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Practice of Personal Protective Measures and Rate of Health Hazards Among Nursing Students- A Cross-Sectional Survey

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Abstract: ***Practice of personal protective measures is important in preventing transfer of micro organisms to patients as well as to the health professionals. Proper practice of personal protective measures starts from student period itself to prevent health hazards acquired from clinics in student period as well as in future professional life. This study reveals the Practice of personal protective measures and exposure to health hazards among nursing students.*** **Objectives:** ***To assess the practice of personal protective measures among nursing students, to assess the rate of health hazards among nursing students and to find the association between practice of personal protective measures and rate of health hazards among nursing students.*** **Methodology:** ***The research approach used in this study is Quantitative approach and the Design is Survey design. Sample includes the Nursing students in SreeGokulam Nursing College, Venjaramoodu and sample size was 237. Sampling Technique was total enumeration. Tools include a questionnaire on socio personal variables, a Likert scale to assess practice of personal protective measures and a questionnaire on health hazards among nursing students. Data collection technique was self reporting.*** **Results:** ***The study finding revealed that majority of the undergraduate nursing students have good practice of personal protective measures (49%), 39% of subjects have average practice and only 12% subjects have poor practice. 30% of subjects were exposed to health hazards while 70% of subjects were not exposed. There is no association between practice of personal protective measures and health hazards.***

Keywords: Personal protective measures, Nursing students

1. Introduction

Health care professionals are constantly exposed to microorganisms. Many of which can cause serious or even lethal infections. Nurses, in particular are often exposed to various infections during the course of carrying out their nursing activities. Nursing students are also at risk of such infections and injuries due to accidental contamination during their practical occupational exposure. Exposure to infectious material can be minimized by adherence to standard precautions which are designed to reduce the risk of acquiring occupational infection from both known and unexpected sources in the healthcare setting. The Center for Disease Control and Prevention (CDC) in 1996, introduced a revised version of a preventive concept against nosocomial infections that originated in the 1960s. It advocates basic standard precautions for all healthcare delivery systems and additional specific measures to protect healthcare workers and patients from exposure to potentially harmful microorganisms. Standard Precautions include: hand hygiene, use of personal protective equipments (e.g., gloves, gowns, masks), safe injection practices, safe handling of potentially contaminated equipment or surfaces in the patient environment and respiratory hygiene.

As the incidence of Hospital Acquired Infections (HAIs) has increased globally, emphasis on strict implementation of standard precautions among health care settings has been carried out.Standard precautions have been shown to effectively reduce occupational hazards. Compliance on the part of healthcare workers with standard precautions has been recognized as an efficient and effective means to prevent and control health care-associated infections in patients and health workers.

Studies on standard precautions are increasing all over the world, however there has been limited attention paid on investigating nursing students' understanding and compliance regarding standard precautions within certain localities. Hence this study was conducted.

A questionnaire based survey was conducted among nursing students in Australia and analyzed needle stick and sharps events as a percentage of all students and also as a proportion of all cases. The results showed that a total of 39.5% of needle stick injuries were not reported. The main reason for non –reporting was that the item was un-used, further it was concluded that, although hepatitis B vaccination coverage among the student was excellent, it is important that the principles of infection control training and reporting of all injuries to be emphasized throughout undergraduate nursing education

A cross sectional study was conducted among first, second and third year nursing students of college of nursing attached to a tertiary care hospital of Pune, India to assess, knowledge and awareness amongst the nursing students regarding risk of HIV infection through accidental needle stick injuries. The study findings suggested that 89.6% were not aware of the correct method of disposal of disposable needles andsyringes and the study concluded that, there is an urgent need of correcting the existing misconceptions through educational program early in the course and providing supportive policies.

2. Background and need of the study

Personal protective measures provides a physical barrier between the user and microorganisms from contaminating the mucous membranes, airways, skin, clothing, hair and

shoes of the student nurse, preventing the potential transmission of microorganisms.

