"Knowledge And Practice Regarding Blood Borne Infections In Health Care Workers: Nurses And Laboratory Technicians Of Tertiary Care Hospital, Gujarat."

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Abstract:
Introduction: Blood borne infections are one of the biggest obstacles in developing countries, destroying lives and livelihoods of millions of people due to reduced resources, limited education on infection control and fewer enforcement structures. **Aims:** This study was undertaken to evaluate the level of awareness, knowledge, and practice of nurses and laboratory technicians regarding blood borne infections. **Methods:** This prospective cross-sectional study was carried out by using pre-validated self-administered questionnaire and included a total of 570 respondents. Out of which 315 (55.26%) were nurses and 255 (44.74%) were laboratory technicians of tertiary care hospital of Gujarat. **Result**: The study found that the majority of the respondents are fairly aware about the general precautions, vaccination and post exposure prophylaxis (p value: >0.005) but have insufficient awareness regarding mode of transmissions and signs and symptoms of the blood borne infections (p Value: <0.05). There is not a significant variation between laboratory technicians and nurses in their understanding and awareness of blood-borne diseases. But nurses were found to be more knowledgeable and aware compared to the laboratory technicians (p value <0.05). **Conclusion:** Despite the fact that the majority of nurses and lab technicians had a fair understanding of blood borne diseases, this did not convert into effective adherence to universal protection measures and recommended practises. Our healthcare personnel must be immediately made aware of the risk of blood borne infections and inspired to follow safe working practises in order to avoid transmissions.

Keywords: Blood-borne infections, occupational exposures, health care workers, awareness

Introduction:

A healthcare worker may become at risk for contracting the hepatitis B virus (HBV), hepatitis C virus (HCV), or human immunodeficiency virus (HIV) if they sustain a percutaneous injury (such as a needle stick injury or cut from a previously used sharp medical object) or come into contact with blood, tissues, or other body fluids while handling non-intact skin. [1] In order to evaluate the issue of blood-borne transmitted viral infections, occupational exposure of health professionals in the health care organisations must first define frequency and risk variables. These evaluations are crucial for planning and carrying out prevention and control activities. The bulk of these infections occur as a result of health personnel being professionally exposed to dangerous contact with potentially infectious material.[2] Due to exposure to prick, needle stick, or cuts caused by sharp objects, at least twenty occupational groups are exposed to various diseases that can be transferred by blood while at work.[3,4]

In order to stop the spread of blood borne pathogens while delivering medical care, a set of measures known as universal precautions have been developed. The Centres for Disease Control (CDC) have advised that normal precautions be taken on all patients, regardless of knowledge about their infection status, because it is not possible to accurately identify people infected with these viruses by medical history and physical examination. [5]

The World Health Organisation (WHO) reported that of the 35 million healthcare professionals, 2 million are exposed to infectious diseases through percutaneous means each year, with an estimated three million needle stick injuries occurring worldwide annually. Needle stick injuries are the primary cause of 37.6% of Hepatitis B, 39% of Hepatitis C, and 4.4% of HIV/AIDS cases among healthcare workers globally. [6]

Most blood borne infections in the past happened when the needle was reheated after the patient's blood was drawn. Although this practise is no longer advised. It is more problematic when healthcare professionals disobey regulations and put sharps disposal containers in plastic bags instead. [7] Failure to take general precautions, disregarding safety protocol guidelines, high-risk practises that increase the risk of blood exposure, such as blood withdrawal, working in a

dialysis unit, giving blood, and the use of needles and other sharp objects without safety features are some of the factors that increase the risk of body fluid exposure. [8]

The WHO emphasises that despite advancements in methods for preventing workplace exposure to blood-borne pathogens, such exposure will still happen. In addition, 90% of all infections among health workers can be traced back to workplace exposure, which is extremely worrying for both the facilities that provide healthcare and the individuals who work there. Particularly at the present time, when healthcare professionals are fighting against Covid-19.[9] Blood-borne infections are a significant issue for healthcare professionals, the healthcare system, and policymakers when they are making crucial decisions to lower the risk of infection of blood-borne diseases. This is one of the reasons high-income nations set up a system to track the exposure of medical personnel to blood and bodily fluids. [10]

