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Missed Nursing Care Infection Prevention and Control Practices in Acute Hospitals in Ireland During the COVID-19 Pandemic

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ABSTRACT

Background: The nursing contribution to patient safety is often linked to their proximity to patients and ability to intervene when quality of care is compromised. However, the quality of nursing care provided also directly contributes to patient outcomes and is associated with increased rates of healthcare-associated infections.

Aim: This study aimed to measure and compare nurses' perceptions of the frequency of and reasons for missed IPC practices in their workplaces and to examine nurses' perceptions of their ability to conduct IPC activities and their hospital capacity to support them.

Methods: This study used a cross-sectional online survey of nurses in acute general hospitals ($n = 113$) using the Missed Nursing Care Infection Prevention and Control (MNCIPC) instrument (March 21–May 26, 2022). Study reportage was informed by the STROBE guidelines.

Results: Care activities relating to *hand hygiene* and *minimisation of hospital-acquired infections* were identified as the most frequently missed infection prevention and control practices. Factors that hindered best practice occurred at systemic (staffing/resources) and environmental (patient room overcrowding/bathroom sharing) levels.

Conclusion: Best practice infection prevention and control care is hampered by factors outside of individual nurse control. Unit-specific infection prevention and control training, including support staff, is recommended to help prevent hospital-acquired infections.

1 | Introduction

The nurse's role in patient safety is frequently linked to their proximity to patients (Institute of Medicine 2004, Patrician et al. 2024) and is sometimes described as the last line of defence against errors and unsafe practices (Lake et al. 2019, Pereira et al. 2023). However, their role in patient safety is greater than this and is also directly linked to the quality of care they provide. Nursing care has a measurable impact on core patient safety outcomes (McCauley et al. 2021), with inadequate, incomplete, or missed nursing care linked to poor patient outcomes, including the occurrence of hospital-acquired infections (HAIs) (Mynaříková et al. 2020; Boev and Kiss 2017; Ausserhofer et al. 2013; Kalisch et al. 2013; Lucero et al. 2010). HAIs can be mitigated by the implementation of appropriate, high-quality, and evidence-based infection

Summary

What is known about this topic?

- Missed nursing care is a pervasive phenomenon in contemporary healthcare, which has been extensively studied.

- While generic instruments that measure missed care have drawn attention to the overall phenomenon, they may not capture the essence of specialist or specific practice.

What this paper adds?

- Hospital-level systemic and environmental factors hindered nurses' infection prevention and control practices, including hand hygiene.

- Fundamental elements of infection prevention and control care were identified as 'most frequently missed' during the study period.

The implications of this paper

- Implementation of these recommendations by hospital managers could support nurses, helping to prevent infection spread on a day-to-day basis and in the event of future pandemics.

prevention and control (IPC) practices (McCauley et al. 2021), and in hospital settings, nurses play a vital and unique role in limiting infection rates through such practices (Albarrak et al. 2022).

COVID-19 brought the reality of infectious diseases as a global threat into sharp focus. While many government and healthcare institutions established emergency plans to cope with such threats, it was frequently nursing staff that provided the frontline response. Nurses are frequently cited as the largest and most reliable caregiver group in such emergencies, but there remains a suggestion that they may be inadequately prepared for such situations (Nie et al. 2022), receiving insufficient training across all measures of pandemic preparedness, particularly in relation to safety and infection control (Al Haliq et al. 2023). Although the likelihood of another global pandemic remains a possibility, a more immediate concern for healthcare providers is the ever-present silent pandemic (WHO 2022) of hospital-acquired infections (HAI), with seven of every 100 patients hospitalised in high-income countries infected with a HAI and an estimated 16 million deaths annually. Coordinated efforts by policymakers and healthcare providers to reduce HAIs have had varying rates of success (Garcia et al. 2022), but relentlessly high HAI rates across countries lend themselves to further investigation to understand the practices of key staff around infection prevention and control.

