

## ORIGINAL ARTICLE

# A Cross-sectional Study on Knowledge of Standard Precautions among Paramedical Health care workers in Teaching Hospital of GIMS, Gadag

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## ABSTRACT

**Background:** Health care workers are more exposed to blood and body fluids of the patients and are at risk of transmission of blood-borne and other pathogens. In developing countries, there is increasing incidence of sharp injuries due to recapping, disassembly, and inappropriate disposal of sharps or needles. **Aims and Objectives:** The objectives of the study were as follows: (1) To assess the knowledge of Standard precautions among paramedical Health care workers in Teaching Hospital of Gadag Institute of Medical Sciences, Gadag and (2) to determine the association between type of paramedical workers and their knowledge of standard precautions in Teaching Hospital of Gadag Institute of Medical Sciences, Gadag. **Materials and Methods:** A cross-sectional study was conducted among paramedical Health care workers working in teaching hospital. A pre-designed and semi-structured questionnaire was used to assess the knowledge of standard precautions among the paramedical staff and data were analyzed by proportion and Chi-square test. **Results:** Out of 157 paramedical Health care workers, majority of study subjects 54.8% were female and 66.9% belonged to the age group of 20–29 years. About 97.41% of nursing staff and laboratory technicians had knowledge of standard precautions involving contamination with bodily fluids and discharge. **Conclusion:** The study concluded that 93% paramedical staff had knowledge about application of standard precautions during caring of all patients regardless of their infection status and attempted to highlight the issues that were to be addressed with regard to standard precautions.

**Key words:** Health care workers, paramedical staff, sharp injuries, standard precautions

## INTRODUCTION

Health care workers are prone for infection as occupational hazard. They are exposed to infection associated with clinical, diagnostic, and therapeutic procedures leading to their morbidity and mortality.<sup>[1]</sup> Exposure to blood and body fluids from infected patients and sharp injuries poses a risk of infection with hepatitis B, C, or HIV to health-care staff.<sup>[2]</sup> Sharp injuries resulted in [16,000 hepatitis C, 66,000 hepatitis B] and 200–5000 HIV infections in health care workers worldwide according to the World Health Organization (2003).<sup>[3]</sup> In developing countries, the incidence of sharp injuries are more due to recapping, disassembly, and inappropriate disposal.<sup>[4,5]</sup> They are at risk of transmission of blood-borne and other pathogens from both recognized and unrecognized sources of infection.

For protection of the health care workers from infection, universal precautions were implemented as one of the

interventional measures by the US Centre for Disease Control and Prevention (CDC) in 1987. Universal precautions include set of precautions devised to prevent transmission of all known body fluids and blood-borne pathogens including HIV, hepatitis B virus, and hepatitis C virus to and from health-care personnel when providing health-care services.<sup>[6]</sup> CDC (1996) replaced universal precautions by standard precautions and it includes care of all patients in hospitals regardless of their diagnosis or presumed infection status.<sup>[7]</sup>

Standard precautions include hand hygiene, use of personal protective equipment, safe management and disposal of sharps, safe disposal of clinical/BMW waste, cleaning and

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decontamination of reusable equipment, maintenance of a clean clinical environment, safe management of laundry, and safe management of body fluid spillages.<sup>[7]</sup> It is designed to reduce the risk of transmission of blood-borne and other pathogens from both recognized and unrecognized sources to a susceptible host.

Health care workers, who provide clinical services to patients under the supervision of a physician, are called paramedical Health care workers or personnel; it includes nurses, technicians, and other ancillary personnel involved in medical care.<sup>[8,9]</sup> The differences in knowledge of standard precautions by health care workers may be influenced by their different type of duties and training. Despite the simplicity and clarity of the standard precautions, various studies showed that the knowledge of standard precautions is low among paramedical Health care workers. Hence, a need is felt to carry out the above research among paramedical Health care workers.

### Aims and Objectives

The objectives of the study were as follows:

1. To assess the knowledge of standard precautions among paramedical Health care workers in Teaching Hospital of Gadag Institute of Medical Sciences, Gadag.