Nurses are required to do small surgical operations, minor bedside patient care, and other tasks that expose them to patients and the potential for blood products, infectious clinical waste, and accidental injury from sharp objects. It is essential to adjust one's attitude towards treating patients with blood-borne illnesses and to possess the requisite knowledge to lower the risk of occupationally acquired blood-borne infections. To protect themselves and those who come into contact with these dangerous diseases like nurses and laboratory technicians, adequate teaching through educational programmes targeted at raising knowledge of the mechanism of transmission and prevention of blood borne infections could be done. [11]

The nurses and laboratory technicians are more likely to be exposed to blood borne infections as they become increasingly involved in contact with patient as well as blood during their work. [12] There haven't been many research done to evaluate nurses' and lab technicians' understanding of blood-borne diseases in Gujarat. Therefore, it becomes necessary to conduct this study in order to evaluate the level of knowledge and awareness regarding blood borne diseases that is advised to stop their transmission.

METHODS:

This prospective cross-sectional study was conducted from June 2021 to May 2022 with permission from the Institute Ethics Committee (IEC). After obtaining the informed consent of all nursing staff and laboratory technicians working in the various departments of Shree Krishna Hospital in Gujarat, a pre-structured Google form questionnaire approved by members of the Hospital Infection Committee and the Institute Ethical Committee was distributed. People who refused to complete the questionnaire were not included in the study. The study includes 570 people in total who answered to the Google form survey. Of those, 255 were laboratory technicians and 315 were nurses.

The study participants were given access to a self-administered 20 question survey designed to gauge their knowledge of blood borne infections and prevention, attitudes towards, day to day practises, adherence of standard safety precautions, and use of personal protective equipment while at work. English and the regional tongue (Gujarati) were the languages of the questions. The questionnaire's items were answered by the participants in an anonymous way.

Statistical analysis was carried out with the Statistical Package for the Social Sciences software (version 20). Analysis was carried out at 5% level of significance and a P value < 0.05 was considered significant. All categorical and ordinal data has been presented as frequencies and percentages and compared by using Chi-square or Fisher's exact tests.

RESULTS:

A total of 570 participants responded to the Google form questionnaire. Out of which 315 were Nurses and 255 were Laboratory Technicians of Shree Krishna Hospital, Gujarat.

As shown in Table 1, A total of 570 responses were received, 345 (60.53%) of which came from women, and 225 (39.47%) came from men. Maximum 223 (39.12%) of these responses came from respondents who were 21 to 30 years old, followed by 193 (33.86%) were 31 to 40 years old, and 134 (23.51%) were 41 to 50 years old. The majority of respondents had a work experience of less than ten years.

The result of Table 2 (a) shows the level of awareness about blood borne infections among nurses and laboratory technicians. Although they weren't sufficiently knowledgeable about immunisation and post-exposure prophylaxis, the majority of respondents had a reasonable understanding of general precautions that should be taken, the method of transmission, and the signs and symptoms of blood-borne diseases. (p value <0.05). 30% of respondents believe that urine and faeces are the only two other possible routes of transmission for HIV, HBV, and HCV, whereas more than half of the respondents think that saliva and cerebrospinal fluid are the route of transmission for blood borne infections. 43.7 % of respondents agree that HBV, HCV, and HIV are sexually transmitted diseases, compared to 52. 8 % who think just HIV is. Sixty percent of health care workers (HCWs) were aware that percutaneous injuries increase the risk of blood-borne infection, and 78.5% knew that HBV-positive patients remain contagious even when they don't have any

symptoms. Half of the respondents were aware about the possibility of seroconversion following HBV occupational exposure.

Table 2(b) shows that there is not a significant variation between laboratory technicians and nurses in their understanding and awareness of blood-borne diseases. But nurses were found to be more knowledgeable and aware compared to the laboratory technicians (p value <0.05). Only 223 respondents (39.12%) scored at or above the 70% mark, compared to about 50.35% who scored at or above the intermediate level whereas only 60 respondents (10.53%) were found to have low awareness (score of less than 50%).

