

Original Research Article

Assessment of knowledge, attitude and practices of universal precautions among medical and nursing students

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ABSTRACT

Background: Universal precautions is an approach to infection control to treat all human blood and certain human body fluids as if they were known to be infectious for HIV, HBV and other bloodborne pathogens. The CDC recommends Standard Precautions for the care of all patients, regardless of their diagnosis or presumed infection status. Health care personals are at risk of being exposed to blood-borne pathogens. The aim of the study to determine the knowledge, attitude and practice of medical and nursing students towards universal precautions.

Methods: A cross-sectional survey was carried out at S. S. Institute of Medical Sciences and Research Centre, Davangere, Karnataka. The participants were medical and Nursing undergraduate students. A questionnaire was prepared based on the WHO and CDC guidelines on Universal Precautions and was validated and pre-tested before finalization. Degree of knowledge was ascertained by means of yes-no questions on each item being evaluated.

Results: All students were aware of Universal precautions, but soundness of their knowledge is very poor. Compliance in Universal precautions is good to average in nursing students but poor to average in medical students.

Conclusions: It can be concluded that interventions to improve Universal precautions among medical students, nursing students urgently needed. So, there is a need for developing strategies to promote the use of Universal precautions which take into account behaviour change and accuracy of knowledge including its integration into practice. Teaching universal precautions early in their curriculum is necessary for better learning and practices during their posting.

Keywords: Curriculum, MBBS students, Nursing students, Universal precautions

INTRODUCTION

Health care workers are often exposed to blood and other body fluids while working in health care settings. Consequently, they are at risk of contracting infection with blood borne pathogens. Health care personnel's who are in direct contact with blood and body fluids routinely during work and require the protection the most to

circumvent occupational hazards of acquiring diseases. The term universal precaution means taking routine safe working practice to protect staff and patients from infection from blood and body fluids.¹ Universal precautions were first officially recommended in 1987 in USA. In 1990, the department of health expert advisory group on AIDS recommended the implementation of universal precautions.¹

In 1993, the department of health recommended that the staff involved in the exposure prone procedures are screened for various infections.² Universal precautions involve the use of protective barriers such as gloves, gowns, aprons, masks of protective barriers which can reduce the risk of exposure of health care workers to potentially infected materials. In addition, it is recommended that all health care workers take precautions to prevent injury by needles, scalpels and other sharp instruments or devices.²

All health workers ought to follow universal precautions in order to reduce the incidences of raising blood borne infections among health care workers worldwide.^{2,3} Compliance on the part of HCWs including medical and nursing students with standard universal precautions and implementing of these measures has been recognized as efficient means to prevent and control hospital acquired infections.⁴ In spite of the effectiveness of these infection control practices, studies have shown a very low compliance by professionals and students alike.⁴⁻⁶

There is a lack of evidence regarding explicit information in the curricula of most medical and nursing undergraduate courses needs to be addressed to reduce the health care workers associated infection, thus teaching and learning requirements of undergraduate medical students regarding the universal precautions need to be assessed. This study was carried out to evaluate the knowledge and awareness about universal precautions as perceived by the medical and nursing undergraduate students.

METHODS

Type of study

A cross-sectional survey was carried out at S.S. Institute of Medical Sciences and Research Centre, Davangere, Karnataka. The participants were medical and Nursing undergraduate students.

Ethical clearance

Institutional ethics Review Board of committee of S. S. Institute of Medical Sciences and Research Centre approved the study.

Inclusion criteria

II-year MBBS students and I-year Nursing students who consented to participate voluntarily and were included in the study.

Exclusion criteria

Students who didn't signed the consent were excluded from the study.

Questionnaire preparation

A questionnaire was prepared based on the WHO and CDC guidelines on Universal Precautions which tests knowledge, attitude and practices among the medical and nursing students. The content validation of questionnaires was done by the subject and reliability tests were done by administering the questionnaires to III year MBBS and II Year Nursing students.¹ The questionnaire was validated for its reliability resulting in statistical value of 0.85 (Cronbach's alpha).

