

Infection Control Awareness Among Nursing Students: Descriptive Insights from Ongoing Clinical Orientations in Odisha

Jagadish Nayak¹, N. Premlata Devi², Sathish Rajamani^{3,*}

Abstract

Background: Effective infection control practices are critical in preventing healthcare-associated infections (HAIs). **Aim:** This study aimed to assess the awareness regarding effective infection control measures among student nurses undertaking their initial clinical orientations at Hospitals. **Method:** The study accepted 64 respondents from II-year BSc Nursing, sampled in clusters from selected Hospitals, Odisha. **Results:** The students yielded a mean awareness score of 0.69, categorized as Good. A comparison revealed that female students consistently outperformed males in all sanitary parameters, with the highest awareness observed in contamination risks (83%). **Discussion:** The findings indicate significant knowledge on nosocomial infections, precautionary standards, and contamination risks among nursing students, with room for improvements in specific domains as such hand hygiene (66.3%) and the use of alcohol-based rubs (59.1%) that require attention. The study further recommends evidence-based training and simulation-based learning to bridge knowledge gaps.

Keywords: Infection control, nursing students, awareness, nosocomial infections, healthcare-associated infections (HAIs)

INTRODUCTION

Healthcare-associated infections (HAIs) are a persistent and pervasive global health challenge, contributing substantially to patient morbidity, prolonged hospital stays, increased antimicrobial resistance, and elevated healthcare costs. The World Health Organization (WHO) and other public health bodies have repeatedly emphasized the importance of addressing HAIs, as they compromise patient outcomes and place immense burdens on healthcare systems, particularly in low- and middle-income countries [1]. Infection control, therefore, forms a critical component of patient safety protocols

and is especially vital in clinical environments where patients may be vulnerable due to invasive procedures, compromised immunity, or prolonged exposure to pathogens within healthcare facilities [2].

In the Indian context, infection control practices assume an even more vital role due to several unique challenges faced by the healthcare system. Overcrowded hospitals, limited resources, inadequate infrastructure, and understaffed facilities make it difficult to maintain optimal hygiene and infection prevention standards consistently [3]. These systemic limitations not only heighten the risk of HAIs but also emphasize the need for strict adherence to infection prevention and control (IPC) measures, particularly among healthcare workers in training.

*Author for Correspondence

Sathish Rajamani
E-mail: sathishrajamani@driems.ac.in

¹Student, School of Nursing, Driems University, Driems University, Cuttack, Odisha, India

²Associate Dean, Professor (HOD), Department of Obstetrics and Gynaecology, School of Nursing, Driems University, Driems University, Cuttack, Odisha, India

³Professor (HOD), Department of Mental Health Nursing, School of Nursing, Driems University, Driems University, Cuttack, Odisha, India

Received Date: August 10, 2024

Accepted Date: September 24, 2025

Published Date: October 06, 2025

Citation: Jagadish Nayak, N. Premlata Devi, Sathish Rajamani. Infection Control Awareness Among Nursing Students: Descriptive Insights from Ongoing Clinical Orientations in Odisha. International Journal of Evidence Based Nursing and Practices. 2025; 3(2): 15–20p.

Nursing students, who are in the early stages of their professional development, represent a crucial demographic in the fight against HAIs. As future caregivers and primary contact points for patients, they must be equipped with the knowledge, skills, and attitudes necessary for stringent infection control [4]. Their awareness, behavior, and commitment to following standard precautions such as hand hygiene, personal protective equipment (PPE) usage, waste disposal protocols, and aseptic techniques can directly influence infection transmission rates in clinical settings. Furthermore, ingraining good infection control practices during the formative years of nursing education can ensure long-term compliance and build a culture of safety in healthcare institutions.

This study, therefore, seeks to examine the current level of infection control awareness among nursing students undergoing clinical orientations [5]. It focuses specifically on students placed in selected hospitals in Cuttack, Odisha, a region where resource constraints often mirror broader challenges in India's public health infrastructure. The research is designed to assess knowledge and awareness across key domains of infection control, such as hand hygiene, disinfection practices, the use of alcohol-based hand rubs, and understanding of transmission pathways. By evaluating these parameters, the study aims to identify existing strengths and potential gaps in infection control knowledge among the participants.

The outcomes of this investigation are expected to provide valuable insights into the effectiveness of current training programs and curricula offered to nursing students in the region. Additionally, the findings can help guide the development of targeted educational interventions that reinforce critical infection control practices. In the long run, enhancing the competency of nursing students in infection control will contribute significantly to reducing the prevalence of HAIs, improving patient outcomes, and fostering safer clinical environments throughout India.

NEED FOR THE STUDY

This study was conducted for an insight on awareness among pre-clinical nursing students towards standard precautions, infection prevention and control in hospitals. The study forms a baseline that enables to assess knowledge and plan further interventions.