Table 1: Demographic characteristic of study participants (N= 570)

Demographic variables	Nurses (%) (n=315)	Technicians (%) (n=255)	Total (%)
Age in years			
21-30	98 (31.11%)	125 (49.02%)	**223 (39.12%)**
31-40	110 (34.92%)	83 (32.55%)	**193 (33.86%)**
41-50	95 (30.16%)	39 (15.29%)	**134 (23.51%)**
51-60	12 (03.81%)	08 (03.14%)	**20 (03.51%)**
Gender			
Male	70 (22.22%)	155 (60.78%)	**225 (39.47%)**
Female	245 (77.78%)	100 (39.22%)	**345 (60.53%)**
Years of experience			
<10 years	118 (37.46%)	110 (43.14%)	**228 (40.00%)**
11-20	95 (30.16%)	58 (22.74%)	**153 (26.84%)**
21-30	57 (18.09%)	49 (19.22%)	**106 (18.60%)**
>30 years	45 14.29%)	38 (14.90%)	**83 (14.56%)**

Table 2(a): A level of knowledge and awareness about blood borne infections in Nurses and Laboratory technicians. (N= 570)

No.	variables		Nurses (n=315)	Laboratory technicians (n=255)	Total	Chi square (p value)
1	**General precautions to be taken**	Aware	293 (93.02%)	235 (92.16%)	**528 (92.63%)**	0.1523(p value > 0.05)
		Not aware	22 (06.98%)	20 (07.84%)	**42 (07.37%)**	
2	**Mode of transmission, signs, and symptoms**	Aware	197 (62.54%)	138 (54.12%)	**335 (58.77%)**	4.1252(p-value < 0.05)
		Not aware	118 (37.46%)	117 (45.88%)	**235 (41.23%)**	
3	**Vaccination and Post exposure prophylaxis**	Aware	133 (42.22%)	113 (44.31%)	**246 (43.16%)**	0.2513(p-value > 0.05)
		Not aware	182 (57.58%)	142 (55.69%)	**324 (56.84%)**	

Table 2(b): A level of knowledge and awareness about blood borne infections in Nurses and Laboratory technicians. (N= 570)

Level of awareness	Nurses (%) (n=315)	Technicians (%) (n=255)	Total (%)
High (>70% score)	133 (42.22%)	90 (35.29%)	**223 (39.12%)**
Intermediate (50-70% score)	157 (49.84%)	130 (50.98%)	**287 (50.35%)**
Low (<50% score)	25 (07.94%)	35 (13.73%)	**60 (10.53%)**

Figure 1 shows the results of nurses and lab technicians who self-reported following of universal precaution and use personal protective equipment during their working at heath care department. The use of personal protective equipment and adherence to general precaution were shown to be more successful in nurses than in laboratory technicians. (p value <0.05) Despite the fact that only a few of the times when there is a risk of exposure, it was discovered that 98 (31.11%) nurses and 85 (33.33%) laboratory technicians are using personal protective equipment and following universal precautions.

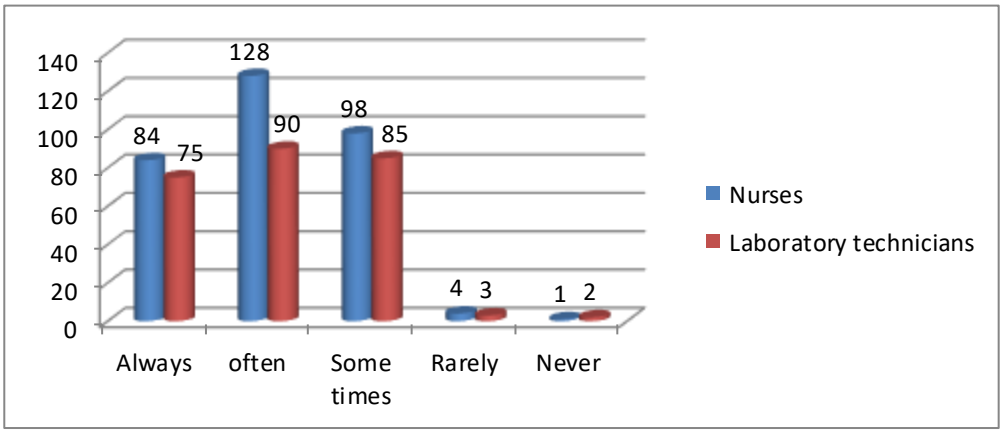

Figure 1: Self-reported adherence to follow universal precaution and use of personal protective devises among nurses and laboratory technicians.

