

# Knowledge, Attitude and Practices of the Standard Precautions among the Laboratory Technicians in a Tertiary Care Hospital at New Delhi

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## Abstract

Healthcare Workers are always at high risk of infection since they deal with the infectious patients and materials in the hospital. The knowledge about the acquired infections and diseases as an occupational hazard, preventive methods and the improvisation of such knowledge by following standard precautions is not known and not followed by significant number of laboratory technicians.

**Objectives:** To determine the awareness and practices of standard precautions among the laboratory technicians of a tertiary care hospital at New Delhi.

**Methodology:** The present study is a hospital-based cross-sectional study. A semi-structured, self-administered bilingual questionnaire, based on WHO standard precautions and ICMR good lab practices, was used to assess the knowledge, attitude and practices of standard precautions among laboratory technicians of biochemistry, pathology, microbiology, DOTS and hematology laboratories of a tertiary care hospital. Ethical certificate for the study was been obtained from the Institute Ethics Committee of VMMC and Safdarjung Hospital.

**Result:** 84 forms were administered to study samples. 81 forms (96.4%) were filled and returned. 17.28% (14) of the participants had experienced needle pricks at some time in the past. 90% of the study participants were aware about the standard precautions. Majority (98.76%) of them did not know about the biosafety level of their laboratories and all of them reported absence of accident register. Majority (69.1%) of them were somewhat knowledgeable (>75% of the total score). There was no significant difference in the knowledge level of the participants based on their sex (p-0.296), age groups (p-0.083) or the departments (p-0.324).

**Conclusion:** The study concluded that there was lack of knowledge among technicians for their safety and health which demands CME program, refresher trainings, re-orientation classes and hands-on-training for reinforcements on standard precautions, regularly.

**Keywords:** Standard precaution, Laboratory technicians, Infectious diseases, Occupational health

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**How to cite this article:** Gandhi A, Kumari S, Kishore J. Knowledge, Attitude and Practices of the Standard Precautions among the Laboratory Technicians in a Tertiary Care Hospital at New Delhi. *Epidem Int* 2017; 2(4): 18-22.

**Digital Object Identifier (DOI):** <https://doi.org/10.24321/2455.7048.201719>

ISSN: 2455-7048

## Introduction

Healthcare workers are always at high risk of infection since they deal with the infectious patients and materials in the hospital. It has been established by previous studies that the transmission of HIV, HBV happens to laboratory workers by needle pricks. Pre- and post-exposure precautions and prophylaxis reduce the risk to a great extent.<sup>1,2</sup> They, especially the laboratory technicians, are exposed to various physical, biological and chemical harmful agents during their work in the laboratories and wards. Hence it is of prime importance that the healthcare workers are aware of the health hazards associated with their profession and the various techniques and procedures that must be employed to protect them against such infections. WHO (World Health Organisation) advises that standard precautions should be the minimum level of precautions used when providing care for all patients. Standard precautions are meant to reduce the risk of transmission of blood-borne and other pathogens from both recognized and unrecognized sources.<sup>3</sup> It includes practices of hand hygiene, gowns, gloves, facial protection and hospital waste management.

WHO has given a set of principles and practices, both at institutional level and individual level, to be adhered to as standard precautions and it becomes essential that the laboratory workers are aware of them and actually practice them in their work place, to ensure the existence of safe working climate.<sup>3</sup> It is also mandatory for the laboratories to provide the safety guidelines, orientation, frequent updates, safety officer and adequate personnel for work safety and protection of laboratory technicians.<sup>4</sup> Standard precautions are not known and are not followed by a significant number of laboratory technicians due to various reasons such as lack of knowledge, non-adherence to such principles, non-availability of protective gears, etc.<sup>5,6</sup> Within the knowledge, the lag may be at institutional level or individual level.

The published and available studies in New Delhi, India, about the knowledge and practices of standard precautions have been done only among doctors and nurses. There is paucity of studies about the knowledge, attitudes and practices of standard precautions among the laboratory technicians in New Delhi. Hence, the present study will assess the knowledge level, awareness and actual practices carried on by the laboratory technicians, which can be

used as a baseline for further planning of activities to fill the gap, if any, that arises out of the study.

## Methodology

The present study was a cross-sectional study. It was carried out among the laboratory technicians belonging to biochemistry, pathology, and microbiology departments in November and December 2016. The list of technicians was obtained from the respective department offices. Complete enumeration of all the laboratory technicians who gave signed Informed consent was included in the study. The eligible technicians were approached individually by the investigators and explained about the study and its objectives in the language they understand. A semi-structured, self-administered questionnaire was used to assess the awareness, attitude and practices of Standard Precautions (SP). If the technician was not found on a particular day, two more attempts were made on successive days, to contact him/her. The filled up forms were collected by the investigators after an interval of 2 hours. The questionnaire was based on WHO standard precautions<sup>3</sup> and ICMR (Indian Council for Medical Research) Good Laboratory Practices.<sup>4</sup> Knowledge level was scored using 16 specific questions with a total score of 16. The knowledge level was classified as very knowledgeable (>75% of the total score), somewhat knowledgeable (50–60% of the score), least knowledgeable (<50% of the total score).

## Ethical Consideration

Ethical clearance certificate for the study was obtained from the Institute Ethics Committee of Vardhman Mahavir Medical College and Safdarjung hospital, New Delhi.

## Statistical Analysis

Data was entered in MS Excel and the statistical analysis was computed using SPSS 21.0 and descriptive frequencies.

