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Original Research Paper

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IMPACT OF CONTINUOUS EDUCATION PROGRAM REGARDING THE KNOWLEDGE AND AWARENESS OF STANDARD PRECAUTIONS AMONG THE HEALTHCARE WORKERS AT NIZAM'S INSTITUTE OF MEDICAL SCIENCES (NIMS)

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ABSTRACT

Infection is one of the most important problems in healthcare services worldwide. It constitutes one of the most important causes of morbidity and mortality associated with clinical, diagnostic and therapeutic procedures. Healthcare workers are at a high risk of needle stick injuries and blood-borne infections as they perform their clinical activities in a hospital. They are exposed to blood-borne infections by pathogens, such as human immuno-deficiency virus (HIV), hepatitis B and hepatitis C viruses, from sharp injuries and contacts with blood and other body fluids. The incidence rate of these causative factors higher in developing countries for the higher rate of infection with previously used syringes.

AIMS & OBJECTIVES:

To assess and compare whether there is any impact of continuous education program regarding the knowledge and awareness of standard precautions among the healthcare workers.

To assess knowledge, awareness on standard/ universal precautions among healthcare workers.

To know the role of demographic variables such as gender, years of service on knowledge & awareness of standard/ universal precautions.

To indentify the divisions of standards/ universal precautions in which the knowledge of healthcare workers is poor and better.

To do a comparative analysis between the groups i.e., doctors, nurses and technicians.

METHODOLOGY: *A cross sectional questionnaire based study was conducted at Nizam's Institute of Medical Sciences for a period of 30 days.*

Sampling: *This study concentrated on doctors, nurse, technicians each group had a sample size of 100 making the total sample size of 300.*

CONCLUSIONS:

Knowledge of standard/ universal precautions was highest among technicians (86.2%) then followed by doctors (84.1%) and nurses (84.1%).

There is a significant difference in knowledge and awareness of standard precautions among studied healthcare professional ('p' value 0.031) and knowledge and awareness of standard precautions did not vary significantly between males and females ('p' value >0.05) and there is no significant difference in knowledge and awareness of standard precautions among groups, with respect to length of service ('p' value >0.05).

In the total studied sample, participants are very knowledgeable in divisions namely hand washing (B), post exposure prophylaxis (PEP) (E) and biomedical waste disposal (F) the participants were somewhat knowledgeable in blood-borne pathogens (G), personal protective equipment (C), general information (A) and sharps disposal (D).

KEYWORDS : Infection, Needle stick injuries, Healthcare workers, Biomedical waste, personal protective equipment.

INTRODUCTION:

Infection is one of the most important problems in healthcare services worldwide. It constitutes one of the most important causes of morbidity and mortality associated with clinical, diagnostic and therapeutic procedures. Healthcare workers are at a high risk of needle stick injuries and blood-borne infections as they perform their clinical activities in a hospital. They are exposed to blood-borne infections by pathogens, such as human immuno-deficiency virus (HIV), hepatitis B and hepatitis C viruses, from sharp injuries and contacts with blood and other body fluids. The incidence rate of these causative factors higher in developing countries for the higher rate of infection with previously used syringes.

Interventional measures have been proposed to minimize exposure of healthcare workers and patients to infection with the implementation of universal precautions as one of the strategies. In 1983, the US Center for Disease Control and Prevention (CDC) published a document that recommended blood and body fluid precautions when a patient was known or suspected to be infected with blood-borne pathogens. In 1987, the CDC recommended that regardless of patient's infection status, the precautions must be consistently used. This extension of blood and body fluid precautions to all patients is referred as "Universal blood and body fluid precautions" or Universal Precautions". In 1996, the CDC included the universal precautions in a new prevention concept called "Standard Precautions" which are devised to be used for the care of all patients in hospitals regardless of their diagnosis or presumed infection status, now replace the "Universal Precautions."

Standard precautions include hand washing; use of barriers (e.g., gloves, gown, cap, mask); care with devices, equipment, and clothing used during care; environmental control (e.g., surface processing protocols, health service waste handling);

adequate discarding of sharp instruments including needles; and patients accommodation in accord to requirement levels as an infection transmission resource and adequate professional immunization, as this guarantees anticipated protection against immune-preventable diseases.

Universal precaution awareness education has not been pronounced among healthcare workers particularly in developing countries. The level of practice of universal precautions by healthcare workers may differ from one type of healthcare worker to another. The differences in knowledge of universal precaution by healthcare workers may be influenced by their different type of training.

