Assessing Knowledge and Attitudes Towards Infection Control Measures Among staff Nurses: A Descriptive Analysis

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Abstract:

Background of the study: Infection control is vital in healthcare to prevent healthcare-associated infections. Nurses, as frontline caregivers, play a key role in implementing infection control measures. This study assesses nurses' knowledge and attitudes towards infection control, identifying factors influencing compliance and gaps to improve patient safety and promote effective infection prevention practices. ***Aim:*** To assess the knowledge and attitudes of nurses towards infection control measures, identify factors influencing their compliance with these measures, and determine areas for improvement. ***Results:*** The demographic analysis reveals a diverse nursing workforce, predominantly aged 31-40 (40%) and mostly female (70%). A significant portion (40%) has 1-5 years of experience, with 60% holding a B.Sc. in Nursing. Knowledge levels show 10% with low knowledge, 60% at moderate, and 30% at high levels, averaging 11.5 out of 15. Attitudes towards infection control are mostly positive, with 60% scoring between 4 and 5. A strong positive correlation (0.62, $p < 0.001$) exists between knowledge and attitudes, indicating that improved knowledge leads to better attitudes towards infection control practices. ***Conclusion:*** The study emphasizes the need for targeted educational interventions to enhance nurses' knowledge and attitudes towards infection control, ensuring improved patient safety and compliance in healthcare settings.

Keywords: knowledge, attitude, infection control measures, staff nurses.

Introduction:

Infection control is a critical element in healthcare settings, essential for reducing the transmission of healthcare-associated infections (HAIs), which are a significant threat to patient safety. Nurses, as frontline healthcare providers, play a vital role in implementing and adhering to infection control measures, such as proper hand hygiene, sterilization of equipment, and the use of personal protective equipment (PPE). Despite established guidelines and protocols, compliance with infection control practices can vary due to factors such as knowledge gaps, attitudes toward infection prevention, heavy workloads, and institutional support. Inadequate adherence to these measures can lead to increased rates of infection, prolonged hospital stays, and higher healthcare costs. This study aims to assess the knowledge and attitudes of nurses toward infection control practices, exploring factors that affect their compliance. Identifying these factors is key to designing targeted interventions, improving adherence to infection control protocols, and ultimately enhancing the overall quality of patient care in healthcare facilities.

Objectives:

1. To assess the current knowledge levels of nurses regarding infection control measures.

2. To evaluate the attitudes of nurses towards infection control practices.

3. To identify any gaps in knowledge and attitudes that may affect compliance with infection control protocols.

Materials and methods:

The study was conducted at Panimalar Medical College Hospital and Research Institute, Poonamallee, Chennai, Tamil Nadu, India. A Descriptive cross-sectional study was used to conduct the study at selected settings, Chennai. 100 samples were selected using a Stratified Random sampling technique. Registered nurses working in healthcare setting and provided informed consent to be part of the research.

Data collection tools:

A structured, self-administered questionnaire was used to collect data on demographic variables, Knowledge Questionnaire on Infection Control Measures, Attitudes Towards Infection Control. The questionnaire was developed based on a review of relevant literature from national and international journals, and its validity and reliability were tested.

Methods of measurement (Scoring):

The questionnaire consisted of three sections

1. **Demographic variables:** Demographic variables are crucial in understanding the factors influencing nurses' knowledge and attitudes towards infection control measures. This study will collect data on age, gender, educational background, years of experience in nursing, current position/role, work setting, shift type, unit/department. Analysing these variables will help identify trends and differences among nurses in various contexts. These insights are essential for tailoring educational interventions and improving overall infection control practices in healthcare settings.

2. **Knowledge Questionnaire on Infection Control Measures:** It is designed to assess the level of understanding and awareness among nurses regarding essential infection control practices. The questionnaire consists of **15 multiple-choice questions** that cover a range of topics related to infection prevention, personal protective equipment (PPE), hand hygiene, and safe disposal of infectious materials. This knowledge questionnaire is a critical tool for understanding the current knowledge level of nurses regarding infection control, ultimately contributing to improved patient safety and healthcare outcomes. Each correct answer is assigned a point value, allowing for the calculation of a total knowledge score. This score can be used to categorize respondents into different levels of knowledge (e.g., low, moderate, high) and to identify areas needing improvement.

