

# Knowledge and Perceived Barriers Regarding Aseptic Techniques among Nurses in a Tertiary Level Hospital

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## ABSTRACT

**Background:** Aseptic techniques are vital in preventing healthcare-associated infections, which remain a major concern in hospital settings. Nurses play a crucial role in maintaining asepsis; however, their knowledge and the barriers they encounter can influence effective practice. This study aimed to assess nurses' knowledge and perceived barriers to practicing aseptic techniques.

**Methods:** A hospital-based descriptive cross-sectional study was conducted among 210 nurses at Pokhara Academy of Health Sciences using a convenient sampling technique. Data were collected through a self-administered questionnaire covering sociodemographic variables, knowledge of aseptic techniques, and perceived barriers. Descriptive statistics such as frequency and percentage were used to summarize data, while Chi-square and Fisher's exact tests were applied to examine associations between selected variables and knowledge level.

**Results:** Most participants (71.4%) were below 30 years, and 43.8% were single. Over half had bachelor's and above, and 47.1% had 1-5 years of experience. Only 23.3% had received formal training in aseptic techniques. Knowledge assessment showed 41.4% had good knowledge, 48.6% moderate, and 10% poor knowledge. Higher education, greater work experience, and prior training were significantly associated with better knowledge ( $p < 0.05$ ). Major barriers included overcrowding, inadequate infrastructure, limited resources, and lack of clear guidelines.

**Conclusion:** Most nurses demonstrated moderate to good knowledge of aseptic techniques where structural and systemic barriers hindered effective implementation. Strengthening training, institutional support, and infrastructure is essential to enhance adherence and promote patient safety.

**Keywords:** Aseptic technique, knowledge level, nursing staffs, perceived barrier

## INTRODUCTION

Aseptic techniques are important in preventing healthcare-associated infections (HAIs), which has a significant concern in healthcare settings. These techniques comprehend a range of practices designed to protect patients from infections acquired during healthcare delivery.<sup>1</sup> Despite advancements in medical care, the incidence of HAIs remains high globally.<sup>2</sup>

According to the World Health Organization (WHO), the prevalence of HAIs in hospital settings worldwide ranges from 6% to 19.5%.<sup>3</sup> However, low-resource countries bear a greater burden of HAIs in comparison to high-income countries.<sup>4</sup>

HAIs not only result in extended hospital stays and increased mortality rates but also contribute to higher healthcare expenses, placing a financial burden on

individuals, communities, and nations. Thus, the prevention and the management of HAIs have emerged as significant public health priorities.<sup>5</sup>

Aseptic technique is a process used to achieve asepsis for preventing the transfer of potentially pathogenic microorganism to a susceptible site that may result in the development of the infection. Aseptic procedures are undertaken by nurses in the general ward settings. Once in clinical setting, if nurse's aseptic techniques are not maintained, this could result to patients or healthcare expositions to hospital-acquired infections which are most of the time caused by lack of knowledge or ignorance of implementing the principles of aseptic technique in daily nursing practice.<sup>1,6</sup> To mitigate the risk of HAIs, it is crucial to prevent the transmission of microorganisms between staff and patients during invasive procedures. This study was conducted to assess the knowledge and perceived barriers to the effective practice of aseptic techniques among nurses aiming to identify areas for improvement and inform strategies to enhance infection prevention practices.

## METHODS

This is a hospital-based descriptive cross-sectional research study to assess the level of knowledge regarding aseptic technique and perceived barriers to the effective practice of aseptic techniques among nurses working at the Pokhara Academy of Health Sciences (PoAHS).

A total enumeration sampling technique was used to recruit participants. The target population included are the all-staff nurses working at PoAHS, totaling 244 individuals. After accounting for non-responses (i.e. total 34 nursing staffs), a total of 210 nurses participated in the study.