Needle stick injuries (NSI) has always been one of the most important risk factor for nursing students for transmission of various infections such as hepatitis B, hepatitis C and human immunodeficiency virus (HIV). Variety of procedures like needle recapping, injuries obtained from the operating room, blood collection or during intravenous line administration, suturing and checking blood sugar can lead to accidental nosocomial injuries.The probability of transmission varies depending on whether the exposure is with a hollow-bore needle or a solid needle due to higher fluid content and pathogen load.

3. Review of literature

A cross sectional study was conducted on knowledge of and compliance with standard precaution among student nurses in a Government University in Samar, Philippines. Data were collected over a period of one month. 58 student nurses were asked to complete the self-report questionnaire regarding standard precautions. Vast majority (89.7%) of the student nurses had good knowledge and had high compliance to standard precautions[1]

A study conducted on infection control among hospital health workers and support workers in an acute hospital and secondary care hospital using an observational design showed that overall compliance with local and international guidelines was satisfied[2]

A quasi-experimental study was conducted on nursing studentsknowledge and practice of infection control precautions. A 16-hour, purpose-designed infection control education programme was implemented for pre-service nursing students in southern Taiwan. Self-administered questionnaires were distributed at three time points during the period September 2005 to April 2006 to examine the sustainability and effectiveness of the intervention. The results showed that,out of 175 pre-service nursing students participated in the study, following the education programme, students in the intervention group showed a statistically significant improvement across time in their knowledge of these precautions [$F_{(2, 180)} = 13{\cdot}53$, $P < 0{\cdot}001$] and confidence in resolving infection-related issues [$F_{(1{\cdot}79, 168{\cdot}95)} = 3{\cdot}24$] when compared with those in the control group[3]

Practice of universal precautions among health care workers was a study conducted among health care workers and the instrument used was a questionnaire that assessed the practice of recapping and disposal of used needles, use of barrier equipments, hand washing, and screening of transfused blood. There were 433 respondents. About a third of respondents (63.8 %) always recapped used needle. Less than 2/3rd of respondent always used personal protective equipment and more than half (56.5%) never used goggles during surgeries[4]

Across-sectional quantitative survey was conducted among nursing students on knowledge and experiences of needle prick injuries among nursing students. The results revealed that a response rate of 96 (74%) was achieved. The average age of the respondents was 23 years, with a minimum age of 18 and a maximum age of 35. The majority (56%) rated needle recapping, disposing used needles (28.1%) and cleaning sharp instruments (56.3%) as extremely high-risk procedures. Furthermore, 30.2% of the respondents thought suturing and blood taking (33.3%) were high-risk procedures for needle prick injuries, while 25% rated administering injections, 35.5% rated blood transfusion and 74.8% rated the lack of adequate containers for sharps disposal to be highly associated with the risk of needle prick injuries. A significant proportion of the respondents rated lack of knowledge about needle prick injuries, policies and protocols at institutions of clinical training as an extremely high risk followed by the lack of accompaniment and in-service training. Only 16.0% of the respondents had suffered needle prick injuries, and only 8.3% had reported the incidence.[5]

The prevalence of needle stick injury at a university teaching hospital of shiraz, Iran was a cross sectional study which evaluated needle stick injuries and practices regarding protective strategies against blood borne pathogens in medical, dental and nursing. These students completed a self administered questionnaire. The questionnaire was completed by 688(53%)students,71.1%(489/685)of the students had needle stick injuries which most commonly (43.6%) occurred in patient rooms.82% of needle stick injuries were not reported.87.8% of the students received information about standardized isolation precautions and 86.2% of them had been vaccinated against hepatitis B.[6]

4. Objectives

- To assess the practice of personal protective measures among nursing students
- To assess the rate of health hazards among nursing students
- To find the association between practice of personal protective measures and rate of health hazards among nursing students

5. Assumption

Majority of the nursing students may not practice adequate personal protective measures

6. Validity and Reliability

Content validity was done by 5 experts from the field of nursing. There was 100%agreements among the experts regarding the item coverage. **I**nternal consistency was calculated using split half method and was found to be 0.94. Stability of the tools was established using test- retest method and was found to be 0.7.

