



To study knowledge attitude and practice of universal precautions among healthcare workers in a tertiary care hospital during covid 19 pandemic

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ABSTRACT

Background: Healthcare workers (HCWs) are potentially exposed to blood and body fluids (BBF) in the course of their work and therefore are at risk of infection with blood-borne pathogens. Despite their best intentions, sometimes, healthcare workers act as vectors of disease. They disseminate new infections among their unsuspecting patients.

Methods: This is a cross-sectional, study to determine Knowledge, Attitude and Practice of universal precautions among healthcare workers of a tertiary care hospital. A cross-sectional survey was carried out in the maternity hospital of Sher I Kashmir Institute of Medical Sciences, Srinagar for a period of two months from September to October 2020. All the healthcare workers of the said facility were included in the study. A questionnaire was prepared based on the WHO and CDC guidelines on UPs and was distributed among the study population. Those who did not return the proforma were excluded from the study. The respondents were divided into three groups viz G1, G2 and G3 which included doctors, nurses and technicians respectively.

Results: A total of 72 HCW's participated in the study. The data reveals that group 1 had mean awareness score of 18 in the time of covid pandemic with 100% doctors having adequate awareness as compared to nurses who had mean awareness score of 15.2 and 90% nurses having adequate awareness. The data reveals that group 3(technician) had mean awareness score of 14.5 in the time of covid pandemic with 83.3 % technician having adequate awareness

Analysis revealed that hand washing was done by greater proportions across all the groups (G1=100%, G2=82%, G3=66.67%).

Wearing gloves as one of the major practices of UPs was emphatically observed and recorded. Analysis revealed that gloves were worn by greater proportions across all the groups (G1=100%, G2=82%, G3=66.67%).

Conclusion: Practices of universal precautions has increased among healthcare workers during covid pandemic. The wearing of masks, gowns, gloves, use of hand sanitizers has increased to a great extent. It can be increased to a greater extent by by regular education programmes.

Keywords: HCW: healthcareworkers, UP: universal precautions

INTRODUCTION

According to CDC guidelines universal precaution infections from blood borne or body fluid borne are set of actions which are required to prevent infection. Main aim of universal precaution is to

protect health workers and patients from infection. Body fluids to be treated in universal precaution are blood, CSF, pleural cavity fluid, pericardial cavity fluid, synovial fluid, semen, amniotic fluid, urine, vaginal secretion and saliva.⁽¹⁾ Healthcare workers (HCWs) are potentially exposed to blood and body fluids (BBF) in the course of their work and therefore are at risk of infection with blood-borne pathogens. Worldwide, three million HCWs experience percutaneous exposure to blood-borne viruses each year (two million hepatitis B, 900,000 hepatitis C and 300,000 human immunodeficiency virus).⁽²⁾ At any given time, over 1.4 million people worldwide suffer from Health Care Associated Infection (HCAI). One or more of the nosocomial infections are acquired by about 5-10% of patients admitted to modern hospitals in the developed world.⁽³⁾ It was reported that of 35 million HCWs worldwide, about two to three million of them every year experience NSIs that contributed to 40–65% of all hepatitis B virus and hepatitis C virus, and 4.4% of HIV infections globally.^(4,5,6,7,8)

Exposure to BBF can occur through a percutaneous injury (needle-stick injury, NSI) or mucocutaneous incident (BBF splash). Awareness regarding this occupational risk led to the issue of guidelines by CDC as universal precautions (UPs) in 1987, later updated in 1996.⁽⁹⁾ Evidence exists that compliance with UPs reduces the risk of infections and protects healthcare practitioners.^(10,11)

