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KNOWLEDGE AND COMPLIANCE WITH STANDARD PRECAUTION AMONG STUDENT NURSES

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ABSTRACT

Background: Objective: This study assessed the knowledge and gegree of complience regarding standard precaution among students nurses. **Study Design:** A cross-sectional study. **Setting:** Study was conducted in the Private sector of Faisalabad. **Period:** Jan 2018 t Mar 2018. **Material and Method:** Vast majority (89.7%) of the student nurses have good knowledge (students are satisfactorily well versed with the concepts of standard precautions) (m = 14.45/19) and high compliance (m = 3.59) of standard precautions. **Results:** The use of mask has the highest degree of compliance (m = 3.95) while the use of eye goggles has the lowest degree of compliance (m = 3.19). Findings suggest no significant association between knowledge and compliance with standard precautions. Teaching approaches must be geared towards intensifying further the compliances especially with the use of other protective equipments such eye goggles and gloves. Furthermore, environment that models and promotes standard precaution practices should be developed by the faculty. **Conclusion:** From this research it is possible to deduce that the level of knowledge and respect for standard precautions among the study population is quite high.

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INTRODUCTION

Knowledge and compliance with standard precautions is essential to prevent hospital associated infections and protect patients as well as medical workers from exposure to infectious agents.[1]

Compliance on the part of healthcare workers with standard precautions has been recognized as an efficient means to prevent and control health care-associated infections in patients and health workers.[1]

Compliance with standard precautions has b een shown to reduce the risk of exposure to blood and body fluids.[2]

All healthcare personnel (HCP) who are persons, paid and unpaid, working in healthcare setting who have the potential for exposure to patients or to infectious material including body substances contained medical supplies and equipment, contaminated environment surfaces, or aerosols generated during certain medical procedure. In essence all Health Care personnel are at risk and this include Physicians, Dentists, Nurses, Midwives, Hospital attendants/Health attendants, other Dental personnel, Laboratory personnel and Pharmacists.[3]

Compliance with standard precautions reduces the risk of exposure to blood and body fluids Gershon et *al,*.)Observed that better knowledge of universal precautions among HCWs was one of the correlates of good compliance.[4]

Observed the same among physicians. Knowledge of standard precautions by HCWs may be influenced by their type of training in Korea observed that nurses who were working in the operating room need training to increase their compliance with standard precautions.[5]

The compliance with Standard Precautions (SPs)

guidelines, as a primary strategy for the prevention of healthcare associated infections, is still suboptimal among healthcare providers.[6]

Standard precautions are set of measures formulated to prevent transmission of blood borne pathogens when providing health care. Since identification of patients infected with these pathogens cannot be reliably made by medical history and physical examination, the Centers for Disease Control (CDC) has recommended that standard precautions are used on all patients, regardless of knowledge about their infection status. Health care workers (HCWs) are at risk of various occupational hazards in the hospital, including exposure to blood borne infections such as HIV and hepatitis B and C virus from sharps injuries and contact with body fluids. Due to a poor knowledge and a fair level of awareness among health workers on standard precautions, this study suggests a capacity building of health workers in order to increase their knowledge on the subject matter. Regular training should include the initial biohazard handling, safety policies, and safety practices, safe handling of equipment and materials, monitoring of potential exposure and hazard.

The level of knowledge and implementation of standard precaution in this study is acceptably standard to guarantee infection safety in health workers and patients. This study calls for a need to build the capacity of health workers on standard precaution either through continuous health education Programme or regular training or sponsor for workshop and seminars. This is the most effective and long-lasting means to improve health workers knowledge and foster compliance with standard precaution measures.

Furthermore, research to identify the factors that may potentially influence nurses' compliance and attitude toward SPs should be carried out as changing current practices demands prior knowledge of such factors. In addition to individual factors, organizational factors have also been implicated in reduced compliance with sPs.[7]

It is seen in many hospitals especially in public hospital that most of the student nurses treat the hospitalized patients and exposed to many infections. They do not have enough knowledge how to prevent infections and standards of precautions. Therefore, to keep up with preventive measures, it is necessary to assess the knowledge and compliance of nursing students for the sake of infection control.