AIM

This study aimed to assess the awareness regarding standard precautions and infection control measures among student nurses undertaking their initial clinical orientations at hospitals and to investigate associations with demographic variables.

OBJECTIVES

- To assess the awareness on infection control among student nurses.
- To explore association of knowledge in comparison to demographic variables.

METHOD

An analytical cross-sectional study was conducted among II-year B.Sc. Nursing students. The sample consisting of 64 participants, aged 18–20 years (22% males, 78% females) undergoing clinical orientations at SCBMCH and Padmini Care Hospital, Cuttack enrolled in UG program at School of Nursing, DRIEMS University, took the survey. A structured (50 points, 25 items) questionnaire evaluated knowledge related six major parameters: nosocomial infections, precaution standards, hand hygiene, proper glove use, contamination risks, and alcohol-based hand rubs [3, 4]. Scores were analyzed for overall awareness and demographic differences. Comparative gender-specific analysis and advanced graphical presentations were employed to visualize findings, emphasizing on the evidence critical for clinical insight for enhancements in infection control practices [6, 7].

RESULTS

The average score was 34/50, with the highest score of 50 and the lowest of 18. The resultant awareness score of 0.69 (or 69%) indicates Good awareness among the respondents. The data were analyzed using SPSS 20. Table 1 demonstrates the socio-demographics.

Table 1. Frequency and percentage distribution of socio-demographic data (N=64).

Items	Socio demographic variables	F	f (%)
1.	<i>Age (years)</i>		
	<18	00	00.00
	18–20	60	93.75
	>20	04	06.25
2.	<i>Gender</i>		
	Male	14	21.88
	Female	50	78.12
3.	<i>Status of Living</i>		
	Good	09	14.06
	Average	42	65.63
	Poor	13	20.31

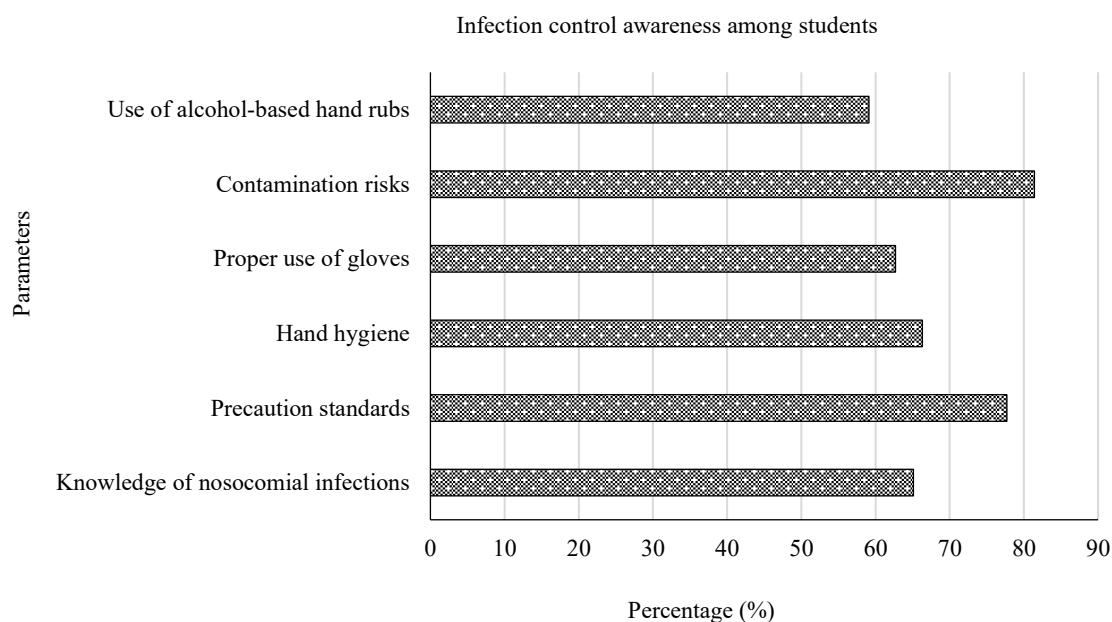


Figure 1. Graphical representation of infection control based on pre-existing parameters.

Table 2. Tabular data on general domains of infection control awareness.

Parameter	Male (%)	Female (%)	Total (%)
Nosocomial Infections	60	67	65.1
Precaution Standards	70	79	77.7
Hand Hygiene	63	67	66.3
Proper Use of Gloves	58	64	62.7
Contamination Risks	75	83	81.4
Alcohol-Based Hand Rubs	55	60	59.1

Report Summary on Domains of Standard Precautions for Infection Prevention and Control

The results indicate that 65.1% of students demonstrated good knowledge on Nosocomial Infections, and 77.7% were aware of major Precaution Standards. Moreover, 66.3% displayed confidence in correct hand hygiene practices and 62.7% understood the proper use of gloves. Reported 81.4% could identify determinants of contamination risk. While 59.1% knew the proper indications for the use of Alcohol-Based Hand Rubs (Figure 1).

