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## ORIGINAL ARTICLE

# Knowledge, Attitude and Practices of Laboratory Safety Measures among Allied Health Staff of Pathology

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### ABSTRACT

**Objective:** To assess Knowledge, Attitude and Practices of laboratory safety measures among allied health staff of Pathology.

**Study Design:** It was a cross-sectional study

**Place and Duration of Study:** This study was carried out in the department of Hematology & Transfusion Medicine, The Children's hospital & ICH Lahore in a period of three months from July 2020 to September 2020.

**Material and Methods:** 250 Allied health workers, working under Pathology Department of the hospital were included. After their informed consent we used a standardized and structured questionnaire to assess knowledge, attitude and practices of the lab safety measures. Data was entered in SPSS version 23.

**Results:** According to our results 171 (68.4%) of the staff had knowledge about the laboratory safety while 43 (17.2%) did not give correct answers and 36 (14.4%) were unclear in knowledge. Regarding the attitude and beliefs of lab personals the correct response rate was 208 (83.2%) and 42 (16.8%) did not answer correctly. In practices of lab safety procedures 193 (77.2%) answered correctly and 57 (22.8%) were not practicing. 144 (57.6%) were female participants and 106 (42.4%) were male.

**Conclusion:** These studies should be conducted at regular intervals in every hospital. All employees working specially in the Pathology Laboratories must be trained for each aspect of laboratory safety.

**Key Words:** *Lab safety, Paramedical, Knowledge, Attitude, Practice*

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### INTRODUCTION

The progression in medical technology in the recent years has transformed medical field from convention to innovation. Nowadays, a large variety of diagnostic investigations are available to the clinicians and hence there is an increase requirement of well-trained laboratory technicians to perform these tests safely and efficiently. A laboratory worker is desired to have updated

knowledge on safe and efficient working with in the laboratories and he should know the implementation of these measures too. There is dire need that safe practice protocols matching the international standards are implemented in our laboratories.<sup>1,2</sup> The World Health Organization (WHO) is working on development of safety protocols to ensure safety of laboratory workers involved in the clinical investigations of patients with medical illnesses.

Laboratory dangers are those that can affect human health or can cause injuries. These laboratory dangers can be Physical, Psychological or can be Biological.<sup>3</sup> Each laboratory and allied health care staff should be educated enough to know the risks associated with his working environment so that they improve their practices and ensure safety at all times. Allied health care staff working in laboratory setting should be provided with protective clothing and monitoring authorities should take care that their staff should be properly screened for their health and fitness at the start of work and remain safe during working time too. Deficiency in Knowing or practical implementation aspects can lead to increase in hazards. So proper education allied health staff related to laboratory safety measures and protocols should be mandatory.

To ensure safe environment in laboratory is the responsibility of the institution and the workers themselves. This study was carried out to check the baseline knowledge, attitudes and practices of allied health care staff towards the laboratory safety protocols in their daily working.

## MATERIAL AND METHODS

This study was a cross-sectional study. 250 Allied health staff members including lab technologists & lab technicians working under Pathology Department of The Children Hospital & ICH hospital Lahore were included in study. The questions that were asked were designed, taken from the literature and then later validated. It consisted of twenty-three standardized questions to assess knowledge, attitude and practices of the laboratory safety measures in the routine working

of allied health workers. The purpose of the study was communicated to the participants and consent to participate in the survey was taken before handing over the questionnaires to them. Questionnaires were handed out and collected from participants by postgraduate trainees. Assistance for understanding questionnaire was provided, if needed. The proforma had been validated through pretest evaluation and Cronbach alpha value was 0.79. Upon completion of data collection, data was entered in SPSS version 23.

## RESULTS

Out of 250 participants, 106 (42.4%) were male and 144 (57.6%) were female. Participants mean age was  $24.10 \pm 4.93$  yrs (Range 18 - 50yrs). 188 (75.2%) participants were unmarried and 62 (24.8%) were married. Majority of the participants had graduate level of education (63.6%) and working experience of more than one year (40.0%) table 1.