7. Research Design and Approach

- Approach : Quantitative
- Design : Descriptive design

8. Sampling technique

- Setting :SreeGokulam Nursing College
- Population :Nursing students
- Sample :Nursing students in SreeGokulamNursing College, Venjaramoodu
- Sample Size : 237
- Sampling Technique : Total enumeration sampling

9. Tools and Techniques

In this study questionnaire on socio-demographic data, Likert scale to assess practice of personal protective measures and rating scale for rating the health hazards were used.Technique used was Self- reporting.

10. Analysis and Interpretation

Table1: Frequency distribution of subjects according to year of study

Year of study	Frequency	Percentage
I year	72	30.5
II year	65	27.4
III year	42	17.6
IV year	58	24.5
TOTAL	237	100

It is evident from table 1 that 30.5% of subjects were in first year while 27.4% of subjects were in second year, 17.6% in third year and 24.5% in fourth year.

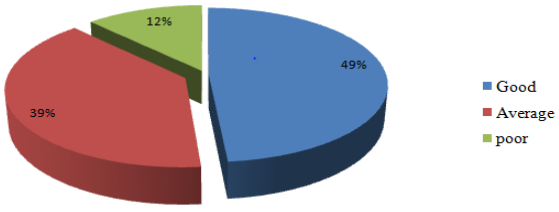

Figure 1: Frequency distribution of subjects according to their practice of personal protective measures (n=237)

It is clear from figure 1that only 49% of students have good practiceof personal protective measures while39% have average practice and 12% have poor practice.

Table 2: Frequency distribution of subjects according to their exposure to health hazards

Variables	Frequency	%
Yes	64	27.0
No	173	73.0
Total	237	100.0

Table 2 shows that 27% of subjects had a history of exposure tohealth hazards, whereasmajority (73%) didn't.

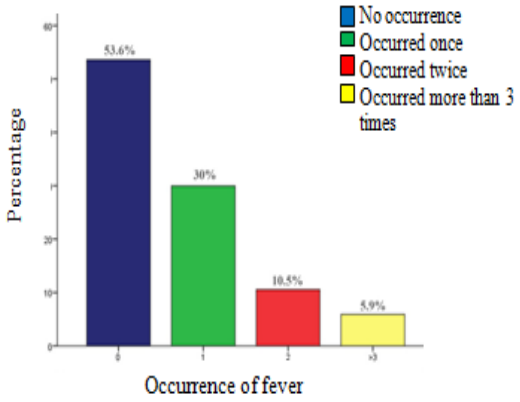

Figure 2: Frequency distribution of subjects according to their exposureto fever within last six months

Figure2 depicts that 30% subjects reported feverfor once, 10.5% of subjects had 2 episode of fever and 5.9% of subjects reported to have morethan 3 episodes of fever within last six months.

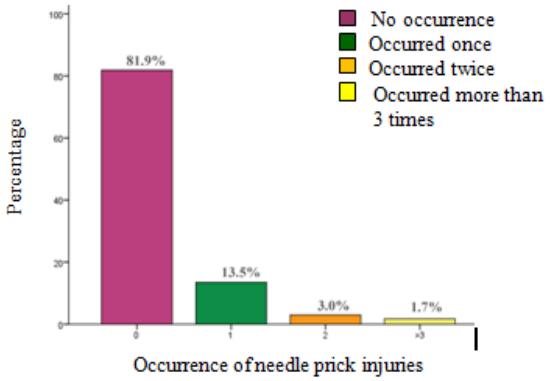

Figure 3: Frequency distribution of subjects according to their exposure to Needle prick injuries within last six months

Figure 3 denotes that 13.5% of subjects reported needleprick injuries for once, 3% of subjects reported 2 episodes of needle prick injuries and 1.7% of subjects had more than 3 episodes of needle prick injuries.