Four important practices recommended in universal precaution are a) hand washing; b) use of protective barriers to prevent direct contact; c) safe handling and disposal of sharps; d) safe decontamination of instruments and other contaminated instruments. Most important pathogens related to universal precautions are HIV, HBV and HCV. Studies show that nurses are the commonest health worker at risk of infection and needle stick injury is the most common way of occupation health hazard in health worker. Additionally, for some of these infections, e.g. hepatitis C (HCV) and acquired immunodeficiency syndrome (AIDS), vaccines are not available. In 1987, the Centers for Disease Control and Prevention (CDC), Atlanta, Ga., USA made recommendations for universal precautions. These universal precautions are infection control guidelines and measures to prevent the transmission of infections through blood and other body fluids among patients and healthcare workers.⁽¹²⁾ The CDC

guidelines impose several requirements on HCWs in order to reduce potential risks of infection and to improve the level of care provided; they include the use of protective tools, such as facemasks, eye shields and gloves.^(13,14) The idea of wearing masks in the OR is first to protect the patients, by reducing the rate of air contamination from the HCWs, and second to protect the HCWs from blood or fluid splash during surgical operations.⁽¹⁵⁾

To reduce the occupational risks for HCWs, it is essential to educate and encourage health workers to practice SPs in healthcare settings, which is defined as “a group of infection prevention practices that apply to all patients, regardless of infection status. It is based on the principle that all blood, body fluids, secretions, excretions except sweat, nonintact skin, and mucous membranes may contain transmissible infectious agents”.^(16,17) In 1985, the CDC introduced Universal Precaution (UP), which stipulated guidelines to guarding against blood-borne pathogens.⁽¹⁸⁾ Despite their best intentions, sometimes, healthcare workers act as vectors of disease. They disseminate new infections among their unsuspecting patients. Attention to simple preventive strategies like hand-washing may significantly reduce disease transmission rates.⁽¹⁹⁾ Likewise, healthcare-associated pathogens are generally transmitted via the contaminated hands of healthcare workers. Hand hygiene has long been considered one of the most important infection control measures to prevent healthcare-associated infections. However, compliance of health care workers with recommended hand hygiene procedures has remained unacceptable concern, with compliance rates generally below 50% for hand hygiene opportunities.⁽²⁰⁾ Thus, there is an urgent need for both nationally and internationally agreed codes of safe practice to be inculcated and the development of guidelines for the medical surveillance of health workers.⁽²¹⁾

The correct knowledge and practice of universal precautions are essential for the health care providers. Hence this present study was planned to evaluate the knowledge, attitudes and practices of paramedical staff regarding the infection control measures like universal precaution.

This study was conducted to access knowledge, attitude and practice regarding universal precautions

among the nursing staff of one of the tertiary care hospital. A self-administered structure study instrument was used to determine knowledge, attitude and practice of Universal Precaution among healthcare workers of MATERNITY UNIT in a tertiary care hospitals of NORTH India. The study included 000 healthcare workers

MATERIALS AND METHODS

This is a cross-sectional, study to determine Knowledge, Attitude and Practice of universal precautions among healthcare workers of a tertiary care hospital. A cross-sectional survey was carried out in the maternity hospital of Sher I Kashmir Institute of Medical Sciences, Srinagar for a period of two months from September to October 2020. All the healthcare workers of the said facility were included in the study.

A questionnaire was prepared based on the WHO and CDC guidelines on UPs and was distributed among the study population. Those who did not return the proforma were excluded from the study. The respondents were divided into three groups viz G1, G2 and G3 which included doctors, nurses and technicians respectively.

The first part consisted of the questions related to demographic profile of the participants and their years of experience in that field (proforma 1). The second part comprised eight questions regarding the participant's perceptions and knowledge regarding standard precautions, workplace hazards, and hospital

safety and control measures (proforma 2). Responses to items of knowledge were "yes" or "no,". The third part consisted of seven questions pertaining to the practicing of standard precautions (proforma 3). There were four questions regarding the safety precautionary practices while performing injections. The practice of wearing gloves when they perform injections was asked with "yes" or "no" responses. In addition, participants were asked if they change the gloves while contacting with another patient (yes or no). Lastly, there were two questions regarding the practice of safe disposal of sharps/needle waste, including whether they recap the needle again (always, sometimes, never, or not applicable) and whether they dispose of the used needle in the specific sharps container.