OBJECTIVE

To assess the knowledge and degree of compliance regarding standard precautions among student nurses in Private sector of Faisalabad, Pakistan.

OPERATIONAL DEFINITION

Standard precautions:

Standard precautions are a set of infection control practices used to prevent transmission of diseases that can be acquired by contact with blood, body fluids, non-intact skin.

Knowledge and compliance:

Knowledge and compliance with standard precautions is essential to prevent hospital associated infections and protect patients as well as medical workers from exposure to infectious agents.

Compliance:

Compliance on the part of healthcare workers with standard precautions has been recognized as an efficient means to prevent and control health care-associated infections in patients and health workers

HYPOTHESIS

Null Hypothesis:

The selected Nursing student have no knowledge about student precaution.

The selected participation have no compliance about standard precaution.

Alternate Hypothesis:
The selected Nursing students have knowledge about student precaution.

The selected participation have compliance about standard precaution.

MATERIAL AND METHODS

Study Design: A quantitative descriptive cross-sectional study design was used to assess Depression and Its Contributing Factors among Undergraduate Nursing Students
Settings: Study was conducted in the Private sector of Faisalabad, Pakistan.
Duration of Study: 4 Month
Target population: Students of Private sector of Faisalabad, Pakistan.
Sample Size: The data was collected from 150 students of Private sector of Faisalabad, Pakistan.
Sampling Technique: A non-probability convenient sampling technique was utilized to select the proposed sample of undergraduate nursing students.
Sample Selection:
Inclusion Criteria:

- All the male and female students of the school of Nursing.
- Undergraduate BS Nursing and Post RN Nursing.
- All the students who are willing and available at the time of data collection included.

Exclusion Criteria:
The students who are not willing and not available at the time of data collection excluded.

Equipment:
Questionnaire adoptedfrom (Labrague, Rosales & Tizon, 2012)was used to collect data from the nursing students.

ETHICAL CONSIDERATIONS

- Written informed consent attached was taken from all the participants.
- All information and data collection was kept confidential.
- Participants remained anonymous throughout the study.
- The subjects were informed that there are no disadvantages or risk on the procedure of the study.
- They were also informed that they were free to withdraw at any time during the process of the study.
- Data was kept in under key and lock while keeping keys in hand. In laptop it was be kept under password.

DATA COLLECTION PROCEDURE

Questionnaire adopted from (Labrague, Rosales & Tizon, 2012) was used to collect data from the students' nurses. Questionnaires consist of two sections, (Section A) composed of demographic data Name (Optional), Age, Sex, & Marital status. (Section B) composed of questions regarding the knowledge of and compliance with standard precautions among student nurses 17 questions, the participants can answer these questions by providing five options (Always, Usually, Sometime, Seldom & Never). After floating Questionnaire among the participants the data was analyzed through SPSS version 21 for Descriptive statistics and finding mean, frequencies, validity and reliability. Consent was taken from all the participants and free hand were given to the participants to take part in the study or refused to participate.

DATA ANALYSIS PROCEDURE

The questionnaire consists of two parts of analysis No 1 Demographic data of analysis which include 4 questions that include Age, Gender, Marital status and No 2 Knowledge of and Compliance with Standard Precautions Among Student Nurses., the data is collected through questionnaire, distributed in 150 students. The collected data is analyze and computed using frequency, table and charts through SPSS version 21.