Ethical approval for the study was obtained from the Institutional Review Committee of PoAHS (Ref no.202/080). Prior to data collection, informed written consent was obtained from all participants to ensure voluntary participation. Anonymity and confidentiality of the participants were maintained. Anonymity was maintained by not collecting any personal identifying information from the participants. Confidentiality was ensured by coding the questionnaires and securely storing the data, which were accessible only to the researcher and used strictly for academic purposes. Data were collected over a period of 8 weeks from July 16<sup>th</sup> to September 16<sup>th</sup> 2025. Data collection was carried out during regular

working days at convenient times for the nurses, without interfering with patient care activities.

Data were collected using a structured self-administered questionnaire consisting three sections. Section I included sociodemographic characteristics of nurses; Section II consisted of questions assessing knowledge regarding aseptic techniques and Section III assessed perceived barriers to practice aseptic technique. Questionnaire was developed after an extensive review of the relevant literature. The questionnaire was validated through literature review, expert consultation for content validity and pretesting among a small group of nurses in a similar setting. Necessary modifications were made before final data collection.

The knowledge section comprised 15 multiple-choice questions designed to evaluate the participants' understanding of aseptic techniques. Each correct response was assigned a score of 1, while incorrect responses received a score of 0. The total possible score was 15, representing 100%. Knowledge levels were categorized based on Bloom's Taxonomy scoring criteria;<sup>7</sup>

Good Knowledge: 80% or above

Average Knowledge: 60-79%

Poor Knowledge: below 60%

The perceived barrier section contains 11 statements related to common barriers such as workload, lack of supplies, time constraints and institutional support etc. responses were measured with options agree, neutral and disagree.

Data were coded and entered into a computerized database and analyzed using SPSS, version 22.

Descriptive statistics (frequencies and percentages) were used to summarize socio-demographic

Data and perceived barrier. Chi-square tests/ Fishers exact test was used to assess associations between of knowledge level and selected demographic variables. A p-value  $\leq 0.05$  was considered statistically significant.

## RESULTS

A total of 210 nurses participated in the study. The majority of respondents (71.4%) were below 30 years of age. Regarding marital status 56.2% were married. More than half (62.4%) had bachelor's and master's level education. In terms of work experience, 11.4% had less than one year, 47.1% had 1-5 years, and 41.4% had more

than five years. Only 23.3% of nurses had received any of the training on infection prevention and control (IPC) or aseptic technique. (Table 1)

**Table 1:** Socio-demographic characteristics of the respondents n=210

Characteristics	Number	Percent
<b>Age</b>		
< 30 years	150	71.4
≥30 years	60	28.6
<b>Marital status</b>		
Single	92	43.8
Married	118	56.2
<b>Educational status</b>		
Proficiency certificate level	79	37.6
Bachelor and Master level	131	62.4
<b>Experience</b>		
< 1 year	24	11.4
1-5 years	99	47.1
>5 years	87	41.4
<b>Training on IPC/aseptic technique</b>		
Yes	49	23.3
No	161	76.7

**Respondents' level of knowledge on aseptic technique**

Regarding knowledge on aseptic technique, 10.0% of respondents had poor knowledge, 48.6% had moderate knowledge, and 41.4% had good knowledge. (Table 2)

**Table 2:** Respondents' level of knowledge on aseptic technique n=210

Knowledge level	Number	Percent
Poor	21	10.0
Moderate	102	48.6
Good	87	41.4

**Association between level of knowledge with selected variables**

Nurses with bachelor's and master's level education were significantly more likely to have good knowledge compared to those with proficiency certificate level (p<0.001). Similarly, work experience was positively associated with knowledge, as nurses with more than five years of experience were more likely to fall in the good knowledge category than those with less than one year (p=0.027). Training on IPC/ aseptic technique also had a significant association (p=0.001), with trained nurses demonstrating higher knowledge than untrained ones. In contrast, age was not significantly associated with knowledge level (p=0.226), suggesting that professional exposure and training played a greater role in determining knowledge than chronological age. (Table 3)