A database was created in MS Excel. The data was analyzed and inference was drawn

RESULTS

Standard precautions apply to the care of all patients, irrespective of their disease state. These precautions apply when there is a risk of potential exposure to (1) blood; (2) all body fluids, secretions, and excretions, except sweat, regardless of whether or not they contain visible blood; (3) non-intact skin, and (4) mucous membranes. This includes the use of hand hygiene and personal protective equipment (PPE), with hand hygiene being the single most important means to prevent transmission of disease.

Table1a: Awareness score in relation to designation of healthcare workers

Designation of HCW	Minimum	Maximum	Mean awareness score	Number
G1	16	20	18	30
G2	11	20	15.2	32
G3	10	17	14.5	12

Table1b: Level of awareness in relation to designation of HCW

DESIGNATION OF hcw	Inadequate awareness(<60%)	Adequate awareness(>60%)
G1	Nil	100%
G2	12.5%(n=4)	87.5%(n=28)

G3	16.7%(n=2)	83.3%(n=10)
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Analysis of data for awareness as depicted in table 1a & 2b shows the awareness score attained by various professional cadres of the study. The data reveals that group 1 had mean awareness score of 18 in the time of covid pandemic with 100% doctors having adequate awareness as compared to nurses who had mean awareness score of 15.2 and 90% nurses having adequate awareness. The data reveals that group 3(technician) had mean awareness score of 14.5 in the time of covid pandemic with 83.3 % technician having adequate awareness

Table 2: Awareness score in relation to Age Distribution

HCW	AGE	NUMBER	MEAN
G1	20-40	28	17.85
	41-60	2	19.5
G2	20-40	6	19.6
	41-60	26	14.5
G3	20-40	10	14.2
	41-60	2	16

Awareness across the study groups of healthcare workers was studied in relation to age. Group 1 (n=30), incorporated individuals of 41-60 years n=2 with significant mean awareness score of 19.5 than 20-40 years age (n=28) revealed awareness score of 17.85.

Awareness across the study group 2 of healthcare workers was studied (n=32), incorporated individuals of 41-60 years n=26 with significant mean awareness score of 14.5 than 20-40 years age (n=6) revealed awareness score of 19.6. Awareness across the study groups of healthcare workers group 3(n=12), incorporated individuals of 41-60 years n=2 with significant mean awareness score of 16 than 20-40 years age (n=10) revealed awareness score of 14.2.

Table 4: Awareness score in relation to Time since recruitment

HCW	Time since recruitment	NUMBER	MEAN
G1	<10yrs	25	17.68
	>10yrs	5	19.4
G2	<10yrs	8	13.75
	>10yrs	24	15.67
G3	<10yrs	8	14
	>10yrs	4	15.5

Analysis of data relating time since recruitment with awareness of universal precautions indicate that those with less than 10 years of experience since recruitment in group 1 had significantly lesser awareness score of 17.68(n=25) than those with more than 10 years of experience (n=5, 19.4). The awareness of universal precautions indicate that those with less than 10 years of experience since recruitment in group 2 had significantly lesser awareness score of 13.75 (n=8) than those with more than 10 years of experience (n=24,

15.67). The awareness of universal precautions indicate that those with less than 10 years of experience since recruitment in group 3 had significantly lesser awareness score of 14 (n=8) than those with more than 10 years of experience (n=4, 15.5).

Current Practices of Universal Precautions by Doctors, Nurses and Laboratory Tech

How far do the different professional groups (G1, G2, G3) put their awareness of Ups into practice was observed personally in maternity unit of tertiary care hospital. Information thus collected was analysed in terms of probable influencing factors like Time since recruitment, Qualification and Formal Training received by individuals observed.

