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KNOWLEDGE REGARDING NOSOCOMIAL INFECTION AMONG NURSING STAFFS IN A HOSPITAL

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ABSTRACT

Aim: This study aimed to evaluate the level of knowledge among nursing staff regarding nosocomial infections and to identify potential gaps to inform targeted training and policy enhancements. **Background:** Nosocomial infections, also called hospital-acquired infections (HAIs), typically manifest 48 to 72 hours post-hospital admission. Globally, more than 100 million patients are affected annually, with South-East Asia reporting a prevalence of around 10%, as per WHO data. Adequate infection control knowledge is essential among nursing personnel to mitigate the risk of HAIs. **Methodology:** A descriptive cross-sectional study was conducted among 146 nurses at Lumbini Province Hospital using stratified proportionate random sampling. Data collection occurred between Jestha 19 to 32, 2081. Ethical clearance was granted by the Institutional Review Committee of Manmohan Memorial Institute of Health Sciences. A self-structured, self-administered questionnaire was used after obtaining informed consent. Data were analyzed using SPSS version 23, applying descriptive statistics. **Results:** Out of 146 participants, 52.1% demonstrated adequate knowledge of nosocomial infections, while 47.9% had inadequate understanding. Although 39.7% identified the correct definition, higher awareness was noted in areas such as common infection types (62.3%), pathogens (79.5%), and symptoms (59.6%). A statistically significant association was observed between knowledge level and both educational attainment ($p = 0.037$) and work experience ($p = 0.050$). **Conclusion:** While more than half of the nursing staff had sufficient knowledge about nosocomial infections, their understanding was significantly influenced by educational background and job experience. The study emphasizes the need for structured training tailored to professional qualifications and clinical exposure to enhance infection prevention practices.

KEYWORDS: Nosocomial infection, Nursing staff, Hospital-acquired infections, Infection control knowledge.

INTRODUCTION

Nosocomial infections, also known as healthcare-associated infections (HAIs), are infections acquired during a patient's stay in a healthcare setting that were neither present nor incubating at the time of admission. These infections typically manifest after 48 to 72 hours of hospitalization.[1] HAIs are a significant global health challenge, particularly in low- and middle-income countries (LMICs), where they contribute to increased morbidity, mortality, prolonged hospital stays, and added financial strain on both healthcare systems and patients.[2]

Evidence indicates that the prevalence of HAIs is considerably higher in LMICs compared to high-income countries. A study by Allegranzi et al. revealed that the risk of acquiring an HAI in LMICs is 2 to 20 times greater than in more developed regions due to limited infrastructure, inadequate infection control practices, overcrowding, and insufficient knowledge among healthcare providers, especially nurses.[3]

HAIs are caused by a variety of pathogens, including bacteria, viruses, and fungi, with bacterial agents being the most commonly implicated. Frequently identified organisms include *Staphylococcus aureus* (including methicillin-resistant strains), *Escherichia coli*, *Klebsiella pneumoniae*, and *Clostridioides difficile*.[4] Fungal infections, notably those caused by *Candida* species, are prevalent in immunocompromised patients or those with indwelling devices. Although less common, viral HAIs can be severe, particularly in intensive care settings.

According to the World Health Organization, up to 10% of hospital deaths in Southeast Asia are attributable to HAIs.[1] The global incidence in high-income countries ranges from 3.5% to 12%, whereas in some LMICs, especially in intensive care units, the prevalence can exceed 40%.[1,3]

Umscheid et al. concluded that a substantial proportion of HAIs could be prevented through consistent application of evidence-based preventive strategies.[5]

The Centers for Disease Control and Prevention (CDC) categorizes HAIs into several primary types: Central Line-Associated Bloodstream Infections (CLABSIs), Catheter-Associated Urinary Tract Infections (CAUTIs), Surgical Site Infections (SSIs), and Ventilator-Associated Pneumonia (VAP).[4] Each category involves specific risk factors and demands tailored prevention protocols.

Nurses are critical to HAI prevention due to their close, continuous interactions with patients. Their responsibilities include adhering to infection control measures such as hand hygiene, use of personal protective equipment (PPE), sterilization techniques, and isolation procedures. Despite this, studies have shown suboptimal knowledge and practices among nursing staff in many LMICs. For instance, a study conducted in Nepal found that only 20% of nurses had adequate knowledge of infection prevention guidelines, underscoring the urgent need for targeted training and continuing education.[6]

Underreporting remains a significant obstacle in addressing HAIs, driven by weak surveillance systems, lack of standard reporting frameworks, and institutional cultures that may discourage open disclosure. Strengthening infection monitoring systems and fostering a culture of safety and accountability are imperative to overcoming these barriers.[2]

MATERIALS AND METHODS

Study Design

A descriptive cross-sectional study design was adopted to assess the level of knowledge regarding nosocomial infections among nursing staff.