RESULTS

There were 58 participants in my study. There were 10 (17.2%) of whom 58 men and 48 (82.8%)

women who responded. Most respondents are 53 (91.4%) in the 21 to 23 age group with an average age of 21.5 years. For the most part, all participants 56 (96.6%) were single, while only 2 (3.5%) were married

Table 1. Participant Demographics

Variable		N	Percentage (%)
Age		58	100
	21-23	53	91.38
	17-20	5	8.62
Gender	Female	48	82.76
	Male	10	17.24
Marital Status	Single	56	96.55
	Married	2	3.45

Table 2. Responses to Questions Regarding Knowledge on Standard Precautions

Statements	Correct Answer	Frequency	Percentage
1. Nosocomial infection…			
A. The environment (air, water, inert surfaces) is the major source of bacteria responsible for nosocomial infection	No	6	10.34
B. Advanced age or very young age increases the risk of nosocomial infection	Yes	47	81.03
C. Invasive procedures increase the risk of nosocomial infection	Yes	51	91.07
2. Precaution standards…			
A. Include the recommendations to protect only the patients	No	53	91.38
B. Include the recommendations to protect the patients and the healthcare workers	Yes	58	100
c. Apply for all the patients	Yes	49	84.48
D. Apply for only healthcare workers who have contact with body fluid	No	45	77.58
3. When is hand hygiene r ecommended ?			
A. Before or after a contact with (or care of) a patient	No	29	50
B. Before and after a contact with (or care of) a patient	Yes	56	96.55
c. Between patient contacts	Yes	37	63.79
d. After the removal of gloves	Yes	49	84.48
4. The standard precautions recommend use of gloves			
a. For each procedure	No	6	10.34
B. When there is a risk of contact with the blood or body fluid	Yes	58	100
c. When there is a risk of a cut	Yes	57	98.27
D. When healthcare workers have a cutaneous lesion	Yes	54	93.10
5. When there is a risk of splashes or spray of b lood and body fluids, the healthcare workers must w ear			
a. Only mask	No	54	93.10
b. Only eye protection	No	56	96.55
c. Only a gown	No	55	94.83
d. Mask, goggles, and gown	Yes	57	98.27

Most participants (n = 51, 91.1%) agreed that invasive procedures increase the risk of transmission of infections, while 89.7% (n = 52) believe that the environment is the main source of infection. bacteria responsible for nosocomial infection. With regard to information on standard precautionary objectives, all participants (n = 58, 100%) knew that the ultimate goal of standard precautions is to protect both health professionals and patients from the transmission of infection, while 84, 5% (n = 49) thought to apply to all patients. Only 8.6% (n = 5) believed that the standard precaution was aimed at protecting only patients from infection. Regarding knowledge on hand hygiene, 96.6% confirmed that hand hygiene is recommended before and after contact with a patient, while half of respondents (n = 29, 50%) reported that it is recommended before or after contact with a patient. All respondents (n = 58, 100%) agree with the use of gloves when there is a risk of contact with blood or body fluids, while 89.7% (n = 52) think that gloves should be worn for all procedures. Finally, almost all respondents (n = 57, 98.3%) know that when there is a risk of splashing or jets of blood and body fluids, health workers should rub the mask, glasses.

Table 3. Knowledge of Student Nurses on Standard Precautions

Marks Range	Frequency (n=58)	Percentage (%)
16-19	25	43.10
12-15	27	46.55
8-11	5	8.62
0-7	1	1.72
Average Score	14.45	

Table presents the participant's collective votes in

the questionnaires on standard precautions. Almost half (46.6%) of respondents obtained a score between 12 and 15, interpreted as "Good knowledge", while 43.1% obtained a score between 16 and 19, which is interpreted as "Ottima knowledge". In general, nursing students have "great knowledge" of standard precautions with a weighted average of 14.45