Table 5: Hand washing practice in relation to various influencing factors

HCW	Hand washing	Compliance %	Time since recruitment		Qualification		Formal Training	
			<10yrs	>10yrs	Graduate	Post graduate	Yes	No
G1	Done Not Done	100% Nil	100%(N=25) Nil	100%(N=5) nil	30%(N=9) nil	70%(N=21) nil	76.67% N=23 nil	23.33% N=7 Nil
G2	Done Not Done	82% (n=26) 18% (n=6)	75%(N=6) 25%(N=2)	83.3%(N=20) 16.67%(N=4)	81.25% (N=26) 18.75% (N=6)	Nil nil	83.3%(N=20) 16.67%(N=4)	75%(N=6) 25%(N=2)
G3	Done Not Done	66.67% (n=8) 33.33% (n=4)	66.7%(N=4) 33.33%(N=2)	66.7%(N=4) 33.33%(N=2)	66.7% (N=8) 33.33% (N=4)	Nil nil	100%(N=2) Nil	60%(N=6) 40%(N=4)

Hand washing as one of the major practices of UPs was emphatically observed and recorded. Analysis revealed that hand washing was done by greater proportions across all the groups (G1=100%, G2=82%, G3=66.67%). Hand washing practices were seen in almost all the doctors irrespective of the years of recruitment and qualification or formal training, owing to the COVID pandemic almost all HCW practiced universal precautions especially during working hours. About 82% nurses practiced hand washing with majority of the group 2 have work experience of >10 years (83.3% vs 75%). About 66.67% technicians practiced hand washing

Irrespective of work experience, with majority of the group 3 have work experience of >10 years (83.3% vs 75%).

Table 6: Use of gloves in relation to various influencing factors

HCW	Gloves	Compliance %	Time since recruitment		Qualification		Formal Training	
			<10yrs	>10yrs	Graduate	Post graduate	Yes	No

G1	Used	100%	N=25	N=5	N =9	N=21	N=23	N=7
	Not used	NIL	nil	nil	nil	nil	nil	Nil
G2	Used	82%	N=6	N=20	N =26	Nil	83.3%(N=20)	75%(N=6)
	Not use	(N=26) 18% (N=6)	N=2	N=4	N =6	nil	16.67%(N=4)	25%(N=2)
G3	Done	66.67%	N=4	N=4	N =8	Nil	100%(N=2)	60%(N=6)
	Not Done	(N=8) 33.33% (N=4)	N=2	N=2	N =4	nil	Nil	40%(N=4)

Wearing gloves as one of the major practices of UPs was emphatically observed and recorded. Analysis revealed that gloves were worn by greater proportions across all the groups (G1=100%, G2=82%, G3=66.67%). Gloves worn by almost all the doctors irrespective of the years of recruitment and qualification or formal training ,owing to the COVID pandemic almost all HCW practiced universal precautions especially during working hours. About 82% nurses worn gloves with majority of the group 2 have work experience of >10 years(83.3%vs75%). About 66.67% technicians wore gloves while delivering patient care in the times of COVID Pandemic

Table 7: Use of Gowns in relation to various influencing factors

HC W	Gown s	Complianc e %	Time since recruitment		Qualification		Formal Training	
			<10yrs	>10yrs	Graduate	Post graduate	Yes	No
G1	Used	100%	N=25,	(N=5)100%	N =9(100%)	N=21(100%)	N=23(100%)	N=7(100%)
	Not used	nil	100%	nil	nil	nil	nil	Nil
			Nil					
G2	Used	93.7%	N=6(75%)	N=24(100%)	N =30(93.7%)	Nil	100%(N=24)	75%(N=6)
	Not use	(n=30) 6.2% (n=2)	N=2(25%)	) NIL	) N =2(6.25%)	nil	) NIL	25%(N=2)
G3	Done	83.3 %	N=6(100%)	N=4(66.6%)	N =10(83.3%)	Nil	100%(N=2)	80%(N=8)
	Not Done	(n=10) 16.67% (n=12)	NIL	) N=2(33.3%)	) N =2(16.7%)	nil	Nil	20%(N=2)