Study Setting

The study was conducted at Lumbini Province Hospital, located in Butwal Sub-Metropolitan City, Rupandehi District, Lumbini Province. Established in 2020 B.S., the hospital operates under the Ministry of Health and Population in cooperation with the Nepal Government. It initially had a capacity of 50 beds and now offers a wide range of both outpatient and inpatient services, including specialties such as General Medicine, General Surgery, Pediatrics, Orthopedic Surgery (including Physiotherapy), ENT Surgery, Obstetrics and Gynecology, Dental, and Dermatology.

The hospital includes specialized wards such as Medical, Surgical, Cabin, Post-Operative, Orthopedic, Emergency, Neurosurgery, High Dependency Unit (HDU), Labor Room, Postnatal Ward, Neonatal Intensive Care Unit (NICU), and Intensive Care Unit (ICU). The hospital has a total staff of approximately 230, comprising 33 physicians, 150 nurses, 37 paramedics, and additional support personnel.

Study Population

The study population comprised 225 registered nurses working at Lumbini Province Hospital, who had completed either a PCL in Nursing, Bachelor in Nursing Science (BNS), B.Sc. Nursing, MN, or MSc Nursing from recognized institutions.

A non-probability convenient sampling technique was used to select the sample, resulting in a total of 146 nurses who participated in the study. Nurses were selected because they are at the frontline of infection prevention and spend more time with patients than other healthcare workers, making them key players in preventing the spread of nosocomial infections.

Inclusion Criteria

- All registered nurses currently working at Lumbini Province Hospital were included.

Research Instrument

A self-developed structured questionnaire was used as the research instrument to assess nurses' knowledge regarding nosocomial infections. The tool was prepared based on extensive literature review and aligned with the study objectives.

The questionnaire was initially developed in English and then translated into Nepali for better understanding. It consisted of two parts.

- Part I: Socio-demographic information (age, religion, ethnicity, marital status, etc.)
- Part II: Knowledge assessment on nosocomial infections, containing 21 questions on topics such as: definition, common types, causative pathogens, contributing factors, signs and symptoms, prevention, hand hygiene, isolation precautions, standard precautions, disinfection, and waste management.

OBJECTIVES

- To assess the level of knowledge regarding nosocomial infections among nursing staff.
- To determine the association between knowledge levels and selected demographic and professional variables such as education, experience, and infection control exposure.

Validity and Reliability

To ensure the validity of the research instrument, several rigorous steps were undertaken. First, the questionnaire was reviewed by academic supervisors and subject matter experts to establish content validity, ensuring it appropriately captured all relevant dimensions of nosocomial infection knowledge. Expert feedback helped confirm that the items reflected the intended constructs.[7] Additionally, the questionnaire's development was grounded in a comprehensive review of current literature and existing validated tools, aligning the instrument with evidence-based frameworks.[8]

Face validity was enhanced by using clear, straightforward language tailored to the comprehension level of the nursing staff. This strategy helped prevent confusion, improved interpretability, and minimized potential bias caused by misinterpretation. These combined strategies supported both the accuracy and credibility of the measurement tool.

To assess the reliability of the questionnaire, a pilot study was conducted with approximately 10% of the target population. This pretesting phase aimed to identify vague, ambiguous, or difficult questions and assess the consistency of responses. Based on the pilot results, revisions were made to refine the instrument for clarity and coherence. After these adjustments, the tool demonstrated internal reliability, indicating that it would yield consistent and reproducible outcomes when applied in the actual research setting.[9]

Together, these steps ensured that the instrument was both valid—measuring what it was intended to measure—and reliable, producing stable and dependable results suitable for scholarly and practical application.