Missed nursing care (MNC) has been well studied over the last 30 years as a nursing phenomenon that is connected to both quality of care and many adverse patient outcomes, including HAIs (McCauley et al. 2021; Recio-Saucedo et al. 2018). Recently, researchers (Henderson et al. 2021, 2020, Riklikiene et al. 2020; Blackman, Shifaza, et al. 2022; Alshyyab et al. 2025) across

countries have suggested that non-compliance by nurses with IPC practice should be conceptualised as missed nursing care, as it is care that is necessary but not provided. Given that many HAIs can be mitigated by effective infection prevention and control (IPC) practices, it has been suggested that the broader field of MNC research, and therefore standard MNC instruments, insufficiently capture the intricacies of infection prevention as they relate to nurse IPC practices (Kirwan and Schubert 2020). This has been addressed through the development of an instrument that has enabled the investigation of which elements of IPC care are missed by nurses and the factors believed to influence such practice (Henderson et al. 2020). Some recent research in this area suggests that IPC practice has changed pre- and post-pandemic (Moreal et al. 2025), reflecting a positive response to an enhanced focus on IPC activities. However, other research conducted during the COVID-19 pandemic suggests that traditional IPC practices may have been compromised at this time, with resources diverted towards COVID-19 outbreaks at the expense of other aspects of infection prevention, resulting in an increase in the more common HAIs (Stevens et al. 2020; Lastinger et al. 2023). Bearing such complexities in mind, it is important to further establish what facilitates and hinders nurses in the delivery of high-quality IPC practices to patients in their care. This may enable planners and providers to address the issues and thereby impact the rates of HAIs in a meaningful and more direct way.

2 | Methods

2.1 | Aim and Objectives

This study aimed to measure and compare nurses' perceptions of the frequency of and reasons for missed IPC practices in their workplaces and to examine nurses' perceptions of their ability to conduct IPC activities and their hospital capacity to support them. Nurses' perceptions of compliance with standard and transmission-based precautions, along with priority given to IPC and HAI inevitability in their workplace, were also examined.

2.2 | Theoretical Framework

Figure 1 illustrates the adapted theoretical framework used for the research design and data interpretation in this study. This framework facilitated the examination of factors that influence missed nursing care, infection prevention, and control activities from the micro level (nurse practice) to understanding the impact of global events that shape nursing practice.

