

# Adoption of Standard Precaution for Infection Prevention among Health Service Workers in Pokhara Metropolitan

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## Abstract:

**Introduction:** Infection is a major problem in health care setting. Standard Precaution taken by health workers which focuses on prevention and reduces the chance of transmission of disease causing pathogen. This study was conducted to find out the knowledge and practice on standard precaution for infection prevention in public and private health facilities in Pokhara Metropolitan, Kaski, Nepal.

**Methods:** Descriptive cross-sectional study was conducted, where simple random sampling was used to collect quantitative data. In total, 178 health service workers from two hospitals (one private and one public) were selected. The data collection tools were self-administered questionnaire and observation checklist.

**Result:** Study showed that good knowledge on standard precaution was 55 % of public and 44.9 % of

## 1. INTRODUCTION

In health care setting infection is one of the major problems. It is one of the most important causes of morbidity and mortality associated with clinical and other procedures<sup>[1]</sup> where health care workers are at a high risk of exposing bodily fluids of the patients who are considered to be possible carrier of pathogen while providing health care services.<sup>[2]</sup>

The use of standard precaution is low in public secondary health facilities, especially in resource limited setting which provides more risk of infection to health care workers. Occupational safety of the health workers and standard precaution is less prioritized topic in low income countries.<sup>[3]</sup>

In Nepal, the study indicate that Nepalese nursing students have a large knowledge gap and low practice on standard precaution on infection prevention, regardless of level of education.<sup>[4]</sup>

The terms standard precaution was a practice that focuses on reduction the chance of transmission of disease causing pathogen, which is adopted by the health care workers.<sup>[5]</sup> Centre of Disease Control (CDC) and Occupational Safety and Health Administration (OSHA) have said that hand washing, personal protective equipment (Specialized clothing or equipment, worn by an employee for protection against infectious materials), respiratory hygiene/ cough etiquette,

private health facility (H.F.) as well 45.9 % in public and 66.7 % in private health facility respondents had good practices on standard precaution. Study showed only 68.8 % in public and 82.6 % in private H.F reported the availability of personal protective equipment (PPE) in their health facilities. In this study most of the respondents got health hazards due to needle stick injury during work.

**Conclusion:** This study showed that the reason of higher number of health hazard faced by health workers were due to lack of availability of personal protective equipment and poor knowledge and practices on standard precaution which need to be improved by providing both basic and refresher training and also by making availability of PPE throughout the year.

**Keywords:** Health Hazards, Infection Prevention, Personal Protective Equipment, Standard Precaution

standard precaution and surface disinfection are most important factors for prevention and control infection.<sup>[6]</sup>

Pokhara Metropolitan is the provincial capital of Gandaki province consisting many public and private hospitals where high numbers of health workers are working for patient care. Hence there is the risk of getting infection if the workers do not follow the standard precaution. Due to limited study in Pokhara long ago the current situation of adopting the standard precaution for infection prevention by the health workers is not known. This study aims to find out the knowledge and practice of health workers on standard precaution for infection prevention in public and private health facilities in Pokhara Metropolitan.

## 2. METHODS

A cross-sectional study was carried out in randomly selected one private (Fewa City Hospital) and in one Public (Western Regional Hospital) hospital from the list of both private and public hospitals where in total 318 health workers were working.

In order to get required sample 22% prevalence<sup>[7]</sup> was used with margin of error 5% and alpha 0.05 and obtained 145 by using the survey formula with adding 10% non-response rate on sample size, the final size was 162.

The total sample was allocated to both hospitals as per sharing percentage of population, but 16 more sample was

collected because some health workers voluntarily showed interest to participate in study. Due to availability of more time voluntarily interested health workers were also added in the study as shown in figure.

**Table 1. Sampling Frame**

S. N.	Health Facility Code	Total Paramedic health worker	% of Paramedic health workers	Selected Sample	Collected Sample
1	A (Public Health Facility)	195	61	99	109
2	B (Private Health Facility)	123	39	63	69
Total		318	100	162	178

Before collecting data researcher took inform consents from all participants and distributed the self-administered questionnaires to fill-up. The questionnaires were first developed in English and then translated into simple Nepali language and were pretested among 10% of the health workers of a non-selected hospital in Pokhara and later it was corrected as necessary. The collected data were checked, compiled, coded and entered in the EPI-DATA version 3.1 and refined data were transferred into SPSS version 20 for further analysis. Data were summarized in terms of frequency, percentage, mean and standard deviation as per necessity. Chi-square test was done for analytical test.

