Equipment is cleaned before it touches each patient	3.37 ± 1.11	2.91 ± 1.24	3.10** ± 1.21
Appropriate personal protective equipments (PPEs) (such as gloves and gowns) are used when providing direct care to patients/residents who have a transmissible disease including multiresistant organisms (MROs).	2.58 ± 1.18	2.21 ± 1.16	2.36* ± 1.18
PPE is donned in the correct order, for example putting on gown first and then gloves to ensure that they are pulled over the cuff of the gown so that no skin is exposed	2.80 ± 1.14	2.55 ± 1.45	2.65 ± 1.33
Gloves are changed when moving from a contaminated/dirty site to a clean site	2.74 ± 1.11	2.30 ± 1.31	2.48 * ± 1.25
'Touch contamination' is avoided, for example not scratching your nose or adjusting your glasses	2.70 ± 0.10	2.47 ± 1.23	2.57 ± 1.15
Gloves are removed before taking off the gown	2.72 ± 1.15	2.70 ± 1.49	2.71 ± 1.36
Hand hygiene is undertaken following gown removal	2.52 ± 1.06	2.28 ± 1.39	2.38 ± 1.27
Facial equipment is removed before hands are washed	2.72 ± 1.20	2.75 ± 1.65	2.74 ± 1.48
Goggles and mask or mask face shield is worn when caring for patients on respiratory/droplet precautions	2.78 ± 1.39	2.61 ± 1.62	2.68 ± 1.53
All new admissions are screened for MRO	3.94 ± 1.79	3.99 ± 1.81	3.97 ± 1.80
Appropriate signage informing staff and visitors of the need for transmission-based precautions is displayed when managing a patient with a MRO	2.54 ± 1.57	2.70 ± 1.75	2.63 ± 1.70
Patients are invited or assisted to perform hand hygiene following use of a bedpan or urinal in bed	3.25 ± 1.41	3.25 ± 1.63	3.25 ± 1.54
Patients are showered preoperatively	3.94 ± 1.99	4.20 ± 2.04	4.10 ± 2.02
Catheter toilet care is performed each shift	3.71 ± 1.70	3.81 ± 1.83	3.77 ± 1.78
Oral care/ teeth are cleaned at least daily	3.41 ± 1.68	3.58 ± 1.83	3.51 ± 1.77
Intravenous cannulas are swabbed with alcohol for 15 seconds and allowed to dry for 15 seconds before flushing or administering medications	3.24 ± 1.49	3.24 ± 1.82	3.24 ± 1.69
Gloves are worn and/or hand hygiene performed for preparing and administration of antibiotics	3.34 ± 1.51	3.16 ± 1.64	3.23 ± 1.59
The nurse/midwife follows up with a medical officer/ senior nurse if a patient has indications of an infection, for example temperature increase, presence of new swelling or pus	2.25 ± 1.30	2.14 ± 1.42	2.18 ± 1.37
Health care organisation documentation specifies the MRO status of patients on admissions	2.61 ± 1.53	2.88 ± 1.78	2.77 ± 1.69
Documentation of patient's MRO status is completed when the patient is discharged	3.16 ± 1.77	3.79 ± 2.05	3.53 * ± 1.97
Nurses/midwives document follow up of pathology tests/results, for example wound swabs, MRO status	3.07 ± 1.51	3.10 ± 1.75	3.09 ± 1.65
Nurse/midwives communicate patient's MRO status at handover	2.74 ± 1.45	2.59 ± 1.53	2.65 ± 1.50
Nurses/midwives communicate patient's MRO status on transfer to other wards or to new department, for example X-rays	2.81 ± 1.52	2.71 ± 1.67	2.75 ± 1.61
Cleaners/support staff wear appropriate PPE	2.66 ± 1.29	2.81 ± 1.69	2.76 ± 1.54
Cleaners/support staff wash hands after removal of PPE	2.94 ± 1.32	3.29 ± 1.87	3.15 ± 1.68
Cleaners/support staff adhere to signage related to transmission-related precautions	2.69 ± 1.47	2.90 ± 1.80	2.81 ± 1.68
Cleaners/support staff fully clean rooms between patients	2.45 ± 1.55	2.75 ± 1.96	2.63 ± 1.81
Cleaners/support staff fully clean rooms when an infected patient is discharged or transferred	2.18 ± 1.56	2.42 ± 1.90	2.32 ± 1.77
Patient's over-way table is cleaned prior to food delivery	4.15 ± 1.24	4.09 ± 1.50	4.11 ± 1.40