2.3 | Design

The study employed a quantitative cross-sectional online survey using the missed nursing care infection prevention and control (MNCIPC) instrument (Henderson et al. 2021). Four additional questions relating to compliance with standard and transmission-based precautions, HAI inevitability in the workplace, and priority given to IPC activities were also included. These questions relate to healthcare priorities in Ireland (HIQA 2017) and emerged as a result of a scoping review carried
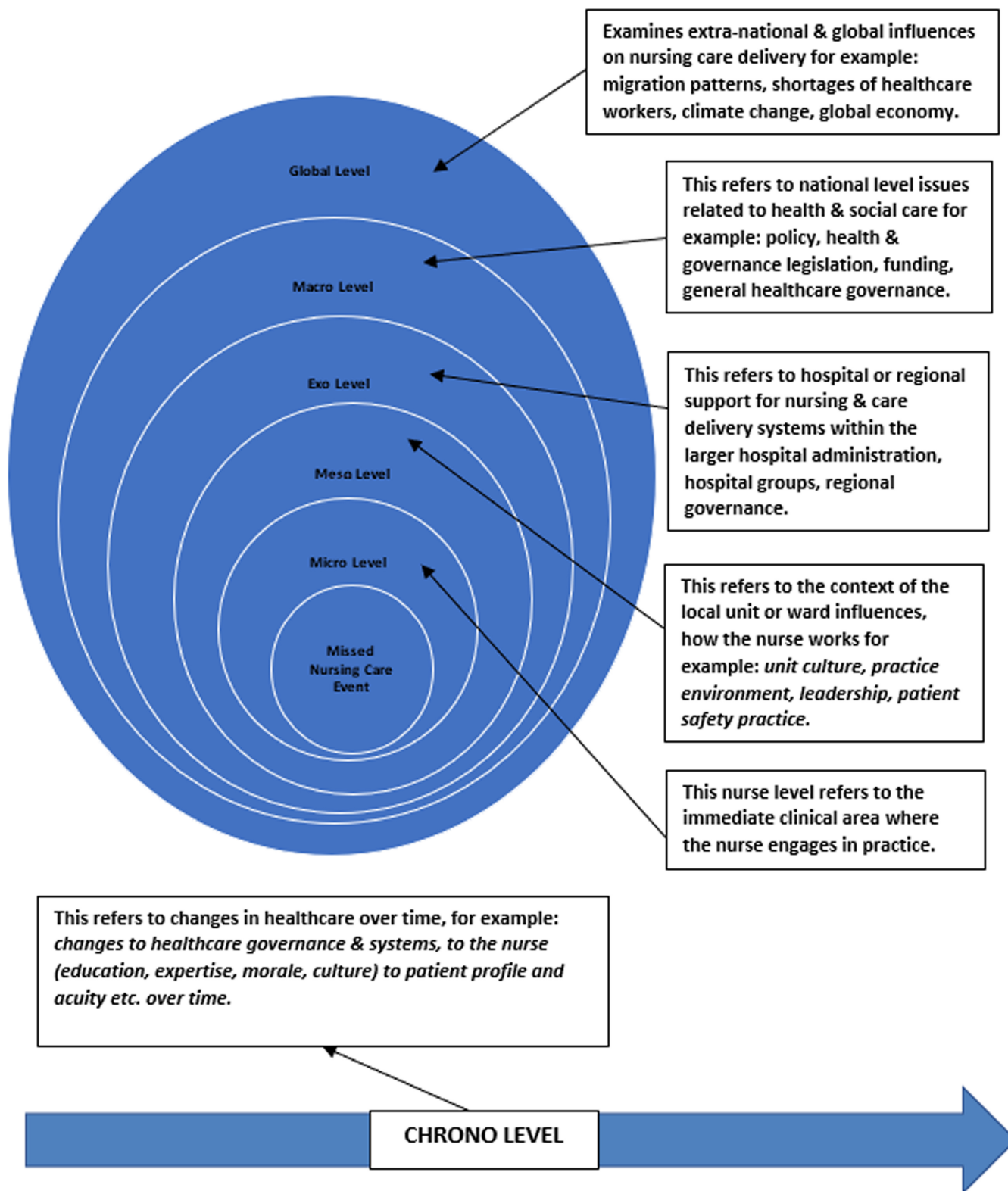
FIGURE 1 | Adapted socio-ecological approach for understanding MNC events (Phelan and Kirwan 2020).

out by the research team (McCauley et al. 2021), which found that most studies of non-compliance related to standard and transmission precautions rather than nursing care. Earlier qualitative research by Henderson et al. (2020) in Australia suggested that nurses felt there was an inevitability to HAIs. Researchers in this study wished to quantify this view.

2.3.1 | Instrument

The MNCIPC research instrument was developed to provide a greater understanding of the relationship between MNC, HAIs, and how IPC activities are conducted by nurses (Henderson et al. 2021). This research instrument has been

tested and modified using Rasch analysis, providing evidence of reliability and validity (Riklikiene et al. 2020). The five subscales relating to Frequency of Missed Infection Prevention and Control are Hand Hygiene (HH), Minimising Bacterial Colonisation, Surveillance, Minimising Hospital-Acquired Infection, and Using Specific Precautions. Scores range from 0 (*Unsure*), 1 (*Never Missed*) to 5 (*Always Missed*), with higher scores indicating that the IPC activity is more frequently missed. Four subscales address the reasons for missed care. These are Resource Support for IPC, Staffing Allocation, IPC Education, and Adequate Storage. The scores range from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Higher scores indicate a greater perceived impact on MNCIPC.

2.3.2 | Instrument Validity and Reliability

Subscale reliability was assessed using Cronbach's alpha. Three subscales querying the frequency of MNCIPC scored above 0.70 (Hand Hygiene at 0.78; Surveillance at 0.72; and Minimising Hospital-Acquired Infection at 0.71). Two (Minimising Bacterial Colonisation at 0.63 and Using Specific Precautions at 0.60) scored below 0.70. However, both subscales have fewer than 10 items, which can explain lower alpha values. When this occurs, Pallant (2016) recommends reporting the mean inter-item correlation values. Optimal mean inter-item correlation values range from 0.15 to 0.50 (Glen 2023). 'Minimising Bacterial Colonisation' has a mean inter-correlation value of 0.292 and 'Specific Precautions' a value of 0.232.