**TABLE 1: Demographic characteristics of allied health staff**

Age	Mean $\pm$ SD (yrs)	24.10 $\pm$ 4.93 18-50 yrs (%)
Gender	Male	106 (42.4)
	Female	144 (57.6)
Marital Status	Married	62 (24.8)
	Unmarried	188 (75.2)
Education	Elementary	2 (0.8)
	Intermediate	74 (29.6)
	Graduate	159 (63.6)
	Postgraduate	15 (6.0)
Occupation	Less than 1 year	35 (14.0)
	More than 1 year	100 (40.0)
	More than 10 year	19 (7.6)

**TABLE 2: Knowledge of allied health staff about laboratory safety**

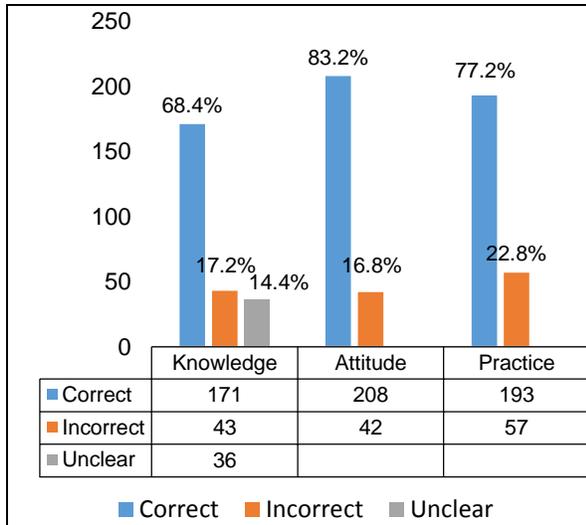
Questions	Response		
	Correct (%)	Incorrect (%)	Unclear (%)
Do you know the term laboratory safety?	231 (92.4)	6 (2.4)	13 (5.2)
Do you know that it starts even before entering the laboratory?	232 (92.8)	10 (4.0)	8 (3.2)
Do you know about various personal protective equipments used for laboratory safety?	208 (83.2)	28 (11.2)	14 (5.6)
Do you know the protective clothing be decontaminated before wash?	224 (89.6)	14 (5.6)	12 (4.8)
Do you know there are many hazards during working in lab?	239 (95.6)	7 (2.8)	4 (1.6)
Do you know blood spillage be a major hazard?	221 (88.4)	20 (8.0)	9 (3.6)
Do you know human samples should be discarded in infectious waste?	236 (94.4)	12 (4.8)	2 (0.8)
Do you know Hepatitis C is major risk while dealing with blood samples?	192 (76.8)	44 (17.6)	14 (5.6)
Do you know think needles & sharp waste disposal is as important as blood?	238 (95.2)	6 (2.4)	6 (2.4)

**TABLE 3: Attitude of allied health staff about laboratory safety**

Questions	Response		
	Correct (%)	Incorrect (%)	Unclear (%)
Do you think any risk of working unprotected in laboratory?	241 (96.4)	7 (2.8)	2 (0.8)
Do you think hepatitis B vaccine important for you?	229 (91.6)	10 (4.0)	11 (4.4)
Do you think wearing latex or nitrile gloves during phlebotomy is wasting time?	42 (16.8)	197 (78.8)	11 (4.4)
Do you think biomedical waste management is important?	222 (88.8)	16 (6.4)	12 (4.8)
Do you think only blood products are hazardous?	77 (30.8)	166 (66.4)	7 (2.8)
Do you think eating drinking inside laboratory is safe?	36 (14.4)	209 (83.6)	5 (2.0)

**TABLE 4: Practices of allied health staff about laboratory safety**

Questions	Response		
	Correct (%)	Incorrect (%)	Unclear (%)
Do you wear gloves at time of blood collection?	151 (60.4)	32 (12.8)	67 (26.8)
Do you wear protecting cloths during work in laboratory?	198 (79.2)	47 (18.8)	5 (2.0)
Have you got vaccinated against hepatitis B?	126 (50.4)	112 (44.8)	12 (4.8)
Do you report needle injury immediately?	206 (82.4)	36 (14.4)	8 (3.2)
Do you segregate waste according to biomedical waste management rules?	221 (88.4)	23 (9.2)	6 (2.4)
Do you discard sharp waste in designated yellow box?	229 (91.6)	17 (6.8)	4 (1.6)
Do you decontaminate your clothing after going home?	120 (48)	124 (49.6)	6 (2.4)
Do you take your snacks and drink while inside laboratory?	38 (15.2)	207 (82.8)	5 (2.0)



**Fig 1: Knowledge, attitude and practice of allied health staff about laboratory safety**

First of all Knowledge of participants was judged through planned questions. According to our results 171 (68.4%) of the staff had adequate knowledge about the laboratory safety while 43 (17.2%) did not give correct answers and 36 (14.4%) were unclear in their knowledge. Majority

of the participants had satisfactory level of knowledge regarding safety measures, laboratory hazards, decontamination and laboratory waste disposal (table 2).