(Continues)

TABLE 2 (Continued)

	Infection control role	No infection control role	All respondents
Staff decontaminate spills of blood and other body substances/fluids	2.07 ± 1.14	2.19 ± 1.50	2.14 ± 1.37
Instruments and equipment are stored to ensure sterility prior to use	1.73 ± 0.83	2.12 ± 1.64	1.97 *** ± 1.47
Hand hygiene is performed after exposure to body fluids	1.73 ± 0.83	1.48 ± 0.92	1.58 *** ± 0.89
Hand hygiene is completed after drug administration	2.93 ± 1.21	2.84 ± 1.35	2.88 ± 1.30

Note: 1 is 'never missed' and 5 is 'always missed'.

*$p \leq .01$.

**$p \leq .001$.

***$p \leq .05$.

Score were rated on a scale from 1 to 5 with higher scores indicating a perception that this activity is missed more frequently. Activities that were reported as frequently missed include the following: cleaning over-way tables prior to food delivery (mean = 4.11); pre-operative showers (4.10); screening of new admissions for infection (3.97); and performance of catheter toilets every shift (3.77). Failure to perform hand hygiene received a mean score of 2.98, the highest score received by the 5 moments of hand hygiene (WHO, n.d.). Significant differences were found on the mean scores between infection control and other nurses on ten items. In eight cases, the activity was viewed as more likely to be missed by infection control nurses. These items include five items related to hand hygiene being: 'Hand hygiene is performed before touching a patient'; 'Hand hygiene is performed after a procedure has been performed' ($p \leq .01$); 'Hand hygiene is performed before a procedure is undertaken' ($p \leq .001$); 'Hand hygiene is performed after touching a patient'; and 'Hand hygiene is performed after exposure to body fluids' ($p \leq .05$). The other activities that were statistically significant relate to cleaning equipment between patients and correct use of PPE. The documentation of infection status upon discharge ($p \leq .01$) and storage of equipment to ensure sterility ($p \leq .05$) were more highly rated by ward nurses as being missed.

Table 3 contains the mean and standard deviations for the score obtained by infection control specialists and other nurses in relation to reasons for infection control activities being missed. The results are categorized into systemic, organisational, environmental and personal factors. Scores range between 1 and 4, with higher scores indicating a greater perceived impact on missed care. Highest scores were obtained for environmental and systemic factors. The highest mean score was associated with the sharing of bathrooms by patients (mean = 2.91). A second environmental factor that received a high mean score was 'patients rooms overcrowded/cluttered with equipment/ supplies' (2.66). Two systemic factors also scored highly: 'urgent patient situation' (2.86) and 'unexpected rise in patient volume and/or acuity on the ward/unit' (2.83). Of the organisational factors, 'unbalanced assignment/allocation to nursing/midwifery staff' (2.50); and 'patient room allocation made without consideration to principles of infection control' (2.47) rated highly. 'Inadequate handover from previous shift, unit, health or aged care facility' was the highest rated personal factor (2.57). Statistically significant differences in means between infection control and other nurses were found on three items. Infection control specialists gave greater weighting to two organisational factors: 'Ward culture does not support infection control activities'; and 'Lack of support from hospital management for resources to undertake infection control activities' ($p \leq .05$); and one personal factor: 'Nurses/midwives have inadequate understanding of transmission-based precautions' ($p \leq .01$).

3.2 | Qualitative data

Ninety-two responses were received to the question: 'Are there other reasons why infection control activities are missed?' The responses were coded as systemic, organisational, environmental and personal factors. Results are summarized in Table 4.

Time pressure and workload were identified as the most common systemic reason for missing infection control activities ($n = 13$ responses). Time constraints were identified by both infection control and other nurses. Nurses not working in infection control roles viewed work pressure as *inhibiting* infection control measures. One nurse stated that '[w]hen staff [are] pushed to rush care quality suffers, normally unintentionally', while another said 'everyone in a hurry but not thinking about the consequences of not being clean!' Ward nurses also cited 'bed flow pressure' as contributing to poor performance of infection control precautions. Infection control staff were more likely to view time constraints as an *excuse* rather than a reason for poor infection control practice. An infection control nurse reported: 'We've been informed that people are too busy to perform hand hygiene', while another noted that activities are missed due to 'the perception that infection control is preventing critical activities and takes up too much time'.

The most commonly identified organisational cause of missed infection control was poor practice by medical staff ($n = 13$), followed by poor access to resources and funding ($n = 11$) and limited management support for infection control ($n = 6$).

