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A descriptive study to assess the level of knowledge on barrier techniques among nurses in general wards of KLE'S Dr. Prabhakar Kore Hospital Belagavi with a view to develop an informational booklet

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Abstract

Background: Nurses are frequently exposed to microorganisms that can cause severe infections. The Centers for Disease Control and Prevention (CDC) recommend Standard Precautions to prevent infection transmission. Barrier nursing techniques are essential in reducing hospital-acquired infections (HAIs), which significantly impact patient safety and public health. Assessing nurses' knowledge of these techniques is crucial for improving infection control practices.

Method: A descriptive study was conducted among 100 registered nurses working in the general wards of KLE'S Dr. Prabhakar Kore Hospital, Belagavi. Participants were selected using a convenient sampling technique. A structured questionnaire assessed their knowledge of barrier techniques.

Results: Among the participants, 7% were aged 21-25 years, 68% were female, and 51% had a GNM qualification. Additionally, 62% had 0-1 year of experience. While 75% demonstrated good knowledge, 15% had moderate, and 10% had poor knowledge. Significant associations were observed between knowledge levels and age, gender, qualification, and experience ($p < 0.05$). BSc Nursing graduates scored higher than GNM nurses ($P = 0.021$), and experience also influenced knowledge levels ($P = 0.027$).

Conclusion: The study highlights knowledge gaps in barrier techniques among nurses. Educational interventions, such as information booklets, can enhance infection control practices, ensuring patient safety and reducing HAIs.

Keywords: Barrier nursing, infection control, hospital-acquired infections, nursing knowledge, KLE'S Dr Prabhakar kore Hospital Belagavi

Introduction

Barrier techniques are essential infection control measures that prevent the spread of infectious agents between patients and healthcare providers. They include hand hygiene, personal protective equipment (PPE), proper waste disposal, and aseptic procedures.^[1]

Hospital-acquired infections (HAIs) remain a major concern, leading to increased morbidity, mortality, and healthcare costs. Nurses, as primary caregivers, play a critical role in applying these techniques, particularly in general wards where cross-infection risks are high.

Despite established guidelines, compliance with barrier techniques varies due to factors like knowledge gaps, training, workload, and resource availability. Assessing nurses' knowledge is essential to identify gaps and improve infection control practices^[2].

Importance of Barrier Techniques in Nursing

Infection Prevention: Hand hygiene, PPE use, and aseptic practices minimise infection risks.

- **Healthcare Worker Protection:** Proper use of barrier techniques reduces occupational hazards.
- **Improved Patient Outcomes:** Reduced HAIs lead to better recovery and shorter hospital stays.
- **Legal and Ethical Responsibility:** Nurses must adhere to infection control standards to ensure patient safety.
- **Cost Reduction:** Preventing infections reduces healthcare expenses^[3].

Role of Nurses in Barrier Techniques

- Nurses ensure infection prevention through.

- Practicing hand hygiene.
- Using appropriate PPE.
- Following aseptic techniques during procedures.
- Maintaining environmental hygiene.
- Disposing of waste safely.
- Educating patients and staff on infection control.

Study Rationale: This study assesses the knowledge of barrier techniques among nurses in the general wards of KLE'S Dr Prabhakar Kore Hospital Belagavi. The findings will guide the development of an information booklet to address knowledge gaps, enhance infection control practices, and improve patient safety.

Materials and Methods

Research approach: A Descriptive research approach

Research design: A Descriptive research design.

Research variable:

- **Dependent:** Level of knowledge of nurses on barrier techniques. This is measured based on their questionnaire.
- **Independent:** Barrier techniques this includes hand hygiene, use of gloves, mask, gowns, eye protection, proper waste disposal.

Research setting: The study was done at general wards

Study population

- **Target population:** Registered nurses working at general wards.
- **Accessible population:** Nurses who are present during data collection period and voluntarily agree to participate.

Sample technique and sample size: Convenience sample technique and sample size is 100.

Standard for sample selection

Inclusion criteria

- Registered nurses working at general wards.
- Nurses who are ready to take a part of survey.

Exclusion criteria

1. ICUs, labor wards, OT nurses.
2. Nurses who are not available during the data collection.

Tools of data collection

- Socio-demographic variable.
- Structured knowledge questionnaire on barrier techniques.

Data collection procedure

The data collection procedure outlines how to gather information from nurses to assess their knowledge of barrier techniques. Here's a steps:

Step 1: Obtain Necessary Approvals

- **Ethical Clearance:** Get approval from the hospital's Institutional Ethics Committee (IEC) or Research Ethics Board.
- **Hospital Permission:** Obtain written consent from the hospital administration to conduct the study in general wards.

