Biological and Clinical Sciences Research Journal
eISSN: 2708-2261; pISSN: 2958-4728
www.bcsrj.com
DOI: https://doi.org/10.54112/bcsrj.v6i3.1653
*Biol. Clin. Sci. Res. J., Volume 6(3), **2025**: 1653*
Original Research Article

Awareness and Practices for Infection Control Measures in Nurses Working in Intensive Care Unit

Sobia Ashiq*, Javeria Liaqat, Maria Liaqat, Adeel Nouman

Department of Nursing, Medicare College of Nursing Multan, Pakistan
**Corresponding author`s email address:* drarooma123@yahoo.com

(Received, 24th February 2025, Accepted 18th March 2025, Published 31st March 2025)

Abstract: *Infection control in intensive care units (ICUs) is critical to reducing nosocomial infections, morbidity, and mortality. Nurses play a pivotal role in implementing infection control practices; thus, assessing their knowledge and practices is essential to guide targeted interventions.* ***Objective:*** *To evaluate the level of knowledge and practices related to infection control among intensive care unit nurses.* ***Methods:*** *This descriptive prospective study was conducted at the Intensive Care Unit of Medi Care Hospital, Multan, from January 2024 to January 2025. A total of 100 nurses, involved in direct patient care, were included through convenience sampling. Data collection utilised a structured questionnaire and a performance observational checklist. The questionnaire assessed demographic information and infection control protocols, while the checklist evaluated infection control practices across 13 dimensions comprising 95 items. Each nurse was observed during three different procedural occasions and routine duties. Data were analysed using SPSS version 20, and results were presented as means ± standard deviations and percentages.* ***Results:*** *The mean total knowledge score was 111.5 ± 16.7, with only 35% of nurses demonstrating a satisfactory level of knowledge. Deficiencies were noted in knowledge regarding isolation procedures (90%), nosocomial infections (75%), sterilisation techniques (90%), and blood-transmitted diseases (77%). The mean unsatisfactory knowledge score was 101.4 ± 14.2. For practices, the mean score was 70.8 ± 8.6, with 58% of nurses displaying satisfactory practices. Strengths were observed in chest tube care (78%), catheter care (90%), personal hygiene (80%), and endotracheal suctioning (89%). The mean satisfactory practice score was 78.1 ± 4.7.* ***Conclusion:*** *Although ICU nurses demonstrated a satisfactory level of infection control practices, their knowledge was found to be suboptimal. This underscores the necessity for regular training programs and continuing education initiatives targeting all age groups to enhance infection control knowledge and ultimately improve patient outcomes.*

Keywords: Infection, Intensive Care Unit, Nosocomial Infections, Nurses

[***How to Cite:*** Ashiq S, Liaqat J, Liaqat M, Nouman A. Awareness and practices for infection control measures in nurses working in intensive care unit. *Biol. Clin. Sci. Res. J.*, **2025;** 6(3): 153-156. doi: https://doi.org/10.54112/bcsrj.v6i3.1653

Introduction

Hospital acquired infections are a common complication in admitted patients with a 5-10% incidence in acute care especially 30% in ICU patients, increasing morbidity and mortality.(1) The risk of developing these infections increases by 2-30-fold in patients with prolonged hospital stay compared to visiting or short-term patients.(2) It can lead to poor outcomes; longer hospital stays and impact quality of life.

According to a multi-country study, the prevalence of nosocomial infections is greater in children than in adults (11.3% vs 10.5%). (3) nurses have a moral responsibility to create a safe environment and protect patients from these deadly conditions through infection control measures. A quality standard must be maintained on the micro level to identify and mitigate risks that allow transmission of infections among patients. Adoption of safety precautions also prevents exposure to cross-contamination of blood and bodily fluids between and among nurses and patients.(4)

Since nurses are at high risk of developing infections due to direct contact with patients, failure to practice hand washing, equipment and sharps safety, appropriate waste disposal, use of protective equipment and single use policy can prove to be deadly.(5, 6) In order to correctly perform these tasks, continuous knowledge is required. Therefore, this study was conducted to evaluate the level of knowledge and practices of infection control in intensive care unit nurses.

Methodology

A descriptive prospective analysis of a total of 100 nurses was carried out in the Intensive Care Unit of Medi Care Hospital, Multan, from January 2024 to January 2025. Nurses working in the ICUs in direct contact with patients were invited to join the study. Nurses on rotation, students and internet services were excluded. Verbal consent was obtained from all the participants. Ethical approval was obtained from the ethical board of the hospital to conduct the study.

