A Study to Assess Knowledge Regarding Standard Precautions among Student Nurses at Bhaarath College of Nursing, Chennai

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Abstract: Topic: A study to assess the knowledge regarding Standard Precautions among student Nurses. **Background:** Nurses are the principal group of health care personnel in all health care settings. Nurse's lack of knowledge may be a barrier in prevention of infections**. Aim**: The objectives of the study were to assess the student nurses knowledge regarding Standard Precautions and to assess the relationship between student nurses knowledge regarding Standard precautions and selected variables. **Method:** This cross-sectional study was conducted between student nurses at first, second and third years at Bhaarath college of Nursing, samples were selected using convenient sampling method. A validated self-prepared questionnaire was used to assess the knowledge. **Results**: 65 %(n=98) had very good knowledge, 4% of samples (n=4) had good knowledge, 3% of samples (n=3) had average knowledge and 28% of samples (n=42) of samples had below average knowledge. **Conclusion**: The findings obtained in this study by analyzing data from survey shows two-third of the participants have adequate knowledge on standard precaution. Hence regular courses should be held especially for the nursing students who are posted in critical care units as well as continuous monitoring of complianceby the nursing educators and Nursing supervisor. A holistic approach should be taken by the Teaching faculty, nurse educator, nurse manager, and nurses to overcome this problem.

Key Words: Standard precautions, contact precautions, barrier, cross sectional, Infection prevention, hospital associated infections

1.Introduction

Infections arise in the hospitals, are termed as hospital associated infections. Such infections have also been called as 'Nosocomial Infections' and sometimes 'Hospital Acquired Infections'. A Nosocomial

infection also called **Hospital** Acquired Infection can be defined as an infection occurring in a patient in a hospital or other healthcare facility in whom the infection was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge and also occupational infection among staff of the facility. (WHO. 2002) A wide variety of microorganism can be transmitted in healthcare setting, including bacteria, viruses, fungi and mycoplasmas. (BMA. 2006)

2. Objective of the Study

1. To assess the knowledge regarding standard precautions among student Nurses.
2. To assess relationship between student nurses' knowledge and selected variables.

3.Methodology

Research approach

A cross-sectional study was adopted for this investigation. Cross-sectional studies involve a single examination like a snapshot of a cross-section of a population at a given time. This study design is appropriate because the main objective of this investigation was to assess a certain group of nursing students' understanding of standard precautions.

Sample and Sampling Techniques: A purposive sampling technique was used to collect the samples. The samples were selected from the student Nurses at Bhaarath college of Nursing, chennai. The size of the sample was 150.The duration of study period was from April 2023 to May 2023.

Criteria for sample collection

Inclusion Criteria: student Nurses in first year, second year, and third year at Bhaarath college of Nursing, chennai .

Exclusion Criteria: student Nurses who are not willing to participate in the study.

Development of Tool: Data collection tool refers to instrument, which was constructed to obtain relevant data. An extensive review and study of literature helped in preparing items for tool. The investigator used a self-prepared questionnaire as tool for the study. Experts of Bhaarath college of Nursing have validated the tool.

Description of Tool

The tool used in the present study consisted of two parts.

Section A consists of Socio demographic data

Section B consists of yes or no questions to assess the knowledge regarding standard precautions

Section C Multiple-choice questions to assess knowledge about Standard Precautions consists of • Hand hygiene, • Hospital Acquired Infections, • Needle stick injuries, • Immunization, • Blood and Body fluid isolation, and • Sterilization of equipment.

Each correct answer carries one mark, wrong answers carry zero marks and unanswered questions also will be given zero. Marks will be converted into percentage. Less than 70%=below average 70-79%=Average 80-89%=Good 90-100%=Very Good

Data Collection: Formal permission was obtained from the authorities. Data was collected during the month of April 2023 to May 2023.The investigator first introduced and explained the need and

purpose of study. The survey was done using Google form. The data obtained from the Nursing student was analyzed by descriptive statistics and is presented in the form of bar and pie diagram.

4.Results

There were 150respondents in the study. Among the study samples 50 (32%) were male and 100(68%) were female respondents. Majority of the respondents 106 (71%) were within the age of 18 -19 years old, 30 (20%) respondents were within the age group of 20-21 years and 14 (9 %) respondents were in the age of 22-23 years old. Total 75 (50%) respondents were in first year B.Sc Nursing students, 69(46%) students were in second year and total 6 (4%) respondents were in third year

Table 1: Participants Demographic Variables:

Variables		**n**	**Percentage**
Age			
	18-19 years	106	71
	20-21 years	30	20
	22-23 years	14	9
Gender	Male	50	32
	Female	100	68
Year of study	First year	75	50
	Second year	69	46
	Third year	6	4

TABLE 2: Represents the cumulative scores of the respondents on the questionnaires on standard precautions.