Ethical Considerations

The study received ethical clearance from the Institutional Review Committee (IRC) of Manmohan Memorial Institute of Health Sciences (MMIHS). Additionally, formal permission was obtained from Lumbini Province Hospital's administration. Prior to data collection, participants were clearly informed about the study's purpose, and written informed consent was obtained. Participation was entirely voluntary, and individuals had the freedom to withdraw at any point without any consequences. Anonymity was protected by excluding personal identifiers from the questionnaire, and all information was treated with strict confidentiality. The researcher personally ensured that each completed questionnaire was reviewed for clarity and completeness, addressing any uncertainties directly with participants to maintain data accuracy and ethical integrity throughout the research process.

Data Collection Procedure

Data were collected over a two-week period, from 2081/02/20 to 2081/03/02, after obtaining all required administrative and ethical approvals. A structured, self-administered questionnaire was provided to participants, who completed it within 25 to 30 minutes in a quiet and comfortable setting. To safeguard participant confidentiality, names were replaced with unique identification codes. The researcher ensured that privacy was respected throughout the process. All completed questionnaires were securely stored, accessible only to the research team, and strictly used for academic purposes. Ethical principles such as voluntary participation, the right to withdraw at any time, and the protection of personal data were carefully followed to maintain trust and uphold research integrity.

Data Analysis

After data collection was completed, all questionnaires were carefully checked to ensure completeness, consistency, and accuracy. Any responses that were incomplete or unclear were excluded to uphold the quality and reliability of the dataset. The valid data were then coded and entered into the Statistical Package for the Social Sciences (SPSS), version 26, for further analysis. Descriptive statistics—including frequency, percentage, mean, and standard deviation—were employed to evaluate the participants' knowledge levels regarding nosocomial infections.

The assessment tool included 13 multiple-choice questions and 8 multiple-response questions. Each correct response was given a score of one, with the total possible score ranging from 0 to 53. A higher score represented a higher level of knowledge about nosocomial infections.

To examine associations between participants' knowledge levels and their socio-demographic characteristics, inferential statistical methods were used. The Chi-square test was applied to identify significant relationships between knowledge scores and selected variables such as age group, level of education, work experience, and previous training on infection control. This statistical approach allowed for the identification of patterns or factors that might influence knowledge levels, providing valuable insight for targeted interventions and future training programs.

RESULT

Table 1: Socio-demographic Characteristics of the.

Variables	Number	Percent
Age (in completed years)		
<26	69	43.3
≥26	77	52.7
Median score±Interquartile range=26 ±58 (Q_1=24, Q_3=29)		
Religion		
Hindu	128	87.7
Buddhist	12	8.2
Muslim	1	0.7
Christian	5	3.4
Ethnicity		
Brahmin/Chhetri	94	64.4
Dalit	13	8.9
Jana Jati	37	25.3
Madhesi	2	1.4
Marital status		
Never married	71	48.6
Married/Living together	68	46.6
Divorced/Separated	5	3.4
Widowed	2	1.4
Level of education		
PCL Nursing	88	60.3
BSC Nursing	37	25.3
BNS	19	3.0
MN/MSC	2	1.4

n=146

The study involved 146 respondents, with a median age of 26 years (IQR: 24–29); 52.7% were aged 26 or older. Most participants were Hindu (87.7%) and of Brahmin/Chhetri ethnicity (64.4%). Nearly half (48.6%) were unmarried, while 46.6% were married or living together. In terms of education, 60.3% had completed PCL Nursing, followed by 25.3% with a BSc in Nursing. The sample reflected a predominantly young, mid-level nursing workforce with diverse but caste-skewed representation.

Table 2: Work Related Variables of Respondents.

Variables	Number	Percent
Job Experience		
0-4Years	97	66.4
5-9Years	44	30.1
10-15	5	3.4
Training		
Yes	42	28.8
No	104	71.2

n=146

Table 2 reveal that a majority of respondents (66.4%) had 0–4 years of job experience, indicating a predominantly early-career nursing workforce. Only 3.4% had over a decade of experience. Furthermore, 71.2% reported no prior training related to nosocomial infection, highlighting a significant gap in professional development and capacity building.

Table 3: Sources of Information among Respondents.

Variables	Number	Percentages
Textbook	116	80.0
Training	43	29.7
Hospital	78	53.8
Social media/mass media	58	40.0
Total	**146**	**100**

n=146

****Multiple Response**

Table 3 discloses that textbooks were the most common source of knowledge regarding nosocomial infections (80.0%), followed by hospital-based learning (53.8%) and social or mass media (40.0%). Only 29.7% of participants reported receiving formal training. This indicates a reliance on informal and institutional sources over structured training.

Table 4: Respondents Level of Knowledge on Nosocomial Infection.