Figure 4. Compliance with Standard Precautions

Compliance Activity	Degree of Compliance					
	Always (n)%	Usually (n)%	Some times (n)%	Seldom (n)%	Never (n)%	WM
Washes hands when comes in contact with different patients	(38) 65.52	(7) 2.07	(2) 3.45	(7) 12.07	(4) 6.90	3.17
Washes hands after taking off the gloves	(33) 56.89	(17) 29.31	(6) 10.34	(1) 1.72	(1) 1.72	3.38
Washes hands immediately after contacting any blood, body fluid, secretion, excretion & dirty substances	(54) 93.10	(4) 6.89	(0) 0	(0) 0	(0) 0	3.93
Wears gloves when drawing blood samples	(38) 65.52	(12) 20.69	(1) 1.72	(1) 1.72	(4) 6.90	3.29
Wears gloves when disposing stool and urine	(47) 81.03	(4) 6.90	(3) 5.17	(2) 3.45	(2) 3.45	3.59
Wears gloves when handling impaired patient skin	(39) 67.24	(9) 15.52	(7) 12.07	(3) 5.17	(0) 0	3.45
Wears gloves when handling patients' mucosa	(54) 93.10	(1) 1.72	(3) 5.17	(0) 0	(0) 0	3.88
Wears gloves when handling saliva or sputum culture	(53) 91.38	3 (5.17)	(2) 3.45	(0) 0	(0) 0	3.88
Wears gloves when performing parenteral injection of medications	(19) 32.76	(17) 29.31	(5) 8.62	(7) 12.07	(10) 17.24	2.48
Wears gloves when pressing wounds	(33) 56.90	(13) 22.41	(8) 13.79	(1) 1.72	(3) 5.17	3.24
Wears gloves when cleaning blood trace	(39) 67.24	(16) 27.59	(0) 0	(3) 5.17	(0) 0	3.57
Wears gloves when comes In contact with blood	(55) 94.83	(3) 5.17	(0) 0	(0) 0	(0) 0	3.95
Wears mask when performing operations/ procedures that might induce spraying of blood, body fluid, secretions & excretions	(55) 94.83	(3) 5.17	(0) 0	(0) 0	(0) 0	3.95
Wears protective eye patch or goggle when performing operations/ procedures that might induce spraying of blood, body fluid, secretions and excretions	(44) 75.86	(3) 5.17	(0) 0	(0) 0	(11) 18.96	3.19
Wears protective suit or gown when performing operations/ procedures that might induce spraying of blood, body fluid, secretions and excretions	(54) 93.10	(4) 6.90	(0) 0	(0) 0	(0) 0	3.93
Do not recap syringe after using	(43) 74.14	(5) 8.62	(6) 10.34	(1) 1.72	(3) 5.17	3.45
Disposes needles & blades in a sharp disposal box or receptacle after using	(48) 82.76	(5) 8.62	(3) 5.17	(1) 1.72	(1) 1.72	3.69

As shown in the table, most respondents (n = 54, 93.1%) wash their hands immediately after contact with blood, body fluids, secretions, excretion and dirty substances, and more than half Wash their hands when they enter in contact with different patients. and after taking gloves with 65.5% and 56.9% respectively.

Table 5. Summary of Compliance of Standard Precautions

Components of Standard Precautions	Weighted Mean	Rank
Hand washing	3.49	4
Use of Gloves	3.40	5
Use of Masks	3.95	1
Use of Eye goggles	3.19	6
Use of Protective Suit	3.93	2
Proper disposal of used needles	3.57	3
Grand Mean	3.59	

Table 6: Correlation between Knowledge and Compliance of Standard Precautions

Variables	r-value	p-value
Knowledge and Compliance of Standard Precautions	0.051449	0.386

Regarding the use of gloves, the vast majority of participants used gloves for stool disposal and urine (n = 47, 81.0%), during the patient's mucosal manipulation (n = 54, 93.1%) , saliva and spit culture (n = 53, 91.4%) and when it comes into contact with blood (n = 55, 94.8%). However, a lower degree of compliance (12.1%, rarely, 17.2%, ever) was observed when wearing gloves during parenteral injection of drugs.

Most respondents adhere to the use of a face mask and protective gown or when performing procedures that can induce blood sputtering, body fluids, secretions and excretions with compliance rates of 94.8% (n = 55) and 93.1 % (n = 54), however, a significant percentage of non-compliance (n = 11, 18.9%) was observed with the use of plasters and protective glasses.

