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*Original Research Article*

# Awareness and Compliance with Universal Precaution Guidelines among Interns and Residents: An Interview Based Study in Rural Tertiary Care Teaching Hospital

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## ABSTRACT

**Background:** "Universal precautions," as defined by Center for Disease Control, are a set of precautions designed to prevent transmission of blood borne pathogens when providing health care, where all patients are considered to be possible carriers of blood-borne pathogens.. The issue of exposure of interns and residents to biological hazards usually doesn't get as much attention as that of physicians or other employed healthcare workers in the hospital. **Objectives:** To assess their awareness on universal precaution, evaluate their use of Universal precaution guidelines and its association with awareness score. **Methods**: Three part questionnaire (knowledge based, compliance with safety precaution and incidence of needle stick injuries with action taken thereof) was administered. Data analysis was done by descriptive and inferential statistics. **Results**: Overall 43.36% were adequately aware of universal precaution. Only 29.79% of interns had good compliance against 62% of residents. Incidence of needle stick injuries in past 3 months was 17.48% while among interns only 18.75% had immediate hand wash, 50% consulted physician and 50% started ART while 50% did nothing. **Conclusion**: All were aware of Universal precautions but soundness of their knowledge is very poor. Compliance in Universal precautions is good to average in residents but poor to average in interns. Adequate knowledge on UP had positive impact on usage of safety precautions. There is paucity of knowledge among the interns for post exposure action to be taken

**Keywords:** Universal precaution, interns and residents, awareness score, compliance, needle stick injury

## INTRODUCTION

"Universal precautions," as defined by Center for Disease Control, are a set of precautions designed to prevent transmission of Human immunodeficiency virus (HIV), hepatitis B virus (HBV), and other blood borne pathogens when providing first aid or health care. Under universal precautions, blood and certain body fluids of all patients are considered potentially infectious for HIV, HBV and other blood borne pathogens. [1] Essentially, they are good hygiene habits, where all patients are considered to be possible carriers of blood-borne pathogens. The recommendations of universal precautions include; wearing gloves, gowns and aprons when collecting or handling blood and body fluids contaminated with blood; wearing face shields when there is danger of blood splashing on mucous membranes. Others include disposing of all needles and sharp objects in puncture-resistant containers. These recommendations are for doctors, nurses, patients, and health care support workers who are required to come into contact with patients or body fluids. Lastly, it is also recommended that all health care workers take precautions to prevent injuries caused by needles, scalpels and other sharp instruments or devices. [2] These measures are important, as it is estimated that the attributable fractions for percutaneous occupational exposure are 37% for hepatitis B, 39% for hepatitis C and 4.4% for HIV. [3]

Medical students are prone to accidental exposure to Blood Borne Pathogens and body fluids because multitude of reasons such as, nature of their work, which invest extensive contact with the sick patients, specimen handling, lack of experience and skill, eagerness to learn new things and material, lack of awareness about policies and procedures to avoid the same, i.e., universal precautions and so on. A study conducted by University of California School of Medicine, Los Angeles gives a more comprehensive picture that 71% of the respondents reported at least one needle stick during the training year, Known HIV exposure rate for students and residents was found to be 9.5% per person per year and only 9% was reported.[4] It is evident from the above study, that there is significant risk of exposure to BBP among interns and residents. The issue of exposure of interns and residents to biological hazards usually doesn't get as much attention as that of physicians or other employed healthcare workers in the hospital. The present study was carried to assess their awareness on universal precaution, evaluate their use of Universal precaution guidelines and its association with awareness score. Also as evident by other studies [5,6] there is high incidence of needle stick injuries among sharps and its nature of containing the residual blood and body fluid makes it most hazardous instrument in medical practice. So further we determine the needle stick injuries in past three months and action taken thereof.