2. To determine the association between type of paramedical workers and their knowledge of standard precautions in Teaching Hospital of Gadag Institute of Medical Sciences, Gadag.

### MATERIALS AND METHODS

A cross-sectional study was conducted for 4 months in the year 2018–2019 among all 157 paramedical Health care workers working in Teaching Hospital of Gadag Institute of Medical Sciences, Gadag, coming in contact with patients either by diagnosis, treatment, or patient care, that is, 102 nursing staffs, 14 laboratory technicians, and 41 Group D staff. All paramedical Health care workers willing to participate in the study were included in the study. Clerical staffs were excluded from the study. Ethical permission was obtained from the Institutional Ethics Committee. Written informed consent was taken in local Kannada language from all the study subjects for voluntary participation and confidentiality of information was maintained. A pre-designed and semi-structured questionnaire was administered to collect information regarding sociodemographic profile and knowledge of standard precautions among the paramedical Health care workers. Data were coded and entered into

**Table 1:** Distribution of the study subjects according to their sociodemographic factors ( $n=157$ )

Variables	Study subjects				Total		P value
	Male	Percentage	Female	Percentage	Total	Percentage	
<b>Age</b>							
20–29	48	30.6	57	36.3	105	66.9	$\chi^2=3.594$ df-3 $P=0.309$
30–39	21	13.4	22	14	43	27.4	
40–49	02	1.3	03	1.9	05	3.2	
50–59	00	00	04	2.5	04	2.5	
Total	71	45.2	86	54.8	157	100	
<b>Education</b>							
Primary school	2	1.27	3	1.91	5	3.18	$\chi^2=12.875$ df-9 $P=0.168$
Middle school	1	0.64	0	0.00	1	0.64	
High school	12	7.64	20	12.74	32	20.38	
Intermediate school	8	5.10	5	3.18	13	8.28	
Graduation	48	30.57	58	36.94	106	67.52	
Total	71	45.22	86	54.78	157	100.00	
<b>Occupation</b>							
Nursing staff	46	29.3	56	35.7	102	65	$\chi^2=1.038$ df-2 $P=0.595$
Laboratory technicians	8	5.1	6	3.8	14	8.9	
Group D staff	17	10.8	24	15.3	41	26.1	
Total	71	45.2	86	54.8	157	100	
<b>Socioeconomic class</b>							
Upper class	38	24.20	46	29.30	84	53.50	$\chi^2=0.081$ df-3 $P=0.994$
Upper-middle class	23	14.65	29	18.47	52	33.12	
Middle class	8	5.10	9	5.73	17	10.83	
Lower-middle class	2	1.27	2	1.27	4	2.55	
Total	71	45.22	86	54.78	157	100	

Excel sheet and analyzed by proportion and Chi-square test using SPSS version 21. The Chi-square test was used to test association between categorical variables.  $P < 0.05$  (two tailed) was considered statistically significant.

## RESULTS AND DISCUSSION

Majority of the study subjects 54.8% (86) were female and 66.9% (105) belonged to the age group of 20–29 years which was almost similar to the study done by Vaz *et al.*<sup>[1]</sup> in Jamaica in which the majority of the study subjects (65%) were female and 52% belongs to the age group of 17–29 years. The majority of the study subjects 53.5% (84) belongs to upper class according to the modified B G Prasad classification,<sup>[10]</sup> 67.52% (106) had completed graduation, 65% (102) were nursing staff, 8.9% (14) were laboratory technicians, and 26.1% (41) Group D staff [Table 1].

Majority of paramedical Health care workers 93% (146) had knowledge about application of standard precautions during caring for all persons regardless of their infection status which was similar to the study done by Harish Kumar *et al.*<sup>[11]</sup> in which 90.8% of nursing students had knowledge about application of standard precautions [Table 2].

Among female paramedical staff, majority 52.2% (82) had knowledge that blood spills should be cleaned up promptly with sodium hypochlorite, 51% (80) were aware of application of standard precautions while caring for all persons regardless of their infection status, 43.3% (68) were aware that if they have non-intact skin, they should not be involved in direct patient care until the condition resolves, 36.9% (58) were aware of washing hands always after contact with a patient and 34.4% (54) had knowledge of sanitizing hands in between treating different patients which were more compared to the male paramedical staff and it was statistically significant ( $P < 0.001$ ) [Table 2].

