



A STUDY TO ASSESS KNOWLEDGE AND COMPLIANCE REGARDING UNIVERSAL SAFE PRECAUTIONS AMONG NURSES IN A REFERRAL HOSPITAL OF DELHI.

Tejinder Singh

Army Medical Corps., India

Amandeep Kaur*

Professor, Department of Biochemistry, Sri Guru Ram Das Institute of Medical Sciences and Research, Amritsar *Corresponding Author

ABSTRACT

Introduction Universal precautions include a group of infection prevention practices that apply to all patients, regardless of suspected or confirmed infection status, in any setting in which healthcare is delivered. Taking this into concern the present study was conducted with the aim to assess the knowledge and compliance of Universal safe precautions among nurses of a Referral Hospital. **Material And Method** This cross-sectional observational study included 40 participants who were selected by randomization method. A structured questionnaire was designed and developed to assess knowledge and compliance. For data analysis, descriptive statistics in the form of frequencies and percentages was used. **Results** All the participants were females in age group of 24-46 yrs. Among all, only 4 nurses have average knowledge score i.e. < 80%, 31 nurses have good knowledge i.e. 80-87% and only 5 have very good knowledge score i.e. > 90%. It was observed that the compliance rate was very low during giving injections i.e. 55% only. Use of protection protective equipment was also not meticulously being followed by all; the compliance rate was between 65-70%. It was also observed that only 10% study population was aware regarding the precautions to be taken after workplace accidents with potentially contaminated sharp materials. **Conclusion** There was adequate knowledge and a fair level of compliance among nurses towards Universal Precautions. Specific training programs may have to target health care workers to establish acceptance of appropriate practices that will enable them to adopt and adhere to universal precautions.

KEYWORDS : Universal precautions (UP), health care workers, nurses, compliance, knowledge regarding universal safe precautions, infections

INTRODUCTION

Health worker's knowledge regarding universal precautions measures is important, as studies show that adherence to these safety measures in health institutions may be related to the knowledge of professionals.^[1] Universal precautions intend to prevent in the health care staff parenteral, mucus membrane, intact and non-intact skin exposure to pathogens by preventing their exposure to blood and body fluids from all patients as if they were all potentially infectious with blood-borne pathogens.^[2] The CDC proposed a series of procedures to prevent and minimise health care workers exposure to these particular viruses. Universal precautions (UP) practices are important as uncertainties about appropriate safe working practices may lead to occupational hazards and cause injuries to staff. Data from a surveillance report (CDC, 1993) showed that nurses are the most frequently involved in either documented or possible occupationally acquired HIV infection.^[3]

The literature shows that knowledge regarding universal precautions measures is lower than desired, many professionals do not have adequate knowledge about universal precautions and those who have knowledge do not adhere to compliance of universal precautions while dealing with patients in health care settings. This is a major concern for various healthcare organisations. There is a necessity to reinforce and clarify the concept of Universal Precautions among nurses. So, the present study was conducted with the aim to measure knowledge about universal safe precautions and to investigate their compliance towards universal precautions among nurses of a Referral Hospital in Delhi. Such information would be useful in identifying specific areas that may need further attention in the continuing education of nursing personnel and in providing feedback to them about improving safe practices.

MATERIALS AND METHOD

Study Design:

The descriptive cross-sectional study was conducted in a Referral Hospital of Delhi.

Study population/ Sample size/ Mode of selection:

Out of 234 nurses of this hospital, 40 nurses were selected for

the study by Random- lottery method of randomisation. Sample population was selected through randomization to eliminate any bias due to qualification, position and number of years of experience. All participants were apprised of the study to be carried out on them and their informed consent was obtained. All participants have been professionally active for one year or more, in direct patient care, hospital hygiene, processing of clothing and waste materials.

Method of data collection:

The data was collected from the participants with the use of pre validated structured questionnaire to assess the knowledge and compliance of Universal Safe precautions. The questionnaire was distributed to the participants during their duty hours. The participants were required to fill the questionnaire and return it on the same day to avoid any response bias because of any collaboration amongst them. Only questionnaires that were complete were included for the final analysis and incomplete ones were excluded from the final analysis.