Data collection was conducted through a structural questionnaire and performance observational checklist. Knowledge about protocols of infection control was assessed by a questionnaire divided into two parts. The first part inquired about sociodemographic features, including age, sex, qualification, job position, work experience, and previous training about infection control. The second section listed infection control protocols and participants ranked their awareness about them. The standards were categorised into 11 dimensions; hand hygiene, nosocomial infections, infection prevention, standard precautions, sharp and needlestick injuries, blood-transmitted diseases, waste management and bodily fluid spillage, sterilisation and disinfection, safety equipment and isolation cautions. One point was awarded for a correct response, and no point was given for a wrong response. A score <75% meant unsatisfactory level of knowledge and a score >75% meant a satisfactory level of knowledge.

Practices regarding infection control were evaluated by a performance observational checklist on 13 dimensions, further divided into 95 items. The dimensions includedwaste management, hand hygiene, IV infusion, use of protective equipment, endotracheal suctioning, linen management, chest tube care, isolation and visitation, catheters care, wound cleaning and care and chest tube care. The tasks were observed in the nurses' practice and marked as performed or not performed. One point was awarded for accurate performance and no point was given when the tasks was wrongly performed, not performed or incompletely performed. A score <75% meant unsatisfactory practices and a score >75% meant a satisfactory practices.

First, nurses were presented with the interview questionnaire in the respective ICUs and given half an hour to complete the tool. To record the practices, nurses were observed while performing procedures on three different occasions and general duty. An average was calculated out of the three incidences and converted into numeric data.

All data was assessed by SPSS 20. Demographic data was calculated as percentages and frequencies. Knowledge and performance scores were presented as mean and standard deviation. Pearson's correlation coefficient was used to assess association between study variables. A p-value of 0.05 or less was considered significant and highly significant at 0.01 or less.

Results

Table I shows the characteristics of nursing population in the study. 75 (75%) of the nurses were in their 20s and had bachelor's degrees. 85 (85%) were staff nurses and 90 (90%) were female. Most participants (55%) had less than 5 years of experience. Only 35% of them had attended a course or training session for infection control. 80% of the population was vaccinated for hepatitis (75%), influenza (10%) and others.

The mean total knowledge score was 111.5 ± 16.7, with a satisfactory level in only 35% of nurses (Table I2). Nurses had poor knowledge about isolation (90%), nosocomial infections (75%), sterilisation (90%), and blood-transmitted diseases (77%). The mean unsatisfaction score was 101.4 ± 14.2. Regarding practices, the mean score was 70.8 ± 8.6 with a satisfactory level in 58% nurses (Table 3). Most of the nurses had good practices about chest tube care (78%), catheter care (90%), personal cleanliness (80%) and endotracheal suctioning (89%). The mean satisfaction score was 78.1 ± 4.7.

A negative association of knowledge was observed with age (r=-0.219) and work experience (r=-0.331) (p=0.005) and practice and these parameters (r=-0.244, r=-0.287, p=0.4 and 0.009). However, knowledge and practice (r=-0.322, p=0.004) and age and work experience (r=0.789, p=0.0) had a positive association. Most people with good knowledge levels were in their 20s (t=2.431), female (t=0.550), unmarried (t=1.582), had experience <10 years (t=2.412), had prior training (t=1.0) and worked day shifts (F=4.568). These sociodemographic characteristics also showed good practice scores.

Table I: Incidence of Sociodemographic Parameters

Parameters	N (%)
Age	
20s	75 (75%)
30s	20 (20%)
Older than 40 years	5 (5%)
Sex	
Male	10 (10%)
Female	90 (90%)
Marital status	
Single	55 (55%)
Married	45 (45%)
Qualification	
Diploma	25 (25%)
Bachelors	75 (75%)
Job position	
Staff nurse	85 (85%)
In-charge/ supervisor	15 (15%)
Work experience	
Less than 5 years	55 (55%)
5-10 years	40 (40%)
More than 10 years	5 (5%)
Working shifts	
Morning/ Evening	30 (30%)
Night	30 (30%)
Alternate shifts	40 (40%)
Previous training on infection control	35 (35%)