TABLE 3 Comparison of means and standard deviations for infection control and other nursing staff for reasons for infection control activities being missed

	Infection control role	No infection control role	All respondents
Systemic factors			
Inadequate number of medical staff	2.39 ± 1.32	2.24 ± 1.46	2.30 ± 1.40
Inadequate number of clerical staff	2.16 ± 1.26	1.97 ± 1.36	2.05 ± 1.32
Inadequate number of nursing/midwifery staff on the ward/unit	2.45 ± 1.21	2.41 ± 1.31	2.42 ± 1.27
Inadequate skill mix of nursing/ midwifery staff allocated for patient care	2.39 ± 1.22	2.44 ± 1.22	2.42 ± 1.22
Inadequate number of cleaning/support staff	2.51 ± 1.25	2.44 ± 1.29	2.47 ± 1.27
Unexpected rise in patient volume and/or acuity on the ward/unit	2.94 ± 1.08	2.76 ± 1.27	2.83 ± 1.19
Urgent patient situation (e.g. a patient's condition worsening)	2.93 ± 1.15	2.82 ± 1.16	2.86 ± 1.15
Organisational factors			
Lack of prompts in patient records to check for signs of infection	2.31 ± 1.29	2.21 ± 1.21	2.25 ± 1.24
Patient room allocation made without consideration to principles of infection control	2.56 ± 1.36	2.40 ± 1.41	2.47 ± 1.39
Lack of cleaning schedule for environmental cleaning in clinical areas	2.22 ± 1.40	2.19 ± 1.32	2.20 ± 1.35
Unbalanced assignment/allocation to nursing/midwifery staff	2.45 ± 1.20	2.53 ± 1.30	2.50 ± 1.26
Ward culture does not support infection control activities	2.44 ± 1.27	2.07 ± 1.26	2.22 * ± 1.27
Lack of nursing/midwifery control over infection control activities	2.27 ± 1.29	2.18 ± 1.28	2.22 ± 1.28
Lack of support from hospital management for committees governing infection control activities	2.48 ± 1.39	2.25 ± 1.39	2.34 ± 1.39
Lack of support from hospital management for resources to undertake infection control activities	2.64 ± 1.33	2.25 ± 1.30	2.41* ± 1.32
Environmental factors			
Patient rooms/bays lack sinks for hand washing	2.11 ± 1.29	2.23 ± 1.37	2.18 ± 1.33
Inadequate places to store belongings (e.g. blankets, patient personal belongings)	2.61 ± 1.43	2.54 ± 1.36	2.57 ± 1.38
Insufficient plastic puncture proof containers for sharps/ used needles	1.69 ± 1.18	1.64 ± 1.16	1.66 ± 1.16
Sterile supplies/ equipment not available when needed	2.06 ± 1.38	2.00 ± 1.25	2.02 ± 1.30
Patients have to share bathrooms	2.94 ± 1.30	2.89 ± 1.35	2.91 ± 1.33
Patients' rooms overcrowded/cluttered with equipment/ supplies	2.66 ± 1.38	2.65 ± 1.35	2.66 ± 1.36
Personal factors			
Nurses/midwives have inadequate education/knowledge of infection control practices	2.41 ± 1.16	2.15 ± 1.08	2.26 ± 1.12
Nurses/midwives have inadequate understanding of transmission-based precautions	2.56 ± 1.17	2.18 ± 1.11	2.34 ** ± 1.15
Inadequate handover from previous shift, unit, health or aged care facility	2.65 ± 1.23	2.52 ± 1.20	2.57 ± 1.21

Note: 1 is 'not important' and 4 'very important'.

*$p \leq .05$.

**$p \leq .01$.

> 'Infection Control [is] not seen as value adding or revenue raising. The cost of HAI infections unable to be quantified to Management in a dollar value or LOS [length of stay]. Infection Control departments under resourced to do all of the IC requirements and increasing mandatory surveillance'.

Poor infection control practice by medical staff was cited by both groups. One nurse stated that '[d]espite escalation of MO inadequacies nothing changes'. Similar responses were received from infection control nurses. One noted that 'nurses are the best, not the source'. Comments citing lack of managerial and budgetary support were most commonly associated with infection control nurses. One noted, for example, that:

Ward layout was the primary environmental factor identified by 11 participants. These responses were most commonly made by infection control nurses. Many identified shared rooms and lack of toilets as undermining infection control. An infection control nurse from a rural hospital noted that: 'per 8 beds we have 3 showers and 4 toilets which is very difficult to manage when there is an outbreak'. Shared rooms were viewed as decreasing hand hygiene. Another infection control nurse said:

'4 bedded rooms mean that hand hygiene leaving a patient space overlaps with hand hygiene before touching the next patient. Or nurses believe 'non carded' patients within four bedded room allows for no hand hygiene between touching non-clinical items'.