DISCUSSION:

It has long been known that exposure to blood and other infectious materials can be dangerous to the health of healthcare personnel. Hence, the current study aimed to assess nurses' and laboratory technicians' knowledge, comprehension, and practises regarding blood-borne infections in order to prevent the transmission. The age of the respondents in the present study ranged from 21 to 60 years, making them a diverse group. According to some respondents, diseases can spread through sharing utensils, shaking hands with contagious persons, kissing on the cheeks, getting bit by mosquitoes, or visiting public facilities.

The present study found that the nurses working Shree Krishna Hospital, Gujarat has fair knowledge and awareness regarding universal precautions and the risk factors of blood borne infections which in contrast to a study done in western Algeria, ignorance is the main cause of failure to follow recommended safety measures.[13] Only 34.2% of nurses in Nigeria who participated in a research on the subject had heard of common precautions.[14] In a survey of HCWs in rural north India, Kermode et al. found that only 56% of respondents had accurate awareness of conventional precautions.[15] In a study of postgraduate nurses in Spain, it was found that there was a lot of ignorance and confusion about common safety practises.[16]

Our study found that work experience is a strong predictor of exposure to blood-borne infection, which makes sense because experienced staff is less likely to make mistakes.[17] The findings of the present study are consistent with these findings and indicated a low prevalence of rare events, but given the years of service, one of the contributing factors was completing work tasks quickly, which should not be expected after years of experience.[17] In our study, nurses and technicians were the subjects who were most frequently exposed to blood-borne viral infections, which is consistent to some earlier research. [18] This can be explained by the fact that most interventions requiring the administration of intramuscular and intravenous injection therapy using infusion fluids are carried out by nurses and technologists. The majority of practitioners that provide and carry out therapy are nurses and technologists. The fact that nurses and technicians made up the biggest proportion of staff at the Institute for Emergency Medical Services in Ni supports these findings. For instance, a study conducted in China between 2015 and 2018 demonstrated that nurses are more susceptible to exposure to blood-transfer infections [19], whereas other studies conducted in Serbia, India, and Jamaica demonstrated that physicians are more susceptible to exposure. [20, 21, 22] Additionally, it was not found that the characteristics of the nurses or technicians were a reliable indicator of the likelihood of professional exposure to blood borne illnesses. Remember that based on general information, there is insufficient information on nurse profiles and job organisation, which could negatively impact how they are used in the workplace based on their various abilities and educational backgrounds. All of this led to poor professional services and unsatisfactory nursing care.

The current study discovered a lack of knowledge and awareness regarding immunisation and post-exposure prophylaxis, supporting a previous study by Esin et al. [23] that claimed there was little information available regarding post-exposure prophylaxis against HIV infection.

Participants in this study expressed little interest in treating HIV/AIDS patients; however, if appropriate training is provided, interest may grow, highlighting the importance of a quality training session. Our results are in line with study by Diekema et al. (1995) [24] who also asserted that people become more willing to handle HIV positive cases after a post-training session.

CONCLUSION:

In order to lower the risk of spreading blood-borne infections and to increase knowledge, skills, and competency in treating infected patients, the present study concludes that educational programmes on universal precaution, post exposure prophylaxis, and nurses are necessary. As a result, it is urgently necessary to create and carry out numerous new ways for educating healthcare workers. Lack of understanding, ignorance, and practise point to the need for additional efforts in the educational sector, better employee control, and the provision of resources for protection at work (gloves, protective masks, measures to preserve space and person hygiene, etc.). The information acquired can help decision-makers and healthcare professionals protect not just the public as whole but also other healthcare professionals.

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