Analysis of the data to study correlation between use of gowns and time since recruitment revealed higher compliance in <10 years in group 3 while G 2 showed higher compliance in >10 years experience group however all the doctors irrespective of years of years of experience showed compliance for gowns in the time of COVID pandemic. It was noted that almost all HCW who received formal education /training in UP showed 100% compliance with gowns

Table 8: Use of Masks in relation to various influencing factors

HCW	Masks	Compliance %	Time since recruitment		Qualification		Formal Training	
			<10yrs	>10yrs	Graduate	Post graduate	Yes	No
G1	Used Not used	100% nil	N=25(100%) Nil	N=5(100%) nil	N=9(100%) nil	N=21(100%) nil	N=23(100%) nil	N=7(100%) Nil
G2	Used Not used	100% (n=32) nil	N=8(100%) Nil	N=24(100%) NIL	N=32(100%) Nil	Nil nil	N=24(100%) NIL	N=8(100%) Nil
G3	Done Not Done	100% (n=12) nil	N=6(100%) NIL	N=6(100%) Nil	N=12(100%) Nil	Nil nil	N=2(100%) Nil	N=10(100%) Nil

Analysis of the data revealed that mask was used by all the HCW irrespective of years of experience/qualification or formal training received in the time of COVID pandemic.

Table 9: Use of Eyewear in relation to various influencing factors

HCW	Eyewear	Compliance %	Time since recruitment		Qualification		Formal Training	
			<10yrs	>10yrs	Graduate	Post graduate	Yes	No
G1	Used Not used	87% (n=26) 13% (n=4)	N=23 N=2	N=3 N=2	N=7 N=2	N=19 N=2	N=22 N=1	N=4 N=3
G2	Used Not use	12.5% (n=4) 87.5%	N=2 N=6	N=2 N=22	N=4 N=28	Nil nil	N=2 N=22	N=2 N=6

		(n=28)						
G3	Done	16.67% (n=2)	NIL	N=2	N=2	Nil	Nil	N=2(20%)
	Not Done	83.3 % (n=10)	N=6(100%)	N=4	N=10	nil	N=2(100%)	N=8(80%)

Table depicts the outcome of various influencing factors on the use of eyewear by the HCW's. Analysis of the data to study correlation between use of eyewear and time since recruitment revealed higher compliance in <10 years in group 1 while G 2 did not show any difference in compliance wrt years of recruitment or formal training received. while G 3 showed least compliance with use of eyewear

DISCUSSION

Healthcare workers are at great risk of blood borne infections. Most of them are because of occupational exposure. Universal precautions are very nicely designed and very effective to control blood borne infections. That will protect healthcare worker as well as patients from getting serious infections such as HIV, HBV, HCV, influenza etc. For that proper knowledge and effective practices of universal precautions are very essential. In our study all the groups were having good knowledge about universal precautions with doctors having the best score. It was observed that due to COVID 19 the use of masks, hands sanitizers, gowns, protective goggles, gloves has increased a very much with all the groups using them most of the time.

Fayaz SH et al found that 31.8% did not always change gloves in between patients²². Noorasyikin Mohd-Nor²³ et al found 53% (n = 35) of the respondents reported not having any basic exposure or training in infection control practices, while the other 47% (n = 31) respondents received their training or basic exposure in infection control practices. Majority of the participants had high level of knowledge. Dr. Jaydeep J²⁴ assessed that most important and the basic thing in the prevention of infection is hand washing; knowledge regarding which was seen in all the nurses, however, compliance to hand washing was found only in 40% nurses. Low compliance of hand hygiene, lack of

training, heavy workloads, underuse of personal protective equipment's are major obstacles in preventing infection and spread of multi-drug resistant pathogens. .

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