**Table 3:** Association between level of knowledge with selected variables n=210

Variables	Level of Knowledge			χ <sup>2</sup>	p-value
	Poor N (%)	Moderate N (%)	Good N (%)		
<b>Age</b>					
< 30 years	12 (8.0)	72 (48.0)	66 (44.0)	2.973	.226
≥30 years	9 (15.0)	30 (50.0)	21(35.0)		
<b>Educational status</b>					
Proficiency certificate level	18 (22.8)	44 (55.7)	17 (21.5)	34.140	.000*
Bachelor and Master level	3 (13.1)	58 (63.6)	70 (53.4)		
<b>Experience<sup>f</sup></b>					
< 1 year	3 (12.5)	9 (37.5)	12 (50.0)	-	.027
1-5 years	12 (12.1)	39 (39.4)	48 (48.5)		
>5 years	6 (6.9)	54 (62.1)	27 (31)		
<b>Training on aseptic technique /IPC</b>					
Yes	19 (11.8)	87 (54.0)	55 (34.3)	-	.001 <sup>f</sup>
No	2 (4.1)	15 (30.6)	32 (65.3)		

*f*=Fisher's Exact Test, \* *p*<0.05 is considered significant

**Perceived barriers on implementing aseptic technique**

Regarding the perceived barriers to implementing aseptic techniques, the majority of nurses agreed that environmental factors such as inadequate ventilation, overcrowded patient rooms, or poor cleanliness (85.7%), and insufficient resources including equipment and staffing (77.1%), were major challenges. Similarly, lack of a separate room for aseptic procedures (70.0%), lack of clear guidelines or protocols (65.7%), and inadequate handwashing stations (60.0%) were reported by more

than half of the respondents. Other frequently cited barriers included inadequate sterilization facilities (57.1%), limited organizational support (55.7%), time constraints and competing priorities (54.8%), and lack of effective cleaning and disinfection facilities (54.3%). In contrast, comparatively fewer nurses agreed on barriers such as inadequate communication and coordination among health care team members (42.9%) and lack of awareness regarding aseptic techniques (41.4%). (Table 4)

**Table 4:** Perceived barriers on implementing aseptic technique n=210

Perceived barrier	Agree	Neutral	Disagree
	N (%)	N (%)	N (%)
The lack of clear guidelines of protocols	138 (65.7)	27 (12.9)	45 (21.4)
Insufficient resources (e.g. equipment and staffing)	162 (77.1)	30 (14.3)	18 (8.6)
Time constraints and competing priorities	115 (54.8)	54 (25.7)	41 (19.5)
Environment factors such as inadequate ventilation, overcrowded patients' rooms or poor cleanliness	180 (85.7)	24 (11.4)	6 (2.9)
Limited support from organizational leadership	117 (55.7)	63 (30.0)	30 (14.3)
Inadequate communication and coordination among health care team members	90 (42.9)	72 (34.3)	48 (22.9)
The lack of awareness regarding aseptic techniques	87 (41.4)	57 (27.1)	66 (31.4)
Lack of effective cleaning and disinfection facility in the hospital	114 (54.3)	42 (20.0)	54 (25.7)
Inadequate facility of sterilization	120 (57.1)	30 (14.3)	60 (28.6)
Lack of separate room for aseptic procedure	147 (70.0)	24 (11.4)	39 (18.6)
lack of adequate handwashing station	126 (60.0)	36 (17.1)	48 (22.9)

**DISCUSSION**

This study demonstrated that nearly half of the respondents (48.6%) had a moderate level of knowledge, 41.4% had good knowledge, and only 10% had poor knowledge on aseptic technique. A similar finding was reported in Nepal, where nurses demonstrated moderate to good knowledge of aseptic practices in the operating theatre.<sup>8</sup> Comparable results were also noted in Ethiopia, where more than half of nurses had only moderate knowledge on infection prevention measures.<sup>9</sup>