Variables	Number	Percentages
Inadequate	70	47.9
Adequate	76	52.1
Total	**146**	**100.0**
Mean Standard Deviation=35±9.23267		

The table 4 displays that out of 146 participants, 52.1% had adequate knowledge, while 47.9% had inadequate knowledge. The mean knowledge score was 35 with a standard deviation of ±9.23, indicating moderate variability in responses. Overall, just over half of the participants demonstrated sufficient understanding.

Table 5: Association between Level of Knowledge with Socio-Demographic Characteristics of the Respondents.

Variables	Level of	knowledge	X2	p-Value
	Inadequate No. (%)	Adequate No. (%)		
Age in Year				
<26	29(42.0)	40(58.0)	1.835	0.175
≥26	39(50.6)	38(49.4)		
Religion				
Hindu	62(48.4)	66(51.6)	0.101	0.751

Others	8(44.4)	10(55.6)		
Ethnicity				
Brahmin/Chettri	44(46.8)	50(53.2)	0.137	0.712
Others	26(50.0)	26(50.0)		
Marital Status				
Never married	30(42.3)	41(57.7)	1.794	0.180
Married	40(53.3)	35(46.7)		
Level of Education				
PCL Nursing	48(54.5)	40(45.5)		
BSC Nursing	11(29.7)	26(70.3)	6.621	0.037*
BNS MN/MSC	11(52.4)	10(47.6)		
Job Experiences in years				
0-4	40(41.2)	57(58.8)	5.997	0.050*
5-9	26(59.1)	18(40.9)		
10-15	4(80.0)	1(20.0)		
Training Received				
No	49(47.6)	54(52.4)	0.019	0.889
Yes	21(48.8)	22(52.2)		

n=146

Note: P value is obtained from Pearson's Chi Square * denoted P significant at ≤ 0.05

Table 5 illustrates a significant association between the level of knowledge on nosocomial infections and both the level of education (p<0.037) and job experience (p<0.050). This suggests that higher academic qualifications and practical exposure may enhance understanding of infection control. However, no significant association was found with age, religion, ethnicity, marital status, or training, possibly due to uniform institutional policies or limited training quality.

DISCUSSION

This study examined the knowledge regarding nosocomial infections among 146 nursing professionals using sociodemographic, job-related, and knowledge-based variables. The results revealed several important insights into the preparedness of the nursing workforce in infection prevention and control. The participants were predominantly young, with a median age of 26 years. Over half (52.7%) were aged 26 years or older, and nearly half were unmarried. This pattern reflects Nepal's broader nursing workforce demographics, which are mostly composed of early-career professionals. Another study also found that a majority of nurses in a tertiary hospital in Kathmandu were in their twenties, suggesting that the sector is increasingly populated by young graduates entering practice early.[10] The majority belonged to the Brahmin/Chhetri ethnic group (64.4%), revealing limited ethnic diversity, which aligns with findings from Bhattachan et al. (2019) that show caste-based disparities persist in Nepal's professional sectors.[11]

From a professional standpoint, two-thirds (66.4%) of the participants had job experience ranging from 0 to 4 years, while only 3.4% had more than ten years of experience. This shows that most respondents were early-career nurses. Moreover, 71.2% had not received formal training in nosocomial infection prevention, exposing a significant gap in institutional capacity-building efforts. Similar concerns were reported in a study by a study, where lack of in-service training significantly affected nurses' compliance with infection control protocols in Nepalese hospitals.[12] Globally, a study from Bangladesh also confirmed that limited training impairs nurses' abilities to implement effective infection control practices.[13]

Knowledge sources revealed that 80% of respondents relied on textbooks, followed by 53.8% who learned through hospital exposure. Only 29.7% received knowledge through training. This over-reliance on academic sources and underuse of formal training may limit the application of practical skills. Ramesh and Joseph reported that institutional and hands-on training play a crucial role in bridging the gap between theoretical knowledge and clinical practice in India.[14] Knowledge assessment showed that 52.1% of participants had adequate knowledge, while 47.9% were found to have inadequate knowledge. The mean score was 35 ± 9.23, indicating moderate variability. Similar findings were observed in a study by Shrestha et al. (2021), where nearly half of the nurses demonstrated suboptimal understanding of hospital-acquired infections despite working in tertiary care settings.[15]

The level of knowledge was statistically associated with educational level (p = 0.037) and job experience (p = 0.050). Participants with BSc Nursing degrees had better knowledge compared to those with PCL qualifications, consistent with findings by KC and Basnet (2022), who observed that higher academic credentials contributed to improved awareness and practice of infection control among Nepalese nurses.[16] No significant associations were found between knowledge level and other sociodemographic variables like age, religion, marital status, or training received. This may be due to uniform

curricula or a lack of refresher training tailored to diverse learner needs.