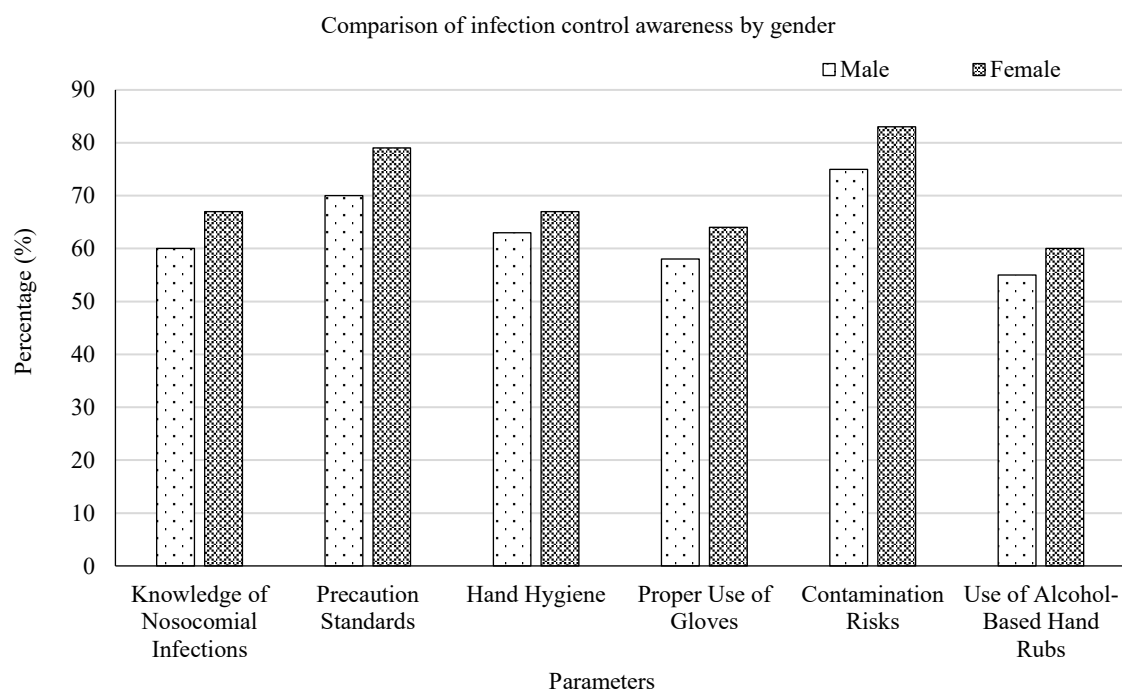


Figure 2. Gender specific comparison to awareness on infection control measures.

Associations Among Knowledge with Demographic Variables

Although the study included more females than males, awareness levels did not show major statistical significance based on gender and other variables so far (Figure 2 and Table 2).

DISCUSSION

The findings reveal a commendable awareness level, among the students, with a majority scoring above the threshold for good knowledge. Their ideas on contamination risks (81.4%) and precaution standards (77.7%) being the strongest areas. However, they had a relatively lower awareness on hand hygiene (66.3%) and alcohol-based hand rubs [8, 9] (59.1%) points to a need for targeted clinical trainings. Gender-specific trends suggest that while females generally outperform males, consistent educational strategies seem essential for students [6, 7].

Given the significant implications of HAIs in Indian healthcare settings, this study underscores a comparative high level of awareness that may stem further with the incorporation of infection control topics in their curriculum and exposure to clinical practices during rotations. The need for robust infection control program, leveraging simulations and hands-on training is of medical significance [10]. Nonetheless, sustained efforts are required to ensure comprehensive knowledge on multimodal infection prevention given the critical role to these measures in minimizing HAIs in resource-constrained settings like India [9].

RECOMMENDATIONS

- Strengthen practical training sessions focused on hand hygiene, scrub and the use of alcohol-based hand rubs [7].
- Incorporate simulation-based learning on CAUTI, CLABSI, SSI, VAP, CDI and MRSA, etc. with workshop on demonstrations related guidelines on infection control protocols [11].
- The implementation of Antibiotic Stewardship Programs is vital for nurses offering enhancements in patient health outcomes [11].
- Conduct regular assessments to monitor knowledge retention and application during clinical interventions in practice [12, 13].

CONCLUSION

This study underscores a notably commendable level of awareness regarding infection control among nursing students participating in clinical orientations, as evidenced by an overall awareness score of 0.69. Such a score reflects a moderate to high level of foundational knowledge and understanding of infection prevention practices, which is essential for ensuring patient safety and reducing the incidence of healthcare-associated infections (HAIs). Given that nursing students are future frontline healthcare providers, their competency in infection control is critical not only for their personal safety but also for the broader healthcare environment.