The internal reliability of the subscales querying the reasons why IPC activities might be missed (Resource Support for IPC; Staffing Allocation; IPC Education and Adequate Storage) demonstrated very good internal consistency, as reflected by the Cronbach's alpha scores of 0.90, 0.84, 0.84, and 0.70 respectively. The structure of the MNCIPC Survey was examined using exploratory factor analysis. Dimensionality was confirmed by principal axis factor extraction with direct oblimin rotation.

2.3.3 | Sampling and Recruitment

The target population was registered nurses working in acute public or private general hospitals in Ireland. Registered staff nurses (RN), infection prevention control (IPC) nurses, and clinical nurse managers (CNM) on general medical units, surgical units, intensive care units, or the emergency department of any public or private general hospital in Ireland were eligible to participate. A direct recruitment approach to find a non-random sample was taken, with a survey link distributed on social media by Dublin City University (DCU) academics and researchers involved in the Irish nursing community. Additionally, the Irish Nurses and Midwives Organisation, representing 42,000 registered nurses and midwives, circulated the survey link in digital and print format in their monthly journal.

2.3.4 | Sample Size and Power

The required sample size was calculated using the formula provided by Tabachnick and Fidell (2013, 123) where ($N > 50 + 8m$)

with m equalling the number of independent variables. This equates to five independent variables needing 90 cases. The number of cases in this study (113 for part A and B and 105 for part C) was suitable for the analyses carried out. Normality tests were applied to the data before proceeding with inferential testing.

2.4 | Data Collection

The online survey was viewed by 250 nurses, with 113 questionnaires considered suitable for analysis. In total, 113 respondents completed the first part, and 105 respondents completed the second part. Frequencies of MNCIPC activities were measured using six Likert-type scales from *Unsure or Not Applicable* to *Always Missed*. Reasons for MNCIPC were measured using five Likert-type scales from *Strongly Disagree* to *Strongly Agree*. The survey was distributed on the web-based survey platform, Qualtrics, between March 21st and May 26th, 2022.

2.5 | Data Analysis

Descriptive statistics for categorical data are reported in terms of percentage and frequency, with continuous and numerical data reported by means and standard deviation (SD) for each group. Statistical significance was set at a p-value less than or equal to 0.05, with analyses conducted using SPSS Statistics Version 27.

2.6 | Ethical Considerations

Ethical approval was obtained in advance of data collection from Dublin City University Research Ethics Committee (DCUREC/2020/044). Participants were informed the online questionnaire was anonymous and provided with a Plain Language Statement outlining how their data would be processed before being asked to provide consent to take part in the study.

3 | Results

Quantitative results are displayed under the adapted socio-ecological framework system levels.

3.1 | Micro-System

Demographic and work characteristics of the participants are set out in Table 1.

3.1.1 | Nurse Education and Experience

More than half of the participants 51.4% ($n = 58$) had additional postgraduate qualifications, with 41.6% ($n = 47$) educated to bachelor's degree level. Of the sample, 34.5% ($n = 39$) worked as a RN for over 20 years, with 16.8% ($n = 19$) having between 5 and 10 years nursing experience.

TABLE 1 | Participants' demographic and work-related profile (*n* = 113).

Demographic profile	*n*	%
Gender		
Female	98	86.7
Male	15	13.3
Age profile		
Up to 30 years	31	27.4
31 to 40 years	33	29.2
41 to 50 years	29	24.8
51 to 65 years	21	18.6
Working pattern		
Full-time	96	85
Part-time	17	15
Nursing role		
Staff nurse	61	54
Clinical nurse manager	36	31.9
Infection prevention and control nurse	9	8
Specialist nurse	7	6.3
Working in		
Public hospital sector	98	86.7

3.1.2 | Frequency of MNCIPC Activities

Table 2 presents the mean scores for nurses' perceptions of the frequency that IPC activities are missed.

The mean score at 1.98 (possible range 0 to 5) across all items on this scale shows good overall compliance with IPC measures. The highest scores (indicating items more likely to be missed) were recorded on the Hand Hygiene (M = 2.13) and Minimising Hospital-acquired Infection (M = 1.97) subscales.