The second part of the questionnaire assessed the attitude and beliefs of paramedical workers regarding laboratory safety. 208 (83.2%) participants gave correct response and 42 (16.8%) did not gave answers correctly. Response towards biomedical waste management and hepatitis B vaccination was satisfactory but attitude and beliefs towards wearing gloves, blood handling and eating habits within laboratory were not up to the standards (table 3).

The third part of the questionnaire assessed the practicing routine of paramedical staff during work regarding laboratory safety. 193 (77.2%) of the participants answered correctly and 57 (22.8%) were not practicing routinely. Half of the participants (50.4%) were vaccinated against hepatitis B and had practice of cloth decontamination routine (table 4).

The correct and incorrect response of allied health

staff related to their knowledge, attitude and practices was shown in the form of graph. Although 68.4% of the workers had adequate level of knowledge about laboratory safety measures but 83.2% had positive attitude and 77.2% were practicing satisfactory measures regarding laboratory safety (fig 1).

## DISCUSSION

In our study, there was a little female dominance in the participants (57.6% were female and 42.4% were male) and participant's mean age was 24.10 ± 4.93 years which is relatively younger age group and is comparable to other studies. In a similar study by Garus-Pakowska in 2019, the percentage of females was 56.9% relatable to our study and 43.1% were male participants.<sup>3</sup> In another study by Kheir, Abdalla, Nimir et al in 2017, performed KAP study on health care workers and female percentage was 70%.<sup>4</sup>

In a study by El-Gilany et al in 2017, 60% percent females were there, with a mean age of 35.4 years and 60% percent of study population had got training in safety protocols.<sup>2</sup>

In our study, satisfactory level of knowledge towards safety measures, laboratory hazards, decontamination and laboratory waste disposal have been observed among the participants but attitude towards wearing gloves, blood handling and eating habits within laboratory were not up to the standards scores (table 1 and 2).

In our study, 68.4% of the allied health staff had adequate knowledge related to safety protocols whereas in a study by Kumar in 2013 from Pakistan, the percentage of correct answers regarding knowledge questions was ranging between 35 to 85% which further increased after training.<sup>5</sup> The knowledge of health workers when compared with their attitude and practice showed that regular trainings and improvement in compliance of rules and protocols can result in betterment in individual's practices.

In our study, attitude towards wearing gloves during phlebotomy was correct only in 42% of the responders. In a study by Tabash in 2016 poor knowledge and practice were seen scores 50% in participants groups before intervention which after training improved to 75% while attitude was same before and after intervention.<sup>6</sup> In our study the

percentage of correct answer in knowledge regarding sharp needle waste was above 90% and in a study by Gheshlagh in 2018, they found that needle stick injuries are more prevalent in Nurses 44% compared than other health care workers 41%. It means that there is more need of implementation of that knowledge about sharp waste to avoid needle stick injuries.<sup>7</sup>

The correct response towards safe handling of blood products and risk of getting blood born infections was 30.8 % and in a study by Sarani the results showed that only 42% of participants had correct practice in safe handling of infectious waste and 37% had moderate attitude towards hospital acquired infection.<sup>8</sup>

In our study, 50.4 % of the health workers in the laboratories were vaccinated against hepatitis B (table 3) whereas in a study by El-Gilany et al in 2017, only 20% had been previously vaccinated against Hepatitis B.<sup>9</sup> In an African study by Tait et al in 2018, 82 % of the laboratory workers were provided with hepatitis B vaccination.<sup>2</sup> In a Pakistani study by Afridi in 2013 showed that 34% of the participants were pre-vaccinated against Hepatitis B virus. Over all this study showed insufficient practice towards adapting proper safety measures as common as proper wearing of gloves and other personal protective equipment for handling of blood products (40%) and poor infection control guideline followed only in 10% among health care workers.<sup>10</sup>

In summary, properly trained allied health care staff, well-educated with laboratory safety standards and protocols and strong administrative check on the staff can result in marked reduction of laboratory related hazards. Regular trainings via workshops and seminars along with monitoring of the worker's practices is mandatory.

## CONCLUSION

These studies should be conducted at regular interval at every tertiary care center so that every employee working in Pathology department should be trained for every aspect of laboratory safety.

**Conflict of interest:** I hereby declare that there is no conflict of interest for this study.

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