However, while the overall awareness is promising, the study identifies noticeable gaps in specific domains, particularly in hand hygiene and the proper use of alcohol-based hand rubs (ABHR). These are core components of infection prevention, recognized globally as the most effective measures to prevent the spread of infections in clinical settings. The improper or inconsistent practice of hand hygiene can significantly undermine infection control efforts, making it imperative to address these gaps early in the training phase.

To enhance the preparedness of nursing students, educational institutions and healthcare training programs must implement targeted and comprehensive educational modules focusing on hand hygiene techniques, the “Five Moments for Hand Hygiene” as recommended by the World Health Organization (WHO), and correct ABHR application protocols. Interactive workshops, simulation-based training, visual demonstrations, and routine assessments can serve as effective tools to reinforce these practices.

Moreover, fostering a culture of accountability and adherence to infection control guidelines within clinical settings can help instill long-term behavioral change. By strengthening these specific domains through structured and repeated educational interventions, nursing students can be better equipped to implement infection control measures effectively. Ultimately, such improvements will contribute significantly to safer and more hygienic healthcare environments across India, supporting national and global health goals.

REFERENCES

1. WHO. WHO Guidelines on Hand Hygiene in Health Care: First Global Patient Safety Challenge Clean Care Is Safer Care. Geneva: World Health Organization; 2009. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK144013/>
2. NCDC. National Guidelines for Infection Prevention and Control in Healthcare Facilities: MoHFW 2020 Training Modules. [Online]. National Centre for Disease Control (NCDC). Accessed December 5, 2024. <https://ncdc.mohfw.gov.in/national-guidelines-for-infection-prevention-and-control-in-healthcare-facilities-mohfw-2020-training-modules/>
3. Das A, Garg R, Kumar ES, et al. Implementation of infection prevention and control practices in an upcoming COVID-19 hospital in India: An opportunity not missed. *PLoS ONE*. 2022; 17(5): e0268071. doi:10.1371/journal.pone.0268071
4. CDC. (2024 May 16). Infection Control for Healthcare Providers. *Infection Control*. [Online]. Accessed December 5, 2024. <https://www.cdc.gov/infection-control/hcp/index.html>
5. Chang SO, Sohng KY, Kim K, Won J, Chaung SK, Choi MJ. How nursing students learn infection control education through undergraduate nursing programs: a phenomenographic research study. *BMC Nurs*. 2023; 22(1): 297. doi:10.1186/s12912-023-01465-9
6. Haque M, McKimm J, Sartelli M, et al. Strategies to Prevent Healthcare-Associated Infections: A Narrative Overview. *Risk Manag Healthc Policy*. 2020 Sep 28; 13: 1765–1780. Accessed December 5, 2024. <https://www.tandfonline.com/doi/abs/10.2147/RMHP.S269315>
7. Sax H, Allegranzi B, Uçkay I, Larson E, Boyce J, Pittet D. “My five moments for hand hygiene”: a user-centred design approach to understand, train, monitor and report hand hygiene. *J Hosp Infect*. 2007; 67(1): 9–21. doi:10.1016/j.jhin.2007.06.004

8. Maki G, Zervos M. Health Care-Acquired Infections in Low- and Middle-Income Countries and the Role of Infection Prevention and Control. *Infect Dis Clin North Am.* 2021; 35(3): 827–839. doi:10.1016/j.idc.2021.04.014.
9. Forrester JA, Starr N, Negussie T et al. Clean Cut (adaptive, multimodal surgical infection prevention programme) for low-resource settings: a prospective quality improvement study. *Br J Surg.* 2021; 108(6): 727–734. doi:10.1002/bjs.11997
10. Maristela TAE, Alano JCR, Wushoma WT, Jumarang TAL, Jael SA. Awareness and Practice of Standard Precautions for Infection Control among Student Nurses. *Hum Behav Dev Soc.* 2020; 21(1): 47–55. Accessed December 5, 2024. <https://so01.tci-thaijo.org/index.php/hbds/article/view/227036>
11. Kang M, Nagaraj MB, Campbell KK, et al. The role of simulation-based training in healthcare-associated infection (HAI) prevention. *Antimicrob Steward Healthc Epidemiol ASHE.* 2022; 2(1): e20. doi:10.1017/ash.2021.257
12. Gaikwad UN, Basak S, Kulkarni P, et al. Educational Intervention to Foster Best Infection Control Practices Among Nursing Staff. *Int J Infect.* 2018; 5(3): 81531. doi:10.5812/iji.81531
13. Kubde D, Badge AK, Ugemuge S, Shahu S. Importance of Hospital Infection Control. *Cureus.* 2023 Dec 22; 15(12): e50931. doi:10.7759/cureus.50931