3.2 | Meso and Exo-Systems Levels

In MNCIPC, the meso-system focuses on supportive factors at unit/ward level while the exo-system relates to hospital, organisational, and regional level support. The perceived reasons for missed IPC care are situated across these system levels.

3.2.1 | Reasons for MNCIPC

Table 3 sets out the mean and standard deviations outlining the perceived reasons why IPC activities are missed. The 'Staffing Allocation' and 'Adequate Ward Storage'—subscales of the

TABLE 2 | Means and standard deviations by nurse role on frequency of missed nursing care infection prevention and control (*n* = 113).

	Mean/SD (*n* = 113)
Hand Hygiene Subscale	
1. Hand hygiene is completed before drug administration	2.65 ± 1.01
2. Hand hygiene is performed before touching a patient	2.52 ± 1.02
3. Hand hygiene is completed after touching a patient	2.46 ± 1.02
4. Hand hygiene is completed after drug administration	2.45 ± 1.11
5. Patients are invited or assisted to perform hand hygiene following use of a bed pan or urinal in bed	2.41 ± 1.37
6. Cleaning/Support staff adhere to signage posted for transmission-based precautions	1.97 ± 1.01
7. Hand hygiene is performed after a procedure is completed	1.96 ± 0.85
8. Hand hygiene is undertaken following gown removal	$1.91^* \pm 1.00$
Surveillance Subscale	
1. Correct order is used when donning PPE: Gown first, then gloves to ensure that they are pulled over the gown cuff so no skin is exposed	2.11 ± 0.88
2. Touch contamination avoided. Not scratching nose/adjusting glasses after hands have been in contact with a patient/surfaces in a room of a patient with MDRO	2.09 ± 1.00
3. Facial equipment is removed before hands are washed	2.08 ± 1.00
4. Cleaning/Support staff wear appropriate personal protective equipment (PPE)	2.00 ± 1.11
5. Appropriate signage displayed informing staff & visitors of the need for transmission-based precautions when managing a patient with a MDRO	1.87 ± 1.03
6. Gloves are changed when staff move from a contaminated/dirty site (e.g., wound) to a clean site	1.86 ± 0.89
7. All new admissions are screened for MDROs	1.74 ± 1.06

(Continues)

TABLE 2 | (Continued)

	Mean/SD (*n* = 113)
8. Nurses' handover/communicate information re patient MDRO/infection status at staff handover/change time	1.70* ± 0.74
Minimising Hospital Acquired Infection Subscale	
1. Catheter care is performed TDS (8 hourly)	2.33 ± 1.45
2. Intravenous cannulas are swabbed with an alcohol-based cleansing agent for 15 s, allowed to dry for 15 s before flushing or administering meds	2.07 ± 1.22
3. Gloves are always worn for both preparing and administration of all antibiotics	1.99 ± 1.01
Using Specific Precautions Subscale	
1. Gloves are removed before taking off the gown	2.01* ± 1.05
2. Goggles and mask or mask-face shield is always worn when caring for a patient on respiratory/droplet precautions	1.96 ± 0.96
3. Healthcare organisation documentation specifies the MDRO status (with or without) of patients on their admission	1.94 ± 1.16
4. Documentation about the MDRO status of a patient is completed when patient is discharged	1.91 ± 1.42
5. Appropriate PPE (gloves/gowns, are used when providing direct care to patients who have a transmissible disease (MDRO)	1.81 ± 0.77

Note: (0) *Unsure or N/A*; (1) *Never Missed*; (2) *Rarely Missed*; (3) *Occasionally Missed*; (4) *Frequently Missed*; (5) *Always Missed*. *$p \leq 0.05$.

MNCIPC instrument—recorded the highest nurse dissatisfaction rating in this study. Systemic factors including 'urgent patient situation' (mean = 4.08); 'unexpected rise in patient volume/acuity' (mean = 3.77); organisational factors—'unbalanced patient assignment/allocation to nursing staff' (mean = 3.70); and environmental factors—'patients having to share bathrooms' (mean = 3.81); 'inadequate place to store patient belongings' (mean = 3.70); and 'patient room overcrowded with supplies' (mean = 3.45)—were the top six reasons cited for MNCIPC care in this study.