Nurses who were not working in infection control roles were more likely to cite poor environmental cleaning as contributing to poor infection control practice. One respondent identified insufficient 'attention given to public areas in hospitals where cross-contamination can occur very easily', while another noted that the 'cleaning of the patient beds is a major issue'.

Thirteen responses highlighted knowledge deficits as a personal factor with 7 respondents identifying nurses as lazy and 6 highlighting poor understanding of infection control principles. Deficits in knowledge and understanding were highlighted by both groups. A ward nurse viewed missed care as arising from 'lack of infection control knowledge to transfer principles into practice', while an infection control nurse stated that '[s]taff are given education in principles, however some incorporate it better than others, into practice'. Infection control nurses associated poor application of infection control knowledge with poor attitude; poor prioritization of infection control practice; a focus upon self-protection over protection of patients; and lack of consequences for breaches of practice.

TABLE 4 Themes arising from content analysis of response to open question 'Are there other reasons why infection control activities are missed?'

Themes	Number of responses
Systemic factors	
Time pressure	13
Patient acuity	3
Patient throughput (admissions and discharges)	2
Staffing levels	2
Organisational factors	
Impact of other staff (medical, allied health)	13
Access to resources	8
Poor management support	6
Cleaning policies	4
Lack of surveillance	3
Budget for infection control	3
Lack of infection control staff	2
Lack of cleaners	2
Ward culture	2
Communication	2
Failures in testing	2
Environmental factors	
Ward layout	11
Personal items	2
Personal factors	
Knowledge of infection control	13
Laziness	7
Understanding and application of infection control knowledge	6
Prioritization of other tasks	5
Forgetting	5
Complacency	3
Use of PPE	3

4 | DISCUSSION

This paper compares the perceptions of infection control and other nurses on how often infection control precautions are missed and the reasons why they are missed using findings from the Australian Missed Nursing Care Infection Prevention and Control (MNCIPC) Survey. This tool measures respondent's perceptions of the extent of missed nursing care and rates the importance of causes for missed care. It also provides scope for further comment about the causes of missed care through open-ended questions. This paper presents both quantitative and qualitative data. Many studies have explored the views of infection control nurses as to why infection prevention activities are omitted and/or are poorly performed, but there are fewer studies comparing these views with those of the wider nursing community.

The respondents as a whole identified 'cleaning over-way tables prior to food delivery' (mean = 4.11); 'pre-operative showers' (4.10); screening of new admissions for infection' (3.97); and 'performance of catheter toilets every shift' (3.77) as the most frequently missed activities. This contrasts with Pereira et al. (2015) who compares compliance rates with standard precautions by nurses in Hong Kong and Brazil. They identified deficits in sharps management and hand hygiene in both contexts and failure to decontaminate surfaces and equipment after use in Hong Kong. Infection control nurses were significantly more likely to identify activities as being missed in eight cases, most notably in relation to hand hygiene. These differences may be accounted for, in part, by demographic differences between the two groups. The nurses working in infection control roles were statistically significantly older, better educated and more likely to have undertaken tertiary education in infection control than the ward nurses. They were also more likely to have worked more than 5 years in their current workplace although this difference was not statistically significant. Differences in perception of the rates of hand hygiene are noteworthy as hand hygiene has been the focus of the National Hand Hygiene Initiative (NHHI) which was implemented in 2008 in Australia. This initiative was based on the World Health Organizations' Guide of Hand Hygiene in Healthcare 2009. Among the responsibilities of Hand Hygiene Australia (HHA) is auditing and performance feedback on compliance with the five moment of hand hygiene (2009). Infection control nurses are likely to be aware of national compliance rates, and this may be reflected in responses. Nurses who do not work in infection control may over-estimate their level of compliance with hand hygiene. Other items identified

by infection control nurses as significantly more likely to be missed include the following: 'equipment is cleaned before it touches each patient'; 'appropriate personal protective equipments (PPEs) are used when providing direct care to patients/residents who have a transmissible disease'; and 'gloves are changed when moving from a contaminated/dirty site to a clean site'. Nurses working outside of infection control viewed two items as being significantly more likely to be missed than infection control nurses. These were as follows: 'the documentation of infection status upon discharge' and 'storage of equipment to ensure sterility'. As these tasks are both performed on the ward, these estimates are likely to reflect practice.

