

Compliance with universal standard precautions among health care workers of medical and surgical wards of Rehman Medical Institute, Peshawar

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ABSTRACT

Introduction: Health Care Professionals (HCPs) are not well versed in standard precautions and their use is not widely practiced even though its use is crucial in protection against blood borne infections such as HIV.

Objective: To assess the level of compliance and factors associated with non-compliance with the use of Standard Precautions in General Medicine and General Surgery wards of Rehman Medical Institute, Peshawar, Khyber Pakhtunkhwa (KP), Pakistan.

Materials & Methods: This was a cross-sectional comparative study conducted in General Medicine and General Surgery wards of Rehman Medical Institute, Peshawar, KP, Pakistan. A total of 80 subjects (40 from each ward) took part in the study. They included Doctors, Nurses and housekeeping staff. A structured questionnaire was completed by the individuals taking part in the study. Data were analyzed with SPSS 23.0 for descriptive statistics; Chi Square test was used to compare the differences of frequencies between groups, keeping $p \leq 0.05$ as significant.

Results: There was no significant difference of compliance regarding the use of gloves (68.4% in General Medicine, 64.9% in General Surgery $p=0.550$), surgical masks (50% General Medicine, 56.4% General Surgery $p=0.172$), eye protection (16.7% in General Medicine, 15% in General Surgery $p=0.945$), gown (40.6% in General Medicine, 44.8% General Surgery $p=0.250$) among the wards being considered in the study. No noteworthy difference was seen between proper sterilization of equipment and proper disposal of waste items between the two wards. Significant difference was noted between the two wards regarding the compliance to WHO recommended handwashing technique (52.6% General Medicine, 79.5% General Surgery ward; $p=0.047$) and routine disinfection of the ward (35% General Medicine, 66.7% in General Surgery; $p=0.08$).

Conclusion: Low level of compliance was found with standard healthcare precautionary measures in General Medicine and General Surgery wards of a tertiary care hospital of Peshawar, KP, Pakistan.

Keywords: Health Care Quality; Quality Assurance; Health Care; Safety Management; Quality of Health Care; Infection Control.

The authors declared no conflict of interest. All authors contributed substantially to the planning of research, data collection, data analysis, and write-up of the article, and agreed to be accountable for all aspects of the work.

INTRODUCTION

Universal / Standard precautions are measures undertaken by health care professionals to reduce the occupational risk of infections via transmission of blood-borne pathogens or through body fluids, mucous membranes and non-intact skin from both recognized and unrecognized sources. These infections can occur during examination of patients, in ward rotations, intensive care unit, operation theaters and emergency rooms.¹

According to the World Health Organization (WHO) guidelines, the basic precautions include hand hygiene, gloves, facial protection (goggles and masks), gown, protection from needle stick and injuries from other sharp instruments, respiratory hygiene and cough etiquettes, environmental cleaning which includes disinfection of linens, waste disposal and proper care of patient equipment.²

A WHO survey in 2002, estimated that sharp injuries resulted in 16,000 hepatitis C (HCV), 1000 HIV and 66,000 hepatitis B (HBV) infections among health care professionals worldwide.³ Needle Stick Injuries (NSI), the chief source of occupational exposure are predicted to occur in 600,000-800,000 health care providers annually in the United States alone. This accounts for approximately 30 Needle Stick Injuries (NSI) for every 100 beds per hospital.⁴

According to WHO, the risk of transmission of HBV, HCV and / or HIV to a Health Care Professional (HCP) following a NSI are 3-10%, 3% and 0.3% respectively.⁵ Failure of the health care system to comply with these basic standards has affected millions of people around the globe ultimately resulting in significant morbidity and mortality. It is an issue that needs to be seriously addressed in both the developing and developed countries.⁶

A study conducted in Aga Khan University (AKU) Hospital suggested that 28.5% and 20.4% needle stick injuries occurred in junior doctors and registered nurses respectively;^{7,8} it failed to report the compliance with use of standard precautions among the subjects. A study from India reported compliance with wearing gloves (85.1%), masks (45.6%), gowns

(28.4%) and use of eye gear (22.2%) respectively,¹ but also failed to report overall compliance to standard precautions.