Statement	**Correct Answer**	**Frequency**	**%**
Section B			
1. Hospital acquired infections are the result of self-infection, cross-infection &environmental infection.	**Yes**	**140**	**92.7**
2. The single most important measure for preventing	**Yes**	**142**	**94**

Hospital-Acquired Infections is hand hygiene.			
3.Caring of patients with HCV or syphilis only needs the standard precautions	**No**	**85**	**56.3**
4. Patients receiving immunosuppressive therapy are susceptible to Hospital Acquired Infections	**Yes**	**115**	**76.2**
5.Sterilization is a process of killing of microorganism only, spores are not removed	**No**	**98**	**64.9**
6.The main goal to implement standard precautions is to protect the medical staff alone	**No**	**112**	**74.2**
7. The most important factor involved in hand washing is friction.	**Yes**	**123**	**81.5**
8. Since the gloves can prevent from pollution of hands there is no need to wash the hands after taking of the gloves	**No**	**116**	**76.8**
9. Standard precautions apply only to all body fluids	**No**	**103**	**68.2**
10. Correct	**Yes**	**126**	**83.5**

technique for drying hands after surgical hand washing is rotatory motion from finger to elbow using sterile towel.			
Section C			
1.Alcohol based hand rubs have good or excellent antimicrobial activity against all of following except:	**Option d**	**83**	**55**
2. Each of the following statements regarding alcohol-based hand rubs is true except:	**Option d**	**74**	**49**
3. Which statement indicates best understanding of the correct protocol for blood & body fluid isolation?	**Option b**	**109**	**72.2**
4. Which of the following is the 1st priority in preventing infections when providing care for a client?	**Option a**	**126**	**83.4**
5. Normal skin flora usually consists of:	**Option c**	**71**	**47**
6. What PPE should a nurse caring for a patient with fever	**Option b**	**120**	**79.5**

and cough anticipate using			
7.Use airborne precautions for patients known or suspected to have serious illnesses for the following conditions except: 151 responses	**Option d**	**60**	**39.7**
8.Which is the proper way of disposal of used needles and sharp materials?	**Option c**	**83**	**55%**
9. Wear clean non-sterile gloves for the following except	**Option c**	**65**	**43**
10. Use contact precautions for the following infections except:	**Option c**	**62**	**41**

Figure: 1 Depicts the overall knowledge score of students on standard precautions. 65% of samples had very good knowledge, 4% of samples had good knowledge, 3% of samples had average knowledge and 28% of samples had below average knowledge.

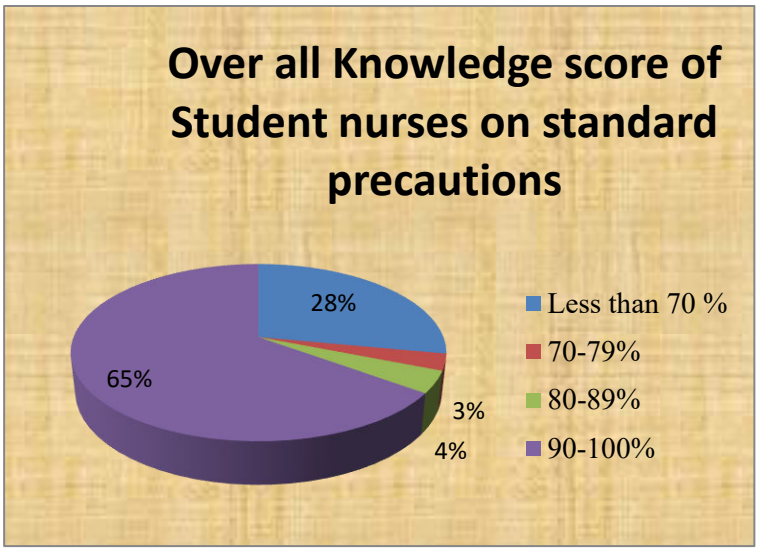

Table 3: Comparisons of standard precaution mean knowledge score and selected demographics (n = 150)