Level of knowledge or practice was based on scoring (1 score for each right response). Good knowledge means knowledge score equal or above mean knowledge score and poor knowledge means knowledge score below to mean knowledge score. Similarly, good practice means score above and equal to mean practice score and poor practice means score below to mean practice score.

Ethical approval from Institutional Review Committee (IRC) of Pokhara University, permission was taken from Pokhara Metropolitan and concern hospitals authorities, prior to conduct study.

### 3. RESULT

**Table 2. Socio-Demographic and Work Related Factors**

Variable	Public H.F.	Private H.F.
Age		
< 20	1 (0.9%)	2 (2.9%)
20 - 29	90 (82.6%)	61 (88.7%)
30 - 39	8 (7.3%)	4 (5.8%)
40 - 49	6 (5.5%)	2 (2.9%)
50+	4 (3.7%)	-
Gender		
Female	104 (95.4%)	63 (91.3%)
Male	5 (4.6%)	6 (8.7%)
Education status		
SLC/T-SLC	5 (4.6%)	1 (1.4%)
Intermediate/PCL	75 (68.8%)	59 (85.5%)
Marital status		
Unmarried	60 (55%)	51 (73.9%)
Married	49 (45%)	18 (26.1%)
Job categories		
Nursing Staffs	97 (89%)	61 (88.4)
Other Paramedics	12 (11%)	8 (11.6%)

Table 2 showed more than four-fifth were within the age group 20-29 years with mean age of 26.04 ( $\pm 8$ ) in public H.F. and 23.99 ( $\pm 5.24$ ) in private H.F. where female participants were 95.4% in public and 91.3% in private H.F. Majority of the participants from both public and private health facilities

are un-married i.e. 55% and 73.9% respectively, likewise majority were Intermediate/PCL education level i.e. 68.8 % in public and 85.5 % private in H.F. Study also showed in both public and private H.F. most of the respondents were nursing staff i.e. 89 % and 88.4 % respectively.

**Table 3. Organizational and Knowledge Related Factors on PPE**

Variable	Public H.F.	Private H.F.
Availability of PPE	Yes	75 (68.8%)
	No	34 (31.2%)
Training on Standard Precaution	Yes	24 (22%)
	No	85 (78%)
Knowledge on Standard Precaution	Yes	49 (45%)
	No	60 (55%)
Re-capping of used needles is allowed	Yes	76 (71.03%)
	No	31 (28.97%)
Re-cap used needles	Yes	82 (78.85%)
	No	23 (21.15%)

Proper way of managing used needles	Wrong Knowledge	70 (64.2%)	52 (75.4%)
	Right Knowledge	39 (35.8%)	17 (24.6%)
Using personal protective equipment	Yes	88 (80.7%)	62 (89.9%)
	No	21 (19.3%)	7 (10.1%)
Reason for not using PPE	Lack of Equipment	13 (61.9%)	4 (57.1%)
	Lack of knowledge	6 (28.6%)	2 (28.6%)
	Lack of time	2 (9.5%)	1 (14.3%)
Use gloves while working	Yes	106 (97.2%)	69 (100%)
	No	3 (2.8%)	-
Use facial protection equipment	Yes	84 (77.1%)	55 (79.7%)
	No	25 (22.9%)	14 (20.3%)

Table 3 showed more than two - third in public and around four-fifth in private H.F. agreed that there is availability of PPE in their health facilities but there is only 22% in public and 36.2% in private H.F. respondent take training on standard precaution. The major finding of this study was only few respondents have knowledge on re-capping of used

needle is not allowed i.e. 28.97 % in public and 26.78 % in private H.F. Second major finding was 78.85 % in public and 68.42 % in private H. F. respondents re- cape needles after use. The proper process of managing used needle was using needle destroyer and using syringe box. Due to lack of equipment and knowledge some health workers do not use PPE.