This study revealed that higher level of education and prior training on aseptic technique/ IPC has significant association with level of knowledge which is in consistent with previous study.<sup>9-11</sup> Experience was also significantly associated with knowledge in our study, aligning with findings from Nepal and China, where more experienced nurses were more likely to demonstrate adequate

knowledge and correct practice of aseptic technique.<sup>8,12</sup> Conversely, age was not significantly associated with knowledge in this study, which is in line with evidence from Uganda, suggesting that professional exposure and refresher training are more influential determinants of knowledge than chronological age.<sup>13</sup>

In terms of barriers, studies have identified lack of resources, inadequate training, and managerial support as major obstacles to maintaining aseptic practice.<sup>14,15</sup> These challenges are relevant to our findings, highlighting the need for continuous training, adequate supply provision, and supportive supervision to sustain proper infection prevention practices.

The findings of this study indicate that environmental and institutional constraints were the most common perceived barriers to the effective practice of aseptic techniques among nurses. The predominance of barriers such as

inadequate infrastructure, overcrowding, insufficient resources, and lack of clear protocols underscores the systemic challenges within hospital settings in low- and middle-income countries.<sup>10,14</sup> Similar findings were reported where inadequate resources and poor working environments were cited as major obstacles to infection prevention practices among nurses.<sup>16</sup> Likewise, a study in Ethiopia demonstrated that overcrowded patient wards and lack of necessary supplies significantly impeded aseptic practice compliance.<sup>17</sup> This suggests that infrastructural and managerial support play a pivotal role in ensuring aseptic compliance, beyond individual nurse knowledge.

The reported lack of guidelines and protocols (65.7%) aligns with findings showing that unclear or absent hospital guidelines often lead to inconsistent practice among health care providers.<sup>[18]</sup> Similarly, limited organizational support (55.7%) has been highlighted in studies from India and Nepal, where weak hospital leadership and inadequate policy frameworks were found to discourage adherence to infection prevention practices.<sup>18</sup>

Interestingly, fewer nurses in this study considered lack of awareness (41.4%) and poor communication among healthcare teams (42.9%) as significant barriers. This contrasts with studies identifying inadequate awareness and training as leading factors for poor compliance with aseptic and infection control protocols.<sup>19</sup>

The recognition of time constraints and competing priorities i.e. heavy workloads and excess responsibilities (54.8%) as a barrier is consistent with international literature. Heavy workloads and competing responsibilities often reduce adherence to hand hygiene and aseptic procedures.<sup>20</sup> This highlights the importance of balancing staffing levels with patient load to ensure adequate compliance.

The results indicate that nurses' professional education, prior training in IPC or aseptic techniques, and clinical experience strongly influence their knowledge levels. Although a majority demonstrated moderate to good knowledge, gaps persist, especially among less experienced or PCL level nurses. Moreover, systemic challenges such as limited resources, overcrowding, and insufficient institutional support have significant obstacles to translating knowledge into practice. These findings highlight the necessity of structured training, periodic refresher courses, and robust institutional

support to ensure that nurses can consistently apply aseptic techniques effectively.

The study was limited by its single center design which limited the generalizability of the findings. Data were collected using self-administered questionnaire which may have introduced response bias. Being cross sectional in nature, casual relationships could not be established.

## CONCLUSION

The study demonstrates the nurses working in the Pokhara Academy of Health Sciences generally possess moderate to good knowledge of aseptic techniques yet their practical implementation is hindered by organizational and environmental factors. Knowledge level is positively associated with education, training, and work experience, while chronological age appears less influential. Enhancing infrastructure, providing sufficient resources, and establishing clear institutional guidelines along with continuous professional development is essential to promote adherence to aseptic practices and improve patient safety.

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## CONFLICT OF INTEREST

The authors declare no conflicts of interest.

## FINANCIAL DISCLOSURE

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