Overall, the findings highlight the urgent need for structured in-service training, inclusive policy implementation, and capacity development strategies to enhance infection control knowledge among nursing staff.

CONCLUSION

This study concludes that although slightly more than half of the nursing staff demonstrated adequate knowledge regarding nosocomial infections, significant gaps remain, particularly among those with lower educational qualifications and less job experience. The lack of formal training among the majority of respondents further highlights the need for structured capacity-building programs. Academic qualifications and job experience were significantly associated with knowledge levels, emphasizing the importance of both education and hands-on exposure. No significant association was found with variables like age, religion, ethnicity, or marital status. Strengthening ongoing professional development and promoting inclusive training are essential to improving infection control practices.

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CLIFICT OF INTEREST

The authors declare that there is no conflict of interest related to the conduct, findings, or publication of this study. All procedures were carried out with academic and ethical integrity.

REFERENCES

1. World Health Organization. Health care-associated infections fact sheet. Geneva: WHO; 2022.
2. Bagheri Nejad S, Allegranzi B, Syed SB, Ellis B, Pittet D. Health-care-associated infection in Africa: a systematic review. Bull World Health Organ. 2011; 89(10): 757–765.
3. Allegranzi B, Bagheri Nejad S, Combescure C, Graafmans W, Attar H, Donaldson L, et al. Burden of endemic health-care-associated infection in developing countries: systematic review and meta-analysis. Lancet. 2011; 377(9761): 228–241.
4. Centers for Disease Control and Prevention. Healthcare-associated Infections. Atlanta: CDC; 2023.
5. Umscheid CA, Mitchell MD, Doshi JA, Agarwal R, Williams K, Brennan PJ. Estimating the proportion of healthcare-associated infections that are reasonably preventable and the related mortality and costs. Infect Control Hosp Epidemiol. 2011; 32(2): 101–114.
6. Karki S, Bhatta DR. Knowledge, attitude and practice of nursing students on hospital acquired infection in a tertiary hospital of Nepal. J Nepal Health Res Counc. 2017; 15(1): 42–46.
7. Polit DF, Beck CT. *Nursing research: Generating and assessing evidence for nursing practice*. 11th ed. Philadelphia: Wolters Kluwer; 2021.
8. Creswell JW, Creswell JD. *Research design: Qualitative, quantitative, and mixed methods approaches*. 5th ed. Thousand Oaks: SAGE Publications; 2018.
9. Rinwa B. A study to assess the knowledge regarding nosocomial infection among staff nurses working in selected hospitals. *Int J Nurs Educ Res*. 2015; 3(2): 204–6.
10. Pandey S, Shrestha R, Thapa B. Knowledge regarding infection prevention among nurses working in tertiary hospital, Kathmandu. *Int J Nurs Health Sci*. 2023; 9(2): 45–50.
11. Bhattachan KB, Sunar TB, Gauchan YB. *Caste-based Discrimination in Nepal: A Study of Dalits and Marginalized Communities*. Kathmandu: DFID Nepal; 2019.
12. Bhandari S, Thapa B, Adhikari K. Infection prevention practices among nurses: Training gaps in Nepalese hospitals. *J Karnali Acad Health Sci*. 2022; 4(1): 33–39.
13. Sultana S, Hossain MJ, Rahman A. Knowledge and awareness of nosocomial infections among nurses in Bangladesh: A cross-sectional study. *BMC Nurs*. 2021; 20(1): 18.
14. Ramesh A, Joseph B. A study to assess the knowledge and practice of nurses regarding nosocomial infection in India. *Asian J Nurs Educ Res*. 2020; 10(1): 85–90.
15. Shrestha S, Maharjan R, Adhikari B. Assessment of knowledge on hospital-acquired infections among nurses in a tertiary hospital of Nepal. *J Manmohan Mem Inst Health Sci*., 2021; 7(1): 23–28.
16. KC S, Basnet S. Influence of education level on infection control practices among nursing staff in Nepal. *Nepal Med Coll J*. 2022; 24(3): 152–15.