Earlier in 2011, a study was conducted using a structured questionnaire to assess the knowledge and awareness of standard precautions among the healthcare workers i.e., doctors, nurses and technicians each group consisting of a sample of 60 members making total sample size of 180. At the Nizam's Institute of Medical Sciences, Hyderabad. The overall results showed that

- Knowledge of standard/ universal precautions was highest among doctors (63.3%), followed by technicians (56.6%) and nurses (40.0%).
- There is a significant difference in knowledge and awareness of standard precautions among studied healthcare professional ('p' value0.031) and knowledge and awareness of standard precautions did not vary significantly between males and females ('p' value >0.05) and there is no significant difference in knowledge and awareness of standard precautions among groups, with respect to length of service ('p' value >0.05).
- In the total studied sample, participants are very knowledgeable in divisions namelygeneral information (A), hand washing (B), post exposure prophylaxis (E) and blood-borne pathogens (G) and the participants are somewhat knowledgeable in personal protective equipment (C), sharps disposal (D) and biomedical waste disposal (F).
- In doctors group, participants are very knowledgeable in divisions general information (A), hand washing (B), sharps disposal (D), post exposure prophylaxis (E) and blood borne pathogens (G) and they were somewhat knowledgeable in personal protective equipment(C) and biomedical waste disposal (F).
- In nurses group, participants are very knowledgeable in divisions hand washing (B), sharps disposal (D), post exposure prophylaxis (E) and blood borne pathogens (G) and they were somewhat knowledgeable in general information (A), personal protective equipment (C) and biomedical waste disposal (F).
- In technicians groups, participants are very knowledgeable in all seven divisions.

There after a continuous education program was conducted among the healthcare workers regarding the knowledge, training and awareness of standard precautions among them at the Nizam's Institute of Medical Sciences, Hyderabad. We therefore conducted this study to assess and compare the knowledge and awareness on Standard precautions among the healthcare workers after providing continuous education program regarding the knowledge and awareness of standard precautions among them at the Nizam's Institute of Medical Sciences, Hyderabad. The results of 2011 and 2021 were compared.

AIMS & OBJECTIVES:

- To assess and compare whether there is any impact of continuous education program regarding the knowledge and awareness of standard precautions among the healthcare workers.
- To assess knowledge, awareness on standard/ universal precautions among healthcare workers.
- To know the role of demographic variables such as gender, years of service on knowledge & awareness of standard/universal precautions.
- To indentify the divisions of standards/ universal precautions in which the knowledge of healthcare workers is poor and better.
- To do a comparative analysis between the groups i.e., doctors, nurses and technicians.

METHODOLOGY:

A cross sectional questionnaire based study was conducted at Nizam's Institute of Medical Sciences for a period of 30 days.

SAMPLING: This study concentrated on doctors, nurse, technicians each group had a sample size of 100 making the total sample size of 300.

QUESTIONNAIRE DESIGN:

A structured questionnaire was prepared consisting 50 items regarding knowledge and awareness of standard precautions in the healthcare system in the following seven areas:

- General information on universal/ standard precautions.
- Care of the skin and hand washing.
- Personnel protective equipment.
- Procedure for the safe handling and disposal sharps.
- Post exposure prophylaxis.
- Biomedical waste and linen disposal.
- Blood-borne and other pathogens.

A score of "1" was assigned for a correct answer and "0" for an incorrect answer. Those who scored ">30" were considered "very knowledgeable", "15 to 30" "somewhat Knowledgeable" and "<15" "least knowledgeable." At the end of the study, results were analyzed statistically with Chi square test.

OBSERVATIONS AND DISCUSSION:

All the selected healthcare workers fully completed the questionnaire. Analysis was made under the following sections.

A) Analysis of demographic information of the studied sample
B) Analysis of scores
C) Knowledge levels with respect to demographic variables i.e., gender and years of service
D) Knowledge levels with respect to the 3 categories of healthcare professions
E) Knowledge levels in the studied population with respect to 7 divisions of the questionnaire.