Nursing staff had better knowledge regarding cleaning of blood spills (65%), need of intact skin during patient care (62.4%), importance of always washing hands after patient care (45.9%), and sanitizing hands in between treating different patients (47.8%) followed by Group D staff and laboratory technicians and it was statistically significant ( $P < 0.05$ ) [Table 3].

Among 116 nursing staff and laboratory technicians, majority of 97.41% (113) had knowledge of standard precautions involving contamination with bodily fluids and discharge, 86.21% (100) knew that subcutaneous injuries to the health care worker during intravenous injections were most common cause of occupational infections. About 80.17% (93) said that gowns should not be reused for repeated contacts with the same patient, 66.38% (77) were aware that a single pair of gloves provides adequate barrier protection for contact with

Table 2: Distribution of the study subjects according to the association between gender and knowledge of standard precautions (n=157)

No. Questions	Male			Female			Total			P value									
	Yes	No	%	Yes	No	%	Yes	No	%		Do not know	%							
1. SP should be applied caring for all persons regardless of their infection status	66	42	0	0	5	3.2	80	51	2	1.3	4	2.5	146	93	2	1.3	9	5.7	$\chi^2-161.06$ df=6 $P=0.0$
2. Blood spills should be cleaned up promptly with sodium hypochlorite	70	44.6	0	0	1	0.6	82	52.2	2	1.3	2	1.3	152	96.8	2	1.3	3	1.9	$\chi^2-160.89$ df=6 $P=0.0$
3. Health care workers with non-intact skin should not be involved in direct patient care until the condition resolves.	62	39.5	4	2.5	5	3.2	68	43.3	11	7	4.5	7	130	82.8	15	9.6	12	7.6	$\chi^2-161.498$ df=6 $P=0.0$
4. Hands should always be washed after contact with a patient.	50	31.8	21	13.4	0	0	58	36.9	27	17.2	1	0.6	108	68.8	48	30.6	1	0.6	$\chi^2-159.93$ df=6 $P=0.0$
5. Sanitizes hands in between treating different patients.	46	29.3	25	15.9	0	0	54	34.4	32	20.4	0	0	100	63.7	57	36.3	0	0	$\chi^2-159.07$ df=4 $P=0.0$

**Table 3: Distribution of the study subjects according to the association between occupation and knowledge of standard precautions (n=157)**

No.	Questions	Nursing staff			Laboratory technician			Group D staff			Total			P value						
		Yes %	No %	Do not know %	Yes %	No %	Do not know %	Yes %	No %	Do not know %	Yes %	No %	Do not know %							
1.	SP should be applied caring for all persons regardless of their infection status	102	65	0	0	0	0	31	19.7	1	0.6	9	5.7	146	93	2	1.2	9	5.7	$\chi^2=32.856$ df-4 P=0.00
2.	Blood spills should be cleaned up promptly with sodium hypochlorite.	99	63.1	1	0.6	2	1.3	40	25.5	0	0	1	0.6	152	96.8	2	1.2	3	1.9	$\chi^2=4.731$ df-4 P=0.32
3.	Health care workers with non-intact skin should not be involved in direct patient care until the condition resolves.	98	62.4	4	2.5	0	0	14	8.9	0	0	12	7.6	130	82.8	15	9.6	12	7.6	$\chi^2=61.6$ df-4 P=0.00
4.	Hands should always be washed after contact with a patient.	72	45.9	30	19.1	0	0	14	8.9	0	0	1	0.6	108	68.8	48	30.6	1	0.6	$\chi^2=12.93$ df-4 P=0.012
5.	Sanitizes hands in between treating different patients.	75	47.8	27	17.2	0	0	14	8.9	0	0	0	0	100	63.7	57	36.3	0	0	$\chi^2=36.34$ df-2 P=0.00

**Table 4: Distribution of nursing staff and laboratory technicians according to their knowledge of standard precautions (n=116)**