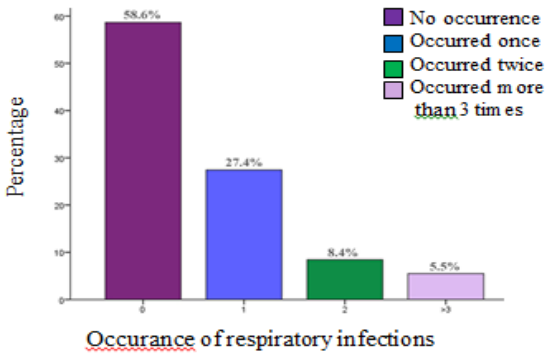

Figure 4: Frequency distribution of subjects according to their exposure to respiratory tract infections within last six months

Figure 4shows that 27.4% subjects had respiratory infections for once,8.4 % of subjects had 2 episode of respiratory infections and 5.5% of subjects had more than 3 episodes of respiratory infections.

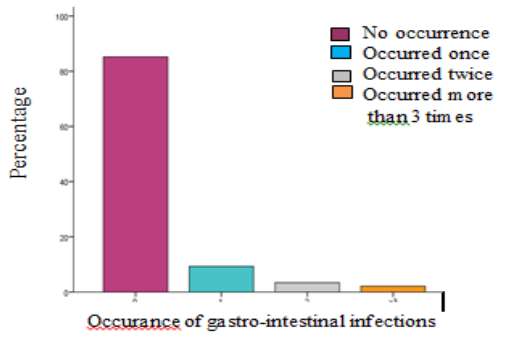

Figure 5: Frequency distribution of subjects according to their exposure to gastro intestinal infections within last six months

It is evident from figure 5 that, 9.3% of subjects had gastro intestinal infections for once,8.4% of subjects had 2 episode of gastro intestinal infections,2.1% of subjects had more than 3 episodes of gastro intestinal infections

Table 3: Association between practice of personal protective measures and health hazards among nursing students

Practice of personal protective measures	Health hazards		χ^2	df	P value
	Yes	No			
Good	30	85			
Average	26	67	0.097	2	p>5.99
Poor	8	21			

Table 3 reflects that there is no significant association between practice of personal protective measures and health hazards among nursing students.

11. Discussion

The present study revealed that the majority of subjects have good practice of personal protective measures, 39% had average practice and only 12% had poor practice. This current study correlates with other studies on exposure to health hazards among nursing students which shows that students are satisfactory well versed with the concepts of standard precautions and had high compliance of standard precaution

The present study revealed that majority of subjects had poor exposure to health hazards.A contradictory study reveals that the student health care workers becomes more involved in patient contact during their training and hence are at risk of exposure to blood borne pathogen. In this study there is no association between practice of personal protective measures and the exposure to health hazards amongnursing students.A study conducted by Leodoro. J.labrague et al in 2012 shows that there is no significant association between knowledge and compliance with standard precautions.

12. Nursing Implications

The findings of this study have implications on nursing practice, nursing education, nursing administration and nursing research.

1) **Nursing Practice**
   By proper use of personal protective measures, rate of health hazards can be reduced.Thereby improved practice leads to rearing efficient nurses in future situations.
2) **Nursing Education**
   Education in nursing has a vital role to play because the strategies to proper practice of personal protective measures will lead to better education.
3) **Nursing Research**
   Research helps to increase the body of knowledge. There is a need for research based standards of practice. Use of research findings should become part of quality assurance evaluation to enhance individual profession as a whole.

12. Limitations of Study

The study participants were nursing students.

13. Recommendations

On the basis of findings of the study, the following recommendations have been made. A similar study can be replicated on a large sample to generalize the findings

- A study can be conducted by including additional dependent variables and can find its association with exposure to health hazards .
- By strict monitoring,increasing the availability of personal protective measures and reinforcing the students, the risk for exposure to health hazards can be reduced

14. Conclusion

This study was able to show that nursing students exhibits good practice of personal protective measures.Among 237 participants 49% have good practice, 39% have average practice and 12%have poor practice. It was also concluded that, the practice of personal protective measures have no relationship with exposure to health hazards among nursing students.

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