The overall scale mean score is above 3.0 on this 5-point Likert scale indicating a moderately high level of dissatisfaction by

TABLE 3 | Means and standard deviations on reasons for missed nursing care infection prevention and control activities (*n* = 105).

IPC Resource Support Subscale	Mean and SD (*n* = 105)
1. Lack of support from hospital management for committees governing infection control activities	2.95 ± 1.36
2. Lack of support from hospital management for resources to undertake infection control activities	2.87 ± 1.37
3. Lack of nursing control over infection control activities	2.77* ± 1.32
4. Patient room allocation made without consideration to principles of Infection control	2.74 ± 1.37
5. Lack of cleaning schedule for environmental cleaning in clinical areas	2.56 ± 1.45
6. Patient room/bays lack sinks for handwashing	2.49 ± 1.47
7. Ward culture does not support infection control activities	2.46 ± 1.33
8. Sterile supplies/equipment not available when needed	2.40 ± 1.30
9. Insufficient plastic puncture-proof containers for sharps/used needles	2.19 ± 1.34
10. Lack of prompts in patient records to check for pyrexia or any other signs of infection	2.10 ± 1.22
Staffing Allocation Subscale	
1. Urgent patient situation (patient condition worsening)	4.08 ± 1.10
2. Patients have to share bathrooms	3.81 ± 1.32
3. Unexpected rise in patient volume &/or acuity on the ward/unit	3.77 ± 1.18
IPC Education Subscale	
1. Nurses have inadequate understanding of transmission-based precautions	2.37 ± 1.22
2. Nurses have inadequate education/knowledge of infection control practices	2.31 ± 1.19
Adequate Ward Storage Subscale	
1. Inadequate places to store belongings (e.g., blankets, patient personal belongings)	3.70 ± 1.29
2. Patient room overcrowded/cluttered with equipment/supplies	3.45 ± 1.30

Note: (1) *Strongly Disagree*, (2) *Somewhat Disagree*, (3) *Neither Agree nor Disagree*, (4) *Somewhat Agree*, (5) *Strongly Agree*. *$p \leq 0.05$.

nurses. The highest scores (indicating greater dissatisfaction) were recorded on the Adequate Storage (M = 3.58) and Staffing Allocation (M = 3.54) subscales.

3.2.2 | Compliance, IPC Priority, and Healthcare-Associated Infection

Compliance with standard and transmission-based precautions was rated as 'Good' or 'excellent' by 75% and 79% of nurses respectively in this study, and 65.4% of respondents 'strongly agree/agree' that IPC activities are given enough priority compared to other nursing activities in their workplace. Nonetheless, 39.4% of nurses still consider that HAIs are inevitable in healthcare settings.

4 | Discussion

Infection control is an important element of care provision in hospitals, not confined to care during pandemics but on an everyday basis to help reduce HAIs which result in an estimated 16 million deaths annually (WHO 2022). Using the adapted socio-ecological framework in this work facilitated the examination of intersecting factors that add to the complexity of providing IPC care at the hospital level. Elements associated with missed IPC care are nested in more than one system level, and this discussion reflects that reality.

At a *micro-level* where the nurse interacts with patients, the most frequently missed activity identified by the nurses in this study—'cleaning of patient table before food delivery'—mirrors that missed by nurses in a 2021 Australian study carried out by Henderson et al., using the MNCIPC instrument. 'Equipment is cleaned before it touches each patient' was the third most frequent activity identified as being missed by nurses in this study compared to 12th by Australian nurses. It is difficult to ascertain whether items that should be cleaned are missed in this study due to nurse uncertainty about who has responsibility for cleaning equipment, but confusion or uncertainty of any kind raises the risk to patients of acquiring infection in hospital. The research literature has highlighted confusion and ambiguity relating to responsibility for cleaning medical equipment, with an Australian nurse/midwife study showing that 10% of staff did not know whose responsibility it is to clean shared medical equipment including items like blood pressure cuffs, IV pump and pole (Curryer et al. 2021). Similar findings have been shown in the United Kingdom, where no single member of staff in a medical ward was assigned responsibility for cleaning certain items of equipment (Meyer et al. 2021). COVID-19 has further heightened this confusion with nurses in Iran stating that ambiguity, confusion, and care protocol changes have all contributed to MNC in their hospital (Safdari et al. 2023).