**Table 4. Practice of Hand Washing and Waste Management**

Variable	Public H.F.	Private H.F.
Steps of standard hand washing *		
Wrong answer	40 (36.7%)	21 (30.4%)
Right answer	69 (63.3%)	48 (69.6%)
Condition of washing hands *		
Before and after any direct patient contact	86 (80.4%)	62 (89.9%)
After touching blood and body fluids	75 (70.1%)	62 (89.9%)
Before handling an invasive device	70 (65.4%)	50 (72.5%)
Immediately after gloves are removed	68 (63.6%)	54 (78.3%)
During patient care	50 (46.7%)	50 (72.5%)
After contact with inanimate objects	40 (37.4%)	44 (63.8%)
Immediate after reaching Hospital	22 (20.6%)	20 (29.0%)
Only after touching patient	17 (15.9%)	8 (11.6%)
Best time of waste segregated out/ separate		
At the time of waste generation	52 (47.7%)	40 (58.0%)
At the time of waste disposal	27 (24.8%)	4 (5.8%)
At the time of waste collection	18 (16.5%)	22 (31.9%)
Others	7 (6.4%)	1 (1.4%)

\*Multiple Response

Table 4 showed around 50 % respondents from both public and private health facilities they segregate waste at the time of waste generation (Best time for waste separation) i.e. 47.7 % and 58 % respectively followed by at the time of waste disposal in public H.F. (24.8 %) and at the time of waste collection in private H.F. (31.9%).

The seven steps of standard hand washing were: wet hands and apply enough soap, rub palm together, rub the back of each hand, rub hands while interlocking fingers, rub back and tip of fingers, rub thumb and end of wrist, rinse both hand properly with water.

**Table 5. Health Hazard**

Variables	Public H.F	Private H.F
	Frequency (%)	Frequency (%)
Got any Health Hazard during duty hour (n=178)		
Yes	62 (56.9)	36 (52.2)
No	47 (43.1)	33 (47.8)
Types of health hazards*		
Pricking by Needle or sharp object injury	55 (88.7)	35 (97.2)
Hazardous medicines or chemicals	22 (35.5)	3 (8.3)
Respiratory Problem	13 (21)	3 (8.3)
Expose to blood borne pathogens	12 (19.4)	6 (16.7)
Others problems	23 (37.1)	23 (64)

\*Multiple Response

Table 5 showed more than 50 % respondents get health hazard i.e. 56.9 % in public H.F. and 52.2 % in private H.F.

Needle stick injury or sharp object injury is common in both public and private H.F. i.e. 88.7 % and 97.2 % respectively.

**Table 6.** Association of training on PPE with knowledge and practice level

H.F. Type	Variables	Poor	Good	χ <sup>2</sup> value	P value
Training on PPE and Knowledge Level					
Public	No	44 (51.8%)	41 (48.2%)	7.236	.007*
	Yes	5 (20.8%)	19 (79.2%)		
Private	No	30 (68.2%)	14 (31.8%)	8.435	.004*
	Yes	8 (32%)	17 (68%)		
Training on PPE and Practice Level					
Public	No	42(49.4%)	43(50.6%)	1.067	.302
	Yes	9(37.5%)	15(62.5%)		
Private	No	25(56.8%)	19(43.2%)	5.324	.021*
	Yes	7(28%)	18(72%)		

Table 6 showed that knowledge on standard precaution is higher among participants who take training on PPE with compared who had not. Study also showed in private health facility training on PPE/standard

precaution was significantly associated with practice on standard precaution, where there was good practice ooiuamong who had taken training on PPE compared with who had not.

**Table 7.** Association of Availability of PPE and Practice on Standard Precaution with Types of Health facilities

H.F. Type	No	Yes	χ <sup>2</sup> value	P value
Availability of PPE				
Public	34 (31.2%)	75 (68.8%)	4.200	.040 *
Private	12 (17.4%)	57 (82.6%)		
Practice on Standard Precaution				
Public	59 (54.1%)	50 (45.9%)	7.354	.007 *
Private	23 (33.3%)	46 (66.7%)		

Table 7 showed there was significant association between availability of Personal Protective Equipment and Practice on Standard precaution with types of health facilities where availability of PPE higher in Public Health Facility compared with Private H.F. The practice on Standard Precaution was higher in Public health facility than Private health facility.