A similar study conducted in Afghanistan found compliance with wearing gloves and washing hands at 92.6% and 88.6% respectively, while non-decontamination of devices and not recapping needles was 21.5% and 42.2% respectively.⁹ It also failed to provide data regarding overall compliance to standard precautions. A study conducted in Gondar University hospital in Northwest Ethiopia showed overall compliance to standard precautions to be as low as 12%.⁶

Standard Universal Precaution awareness has not been evident among health care workers despite several guidelines, particularly in developing countries. The level of compliance of universal standard precautions by health care professionals vary from one to another. The differences in practices of universal standard precautions by health workers may be influenced by their different type of training.¹⁰ Standard Precautionary measures are vital as any health care institute has the obligation to protect its staff members from potential occupational hazards and similarly, from increasing the chances of nosocomial infections in patients. The chances of getting infected with HBV after a known occupational exposure is about 25% and there is a likely 0.3%–0.5% risk of infection with HIV; thus Primary prevention guidelines remain the cornerstone of protecting health workers.¹¹ Studies conducted on the health care workers who keep up with the universal standard precautionary protocol show significantly decreased incidence of occupational hazards i.e. accidental exposure to blood borne diseases.¹²

The objective of the present study was to assess the level of compliance with the use of Standard Precautions, and factors associated with non-compliance in General Medicine and General Surgery wards of Rehman Medical Institute (a tertiary care hospital), Peshawar, Khyber Pakhtunkhwa (KP), Pakistan; no similar study has been conducted till now.

MATERIALS & METHODS

The Questionnaire based cross sectional comparative study was conducted in General Medicine and General Surgical wards of Rehman Medical Institute from July to September 2017. The

participants included Registrars, Trainee Medical Officers, Medical Officers, House Officers, Nurses, and House Keeping staff. Consultants were excluded. Total sample size was 80 out of which 40 individuals belonged to General medicine while the rest belonged to General surgery. The questionnaire was prepared using the Standard Precaution List formed by the World Health Organization.² Compliance to Standard precautions along with factors associated with non-compliance were documented.

Data were entered in SPSS version 23.0 for analysis. Valid percentages were taken into account and missing values not considered. Adherence was deemed when the said precaution was “always” used. Rest of the options such as (sometimes, rarely, satisfactory, substandard, quite deficient) were considered as not being practiced.

Calculations were done for frequencies and percentages. The Chi Square Test was used to compare frequencies among groups, keeping $p \leq 0.05$ significant.

RESULTS

There was no significant difference between compliance regarding the use of gloves (68.4% in General Medicine, 64.9% in General surgery $p=0.550$), surgical masks (50% General Medicine, 56.4% General Surgery $p=0.172$), eye protection (16.7% in General Medicine, 15% in General Surgery $p=0.945$), gown (40.6% in General Medicine, 44.8% General Surgery $p=0.250$) among the wards being considered in the study. No noteworthy difference was seen between proper sterilization of equipment and proper disposal of waste items between the two wards (Table 1).

The major differences in compliance was seen in the use of proper handwashing technique ($p=0.047$) and proper routine disinfection of the wards ($p=0.008$); 52.6% individuals reported compliance associated with the use of Proper Hand washing techniques (as recommended by WHO) in General Medicine ward as compared to General Surgery ward which was 79.5%. The number of individuals who thought that routine disinfection of the ward was according to the standard protocols was 35% in General Medicine ward as compared to 66.7% individuals in General Surgery ward.

Table 1: Compliance of health care professionals of selected wards with Standard Precautions (n=80).

#	Standard Precautions	General Medicine Ward			General Surgery Ward			p value
		Always n (%)	Sometimes n (%)	Rarely n (%)	Always n (%)	Sometimes n (%)	Rarely n (%)	
	Personal Practices							
1.	Hand Hygiene	20 (52.6)	15 (39.5)	03 (7.9)	31 (79.5)	08 (20.5)	0	0.047
2.	Wearing Gloves	26 (68.4)	12 (31.6)	0	24 (64.9)	12 (32.4)	01 (2.7)	0.550
3.	Wearing Face Masks	20 (50.0)	20 (50.0)	0	22 (56.4)	14 (35.9)	03 (7.7)	0.172
4.	Using Eye Protection	05 (16.6)	11 (36.7)	14 (46.7)	03 (15.0)	06 (30.0)	11 (55.0)	0.945
5.	Wearing Gown	13 (40.6)	12 (37.5)	07 (21.9)	13 (44.8)	12 (41.4)	04 (13.8)	0.250
	Safety Practices	Adequate	Satisfactory	Deficient	Adequate	Satisfactory	Deficient	p value
6.	Proper Disinfection	14 (35.0)	24 (60.0)	02 (5.0)	26 (66.7)	10 (25.6)	03 (7.7)	0.008
7.	Proper Disposal	24 (60.0)	14 (35.0)	02 (5.0)	29 (74.3)	09 (23.1)	01 (2.6)	0.373
8.	Proper Sterilization	30 (85.7)	02 (5.7)	03 (8.6)	35 (89.7)	04 (10.3)	0	0.256

Table 2 provides the data for con-compliance with Eye Protection Guidelines as recommended by the World Health Organization and shows that overall 17.5% of General Medicine and 40% of General Surgery ward health care professionals were non-compliant. The most common reason for non-compliance was non availability of resources for 10.0% of participants of General Medicine ward and 30.0% of non-compliant participants of General Surgery ward. Lack of awareness of WHO recommended guidelines was claimed by 7.5% non-compliant participants from General Medicine and 5.0% from General Surgery wards, while 5.0% health care professionals from General Surgery ward did not consider it essential to wear Eye Protection.