	Very good	Good	Average	Below Average	Total	P Value
Year of study						
III year	65(86%)	2(3%)	2(3%)	6(8%)	75(50%)	
II year	31(45%)	2(3%)	1(1%)	35(50%)	69(46%)	0.001
I year	2(33%)	2(33%)	1(17%)	1(17%)	6(4%)	
Total	98(65%)	6(4 %)	4(3%)	42(28%)	150	
Gender						
Male	16(32%)	3(6%)		31(62%)	50(33%)	0.005
Female	82(82%)	3(3%)	4(4%)	11(26%)	100(67%)	
Total	98(65%)	6(4%)	4(3%)	42(28%)	150	
Age						
22-23	76(72%)	2(2%)	4(4%)	24(22%)	106(71%)	0.001
20-21	14(47%)	2(6%)	0	14(47%)	30(20%)	
18-19	8(57%)	2(14%)		4(29%)	14(9%)	
Total	98(65%)	6(4%)	4(3%)	42(28%)	150	

The above table 3 depicts that Students in higher years (III year) demonstrated a significantly higher mean knowledge score about standard precautions compared to those in the II and I years. Specifically, 86% of III-year students rated their knowledge as "Very good," while only 45% of II-year and 33% of I-year students

gave similar ratings. This difference is statistically significant, with a p-value of 0.001, suggesting that as students advance in their academic studies, their knowledge about standard precautions improves, possibly due to more in-depth exposure and practical experience. There is a notable gender difference in knowledge scores. A significantly larger proportion of female students (82%) rated their knowledge as "Very good" compared to male students, where only 32% rated themselves similarly. Conversely, 62% of male students rated their knowledge as "Below Average," whereas only 26% of female students did so. The p-value of 0.005 indicates a significant gender difference in knowledge scores, suggesting that female students may have better knowledge of standard precautions or perhaps more confidence in their understanding. Age also plays a role in knowledge scores. Students aged 22-23 performed better, with 72% of them rating their knowledge as "Very good." In comparison, only 47% of students aged 20-21 and 57% of students aged 18-19 rated themselves similarly. The p-value for age is 0.001, showing that older students generally have higher knowledge scores, possibly due to more life experience, longer exposure to the subject, or greater academic maturity.

5. Conclusion: Significant difference in knowledge is noted with regard to students' gender and year of study. Female student had significantly higher knowledge compared to the male students and also higher knowledge is associated with participantsage group.
These findings have implications on the current clinical practices and might require a collaborative effort of nursing administrators from the academic and clinical areas to develop effective strategies to overcome this problem.

Knowledge Gaps and Areas for Improvement

Despite the overall positive results, the study identified several areas where student nurses lacked complete knowledge, particularly in relation to specific infection control protocols. For instance, only 47% of respondents correctly identified normal skin flora, and 43% were unaware of the correct procedures for the disposal of used needles and sharp objects. These are critical aspects of infection prevention, and it is essential that nursing students receive more targeted training in these areas.

Furthermore, misconceptions about the applicability of standard precautions in different patient scenarios, such as with immunocompromised patients or those with certain infectious diseases, indicate a need for more detailed and context-specific education. Misunderstanding of sterilization practices, as noted in the responses regarding sterilization being limited to killing microorganisms without removing spores, suggests a gap in knowledge regarding the depth of infection control measures.

Implications for Nursing Education

The findings from this study have several implications for nursing education. First, while most students demonstrated adequate knowledge of standard precautions, the gaps identified highlight the need for continuous and focused educational interventions. Regular in-service training, workshops, and simulation exercises on infection control should be integrated into nursing curricula to ensure that students develop a deeper understanding and practical skills to implement these precautions effectively in clinical settings.

In particular, nursing educators should prioritize training on the proper use of personal protective equipment (PPE), the correct techniques for hand hygiene, and the safe disposal of sharp materials.

Additionally, a focus on reinforcing the rationale behind these precautions, rather than just their implementation, could help students understand the importance of infection control in preventing hospital-associated infections and protecting both patients and healthcare workers.

Another important aspect to address is the difference in knowledge between students of different years. As third-year students tend to have higher knowledge levels, it would be beneficial to offer refresher courses and additional clinical training for first- and second-year students to bring them up to the same level of competency before they enter their clinical placements. A continuous, progressive approach to education may help bridge the gap and ensure that all students have the necessary knowledge to protect themselves and their patients.

Limitations and Future Research

While this study provides valuable insights, it is not without limitations. The cross-sectional design limits the ability to draw causal inferences, and the use of self-reported questionnaires may introduce biases in the responses. Additionally, the study was conducted at a single nursing college, and the findings may not be generalizable to all nursing schools or regions.

Future research should explore the effectiveness of different teaching strategies, such as simulation-based learning or interactive workshops, in improving knowledge and compliance with standard precautions. Longitudinal studies could also track the development of infection control knowledge and practices as students progress through their nursing education and clinical experiences.

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