**4. DISCUSSION**

The study showed more than four-fifth respondents were within age group 20-29 years with mean age of 26.04 ±8 years in public H.F. and 23.99 (±5.24) in private H.F. Similarly, study conducted among health care workers of tertiary level hospital of Kathmandu showed majority of participants with were within age group 21-30 years with mean age 28.7 years.<sup>[7]</sup>

In this study majority of respondents were female i.e. 95.4 % in public and 91.3% from private H.F. Similar study among health care workers on universal precaution in Ogun State, Nigeria showed there is also majority of female respondent i.e. 76.7%.<sup>[8]</sup>

In this study majority of the respondents were nursing staffs (Staff Nurse, Auxiliary Nurse Midwife, Bachelor of Nursing/Bachelor of Sciences in Nursing) i.e. 89 % in public and 88.4 % in private H.F. followed by Health Assistant, Auxiliary Health Worker/Community Medicine Assistant, Laboratory Workers etc. Similarly study among health care workers on universal precaution in Ogun State, Nigeria majority of the respondents were nurses i.e. 48.7% followed by auxiliary nurses, doctors and others health care workers.<sup>[8]</sup>

The current study showed that there was no significant association between gender and knowledge on standard precaution in contrast study in Jamaica showed that knowledge on universal precaution was significantly more in female (75.4%) than male (42.9%).<sup>[9]</sup>

This study showed 55 % in public and 44.9 % in private health facilities respondents had correct knowledge on standards precaution which is higher than previous study in Western Development Region of Nepal where only 22% basic health worker had correct knowledge on it. <sup>[10]</sup> In Nigeria, study showed 16% and 29% had fair and poor general knowledge on standard precaution.<sup>[11]</sup>

Only few respondents (35.8 % in public and 24.6 % in private) have knowledge on proper way of manage used needles (i.e. use needle destroyer, use syringe box) found in this study compared to previous study in Western Cape showed 93.6 % respondents have knowledge on proper way to manage used needles. <sup>[12]</sup> In Costal South India study showed 87.6% participants disposed needles and sharp object into designed container.<sup>[9]</sup>

In Costa South India 77.5 % participants use gloves <sup>[9]</sup> but in this study 97.2 % in public H.F. and 100 % respondents in private H.F. use gloves while working in health facilities. Study also showed that in public 77.1% and in private 79.7 % respondents use facial protective equipment specially masks while in Western Cape 85.5 % respondents had knowledge on goggles and masks are necessary in nursing activities. <sup>[12]</sup>

Studies showed, only 19.3 % in public and 10.1 % in private health facilities respondents reported that they do not use PPE but in Jamaica study showed that 28 % male and 6.2% of

female do not use PPE. [13] This Study showed that lack of equipment and lack of knowledge related to equipment is the major reason of responded not use PPE similarly study in Western Cape showed 14.5 % respondent have no idea about when to use PPE.[12]

Studies denote that most of the participants wash their hands before and after direct patient contact (i.e. 80.4 % in public and 89.9 % in private) followed by after touching blood or blood product. Similarly, in Western Development Region, Nepal study showed 63 % basic health workers washed their hands regularly before and after attending to each patient. [10] This study also showed in public H.F. 63.6 % and in private H.F. 78.3 % respondents wash their hands after gloves are removed which is almost same in Costal South India where 75.8 % health workers wash their hands after gloves removed.[9]

In needle management practice, study showed that in public H.F. 78.85 % and in private H.F. 68.42 % respondent's recapped needles after use but in Nigeria study showed almost one third (31.9%) participants admit to recap used needles.[11]

## 5. CONCLUSION

This study showed that only few participants take training on standard precaution. There is also inadequate supply of personal protective equipment in health facilities, hence only four-fifth respondents use personal protective equipment. Study also found that only less than one-third respondents have knowledge on re-capping of used needle is not allowed and more than two-third respondents re- capped needles after use.

Study conclude that more than 50% respondents got health hazard (needle stick injury) due to lack of knowledge and practice on standard precaution/PPE.

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