Type of data collection:

The data was collected through questionnaire based on knowledge and compliance of Universal safe precautions. The survey also collected socio-demographic details including age, sex, professional qualification and years of experience, along with the questions related to knowledge and compliance of universal safe precautions.

Data analysis:

The data was collected and analysed statistically using SPSS software. The primary data was compiled, analysed and based on the findings, necessary recommendations and conclusions were made.

Type of interview:

The data collection was done by indirect interview through a structured questionnaire.

Type of questionnaire:

In this study, a structured questionnaire guided by the research objectives, considering the study population was taken. The questionnaire was in English, using simple basic

questions and statements to enhance clarity. The questionnaire had three main parts, namely, socio-demographic information, questions regarding knowledge of universal safe precautions and questions to assess the compliance of Universal safe precautions among nurses. The limitation of the study was that the compliance of Universal Safe precautions could not be observed but evaluated based on indirect interview through structured questionnaire.

OBSERVATIONS

Demographic characteristics of the study population:

The study population comprised of forty nurses from various units of a Referral Hospital. The study population comprised of all females. The demographic details of the study population are shown below:

Table 1 a): Demographic details of the study population by age

Number (N)	40
MeanSD (years)	29.055.46
Minimum age (years)	24
Maximum age (years)	46

Table 1b): Distribution of study population according to age

Age (years)	Frequency	Percentage
24	8	20.0
25	2	5.0
26	6	15.0
27	5	12.5
28	3	7.5
29	2	5.0
30	5	12.5
32	2	5.0
33	1	2.5
34	1	2.5
37	1	2.5
39	1	2.5
42	2	5.0
46	1	2.5
Total	40	100.0

The data given in Table 1a and b shows that the age of the nurses ranged from 24-46 years. Majority of the nurses; about 77.5% of the total were in the age group of 24-30 years.

Table 2 a): Details of study population according to experience:

Number (N)	40
MeanSD (years)	6.245.31
Minimum years of experience	1.5
Maximum years of experience	22

Table 2 b): Distribution of study population according to experience:

Years of experience	Frequency	Percentage
1.50	1	2.5
2.00	8	20.0
2.20	1	2.5
2.50	2	5.0
3.00	4	10.0
4.00	2	5.0
5.00	6	15.0
6.00	2	5.0
6.50	1	2.5
7.00	2	5.0
7.50	1	2.5
8.00	1	2.5
8.50	2	5.0
9.00	2	5.0
13.00	1	2.5
16.00	1	2.5

20.00	1	2.5
21.00	1	2.5
22.00	1	2.5
Total	40	100.0

The data given in Table 2a shows that the years of experience of the nurses ranged from 1.5-22 years with meanSD of 6.245.31. Table 2b shows that 57.5% of nurses having experience between 2-5 years. Majority of the nurses are having work experience of 2 years (8/40) and 5 years (6/40).

Table 3 a): Knowledge score of the study population about Universal Safe Precautions:

Number (N)	40
MeanSD (score %)	84.805.91
Minimum score (%)	67
Maximum score (%)	93

Table 3 b): Distribution of Knowledge score regarding Universal Safe Precautions among the study population:

Score (%)	Frequency	Percentage
<80% (average)	4	10
<90% (good)	31	77.5
>90% (very good)	5	12.5
Total	40	100.0

The data shows that the knowledge score of the study population ranged from 10- 14 marks out of total 15 marks which were expressed in percentage as 67-93% with meanSD of 84.805.92 (Table 3a). Among all, only 4 nurses have average knowledge score i.e. < 80% and 31 nurses have good knowledge i.e. 80-87%. Out of 40 nurses, only 5 have very good knowledge score i.e. > 90% (Table 3b). So, majority of nurses, 77.5% attained good knowledge score.

The knowledge score of the nurses was calculated by their responses to the questionnaire which comprised of 15 questions based on knowledge regarding UPs. Every right response to the question carried 1 mark and then total percentage was calculated for each question by getting the responses of all the participants to that one particular question.