With regard to noncompliance with wearing gowns, an overall 17.5% of participants from General Medicine ward and 40% from General Surgery ward were noncompliant; 07.5% of the noncompliant individuals in General Medicine ward reported to be unaware of the recommended guidelines while 10% reported to either not having enough time or lack of availability of resources as the prime reason of noncompliance. In the General Surgery ward, 5.0% reported to be unaware of the recommended guidelines, 5.0% did not consider it essential to wear gowns, and 30.0% reported lack of available resources as the reason of nonadherence (Table 2).

Table 2: Reasons for not using eye protection or wearing gowns given by health care professionals of selected wards (n=80).

Wards		Do you take measures for eye protection (goggles, eye visor) in potentially contaminated/infected conditions? If no, why?			Total
		I am not fully aware of recommended guidelines	I don't consider it essential	I am not provided with the required resources	
General Medicine (n=40)	Count (%)	03 (7.5)	0	04 (10.0)	07 (17.5)
General Surgery (n=40)	Count (%)	02 (5.0)	02 (5.0)	12 (30.0)	16 (40.0)
p value		0.206			
Wards		Do you wear a gown before contact with a patient during activities that are likely to generate splashes or sprays of body fluids? If no, why?			Total
		I am not fully aware of recommended guidelines	I don't consider it essential	I am not provided with the required resources	
General Medicine (n=40)	Count (%)	3 (7.5)	0	4 (10.0)	7 (17.5)
General Surgery (n=40)	Count (%)	2 (5.0)	2 (5.0)	12 (30.0)	16 (40.0)
p value		0.208			

DISCUSSION

It is imperative for a private medical institute such as Rehman Medical Institute to uphold the highest levels of safety for individuals that work under its banner, whether medical or non-medical staff.

In this study it was found that compliance to use of hand washing was 52.6% and 79.5% respectively of each ward while a study conducted in Afghanistan showed that compliance to hand washing was 88.6%.⁹ A study conducted in Iran showed that compliance of using gown was 99.3% while in the present study the compliance of both wards was an average of 42.7%.¹¹ A study in Nigeria also found the use of gowns to be 76.8%.¹³

This study found the use of face masks to be 53.2% on average in both wards as compared to a study conducted in India¹ that showed compliance with face masks to be 45.6%. In the same study compliance to use of gloves was 85.1% whereas in the present study the use of gloves was 66.65% on average in both wards. A study conducted in Afghanistan⁹ showed the use of gloves to be 92.6%. The same variable was addressed in a study in Ethiopia⁶ and showed the compliance to wearing gloves was 88.7%.

The use of eye protection in this study was found to be on average at 15.8%; a study conducted in Ethiopia⁶ showed compliance to

wearing eye protection of 21.6%, while in India¹ the use of protective eye equipment was shown to be 22.2%.

Disinfection of hospital wards carries great importance in spread of nosocomial infections, including drug-resistant forms. A study from UK¹⁴ describes significant reduction in Methicillin Resistant *Staphylococcus aureus* (MRSA) after a disinfection intervention was carried out in a District General Hospital. In the present study of General Medical and General Surgical wards of a tertiary care hospital, average disinfection practice rates were 50.85%.

Proper disposal of waste products was found to be an average of 67.15% in both the wards selected in the present study, while a study conducted in Nigeria¹³ showed proper disposal of waste was 80%.

The practice of sterilization fared better in the present study with an average of 87.7%; an audit of several hospital sections for sterilization practices conducted in a major general hospital of France,¹⁵ showed a health risk control of 67% for hospital safety policy, 68% for pharmacy, 64% for intensive care unit, and 88% in the surgical care unit, which compares favorably with the findings of the present study.

LIMITATIONS

The validity of self-reporting of use of standard precautions depends on the respondents' own willingness to reply with full honesty in the questionnaires which might add to the doubtful authenticity of the overall response from the respondents. Secondly, this was a case of private teaching hospital where there is strict supervision for adherence to international protocol, therefore cannot be generalized to other institutes as management and protocol of each organization varies. The sample size in our study may not reflect a true picture of the use of standard precautions in the hospital so a study should be conducted where every individual

encountering patients in every ward of this hospital is taken as a participant. Furthermore, the study findings cannot be generalized to public sector hospitals where the patient load is very high, and lack of equipment is a source of hue and cry for every ward.

CONCLUSION

The wards included in this study showed lower than expected levels of compliance with the precautions set for individuals encountering patients by the World Health Organization. Where noncompliance occurred, it was either due to lack of awareness of use of standard precautions or the lack of equipment.

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