Regarding the care of used needles, 82.8% (n = 48) discarded needles and blades in a waste box or sharp container after use, and almost three quarters (n = 43, 74.14%) did not become cover the syringe after using it. In general, student nurses have a standard precaution of "high compliance" with an average of 3.59. When the elements were grouped into the 6 components, an average was calculated for all the elements of each component for each respondent. The global averages were then calculated based on the respondents' average scores for each item. The data indicate that the use of the mask has the highest degree of compliance with a weighted average of 3.95 which is interpreted as "High compliance". On the other hand, the use of glasses has the lowest degree of compliance with a weighted average of 3.19, which is interpreted as "average compliance".

Table 6 shows the relationship between the knowledge of nursing students and compliance with standard precautions. As seen in the table, the relationship between the knowledge of nursing staff and compliance with standard precautions has registered an r value of 0.051 with a calculated p-value of 0.386 which was lower than its critical value of 2.00 at a level of meaning of 0.05

DISCUSSIONS

Forty eight of the 50 nurses surveyed had received formal training regarding SPs while 49 expressed fair knowledge of SPs. High compliance (97%) with hand washing while low compliance (65%) with the use of gloves was observed. A high proportion (72% of nurses) considered SPs as idealistic, waste of resource and interference in work and 84% accepted overlooking compliance with SPs when under heavy workload. Almost all respondents deemed institutional provision of sharps bins, masks, gloves and antiseptic liquids as acceptable but more than half described availability and/or accessibility to surgical gloves, eye goggles and plastic aprons as unsatisfactory. Most nurses (> 80%) perceived occupational health risks adequately but the practice of post-exposure screening and prophylactic vaccination was seen in less than 35% of the nurses.[7]

Overall, 98 (97.0%) nurses had heard about standard precautions; had not , despite being in daily practice; all had pr ofessional experience < 5 years. The remai ning knowledge questions were answered b y those who were aware of standard preca utions. Among them 51 (52.0%) had obtaine d informationaboutthe concept of standard precaution from seminars and workshops, 3 1 (31.6%) from classroom lectures given by their teachers and only 16 (16.3%) got t heir knowledge of standard precautions fro m books.[8]

Healthcare-associated infections (HAIs) can be considered the most frequent adverse event that occurs in providing healthcare worldwide .It has been estimated that over 4 million patients in Europe and 1.7 million in the United States develop a HAI every year, with a higher prevalence in developing countries.[9]

Further, around half of the students did not tell anyone about the injuries nor have done any blood test after the NSI incidence. Most of the NSI cases occurred in the emergency units and the medical surgical units. Omer et al. (2015) showed that the NSIs represent the most common mode of exposure in 189 (75.9%) healthcare personnel;[19] while Salmanzadeh et al. (2015) showed that the highest frequency of NSIs were observed among medical staff (79.7%).[9]

A study by Ask Arian and Malekmakan (2006) reported that 71.1% (489/688) of the students experienced NSIs which usually occurred in the patient rooms (43.6%); while 82% (401/489) of NSIs were not reported. Similarly, a study by Shiao et al. (2002), revealed that the incidences of NSIs during the internship years accounted for 61.9 % (438/708)of students, 14.2%(62/438) of whom madea formal report, and the dominant part (70.1%) have not reported NSI incidences in the patient's room. Moreover, the hollow-bore needles added to half (219/438) of the NSIs of which 86.8% were syringe needles. Simply over half (53.2%) of those things required in NSIs had been utilized on patients, and therefore, reported NSIs as well as non-reporting of NSIs were very common among.[10]

According to the U.S. Centers for Disease Control (CDC) more than 2 million infections start every year in a hospital, nursing home or another healthcare setting, 70,000 people die every year as the result of getting an infection in a hospital, nursing home or another healthcare setting, every infection that is caught in a hospital, nursing home or other healthcare setting. Nosocomial infections(NCI) are the most frequently reported adverse events in health care delivery. As the incidence of nosocomial infection has increased globally, more than 1.4 million people worldwide acquire infectious complications in hospitals annually.[8]

The results of this study indicated that student nurses were aware of standard precautions. Kim et al. He also reported that knowledge of standard precautions was better among nursing students than among medical students. This completely disagrees with the Bamigboye and Adesanya study, where only 46.2% of student nurses had very good knowledge. Studies among the nursing population also showed a similar result to this study. Vaz et al. He also reported that 90.0% of nurses were aware of standard precautions.