Method

Among 489 MBBS students and 197 BSc Nursing students enrolled voluntarily for the study. Degree of knowledge, attitude and practices were ascertained by means of yes-no questions on each item being evaluated.⁷⁻⁹ The students were asked to answer the questionnaire in the course of their normal classroom activities. Both the questionnaire and the informed consent form had a corresponding identification number, thus allowing the authors to pair them and compare answers with observed practice.^{9,10} Result of test was interpreted as follows; 16-19 as "Very Good Knowledge", 12-15 as "Good Knowledge", 8-11 as "Fair Knowledge", and 0-7 as "Poor Knowledge".

Data analysis

The data from the questionnaire were coded and entered into a computerized data base and analyzed using SPSS, version 16. Frequencies, percentages, mean and median were used for analyzing the selected socio-demographic data and assessing level of knowledge and degree of compliance of student nurses. Chi-square test was used for comparing proportions and statistical significance was taken as $p < 0.05$. A p-value of equal to or less than 0.05 was considered statistically significant.

RESULTS

Among 489 MBBS students and 197 BSc Nursing students participated in the study. In the present study respondent's answered multiple questions in each broad domain. Author clubbed them to represent the awareness regarding Universal precautions among study subjects.

Table 1 shows the level of awareness regarding Universal precautions among study subjects. It shows that in spite of high level of awareness programmes for all health professionals, awareness of study subjects regarding Universal precautions is low.

In the present study overall correct response from medical students was 61.13% and from nursing students was 64.58%. The results of Chi-square test show that there are statistically significant differences between interns and nurses regarding various aspects of awareness regarding Universal precautions.

Table 1: Awareness regarding universal precautions and its applications among MBBS and Nursing students.

	MBBS	Nursing	p value	Odds ratio
Have you ever heard of universal precautions?	298 (60.9%)	197 (100)	0.000	0
Universal precautions should be applied only to patients with HIV and HBV	460 (94.1%)	144 (73%)	0.000	0.09
Universal precautions are to be applied to all irrespective of their infection status	447 (91.4%)	154 (78.2%)	0.000	4.2
Isolation is necessary for people with blood borne infections	373 (76.3%)	150 (76.1%)	0.008	0.58
User needles should be recapped after giving an injection	246 (50.3%)	157 (79.7%)	0.000	2.33
For decontamination of devices such as manometer (with contact only with skin), washing with detergent is enough	344 (70.3%)	175 (88.8%)	0.002	1.15
Subcutaneous injuries during intravenous injections are most common cause of occupational injuries	218 (44.8%)	131 (66.5%)	0.337	0.82
Universal precautions are not necessary in situations that may lead to contact with saliva	417 (85.3%)	167 (84.8%)	0.033	0.6
There is an effective anti HCV Vaccine	221 (45.2%)	121 (61.4%)	0.001	0.54
HCW's with non-intact skin should not be involved in direct patient care until the condition resolves	417 (85.3%)	166 (84.3%)	0.000	2.64
Blood spills should be promptly cleaned with sodium hypochloride	404 (82.6%)	156 (79.2%)	0.000	3.01
I assume that blood and all body fluids of patients are contagious	288 (58.9%)	177 (89.8%)	0.004	0.54
I wear mask, eyewear and gown if procedures and patient care activities likely to cause splashing of blood and body fluids	366 (74.8%)	185(93.9 %)	0.001	0.39
I dispose used needles in a box after injection	446 (91.2%)	192 (97.5%)	0.715	1.13
I wear gloves as the first step in cleaning surfaces contaminated with blood and other body fluids	472 (96.5%)	195 (99.0%)	0.838	1.13
Washing with soap and water for five minutes is my first step after contact with infective material	421 (86.1%)	184 (93.4%)	0.002	2.08
Apply universal precautions in situations that may lead to contact with sweat	200 (40.9%)	187 (94.9%)	0.000	0.2
If I have a wound, I wear gloves before contact with patient	470 (96.1%)	177 (89.8%)	0.001	3.39
I apply universal precautions in situations that may lead to contact with vaginal discharge	467 (95.5%)	179 (90.9%)	0.000	9.27