## METHODOLOGY

Ninety four interns and forty nine residents from clinical department available during study period were recruited for present study. Questionnaire having three parts was administered, require 15 minutes to complete. First part was knowledge based prepared on CDC guidelines for universal precaution containing 16 items, each scoring one point. Those who score ≤ 50% i.e. 8 was interpreted as poorly aware, 9-12 partially aware and 13-16 as adequately aware. Next part of questionnaire was regarding the compliance with safety precautions. Use of safety equipments like gloves, mask, goggles, gown/ apron, covering the open wound, use of antiseptic

during hand wash were given one point each for always use and half point for occasional use. Correct method of needle disposal (burning, and replacing in puncture proof container) was given one point each while for improper method like capping one point was deducted as this is important reason for needle stick injuries. [6] Total score for this part of questionnaire was eight points. Those who had scored ≤ 50% i.e. four points had poor compliance, 4-6 pts moderate compliance and 6-8 good (acceptable) compliance. In last part of questionnaire they were asked about needle stick injuries in past three months and action taken during that time was noted.

Data analysis was done by descriptive and inferential statistics using MS excel and stat pac. Pearson moment correlation was computed for a relationship between awareness score and usage of safety precaution score.

## RESULTS

Table 1: Overall 43.36% were adequately aware of universal precaution. 18% and 38% of interns were partially and inadequately aware verses 32.6% and 20% of residents respectively. There is significant difference in awareness score of interns and residents. ($\chi^2$ – 6.246 p- 0.045 *)

Table 2: Only 29.79% 0f interns had good compliance against 62% of residents. 42.55% and 27.66% of interns had average and poor compliance respectively while no resident had poor compliance. The difference was statistically significant. ($\chi^2$- 8.757,df- 2, p- 0.003**)

Table 3: 11.7% of interns and 18.37% of residents had history of needle stick injuries in past three months. Among interns 18.75% had immediate hand wash, 50% consulted physician, 50% started ART while 50% did nothing. 100% of residents had immediate hand wash, 66.67% consulted physician 77.78% started ART.

There is strong positive correlation (r- 0.967) between awareness score and usage of safety precautions score. (Fig 1)

**Table 1: Interpretation of awareness scores for universal precaution of study participants.**

| Interpretation | Interns | Residents | Total |
|---|---|---|---|
| Adequately aware | 41(43.6%) | 23 (44.68%) | 62 (43.36%) |
| Partially aware | 17(18.08%) | 16 (32.65%) | 33 (23.08%) |
| Inadequately aware | 36(38.3%) | 10 (20.41%) | 46 (32.17%) |
| Total | 94 (65.73%) | 49 (34.26%) | 143 (100%) |

$\chi^2$ – 6.246 p- 0.045 *

**Table 2: Interpretation of compliance with universal precaution standards by usage of safety precautions score.**

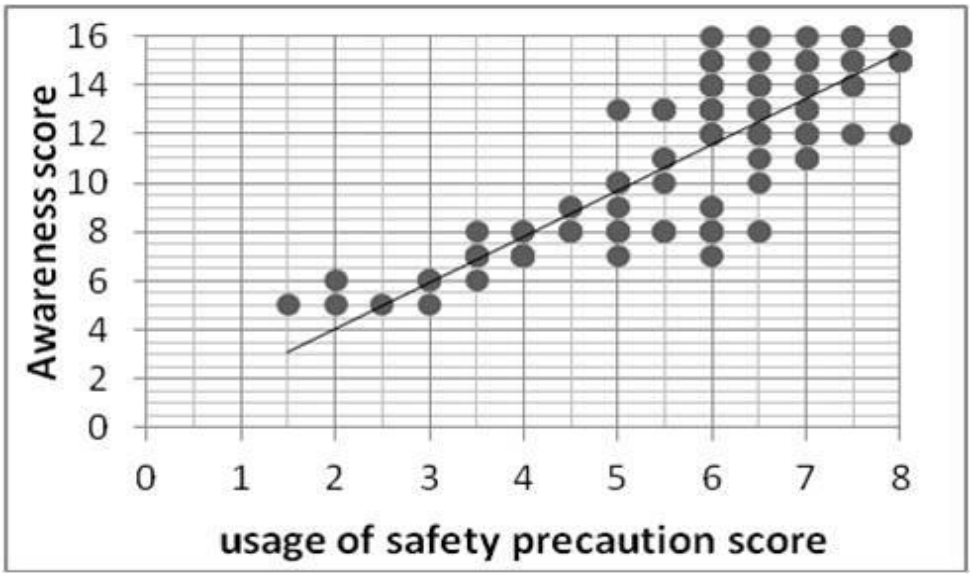
| Interpretation | Interns | Residents | Total |
|---|---|---|---|
| Good | 28 (29.79%) | 31 (62.26%) | 59 (41.26%) |
| Average | 40 (42.55%) | 18 (36.73%) | 58 (40.56%) |
| Poor | 26 (27.66%) | 0 | 26 (18.18%) |
| Total | 94 (65.73%) | 49 (34.26%) | 143 (100%) |