Good knowledge of standard precautions among nursing students may be due to the inclusion of standard precautionary concepts in the Philippines nursing curriculum. It is worth noting this result, since a previous study suggests that one of the factors influencing compliance with standard precautions in any hospital environment is a solid understanding of concepts and principles. Sax et al. reported that lack of knowledge is the main reason for not complying with standard precautions and isolation. However, the result of this investigation does not agree with previous studies conducted between nurses and other doctors on knowledge of aseptic techniques and standard precautions in the hospital setting. Melo et al. They examined nurses in a hospital in Goiania, Brazil, and found that only 75.6% understood standard precautions as protective measures.

In the survey by Luo et al of 1444 nurses, only half (n = 722) whose were aware of all the standard precautions, while Abdulraheem et al. noted that half (50%) of health workers were not aware of universal precautions. The results of this study also showed that knowledge of nosocomial infection was the lowest of the five components of standard precautions. The students did not know exactly what or who were the main sources of bacteria responsible for nosocomial infection, since most of them thought that the environment was the main source of bacteria. This reinforces the need to

intensify and reinforce the teachings on standard prudence in the classroom

Regarding compliance with standard precautions, the results revealed that the students had high compliance. This may be due to rigorous control by the teaching staff in relation to standard precautionary practices during clinical rotation. Furthermore, the percentage of students per faculty during the clinic could also be attributed to this compliance. Due to the limited number of students compared to the number of teachers, they were able to monitor and monitor their students while performing standard precautionary practices. It is important to consider this result, since not using and applying standard precautions could be responsible for problematic and intractable infections This result, however, is not comparable to the studies carried out by previous authors.

Although most students know that health professionals should wear masks, glasses and gowns when there is a risk of splashing or splashing of blood and body fluids, surprisingly, compliance with the use of eye patches or goggles it was relatively low. This can be attributed to the lack of availability of personal protective equipment in every hospital ward where they are rotated. This result is similar to that of Luo et al. where they observed that the use of protective items such as eye shields, masks and quarantine clothing among Chinese nurses was the lowest. Sadoh et al. He also noted that less than two-thirds of health workers wore personal protective equipment, such as aprons, gowns and gloves, during surgery and deliveries.

The central result of this research was the lack of a significant association between knowledge and compliance with standard precautions. This implies that knowledge of standard precautions does not necessarily affect compliance and application. This result is not compatible with other authors. In the study by Kim et al. revealed that knowledge is correlated with the implementation of universal precautions] This result contradicts the results of other authors strongly suggest that knowledge of standard precautions was positively correlated with respect, confirming that greater knowledge of standard precautions, compliance with the activity is better [13-15, 23, 24]. It is clear that knowledge alone cannot be the determining factor for compliance with standard precautionary practices. Furthermore, the results indicate that there is a dichotomy between theory and practice, as suggested by many authors.

CONCLUSION

From this research it is possible to deduce that the level of knowledge and respect for standard precautions among the study population is quite high. However, teaching should be strengthened, in particular with regard to the concepts of nosocomial infection and hand hygiene in which the students obtained a lower score. Future educational strategies can be improved through intensive demonstration of the return of effective use of protective devices such as masks and glasses, which require students to present a written diary, nursing care plans (NCP) and an anecdotal demonstration record and integration of standard precautionary practices during clinical exposure. Furthermore, nursing educators may need to provide an environment that shapes and promotes standard precautionary practices through positive role models. Snow et al. reported that tutor hand hygiene practices influence student hand hygiene practices, and Feather et al. They stressed the importance of teachers who model good clinical practice.

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