In the present study it was found that 29% of medical students have a not heard about the universal precautions as compared to the nursing students (100%) and 5.9% medical and 39% nursing students felt that Universal precautions should be applied only to patients with HIV and HBV. Majority of medical (91.4%) and nursing (78.2%) students had correctly known that Universal precautions are to be applied to all irrespective of their infection status. Further, half of medical students and more than three-fourth of nursing students answered that user needles should be recapped after giving an injection and 91.2% of medical student and 97.5% of nursing student agreed that used needle should be disposed in the metallic box. Most of the medical (79%) and nursing students (89.7%) knew about the other aspects of infection control practices viz., HCW's with non-intact skin should not be involved in direct patient care until the condition resolves, Blood spills should be promptly cleaned with sodium hypochloride, assume that blood and all body fluids of patients are contagious, wearing of

personal protective equipments (PPE), dispose used needles in a box after injection and Washing with soap and water for five minutes is my first step after contact with infective material. Also, it was found that 40.9% medical and 94.9% nursing students knew that Apply universal precautions in situations that may lead to contact with sweat and 96.1 % medical and 89.8% nursing students knew that they should wear gloves before contact with patient when they have a wound. Almost 95.5% medical and 90.9% nursing students have agreed that apply universal precautions in situations that may lead to contact with vaginal discharge.

(Table 2) presents the cumulative scores of the respondents on the questionnaires on standard precautions. Half (50%) of the medical students and 63.5% of nursing students scored within the score range of 12 to 15 which is interpreted as “Good Knowledge”, while 2.1% of medical students and 7.1% of nursing students scored within the score range of 16 to 19 which

is interpreted as “Very Good Knowledge”. In general, student nurses possess “Good Knowledge” on standard precautions compared with the medical students.

Table 2: Cumulative knowledge scores regarding Universal precautions among MBBS and Nursing students.

Score range	MBBS student frequency	%	BSc nursing student frequency	%
16-19	10	2.1	14	7.1
12-15	242	50	125	63.5
8-11	225	46.5	59	29.9
0-7	7	1.4	Nil	

DISCUSSION

This study indicates that most of the HCWs in an urban tertiary health care facility (HCF) in India possessed incomplete knowledge, as shown by other studies in developed as well as developing countries, including India.^{4,5,7-10} This lack of appropriate knowledge may be a factor leading to a high level of anxiety among them regarding exposure to BBF and NSIs.

This study indicates that most of the health care workers in tertiary health care facility in India possessed incomplete knowledge, as shown by numerous other studies conducted in different parts of the country.

Good knowledge of standard precautions among student nurses may be due to inclusion of the concepts of standard precautions in the RGUHS nursing curriculum. This result is worth noting since previous study conducted suggests that, one of the factors impacting compliance with the standard precautions in any hospital settings is sound knowledge on its concepts and principles.¹⁰⁻¹² Sax et al, reported that lack of knowledge is the major reason for non-adherence to standard and isolation precautions.¹¹ However, result of this investigation disagrees with the other previous studies conducted among nurses and other clinicians regarding knowledge on aseptic technique and standard precautions in hospital settings. Melo et al, investigated nurses in one hospital in Goiania, Brazil, and found that only 75.6% understood the standard precautions as protective measures.⁶ In the survey of Luo et al, of 1444 nurses, only half (n=722) had knowledge of all the standard precautions, while Abdul raheem et al, observed that half (50%) of the health workers had no knowledge of universal precautions.^{10,12,13} Results of this study also showed that knowledge about nosocomial infection was Nursing students were better than medical students in almost all aspects of knowledge regarding Universal precautions as well as compliance to Universal precautions.^{14,15} There was significant difference in awareness in nursing students as against medical students contradictory to findings as shown by other studies, but most of these studies compared doctors with nurses.^{16,17} Since the Universal Precautions are not taught in the first year of

MBBS curriculum, Medical students showed lesser knowledge regarding UP compared to the nursing students.

CONCLUSION

To conclude, all students were aware of Universal precautions, but soundness of their knowledge is very poor. Compliance in Universal precautions is good to average in nursing students but poor to average in medical students. It can be concluded that interventions to improve Universal precautions among medical students, nursing students urgently needed. So, there is a need for developing strategies to promote the use of Universal precautions which take into account behaviour change and accuracy of knowledge including its integration into practice. Teaching Universal precautions early in their curriculum is necessary for better learning and practices during their posting.

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Conflict of interest: None declared

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