Respondents were also asked to indicate why they thought infection control precautions were missed. Similar scores were obtained for both groups on the quantitative items. Missed care is commonly associated with systemic factors such as staffing; workload; patient acuity; and unexpected changes in workload associated with an urgent patient situation (Blackman et al., 2015; Kalisch and Williams, 2009; Schubert et al., 2013). This was evident in this study with respondents rating 'urgent patient situation' and 'unexpected rise in patient volume and/or acuity on the ward/unit' highly. These findings suggest that unplanned increases in workload may result in breaches of infection control precautions. Similar results are reflected in responses to open-ended questions. Nurses identified workload and time constraint as impacting capacity to undertake infection control precautions. This appears to be confirmed by retrospective studies, which associate adverse outcomes with staffing levels (Aitken et al., 2014; Van et al., 2020); however, infection control nurses viewed this as a *rationale*, rather than a *reason* for missed care.

Infection control nurses placed greater emphasis upon organisational factors. Two survey items were significantly more likely to be identified by infection control than other nurses as contributing to missed care: 'ward culture does not support infection control activities' and 'lack of support from hospital management for resources to undertake infection control activities'. Poor resourcing of, and management support for, infection control activities was also identified in responses to the open-ended question. These factors have been identified in other studies (Halton et al., 2017; Henderson et al., 2020) and have been associated with limited education opportunities and lack of access to technology. Recent changes in funding in Australia have tied reimbursement rates for public hospitals to rates of HAI (IHPA, 2017), and this is likely to increase managerial investment in infection control. Respondents also highlighted poor hand hygiene compliance by medical staff. This finding is confirmed by HHA audit data. Data collected during the pandemic from 1 April to 30 June 2020 found 79.5% compliance by doctors compared with 90.4% among nurses (Australian Commission on Safety & Quality in Healthcare, 2020).

Responses to closed questions indicate that the sharing of toilets was the environmental factor rated as having the greatest impact on infection control. Shared rooms and bathroom facilities were also identified by infection control nurses as the primary environmental causes of missed care in the open-ended questions. This finding is supported by a retrospective study exploring the relationship between private rooms and rates of HAIs (Park et al., 2020). Nurses working outside of infection control highlighted failure in environmental cleaning. Poor room cleaning between patient has been implicated in transmission of MRSA, while toilets have been found to transmit norovirus. Bed rails, bedside tables, surfaces of ventilators, sinks, suction equipment, mattresses, resuscitation equipment, curtains, slings for patient lifting, mops, buckets, door handles, stethoscopes, incubators and computer keyboards have all been identified as potential sources of cross-contamination (Weber et al., 2010).

The most cited personal reason for failure to perform infection control precautions was related to knowledge deficits. These extend beyond nurses to medical and cleaning staff. Infection control nurses were significantly more likely to associate omitting these activities with 'Nurses/midwives have inadequate understanding of transmission-based precautions'. Responses from open-ended questions implicate failure to apply knowledge in practice and were identified by both groups of respondents.

4.1 | Limitations

There are two notable limitations to the current study. The survey tool had not been validated at time of administration, and subsequent testing has suggested that some items could be removed (Riklikiene et al., 2019). Further, many respondents did not complete all questions meaning that the response rate for later questions is often less than the 500 respondents who commenced the survey. Finally, missed care focuses upon structural factors to the detriment of individual factors and there is potential for additional questions relating to personal causes of missed care. This was countered to some extent by the inclusion of an open-ended question.

5 | CONCLUSION

A study of Australian nurses conducted prior to COVID-19 found that many activities, notably hand hygiene, were perceived to be poorly performed. Infection control specialists were significantly more likely to identify deficits on eight items than other nurses. Failure to perform infection control precautions was related to ward layout and cleaning; unexpected rise in workload; lack of managerial support for infection control; poor practice by medical officers; and failure to apply infection control principles to practice.

6 | IMPLICATIONS FOR NURSING MANAGEMENT

Few studies compare the views of infection control and other nurses in relation to performance of infection control precautions. This study demonstrates that infection control nurses identify higher levels of missed infection control activities. While similar scores were obtained in relation to the reasons for missed care, infection control

nurses identify blockages in relation to funding and support from hospital management. Changes in workload were identified as leading to missed infection control precautions by both groups. Further, despite education, there is a perception that nurses do not always apply this knowledge in their practice.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

ETHICS STATEMENT

This study was approved by the Flinders University Social and Behavioural Research Ethics Committee.

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