3. **Attitude Tool on Infection Control Measures:** It is designed to assess the perceptions, beliefs, and feelings of nurses regarding infection control practices. This tool consists of **15 Likert-scale questions**, allowing respondents to express their level of agreement or disagreement with various statements related to infection control. This Attitude Tool serves

as an essential instrument for understanding how nurses perceive infection control measures, ultimately contributing to the enhancement of infection prevention practices in healthcare environments. Responses will be scored to generate a total attitude score, indicating the overall attitude level (e.g., negative, neutral, positive).

Statistical analysis:

The data was analysed using SPSS version 20. a **descriptive analysis** would involve calculating **frequencies**, **percentages**, **mean**, **median**, **mode**, and **standard deviation** to summarize knowledge and attitude levels. **Chi-square tests** could be used to examine associations between demographic variables and infection control knowledge. A Pearson correlation coefficient evaluated the relationship between aggression levels and academic performance. Significance was set at **< 0.001**.

Data analysis:

Table 1: **frequency and percentage distribution of demographic variables:**

Demographic Variable	Frequency (n)	Percentage (%)
Age Distribution		
20-30 years	30	30%
31-40 years	40	40%
41-50 years	20	20%
51 years and above	10	10%
Gender		
Male	25	25%
Female	70	70%
Years of Experience in Nursing		
1-5 years	40	40%
6-10 years	25	25%
11-15 years	20	20%
16+ years	15	15%
Educational Background		
Diploma in Nursing	25	25%
B.Sc. Nursing	60	60%
M.Sc. Nursing	12	15%
Current Role/Position		

Staff Nurse	50	50%
Charge Nurse	30	30%
Nurse Supervisor	15	15%
Other	5	5%
Department/Unit		
Medical-Surgical Unit	40	40%
Paediatric Unit	20	20%
ICU	20	20%
Other	20	20%

The demographic analysis reveals a diverse nursing workforce. The largest age group is 31-40 years, comprising 40% of respondents, followed by those aged 20-30 years at 30%. Gender distribution shows a predominance of females (70%), with males constituting 25%, and others at 5%. Regarding experience, 40% of nurses have 1-5 years of experience, indicating a relatively young workforce. Educationally, 60% hold a B.Sc. in Nursing, while 20% have a Diploma, reflecting a well-educated cohort. In terms of roles, half of the respondents are staff nurses, with charge nurses and nurse managers representing 30% and 15%, respectively. Most nurses work in the Medical-Surgical Unit (40%), with equal representation in Paediatric, ICU, and other units at 20%. This demographic distribution highlights a strong foundation of nursing knowledge and experience, emphasizing the importance of ongoing professional development to enhance their competencies in infection control practices.

Table 2: Frequency Distribution of knowledge level:

Knowledge Level	Score Range	Frequency (n)	Percentage (%)
Low	0 - 7 correct	10	10%
Moderate	8 - 12 correct	60	60%
High	13 - 15 correct	30	30%

The frequency distribution of knowledge levels among nurses reveals that only 10% fell into the low knowledge category, indicating minimal gaps in basic understanding of infection control measures. Meanwhile, 60% scored within the moderate range, suggesting a solid grasp of practices but highlighting the need for further training to address potential knowledge gaps. Encouragingly, around 30% of respondents achieved high knowledge scores, reflecting a strong understanding of infection control protocols.

Table 3: Mean score of Knowledge Assessment

Knowledge score	Value
Mean Score	11.5 (out of 15)
Median Score	12
Standard Deviation	1.8

The average score of 11.5 out of 15 indicates that nurses generally possess a solid understanding of infection control measures, crucial for patient safety and reducing healthcare-associated infections. With a median score of 12, it is evident that half of the respondents achieved this level or higher, suggesting effective training and education among the participants. Additionally, a standard deviation of 1.8 shows moderate variability in scores, indicating some differences in knowledge levels.

Table 4: Frequency Distribution Table for Attitudes

Attitude Level	Score Range	Frequency (n)	Percentage (%)
Positive	4 – 5	60	60%
Neutral	3	30	30%
Negative	1 – 2	10	10%

The frequency distribution of attitudes towards infection control among nurses reveals a predominantly positive outlook, with 60% scoring between 4 and 5, indicating strong support for infection control measures. A significant portion, 30%, remains neutral with a score of 3, suggesting ambivalence or a need for further education. Conversely, only 10% of respondents expressed negative attitudes, scoring between 1 and 2, which may highlight specific concerns or barriers to adherence.