No. Questions	Male						Female						Total		P value				
	Yes	%	No	%	Do not know	%	Yes	%	No	%	Do not know	%	Yes	%		No	%	Do not know	
1. SP involving contamination with bodily fluids and discharge.	53	45.69	1	0.86	0	0	60	51.72	2	1.72	0	0	113	97.41	3	2.59	0	0	$\chi^2=0.534$ df=2 P=0.766
2. Subcutaneous injuries to the health care worker during intravenous injections are most common cause of occupational infections.	45	38.79	7	6.03	2	1.72	55	47.41	5	4.31	2	1.72	100	86.21	12	10.34	4	3.45	$\chi^2=1.105$ df=3 P=0.776
3. Gowns can be reused for repeated contacts with the same patient.	10	8.62	44	37.93	0	0	12	10.34	49	42.24	1	0.86	22	18.97	93	80.17	1	0.86	$\chi^2=1.224$ df=3 P=0.747
4. For contact with blood and bodily fluids during non-surgical patient care, a single pair of gloves generally provides adequate barrier protection.	36	31.03	15	12.93	3	2.59	41	35.34	19	16.38	2	1.72	77	66.38	34	29.31	5	4.31	$\chi^2=0.764$ df=3 P=0.858
5. For decontamination of devices such as Baumanometer (only contact with skin), washing with usual detergent is enough.	45	38.79	4	3.45	5	4.31	43	37.07	6	5.17	13	11.21	88	75.86	10	8.62	18	15.52	$\chi^2=3.798$ df=3 P=0.284
6. The cleaning and disinfection of all patient care areas are important for frequently touched surfaces, especially those closest to the patient, that are most likely to be contaminated.	50	43.10	3	2.59	1	0.86	56	48.28	5	4.31	1	0.86	106	91.38	8	6.90	2	1.72	$\chi^2=0.607$ df=3 P=0.895
7. Used needles can be recapped after giving an injection.	11	9.48	43	37.07	0	0	12	10.34	50	43.10	0	0	23	19.83	93	80.17	0	0	$\chi^2=0.335$ df=3 P=0.846
8. Isolation is necessary for patients with all blood-borne infections.	44	37.93	10	8.62	0	0	51	43.97	10	8.62	1	0.86	95	81.90	20	17.24	1	0.86	$\chi^2=2.465$ df=4 P=0.651
9. Are the standard precautions not necessary in situations that might lead to contact with saliva?	19	16.38	33	28.45	2	1.72	18	15.52	35	30.17	9	7.76	37	31.90	68	58.62	11	9.48	$\chi^2=5.436$ df=4 P=0.245

blood and bodily fluids during non-surgical patient care, and 75.86% (88) had knowledge that washing with usual detergent is enough for decontamination of devices such as Baumanometer (only contact with skin) [Table 4].

Among 116 nursing staff and laboratory technicians, 91.38% (106) had knowledge that cleaning and disinfection of all patient care areas are important for frequently touched surfaces, especially those closest to the patient, that are most likely to be contaminated, 80.17% (93) had knowledge that used needles should not be recapped after giving an injection, 81.90% (95) had agreed that isolation is necessary for patients with all blood-borne infections, and 58.62% (68) disagreed that the standard precautions were not necessary in situations that might lead to contact with saliva, all these findings were statistically significant ( $P < 0.001$ ) which in contrast to the study done by Gebresilassie *et al.*<sup>[12]</sup> 11.8% of the HCWs recap needles after injection [Table 4].

## CONCLUSION

The study concluded that 93% paramedical Health care workers had knowledge about application of standard precautions during caring of all patients regardless of their infection status. The study showed different levels of knowledge of standard precautions among paramedical Health care workers with nursing staff having more knowledge followed by Group D and then laboratory technicians. There was inconsistent knowledge of standard precautions in the health-care setting which increased the risk of acquiring nosocomial infections. It has attempted to highlight the issues that are to be addressed with regard to standard precautions. It will be helpful in conducting focused training programs to address the weak areas and to safeguard the health of paramedical Health care workers. It will also be helpful in better utilization of resources in organizing training programs and workshops on standard precautions.

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