- **Informed Consent from Participants:** Ensure nurses voluntarily participate after explaining the study's purpose.

Step 2: Preparation for Data Collection.

- **Develop the Questionnaire:** Finalize a structured questionnaire (Validated through a pilot study).
- **Fix a Data Collection Schedule:** Choose dates and times convenient for nurses to participate without disrupting hospital workflow.

Step 3: Data Collection Process

- **Recruit Participants:** Approach nurses in general wards who meet the inclusion criteria.
- Explain the study, provide informed consent forms, and assure confidentiality.
- **Distribute the Questionnaire:** Provide a self-administered questionnaire to nurses.
- **Address any queries:** If nurses have doubts and question, clarify without influencing their responses.

Step 4: Post-Collection Activities

- **Check for Completeness:** Ensure all questionnaires are filled properly.
- **Code and Enter Data:** Assign numerical codes for easy data entry into SPSS or Excel.
- **Store Data Securely:** Maintain confidentiality by keeping responses in a locked file or password-protected system.

Step 5: Data Analysis Use descriptive statistics (Percentages, mean, standard deviation) to analyze knowledge levels. Categorize responses into poor, moderate, and good knowledge.

Results

This chapter deals with analysis and interpretation of the data collected to assess the level of knowledge of nurses on barrier techniques. The collected data was analyzed by suitable descriptive analysis and interpreted by following objectives.

- To assess the level of knowledge on barrier nursing techniques among a staff nurse
- To find out the association between the level of knowledge with selected demographic variables.
- To prepare the information booklet on barrier techniques for nurses.

Presentation of data

- **Section 1:** Socio-demographic characteristics.
- **Section 2:** Assess the level of knowledge on barrier nursing techniques among a staff nurse.
- **Section 3:** Association between Socio-demographic profile with level of knowledge.
- **Section 4:** Comparison of Socio-demographic profile with mean knowledge scores.

Section 1: Socio-demographic profile

In the current study none of the participants were below 20 years, majority of them, i.e 7% were between 21-25 years, followed by 16% between 25-30 years, 12% belonged to age group above 30 years.

Table 1: Showing the distribution of the study participants

Age group	N	%
Below 20 years	0	0
21-25 years	72	72
25-30 years	16	16
Above 30 years	12	12
Total	100	100

Table 2: Showing the distribution of the study participants according to gender

Area of residence	N	%
Male	32	32
Female	68	68
Total	100	100

The Table 2 Present the gender distribution of respondents in the study. Majority of the respondents, 68(68%) are females, while 32(32%) are male

Table 3: Showing the distribution of the study participants according to Qualification

Qualification	N	%
GNM	51	51
BSC	32	32
PB BSC	17	17
MSC	0	0
Total	100	100

The Table 3 Represents distribution of the study participants according to Qualification. Majority of the participants 51(51%) were Gnm (nursing) while 32 (32%) were BSc. (nursing), 17 (17%) of the participants had studied PB B.Sc. (Nursing) and none of them were MSc (nursing) qualified.

Table 4: Showing the distribution of the study participants according to years of experience

Experience	N	%
0-1 year	62	62
3-5 years	25	25
>5years	13	13
Total	100	100

The Table 4 Represents study distribution of the study participants according to years of experience. Majority of the participants i.e. 62(62%) had 0-1year experience, while 25(25%) had 3-5 years and 13(13%) had more than 5years experience

Table 5: Showing the distribution of the study participants according to training in barrier nursing

Training in barrier nursing	N	%
Trained	100	100
Not trained	0	0
Total	100	100

The Table 5 Represents the distribution of the study participants according to training in barrier nursing 100% of the participants were trained in barrier nursing.

The Table 6 Represents distribution of the study participants according to knowledge, majority of the participants, i.e 75(75%) of them had good knowledge, followed by 15(15%) who had medium knowledge and 10(10%) of them had poor knowledge

Table 6: Showing the distribution of the study participants according to knowledge

Level of knowledge	N	%
Poor knowledge	10	10
Medium knowledge	15	15
Good knowledge	75	75
Total	100	100

Table 7: Showing distribution of study participants according to the knowledge levels across socio demographic profile

Socio demographic variable	Poor knowledge	Medium Knowledge	Good Knowledge	Chi square	P-Value
Age Group	%	%	%		
Below 20 years	0	0	0	16.32	<0.05*
21-25 years	6	5	61		
25-30 years	3	5	8		
Above 30 years	1	5	6		
Total	10	15	75		
Gender					
Male	1	1	30	10.96	<0.05*
Female	9	14	45		
Total	10	15	75		
Qualification					
GNM(nursing)	1	8	42	11.66	<0.05*
BSC(nursing)	8	5	20		
PB BSC (nursing)	1	2	13		
MSC (nursing)	0	0	0		
Total	10	15	75		
Experience					
0-1 year	8	1	53	40.39	<0.05*
3-5 years	1	5	19		
>5 years	1	9	3		
Total	10	15	75		