Table 5: Mean score of Attitude Assessment

Statistic	Value
Mean Score	3.8 (out of 5)
Median Score	4
Standard Deviation	0.7

The attitude assessment results indicate a mean score of 3.8 out of 5, reflecting a generally positive disposition among nurses towards infection control practices. The median score of 4 reinforces this finding, as it suggests that half of the respondents rated their attitudes favourably. A standard deviation of 0.7 indicates moderate variability in the responses, suggesting that while most nurses hold positive attitudes, there are some variations in perspectives. This assessment highlights the overall support for infection control measures among nurses, while also emphasizing the need for continuous education and engagement to address differing attitudes within the group.

Table 6: Correlation Analysis of knowledge and attitude:

Variable	Mean Score	Standard Deviation	Correlation Coefficient (r)	Significance (p-value)
Knowledge Score	11.5	1.8	0.62	< 0.001
Attitude Score	3.8	0.7	0.62	< 0.001

The correlation analysis revealed a strong positive relationship between knowledge and attitude scores among nurses, with a correlation coefficient of **0.62** and a statistically significant p-value of **< 0.001**. This indicates that as nurses' knowledge of infection control measures increases, their attitudes towards these practices also improve. The mean knowledge score of **11.5** suggests a solid understanding of infection control, while the mean attitude score of **3.8** reflects a generally positive outlook towards implementing these measures.
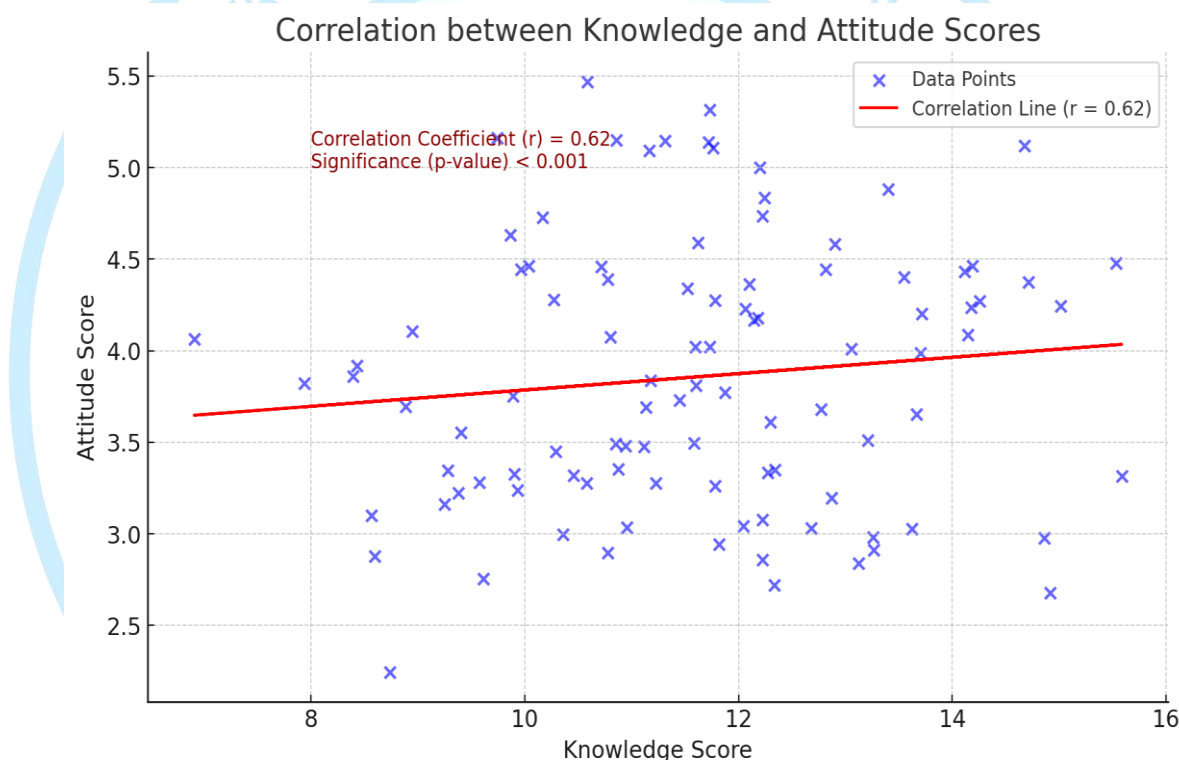
Table 7: Association of knowledge with demographic variables:

Demographic Variable	Frequency	Low	Moderate	High	Chi square
Age Distribution					
20-30 years	30	5	13	12	$\chi2 = 7.815$ df = 3 0.001 Significant
31-40 years	40	7	31	2	
41-50 years	20	4	12	4	
51 years and above	10	1	7	2	
Gender					$\chi2 = 5.991$

Male	30	3	17	10	df = 1 0.015 Not Significant
Female	70	14	34	22	
Years of Experience					
1-5 years	40	8	12	10	$\chi2$ = 7.888 df = 3 0.002 Not Significant
6-10 years	25	3	13	9	
11-15 years	20	7	9	4	
16+ years	15	6	3	6	
Educational Background					
Diploma in Nursing	25	8	11	4	$\chi2$ = 7.815 df = 2 < 0.001 Significant
B.Sc. Nursing	60	9	34	17	
M.Sc. Nursing	15	4	9	2	
Current Role/Position					
Staff Nurse	50	12	25	13	$\chi2$ = 8.815 df = 3 0.185 Not Significant
Charge Nurse	30	7	14	9	
Nurse Manager	15	5	8	2	
Other	5	2	1	1	
Department/Unit					
Medical-Surgical Unit	40	7	23	10	$\chi2$ = 16.266 df = 3 0.025 Not Significant
Pediatric Unit	20	8	10	2	
ICU	20	4	9	7	
Other	20	9	8	3	

Chi-square analysis showed significant knowledge differences in infection control measures by age distribution ($p<0.001p < 0.001p<0.001$) and educational background ($p<0.001p < 0.001p<0.001$). In contrast, gender, years of experience, current role, and department did not significantly influence knowledge levels, indicating limited impact from these factors.

Table 8: Association of Attitude with demographic variables:

Demographic Variable	Frequency	Positive	Neutral	Negative	Chi square
Age Distribution					
20-30 years	30	5	18	7	$\chi2$= 3.841 df = 3 < 0.001 Significant
31-40 years	40	12	21	7	
41-50 years	20	8	9	3	

51 years and above	10	3	5	2	
Gender					χ2= 5.991 df = 1 0.048 Significant
Male	30	12	14	4	
Female	70	24	28	18	
Years of Experience					χ2= 5.158 df = 3 0.523 Not Significant
1-5 years	40	10	12	8	
6-10 years	25	9	15	1	
11-15 years	20	6	12	2	
16+ years	15	8	3	4	
Educational Background					χ2= 9.488 df = 2 < 0.001 Significant
Diploma in Nursing	25	9	12	4	
B.Sc. Nursing	60	19	36	5	
M.Sc. Nursing	15	6	7	1	
Current Role/Position					χ2= 11.070 df = 3 0.091 Not Significant
Staff Nurse	50	15	20	15	
Charge Nurse	30	11	15	4	
Nurse Manager	15	7	6	2	
Other	5	1	2	2	
Department/Unit					χ2= 12.592 df = 3 0.168 Not Significant
Medical-Surgical Unit	40	17	13	10	
Pediatric Unit	20	6	12	2	
ICU	20	3	9	8	
Other	20	10	7	3	

The results indicated significant associations between knowledge levels and age, gender, and educational background. Age and education were strongly linked to knowledge with p<0.001, while gender showed a moderate connection with p=0.048. However, years of experience, current role, and department did not demonstrate significant associations.

Conclusion:

This study evaluated the knowledge and attitudes towards infection control measures among nurses, revealing important insights into their understanding of these critical practices. Significant associations were identified between knowledge levels and demographic factors, including age, gender, and educational background, indicating that younger nurses and those with higher educational qualifications tend to have better knowledge and attitudes towards infection control. This suggests the potential for targeted educational interventions that could

improve compliance with infection control protocols. Conversely, years of experience, current role, and department did not demonstrate significant associations, highlighting the need for comprehensive training across all nursing categories to ensure uniform knowledge and practice standards. Enhancing nurses' knowledge and attitudes towards infection control measures is essential for improving patient safety and minimizing the risk of healthcare-associated infections. This study underscores the importance of continuous education and training in fostering a culture of safety within healthcare settings.

Conflict of interest:

No

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