From the below data it was observed that all of them were aware of Universal precautions but they have very sparse knowledge about the main objective of the UPs i.e only 12.5% nurses were aware of the objectives of UPs. 87.5% nurses were not in favour with the statement 'Universal Precautions should only be used in patients diagnosed with infection or patients who are in the incubation period for a given infection' whereas 12.5% participants were having wrong information regarding this. All of them have satisfactory knowledge about other knowledge variables of UPs. The data stated that all of them were well versed with the protocol of hand washing, use of gloves, usage of PPE and precautions to be taken while providing care to patients of tuberculosis, chicken pox, intestinal and skin infections. (Table 4)

Table 4: Knowledge of study population about Universal Safe Precautions on selected variables:

Universal Precautions knowledge variables	Response of nurses (%)	
	True	False
1. Do you know what the Universal Precautions measures are?	100	0
2. Universal Precautions should only be used in patients diagnosed with infection or patients who are in the incubation period for a given infection	87.5	12.5
3. The adherence to the Universal Precautions measures has main objective to protect the health care workers	15	85

4. When in contact with blood or any other potentially contaminated materials, wash hands immediately	97.5	2.5	8. Procedures involving the possibility of touching a patient's airway discharges.	95	2.5	2.5	0	0
5. Hand hygiene should be performed while providing care to different patients	100	0	9. Intramuscular or subcutaneous injections.	55	25	5	5	10
6. Since gloves may prevent hand contamination, it is not necessary to wash hands after removing gloves	95	5	10. Dressing of wounds.	97.5	2.5	0	0	0
7. Personal Protective Equipment (PPE) should not be shared	100	0	11. Cleaning for blood removal.	97.5	2.5	0	0	0
8. In blood collection or venipuncture procedures, the use of gloves is required	97.5	2.5	12. Venipunctures.	92.5	5	2.5	0	0
9. In procedures where hand contact with secretion or excretion occurs, glove use is required	100	0	13. Contact with blood samples.	92.5	7.5	0	0	0
10. Gloves should be changed between care of different patients	97.5	2.5	14. Wears a protection mask when there is a possibility of touching drops of blood, bodily fluids, discharges	87.5	2.5	7.5	0	2.5
11. In procedures where there is a possibility of blood, body fluids, secretion or excretion spilling, protective masks, goggles, apron or face shield should be used	95	5	15. Wears protection glasses when there is a possibility of touching drops of blood, bodily fluids, or discharges	75	2.5	0	12.5	10
12. In situations where blood splatters, body fluids, secretion or excretion may occur, disposable caps and hats should be used	92.5	7.5	16. Wears a protection apron when there is a possibility of touching drops of blood, bodily fluids, or discharges	65	10	10	12.5	2.5
13. It is forbidden to bend or recap needles. When necessary, perform the one-hand recapping method. Disposal containers should be near the handling area	97.5	2.5	17. Wears disposable caps and shoe covers when there is a possibility of touching drops of blood, bodily fluids, or discharges	67.5	0	17.5	12.5	2.5
14. When providing nursing care to patients with active tuberculosis or chickenpox, it is necessary to adopt the Standard precautions measures in addition to the droplet precautions measure	100	0	18. Does not recap used needles or uses the one-hand recapping method.	77.5	2.5	7.5	2.5	10
15. When providing nursing care to patients with intestinal infections or skin infections, Standard precautions should be taken in addition to contact precautions	95	5	19. Disposes needles, blades, and other sharp materials in containers that are specific for that purpose.	97.5	2.5	0	0	0
			20. After workplace accidents with potentially-contaminated sharp materials, immediately squeezes the affected part, washes it, disinfects it, and dresses the wound.	82.5	5	2.5	0	10

Table 5: Compliance of study population to Universal Safe Precautions on selected variables:

Universal Precautions compliance variables	Response of nurses (%)				
	Always	Often	Sometimes	Seldom	Never
1. Sanitizes hands in between treating different patients.	90	10	0	0	0
2. Sanitizes hands after taking off gloves.	80	15	2.5	0	2.5
3. Sanitizes hands immediately after touching potentially-contaminated biological materials.	95	5	0	0	0
Wearing gloves in procedures in which there are possibilities for getting in contact with the potentially-contaminated biological materials listed below:					
4. Blood collection.	92.5	5	2.5	0	0
5. Procedures involving the possibility of touching urine or feces.	87.5	10	0	0	2.5
6. Procedures involving the possibility of touching a patient's non-intact skin.	82.5	12.5	2.5	0	2.5
7. Procedures involving the possibility of touching a patient's mucous membrane.	95	2.5	2.5	0	0

Table 5 shows the percentage of the nurses' response for the compliance to UPs. The compliance score was assessed as per their response on the questionnaire regarding compliance of UPs which was described in 5 point likert scale i.e. always, often, sometimes, seldom and never. It was observed that they have adequate knowledge of wearing gloves in procedures where there is possibility of getting in contact with contaminated biological material but the compliance rate was very low during giving injections i.e. 55% only. Use of protection apron, caps, and shoe covers was also not meticulously being followed by all; the compliance rate was between 65-70%. It was also observed that the compliance for 20th variable was very low, only 10% study population was aware regarding the precautions to be taken after workplace accidents with potentially contaminated sharp materials. For rest of variables, compliance to UPs was satisfactory among nurses.

DISCUSSION

Nurses are the largest occupational group in any health care agency. By virtue of their job responsibility they are frequently exposed to blood and body fluids. The nurses' risk of exposure to health hazards and the nurse as a cause of iatrogenic infection to the patients are equally challenging issues to the nurses all over the world. By using simple techniques of universal precautions nurse can avoid dangerous occupational hazards and the knowledge of Universal precautions can make nurses confident to deal with the patients having various infections. Thus, it is a need to educate the nurses regarding Universal precautions as an effective strategy to prevent HAI.

In view of importance for prevention of occupational hazards and minimizing the spread of blood borne diseases, the

present study was conducted in 40 nurses working in Army Hospital Research and Referral, Delhi Cantonment. They were selected by random sampling technique. All the participants were females. In the present study, mean age of participants was 29.055.46 years ranged from 24-46 years. Majority of the nurses; about 77.5% of the total were in the age group of 24-30 years (Table 1a and 1b). The data shows that 57.5% of nurses were having work experience of 2-5 years. (Table 2a and 2b)

All the participants were given a questionnaire that contained 15 questions regarding the knowledge of UPs, marks obtained ranged from 10-14 marks. Regarding the knowledge of Universal precautions, only 4 nurses have average knowledge score i.e. < 80% while 31 nurses have good knowledge i.e. 80-87%. Out of 40 nurses, only 5 have very good knowledge score i.e. > 90% (Table 3b). So, majority of nurses, 77.5 % attained good knowledge score. It was observed that all of them were aware of Universal precautions but they have very sparse knowledge about the main objective of the UPs i.e only 12.5% nurses were aware of the objectives of UPs. This finding was in accordance with the study conducted by Zaveri J et al^[4] among medical laboratory technicians to assess the knowledge, attitude and practice of UPs. 87.5% nurses were not in favour with the statement 'Universal Precautions should only be used in patients diagnosed with infection or patients who are in the incubation period for a given infection' whereas 12.5% participants were having wrong information regarding this. All of them have satisfactory knowledge about other knowledge variables of UPs. The data stated that all of them were well versed with the protocol of hand washing, use of gloves, usage of PPE and precautions to be taken while providing care to patients of tuberculosis, chicken pox, intestinal and skin infections. (Table 4) These findings were in accordance with the results observed by Ogoina D^[5], Bolaji-Osagie SO et al^[6] and Vaz K et al.^[7] This study showed that the knowledge and awareness of universal precautions among some of the participants was variable. The adequate knowledge of Ups among nurses may reflect the fact that universal precautions have been incorporated in the curriculum of nursing students and in- job training and orientation programmes to be conducted.