The Chi-square test showed a statistically significant association ($p < 0.05$) In this study, 61% of participants aged 21-25 years had good knowledge, compared to 8% in the 25-30 years group and 6% above 30 years ($\chi^2 = 16.32$). 45% of females had good knowledge compared to 30% of males ($\chi^2 = 10.96$). Among qualifications, 42% of GNM, 20% of BSc Nursing, and 13% of PB BSc Nursing participants had good knowledge ($\chi^2 = 11.66$). Knowledge also varied significantly with experience ($\chi^2 = 40.39$).

Table 8: Showing the mean score and standard deviation across socio demographic variables

Socio Demographic Variable	Mean ± Std Dev	F/T Value	P-Value
Age Group		F-value	
Below 20 years	0	1.808	0.183
21-25 years	16.22±3.42		
25-30 years	17.45±2.65		
Above 30 years	18.96±3.54		
Gender		T value	
Male	17.67±4.56	0.356	0.728
Female	18.45±5.21		
Qualification		F value	
GNM	15.63±3.25	2.35	0.021*
BSC	18.76±2.66		
PB BSC	16.77±2.68		
MSC	0		
Experience		F value	
0-1 year	15.33±4.55	4.09	0.027*
3-5 years	18.42±3.55		
>5 years	20.33±3.65		

ANOVA and the unpaired Student's t-test were used, with $p < 0.05$ considered significant. Knowledge scores increased with age, but this was not statistically significant ($F=1.808$, $P=0.183$). Females had higher scores (18.45 ± 5.21) than males (17.67 ± 4.56), but the difference was not significant ($T = 0.365$, $P=0.728$). BSc Nursing graduates scored higher (18.76 ± 2.66) than GNM-qualified nurses (15.63 ± 3.25), showing a significant difference ($F=2.35$, $P=0.021$). Scores also increased with experience (15.33 ± 4.55 for 1 year, 18.42 ± 3.55 for 2 years, 20.33 ± 3.65 for 3 years), which was statistically significant ($F=4.09$, $P=0.027$).

Discussion

Socio-Demographic Details In the current study, most participants (7%) were aged 21-25 years, followed by 16% aged 25-30 years, and 12% above 30 years. Similar age distributions were reported by Nipin Kalal and Anjali Walia, though Caroline E.'s study showed a higher proportion of participants above 40 years. Regarding gender, 68% were females and 32% were males. This aligns with studies by Anjali Walia and Megha S., while Nipin Kalal and Caroline E. reported differing gender distributions. In terms of qualifications, 51% had GNM, 32% had BSc in Nursing, and 17% had PB BSc. None had MSc qualifications, unlike studies by Nipin Kalal and Anjali Walia, which reported a higher number of degree holders. Most participants (62%) had 0-1 year of experience, indicating a younger workforce compared to Nipin Kalal and Caroline E.'s studies, where participants had greater experience. Notably, 100% of participants were trained in barrier nursing, significantly higher than in other studies.

Assessment of knowledge of nurses

In the present study, 75% of participants had good knowledge, 15% had medium knowledge, and 10% had poor knowledge. This contrasts with Nipin Kalal's study, where 92% had inadequate knowledge, and Anjali Walia's study, where only 7% had good knowledge.

Age, gender, qualification, and experience significantly influenced knowledge. Participants aged 21-25 years, females, and those with GNM qualifications demonstrated better knowledge, with statistically significant results. Experienced nurses also showed higher knowledge scores, consistent with findings from Nipin Kalal, Anjali Walia, and Naveen Paliwal, highlighting the importance of experience and training in improving knowledge levels.

Conclusion

While nurses showed good knowledge of infection control, there is room for improvement. Continuous education and training are essential for strengthening barrier nursing practices, ensuring patient safety, and preventing infection spread.

Nursing Education Mandatory barrier nursing education can reduce infection transmission and lower patient morbidity and mortality.

Nursing Practice Developing educational booklets addressing knowledge gaps can improve nurses' understanding and enhance infection control efforts.

Nursing Research Further research is needed to create standardized training materials, ensuring consistent knowledge across healthcare institutions.

Recommendations Implement compulsory, standardized barrier nursing training. Conduct regular refresher sessions.

Address identified knowledge gaps. Establish monitoring teams for quality control.

In this study, experienced nurses scored higher in knowledge ($F=4.09$, $P=0.027$), highlighting the importance of continuous training and experience.

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Conflict of Interest

Not available

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