Hand hygiene is the most widely acknowledged and successful defence against a range of healthcare-associated infections. During the COVID-19 pandemic, its importance was universally recognised. Unexpectedly then, given that this study was conducted during the COVID-19 pandemic, four HH items (before *and* after drug administration and before *and* after touching a patient) were reported as being the second, fourth, fifth, and sixth most frequently missed care activities. Nurses in the Henderson et al. (2021) study (data collected in 2019, pre-pandemic) ranked these items as less likely to be missed at 10th, 14th, 18th, and 15th. Slovakian nurses in an internationally conducted MNCIPC study (data collected in 2019 pre-pandemic) identified similar missed HH items as nurses in the current study, with Lithuanian nurses identifying lower rates of missed HH overall. Compared to novice nurses, staff in that international study with between five and 10 years of work experience identified more missed HH care, with age found to be a predictor of higher instances of missed HH and items related to minimising bacterial colonisation (Blackman, Riklikiene, et al. 2022). In the context of COVID-19, it is notable that contradictory results have been reported in the literature on HH compliance. Research in acute care Swiss hospitals demonstrated that although HH increased significantly during the first wave of COVID-19, it was noted that over the 2-year period adherence invariably returned to pre-pandemic levels *despite* ongoing COVID-19 activity (Rüfenacht et al., 2023). Comparable results were found in hospitals in Canada (Williams et al., 2021) and Denmark (Sandbøl et al., 2022). On the other hand, (Roshan et al., 2020) observed HH compliance of over 90%, and reductions in the numbers of HAIs in a private tertiary hospital in Pakistan in March and April 2020 during COVID-19. Similarly, Israel et al. (2020) demonstrated increased compliance of between 46% and 89% during COVID-19 (January–April 2020) with pre-pandemic compliance ranging from 35% to 71%. However, both of these studies report results from the initial stages of the pandemic, at a time of heightened anxiety. It is likely that vaccine introduction, nurse adaptation to COVID-19 along with staff and resource shortages played a part in lower HH compliance, as demonstrated in this and previously mentioned studies.

The 'Staffing Allocation' (M = 3.54) and 'Adequate Ward Storage' (M = 3.58) subscales of the MNCIPC instrument—recorded the highest nurse dissatisfaction rating in this study. Systemic factors including 'urgent patient situation' and 'unexpected rise in patient volume/acuity,' organisational factors—'unbalanced patient assignment/allocation to nursing staff' and environmental factors– 'inadequate place to store patient belongings', 'patients having to share bathrooms' and 'patient room overcrowded with supplies' were the top six reasons cited for MNIPC care in *both* the current and Australian study. These findings are very much in line with the factors identified in the literature including poor nurse–patient ratios and systemic and environmental factors (Henderson et al. 2021; Bail et al. 2021) all of which are all linked to higher levels of MNC.

A surprising finding in the current study situated at the *exo-level* of the framework is the high level of acceptance by nurses of HAI inevitability in hospitals. It appears this acceptance is also present among nurses in Australia, with results from a qualitative study conducted by Henderson et al. (2020) finding that IPC activities can be missed because of an acceptance of HAIs, along with a failure to recognise the risks associated with substandard performance of care fundamentals. A 2015 Framework document on IPC states, 'HCAI are not an inevitable consequence of providing patient care' (HSE 2015, p4). Although complete elimination of HAIs is unrealistic, the extent of nurse acceptance of HAI inevitability in this study may lead to a lowering of standards and an embedding of less than optimum IPC practices in hospitals.

Decisions relating to nursing practice are often made nationally at a *macro-level*. Because nurses work at the frontline, it is concerning that they perceive they 'lack control over IPC activities' and have no input into the decision-making processes around the care they deliver. This is reflected in the reality that, while nurses make up 59% of the global healthcare workforce, senior nurse leaders in a quarter of national nursing associations were not involved in high-level decision-making during COVID-19. Similarly, 40% of national nurse associations reported that IPC nurses were not involved in establishing IPC policies/plans during COVID-19 (ICN 2022).