Analysis of demographic information of the studied sample:

Table 1: Analysis of demographic information of the studied sample

DEMOGRAPHIC INFORMATION OF THE STUDIED SAMPLE								
Variable	Category of Healthcare Professional							
	Doctors		Nurse		Technicians		Total	
Gender	2011	2021	2011	2021	2011	2021	2011	2021
Male	39(21.6%)	58(19.3%)	12(6.6%)	19 (6.3%)	33(18.3%)	69 (23%)	84(46.6%)	146(48.6%)
Female	21(11.6%)	42 (14%)	48(26.6%)	81(27%)	27(15%)	31(10.3%)	96(53.3%)	154(51.3%)
Length of service in years	Doctors	Nurse	Technicians	Total				
	2011	2021	2011	2021	2011	2021	2011	2021

0-5	29(16.1%)	57 (19%)	10(5.5%)	54 (18%)	0	36 (12%)	39(21.6%)	147 (49%)
6-10	13(7.2%)	24 (8%)	7(3.8%)	24 (8%)	10(5.5%)	36 (12%)	30(16.6%)	84 (28%)
>10	18(10%)	19 (6.3%)	43(23.8%)	22 (7.3%)	50(27.7%)	28(9 . 3 %)	111(61.6%)	69 (23%)

Demographic data was analyzed and it was observed that the percentage techinicians who participated in the study has increased from 18.3% in 2011 to 23% in 2021.

However the percentage of doctors and nurses was decreased by 2.3% and 0.3%. The percentage of total number of participants has increased slightly by 2%. There was a significant increase in the participants who have 0-5 & 6-10 length of service years by 27.4% & 11.4% respectively.

B) Analysis of scores:

Table 2: Analysis of scores

LEVELS OF KNOWLEDGE OF THE STUDY SAMPLE		
Knowledge of standard precautions	Total (2011)	Total (2021)
Very knowledgeable	96(53.3%)	256 (86.3%)
Somewhat knowledgeable	84(46.7%)	44 (14.6%)
Not knowledgeable	0	0

The levels of Knowledge among the study participants were analysed and it was observed that the percentage of very knowledgeable participants has increased from 53.3% to 86.3% and the percentage of somewhat knowledgeable participants was decreased from 46.7% to 14.6%. And as none of the study participants scored <15, the not knowledgeable group was excluded from this analysis.

C) Knowledge levels with respect to demographic variables i.e., gender and years of service:

Table 3: Knowledge levels with respect to demographic variables i.e., gender and years of service

AWARENESS OF STANDARD PRECAUTIONS STRATIFIED BY PARTICULAR VARIABLE					
Variable		Awareness of standard precautions, n (%)			
		Very knowledgeable		Somewhat knowledgeable	
	2011	2021	2011	2021	
Gender	Male	48(57.1%)	126(86.3%)	36(42.9%)	16(10.9%)
	Female	48(50%)	130(84.4%)	48(50%)	28(18.1%)
Length of service in years	0-5 years	21(53.8%)	135(52.7%)	18(46.2%)	12(27.2%)
	6-10 years	18(60%)	57(22.2%)	12(40%)	10(22.7%)
	>10 years	57(51.3%)	64(25%)	54(48.7%)	22(50%)
Profession	Doctors	38(63.3%)	97(37.8%)	22(36.7%)	10(22.7%)
	Nurses	24(40%)	77(30%)	36(60%)	21(47.7%)
	Technicians	34(56.6%)	82(32%)	26(43.4%)	13(29.5%)

Awareness of standard precautions by profession has shown that there is a decrease in the very knowledgeable group among the doctors, nurses and technicians which emphasizes of the need for continuous training.

D) Knowledge levels with respect to the 3 categories of healthcare professions a comparison between 2011 and 2021:

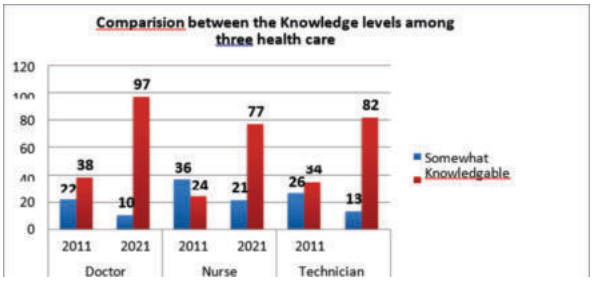

Fig 1: Knowledge levels with respect to the 3 categories of healthcare professions a comparison between 2011 and 2021

E) Knowledge levels in the studied population with respect to 7 divisions of the questionnaire

Each questionnaire was analyzed under 7 divisions and sub-total for each division was calculated. The average of sub-total was calculated with respect to each group, later all three groups as a whole. The averages were converted into percentage for analysis. If the average score of any division is:

- >75% it has been considered that the particular group is very knowledgeable.
- 50-75% is somewhat knowledgeable and
- <50% is not knowledgeable.

The results were depicted in the form of table and bar charts. Letter A, B, C, D, E, F, G denote divisions general information on standard precautions, care of the skin and hand washing, personal protective equipment, procedure for the safe handling and disposal for sharps, post exposure prophylaxis, biomedical waste and linen disposal, blood-borne and other pathogens respectively. Finally a comparative study was made between the divisions with respect to each group at first and all three groups as a whole.