Table 2: Knowledge Scores and its Categorisation Among Study Population

Dimensions	Mean Scores	Satisfactory Knowledge (N%)
General information about infections	19.2 ± 5.4	30 (30%)
Nosocomial infections	15.3 ± 4.0	25 (25%)
Hand washing	14.5 ± 3.3	75 (75%)
Infection prevention	8.8 ± 2.6	60 (60%)
Sharp and needlestick injuries	7.1 ± 0.9	82 (82%)
Waste management and bodily fluid spillage	4.7 ± 0.8	41 (41%)
Safety equipment	13.5 ± 2.1	95 (95%)
Isolation cautions	11.7 ± 4.2	10 (10%)

Sterilisation and disinfection	4.5 ± 0.9	10 (10%)
Blood-transmitted diseases	7.2 ± 2.2	23 (23%)

Table 3: Practice Scores and its Categorisation Among Study Population

Dimensions	Mean Scores	Satisfactory Practices N (%)
Hand washing	8.2 ± 2.0	22 (22%)
Sharp objects	7.1 ± 1.3	65 (65%)
Waste management	2.3 ± 0.5	62 (62%)
Use of safety equipment	10.4 ± 0.8	40 (40%)
Linen management	4.5 ± 1.1	40 (40%)
Isolation and visitation	5.7 ± 1.4	56 (56%)
Personal cleanliness	2.9 ± 0.8	80 (80%)
IV infusion	7.2 ± 0.9	42 (42%)
Endotracheal suctioning care	5.6 ± 1.5	89 (89%)
Wound care	3.8 ± 1.2	73 (73%)
Chest tube care	5.0 ± 1.1	78 (78%)
Catheters care	7.6 ± 1.0	90 (90%)
Central line care	4.8 ± 0.9	24 (24%)

Discussion

This study was conducted to investigate the level of awareness and practices of ICU nurses regarding infection control measures. The results showed an unsatisfactory level of knowledge (75%) but satisfactory practices (58%) among the participants. Literature has reported contradictory findings according to these demographics. Nasiri et al concluded good knowledge levels (40-90%) n majority of studies in the systematic review. (7) An adequate level of knowledge (70.8-84.7%) was reported only reported in two studies in another systematic review by Alhumaid et al.(8) The prevalence of good knowledge was 67.6% in a Saudi Arabian study.(9) Considering these studies, the level of knowledge in our study is significantly lower, which is a cause of serious alarm since these nurses are in charge of chronically ill patients in the ICU. On the other hand, the practice score in our study complied with other studies.(10-12)

Knowledge and age were negatively related with younger nurses in their 20s having higher level of knowledge than older nurses. This may be due to the fact that younger people are more open to updated and continuing knowledge. In addition, females had a higher level of knowledge but this maybe attributed to fewer number of male nurses in our study. Similar findings have been reported by previous studies.(13, 14)

Nurses with more years of experience and older age had poorer knowledge than their peers which can be explained by lack of continuing knowledge and modern training which allows them to resort to traditional management. Similarly, knowledge and practice was directly related so nurses with higher knowledge also had greater compliance to newer practices.(15, 16)

Prior training and day shifts had a positive association with knowledge and practices. Because training helps improve skills and since the flow of patients is higher at day, nurses would get an opportunity to practice these skills.(17, 18)

Conclusion

There was a poor level of awareness and a satisfactory level of compliance to good practices among ICU nurses. It highlights the need for frequent training programs for all age groups and encourage the healthcare workers to continue education to improve patient outcomes.

Declarations

Data Availability statement
All data generated or analysed during the study are included in the manuscript.
Ethics approval and consent to participate
Approved by the department concerned. (IRBEC-MCH-23)
Consent for publication
Approved
Funding
Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

SA (Post RN BSN final year)
Manuscript drafting, Study Design,
JL (Post RN BSN final year)
Review of Literature, Data entry, Data analysis, and drafting articles.
ML (Post RN final year)
Conception of Study, Development of Research Methodology Design,
AN (Lecturer)
Study Design, manuscript review, critical input.

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

References

1. Raoofi S, Pashazadeh Kan F, Rafiei S, Hosseinipalangi Z, Noorani Mejareh Z, Khani S, et al. Global prevalence of nosocomial infection: A systematic review and meta-analysis. PloS one. 2023;18(1):e0274248.
2. Lemiech-Mirowska E, Kiersnowska ZM, Michałkiewicz M, Depta A, Marczak M. Nosocomial infections as one of the most important problems of healthcare system. Annals of Agricultural and Environmental medicine. 2021;28(3).