## Results

The questionnaire was administered to 84 technicians who gave consent. Among them, 81 forms were returned, with a response rate of 96.42%. Majority of the participants were in the age group of 40–50 years (42%). Most of them (95.1%) had tertiary level education such as MLT, B.Sc. degrees. 90% of the study participants were aware about the term standard precautions.

**Table 1. Distribution of Study Participants according to Sex and Department (N=81)**

Sex	Frequency	Percentage
Male	32	40
Female	49	60
Department		
Biochemistry	25	31
Microbiology	12	15
Pathology	44	54

Among the participants, 32 (40%) of them were male and 49 (60%) were females. 25 (31%) of the participants responded from biochemistry department. 12 (15%) of them responded from microbiology and 44(54%) responded from pathology (Table 1).

**Table 2. Availability of Materials in Laboratories**

Materials	Availability (n)	Availability %
Hand Glove	81	100
Soap Water	77	95.1
Sharps Container	72	88.89
Needle Incinerator	68	83.96
Goggles	11	14
Facemasks	69	85
Disinfectants	77	95.1

Availability of goggles is very low (14%) as reported by the participants. Other protective gears like hand gloves (100%), soap water (95.1%), face masks (85%), etc., were reported to be adequately available by the respondents (Table 2).

**Table 3. Knowledge, Attitude and Practices of Standard Precautions among the Study Participants (N=81)**

	n	Percentage
Willingness to attend program on SP	81	100
Good attitude towards post-exposure prophylaxis	80	98.76
Correct needle disposal methodology	79	97.53
Hepatitis B vaccine taken	78	96.29
Hand wash as single most measure to prevent infection	73	90.12
Correct Timing of hand gloves wearing	73	90.12
Correct Food and Drink practices in lab	72	88.88
Pre and Post Exposure prophylaxis awareness	71	87.6
When to hand wash	70	86.4
Biosafety officer availability	66	81.48
Protective gears availability	63	77.77
Correct measures to be taken immediately after needle stick injury	24	29.6
Wear coverings over toes	16	19.75
Masks in lab	12	14.84
Allow friends	4	4.94
BSL of their lab	1	1.24
Accident register	0	0
Biosafety levels	0	0

90% of the participants knew that hand wash is an important measure to avoid infection. All of them were willing to attend the orientation program on standard precautions. 17.28% (14) of the participants had experienced needle

pricks at some time in the past. Majority of them did not know about the biosafety levels and accident register in their laboratories (Table 3).

Majority (69.1%) of them were somewhat knowledgeable regarding standard precaution (<75% of the total score). There was no significant difference in the knowledge level of the participants based on their sex ( $p=0.296$ ), age groups ( $p=0.083$ ) or the departments ( $p=0.324$ ).

## Discussion

In the present study, 90% of the study participants were aware about the standard precautions, which is a very good indication to further analyze their knowledge and practices in the principles. A study by Fadaye et al.<sup>5</sup> in Nigeria reported that only 58.5% were aware about the term.

Our study showed that protective gears are adequately available in laboratories, except goggles, according to the participants. This indicates that the eye safety measures are poor in the laboratories. The technicians are exposed to the risk of transmission by splashes while working with the body fluids. The study by Fadaye et al.<sup>5</sup> had a similar finding regarding protective gears (84.6%).

96.29% of our participants reported that they took Hepatitis B vaccination. It is a positive finding considering their awareness with regards to the preventable hospital-acquired infections. Zaveri et al.'s<sup>6</sup> study shows that only 8.5% were Hepatitis B vaccinated, which is very low compared to our study. A study by Fayaz et al.<sup>7</sup> revealed that 78% of the study participants were vaccinated. Girma<sup>8</sup> in her study conducted in 2015 showed that only 6% of the study participants were vaccinated with Hepatitis B. However, the study participants in the above two studies included physicians, surgeons, nurses, etc., along with laboratory technicians.

Only 29.6% of our study population knew about correct measures to be followed after needle prick injury which is alarming. The laboratory technicians are in a greater risk of acquiring infection from needle pricks, since they do not know and follow the prescribed measures. A similar study by Zaveri et al.<sup>6</sup> conducted in Ahmedabad reported it to be 17.5%. Fayaz et al.<sup>7</sup> showed that only 48.6% were knowing the correct procedures to be followed after needle prick injury

The overall knowledge score assessed by the present study revealed a somewhat knowledge level of 70% among the technicians and none of them having very knowledgeable level. This implies the necessity to sensitize the laboratory technicians to the latest guidelines on standard precautions and waste management. A study by Mudella et al.<sup>9</sup> conducted in Hyderabad showed 56.6% very knowledgeable level among the laboratory technicians. The questions used to score the knowledge level in the two studies are different. The difference in knowledge level might have occurred due to that. There is no significant difference

in knowledge levels between male and female groups ( $P>0.05$ ) in our study. The same was observed by Mudella et al.<sup>9</sup> in their study.

## Limitations

The study was conducted in one institute and only at a tertiary level of care. Hence, the results are limited in external validity to other levels and geographical areas. Further studies on laboratory technicians involving multiple hospitals and levels of care must be undertaken.

## Conclusion

The study concluded that there was lack of knowledge among technicians for their safety and health, which demands CME programs, refresher trainings, reorientation classes and hands-on-training for reinforcements on standard precautions, regularly. Accident register must be maintained in each laboratory and reports should be properly compiled. All technicians must be made acquainted with the biosafety officer of their respective laboratories. Posters on standard precautions must be displayed in the stations of the laboratory workers.

**Conflict of Interest:** None

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Date of Submission: 2017-11-16

Date of Acceptance: 2017-12-16