$\chi^2$- 8.757,df- 2, p- 0.003**

**Table 3: Distribution of respondent as per action taken after needle sticks injury**

| Action taken | Interns | Residents | Total |
|---|---|---|---|
| Immediate hand wash with antiseptic | 03(18.75%) | 9(100 %) | 12 (48%) |
| Consulted to senior physician | 08 (50 %) | 6 (66.67 %) | 14 (56%) |
| Started ART | 08(50 %) | 07(77.78%) | 15 (60%) |
| Did nothing | 08(50 %) | 0 | 03 (12) |
| Total (prevalence %) | 16 (17.02%) | 9 (18.37%) | 25 (17.48%) |

**Fig 1: Awareness score verses compliance to usage of safety precaution score.**




r- 0.967

## DISCUSSION

There was significant difference in awareness score in interns (10.78 ±3 .31) and that of residents (12.15 ± 3.04) [t- 2.414, p- 0.017]. Other study [7] also reported that length of service is proportional to awareness of universal precaution as they are more exposed to workshops and educational training. 38.3 % of interns score less than 50% against 20.4% residents. All of them have heard of UP , diseases which it prevents, barrier protective measures but many of interns don't know the body fluid to which they are applied, method of effective hand washing, disposal of sharps and post exposure action to be taken. Number of poorly aware was 32% which is very similar to other studies [8,9] while low compared to other studies that reported 88%, 94% awareness in medical doctors as all these surveys were carried out in developed settings where there was profound exposure to training material. [7,101]

Compliance score in interns was 5.37 ± 1.44 and that of resident was 6.7 ± 0.97. There was significantly good compliance in resident than interns. (t-5.81**). The reason quoted could be due to their exposure to educational program, awareness regarding risk of BBP and compulsion in some department to follow certain safety

precautions while interns are mostly neglected in term of provision of safety equipments. Other study states that compliance rate among senior residents approximated that of interns and junior residents.[11] Overall good compliance was reported by 41% of doctors similar to other studies [7,12]while much higher compliance was reported by Helfgott[11] as participants must had some knowledge of being observed during study period. However compliance rate varies depending on emergency situation and busy hours.[12,13] The main reason for non compliance in interns were unavailability (41%), not comfortable (22%), lack of time (20%), and ignorance(16%) while in residents time constraint(81%), judge patient as non infected (13%) and interfere in diligence of procedure (6%). Non compliance among health care workers could be due to their belief that their workload is increased by adhering to UP and therefore these procedures are difficult to accommodate due to day to day current clinical practice. Similar reasons were given by other studies.[9,11,12,13]

Awareness score is positively correlated with the usage of safety precaution score (r- 0.967). Greater awareness among health care workers not only encourages them for safer work practice but also improve concordance with policy and procedure. [14] This finding is contradicted by Helfgott et al. [11] The reason given was increase level of confidence with experience or just plain laziness to comply.

11.89% had history of needle stick injuries in past three months. Striking feature was that only 18.75% interns had knowledge to have immediate hand wash while 50% did nothing. Thus there is lack of knowledge among the interns about action to be taken after post exposure, assessing services like HIV screening and consulting senior physician.

## CONCLUSION

All were aware of UP but soundness of their knowledge is very poor. Compliance in UP is good to average in residents but poor to average in interns. Adequate knowledge on UP had positive impact on usage of safety precautions. There is paucity of knowledge among the interns for post exposure action to be taken. So there is a need for developing strategies to promote the use of universal precautions which take into account behavior change and accrual of knowledge including its integration into practice. Orientation training programme and regular workshops in universal precautions should be organized for interns and residents, involvement of senior health staff in the policies and their implementation, and systems for monitoring the appropriate use of equipments and establishing post exposure reporting system for risk assessment and starting necessary therapy.

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