At a *global level*, the subscale measuring 'adequate staffing and resources' was identified in this study as compromising safe IPC practices. One of the most pressing issues in nursing internationally is recruiting and retaining RNs. Combined with a growing and ageing population, nurse shortages present a strategic risk to the provision of safe IPC practices in Irish hospitals.

The *chrono level* of the framework enables examination of historical events and evaluation of responses to previous public health threats. Despite the heightened awareness of the need to prepare for future pandemics in the aftermath of the 2009 (H1N1) influenza pandemic, 60% of Irish hospitals did not compile 'lessons learned' from exercises conducted to revise emergency response plans. Fifty-five percent had insufficient airborne isolation facilities to cope with demand. While 30 out of 46 Irish hospitals had a plan in place to vaccinate their HCWs, only two had a prioritisation plan to vaccinate HCW families and administer anti-infective/viral therapy in the event of an emergency (Reidy et al. 2015). Multisystem deficits were shown in this study to contribute to MNCIPC care, and a proactive response by the healthcare service is required to protect not only patients from care deficits but also the healthcare workforce who are required to risk their own and their families' health when dealing with infection. Such a response is needed not only during pandemics but daily given the rise in HAIs and multidrug resistant organisms.

4.1 | Study Limitations and Strengths

Because this study was conducted during COVID-19, it is difficult to isolate the experiences of nurses or understand what IPC challenges pre-existed the pandemic. The sample was non-random and is therefore not representative but provides a snapshot from nurses who self-selected to take part in the study. Despite the limitations outlined above, this study provides new knowledge in relation to MNCIPC care, using a validated research instrument not previously used in the Irish context.

5 | Conclusion

Much of the emphasis on infection control practices over the last 4 years has focussed on COVID-19. However, it is important, given the vital role nurses play in keeping patients safe on a day-to-day basis, to recognise that nurse IPC practices are key in the reduction of HAIs, which result in approximately 16 million deaths annually (WHO 2022).

This study provides preliminary insights into MNCIPC care using a socio-ecological lens. As demonstrated by this and other studies (Henderson et al. 2021, 2020, Bail et al. 2021; Blackman, Shifaza, et al. 2022), MNCIPC care does not occur in a vacuum but results from multiple factors. MNCIPC in hospitals often arises, not as a result of a single event but as a result of a series of failures to perform basic care activities, some of which involve staff beyond the nurse (Bail et al. 2021). The socio-ecological model emphasises the need for change, not only in relation to individual factors but also those within the physical and social/cultural environment. With the right support, these lessons can be applied to ensure nurse IPC practice can be facilitated to help prevent HAIs daily and in the event of a future pandemic.

Because the nature of the study was exploratory, the study findings have been placed in the context of the literature in the broader area of patient safety, and the recommendations reflect this reality. In making these recommendations, it is important to capitalise on a more IPC-literate public because of COVID-19.

1. The provision of clear written guidelines to staff on role responsibilities in terms of HH practices, cleaning, and equipment responsibility as it relates to IPC practices should be prioritised.

2. One benefit of the COVID-19 pandemic is that patients are much more aware of the importance of hygiene practices and the role of IPC in keeping patients safe. Hospital managers could take the opportunity to implement measures to educate patients on infection prevention within hospital care.

3. A public health-led publicity campaign aimed at the public highlighting the importance of IPC in hospital and healthcare settings and the role it plays in the prevention of HAIs could help increase understanding and compliance by the public.

Recommendations for future research include the addition of a qualitative element which could help provide clarity and insight into areas of uncertainty such as nurse interpretation of aspects of NCIPC and Standard Precautions shown in this study to have a degree of uncertainty attached to them. Given the finding relating to HH adherence, the opportunity to conduct an observational study in HH practices alongside the quantitative and qualitative elements would triangulate the data, allowing researchers to develop a more comprehensive understanding of MNCIPC.

Ethics Statement

Ethical approval was obtained in advance of data collection from DCU Ethics Committee (Ref: DCUREC/2020/044).

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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