3. Taye ZW, Abebil YA, Akalu TY, Tessema GM, Taye EB. Incidence and determinants of nosocomial infection among hospital admitted adult chronic disease patients in University of Gondar Comprehensive Specialized Hospital, North–West Ethiopia, 2016–2020. Frontiers in Public Health. 2023;11:1087407.
4. Isigi SS, Parsa AD, Alasqah I, Mahmud I, Kabir R. Predisposing factors of nosocomial infections in hospitalised patients in the United Kingdom: systematic review. JMIR public health and surveillance. 2023;9:e43743.
5. Ayele DG, Baye Tezera Z, Demissie NG, Woretaw AW. Compliance with standard precautions and associated factors among undergraduate nursing students at governmental universities of Amhara region, Northwest Ethiopia. BMC nursing. 2022;21(1):375.
6. Livshiz-Riven I, Hurvitz N, Tomer Z-B. Standard precaution knowledge and behavioral intentions among students in the healthcare field: a cross-sectional study. Journal of Nursing Research. 2022;30(5):e229.
7. Nasiri A, Balouchi A, Rezaie-Keikhaie K, Bouya S, Sheyback M, Al Rawajfah O. Knowledge, attitude, practice, and clinical recommendation toward infection control and prevention standards among nurses: A systematic review. American journal of infection control. 2019;47(7):827-33.
8. Alhumaid S, Al Mutair A, Al Alawi Z, Alsuliman M, Ahmed GY, Rabaan AA, et al. Knowledge of infection prevention and control among healthcare workers and factors influencing compliance: a systematic review. Antimicrobial Resistance & Infection Control. 2021;10(1):86.
9. Abalkhail A, Al Imam MH, Elmosaad YM, Jaber MF, Hosis KA, Alhumaydhi FA, et al. Knowledge, attitude and practice of standard infection control precautions among healthcare workers in a university hospital in Qassim, Saudi Arabia: a cross-sectional survey. International journal of environmental research and public health. 2021;18(22):11831.
10. Thazha SK, Cruz JP, Alquwez N, Scaria B, Rengan SS, Almazan JU. Infection prevention and control awareness, attitudes, and practices among healthcare professionals in South India. The Journal of Infection in Developing Countries. 2022;16(04):659-67.
11. Letho Z, Yangdon T, Lhamo C, Limbu CB, Yoezer S, Jamtsho T, et al. Awareness and practice of medical waste management among healthcare providers in National Referral Hospital. PloS one. 2021;16(1):e0243817.
12. Lim SH, Bouchoucha SL, Aloweni F, Suhari NAB. Evaluation of infection prevention and control preparedness in acute care nurses: Factors influencing adherence to standard precautions. Infection, Disease & Health. 2021;26(2):132-8.
13. Ghabayen F, ALBashtawy M, Abdelkader RH, Jarrah S, Eshah N, Abdalrahim A, et al. Knowledge and Compliance With Standard Precautions Among Nurses. SAGE open nursing. 2023;9:23779608231189966.
14. Dhedhi NA, Ashraf H, Jiwani A. Knowledge of standard precautions among healthcare professionals at a Teaching Hospital in Karachi, Pakistan. Journal of family medicine and primary care. 2021;10(1):249-53.
15. Abuduxike G, Vaizoglu SA, Asut O, Cali S. An assessment of the knowledge, attitude, and practice toward standard precautions among health workers from a hospital in Northern Cyprus. Safety and health at work. 2021;12(1):66-73.
16. Lee J-i, Kim JK. Factors affecting nurses' performance of standard precautions for infection in public medical institutions: Focusing on knowledge and safety environment. The Journal of the Korea Contents Association. 2021;21(7):238-47.
17. Park S, Yang Y, Song E. Factors influencing knowledge, awareness, and compliance with standard precautions among psychiatric nurses. Archives of Psychiatric Nursing. 2021;35(6):625-30.
18. Bahegwa RP, Hussein AK, Kishimba R, Hokororo J, German C, Ngowi R, et al. Factors affecting compliance with infection prevention and control standard precautions among healthcare workers in Songwe region, Tanzania. Infection prevention in practice. 2022;4(4):100236.