The level of practice of UPs by health care workers may differ from one type of health care worker to another. In the present study, the compliance score was assessed as per their response on the questionnaire consist of 20 questions regarding compliance of UPs which was described in 5-point likert scale i.e always, often, sometimes, seldom and never. It was observed that they have adequate knowledge of wearing gloves in procedures where there is possibility of getting in contact with contaminated biological material but the compliance rate was very low during giving injections i.e., 55% only. Use of protection apron, caps, and shoe covers was also not meticulously being followed by all; the compliance rate was between 65-70%. It was also observed that only 10% study population was aware regarding the precautions to be taken after workplace accidents with potentially contaminated sharp materials. For rest of variables, compliance to UPs was satisfactory among nurses. These findings were in accordance with the various studies conducted by researchers Kotwal A et al^[8], Dhaliwal B et al^[9] and Jawaid M et al.^[10]

The present study has its own limitations, to begin with; the study assessed the self reported compliance of practice of practice of 'Universal precautions', while the actual practice may be even lower. The results of this study could not be extrapolated to other groups of health care workers because they had not been included in the study. However, this study has to some extent been able to assess the training needs of the nurses. Similar studies on different groups of healthcare

workers are needed to determine whether knowledge and compliance differ in different groups and data from such studies will be useful for hospital authorities for improvement of health care facilities.

CONCLUSION

The present study showed satisfactory knowledge and low level of compliance among nurses towards Universal Precautions. UPs are vital measures that have been adopted to help prevent health care workers from being infected in the line of duty. There is a necessity to reinforce and clarify the concept of Universal Precautions among nurses. The data collected from the study would be useful in identifying specific areas that may need further attention in the continuing education of nursing students and in providing feedback to them about improving safe practices. It should be emphasized that making possible permanent and continuing education activities is not sufficient. There is need to review how these are realized. If the nurses have sufficient knowledge, it is obvious that the compliance for the same is increased with supportive supervision and continuous monitoring.

REFERENCES

1. Luo Y, He GP, Zhou JW, Luo Y. Factors impacting compliance with standard precautions in nursing, China. *Int J Infect Dis.* 2010 Dec; 14(12):e1106-14.
2. Centres for Disease Control and Prevention. Recommendations for prevention of HIV transmission in health care settings. *Morbidity and Mortality week. Report* 36. 1987; 15-18S.
3. Centres for Diseases Control and Prevention. *HIV/AIDS Surveillance Report.* 1993; 5(3): 13.
4. Zaveri J and Karia J. Knowledge, attitude and practice of laboratory technicians regarding Universal work precaution. *National journal of medical research.* 2012 March; 2(1): 113-5.
5. Ogoina D, Pondei K, Adetunji B, Chima G, Isichei C and Gidado S. Knowledge, attitude, and practice of standard precautions of infection control by hospital workers in two tertiary hospitals in Nigeria. *Journal of Infection prevention.* 2015; 16(1): 16-22.
6. Bolaji-Osagie S, Adeyemo FO and Onasoga OA. The knowledge and practice of universal precautions amongst midwives in Central hospital, Benin City. *Journal of public health and epidemiology.* 2015; 7(11): 331-6.
7. Vaz K, McGrowder D, Alexander-Lindo R, Gordon L, Brown Pand Irving R. Knowledge, awareness and compliance with universal precautions among Health care workers at the university hospital of the West Indies, Jamaica. *IJOEM.* 2010 October; 1(4): 171-80.
8. Kotwal A, Taneja DK. Health care workers and universal precautions: perceptions and determinants of non-compliance. *Indian J Community Med.* 2010; 35(4): 526-8.
9. Dhaliwal B, Saha PK, Goel P, Huria A. Universal precautions against HIV and other blood-borne pathogens- Knowledge, attitude and compliance among health professionals in Obstetrics and Gynecology. *NJOG.* 2011; 6(1): 13-6.
10. Jawaid M, Iqbal M, Shahbaz S. Compliance with standard precautions: A long way ahead. *Iran J Public Health.* 2009; 38(1): 85-8.