I) Response analysis of Doctors:

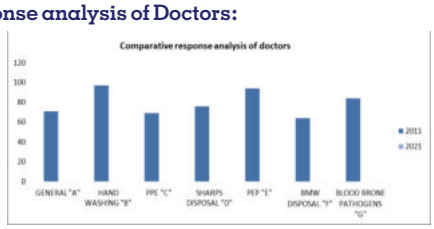

Fig 2: Response analysis of Doctors

II) Response analysis of nurse:

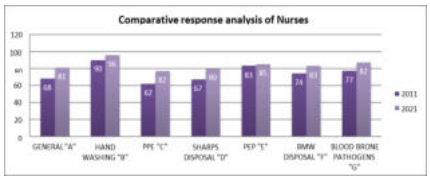

Fig 3: Response analysis of nurses

III) Response analysis of technicians:

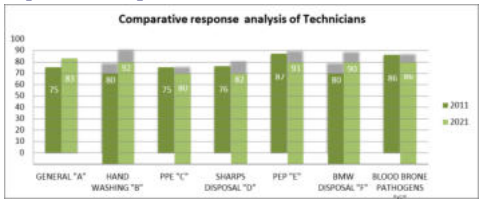

Fig 4: Response analysis of technicians

iv) Response analysis of total sample:

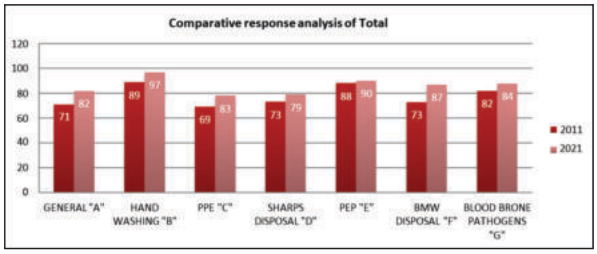

Fig 5: Response analysis of total sample

In the total sample, participants are very knowledgeable in four out of seven division's namely hand washing (B), post exposure prophylaxis (PEP) (E) and biomedical waste disposal (F). Knowledge levels were highest in division "B" which is hand washing with an average score of 97%. Participants were somewhat knowledgeable in three divisions which are blood-borne pathogens (G), personal protective equipment (C), general information (A) and sharps disposal (D). Knowledge levels are least in division "D". The average total score of studied sample is 86%.

CONCLUSIONS:

- Knowledge of standard/ universal precautions was highest among technicians (86.2%) then followed by doctors (84.1%) and nurses (84.1%).
- There is a significant difference in knowledge and awareness of standard precautions among studied healthcare professional ('p' value 0.031) and knowledge and awareness of standard precautions did not vary significantly between males and females ('p' value >0.05) and there is no significant difference in knowledge and awareness of standard precautions among groups, with respect to length of service ('p' value >0.05).
- In the total studied sample, participants are very knowledgeable in divisions namely hand washing (B), post exposure prophylaxis (PEP) (E) and biomedical waste disposal (F) the participants were somewhat knowledgeable in blood-borne pathogens (G), personal protective equipment (C), general information (A) and sharps disposal (D).
- In doctors group, participants are very knowledgeable in divisions hand washing (B), post exposure prophylaxis (E), blood borne pathogens (G), sharps disposal (D) and biomedical waste disposal (F) and they were somewhat knowledgeable in general information (A) and personal protective equipment (C).
- In nurses group, participants are very knowledgeable in divisions hand washing (B), post exposure prophylaxis (E), personal protective equipment (C), sharps disposal (D), biomedical waste disposal (F) and blood borne pathogens (G) and they were somewhat knowledgeable in general information (A).
- In technicians groups, participants are very knowledgeable in divisions hand washing (B), post exposure prophylaxis (E), biomedical waste disposal (F) and blood borne pathogens (G) and they were somewhat knowledgeable in general information (A), sharps disposal (D) and personal protective equipment (C).

RECOMMENDATIONS:

- Compliance to follow standard precautions will increase with sensitization and reinforcement which can be achieved by regular training programs.
- Regular training programs are to be organized to increase the knowledge and awareness of standard precautions among healthcare workers who scored low.
- The importance of practicing standard precautions in order to prevent cross infection of pathogens transmissible by blood and any other body fluids should be strongly encouraged among the healthcare workers at NIMS.
- Healthcare settings should adopt an environment which models and promotes standard precaution practices developed and closely monitored by the faculty.

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