



Awareness of Needle Stick Injuries and Blood Borne Disease Transmission: A Focused Study

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Abstract

Background: needle stick injuries expose healthcare workers to blood-borne viruses including HIV, hepatitis B, and hepatitis C, they pose a serious occupational danger. To lessen these risks, infection prevention procedures must be understood and followed. **Objective:** This research seeks to assess healthcare workers' understanding, habits, and views of needle stick injuries and to determine the variables affecting their compliance with preventative measures. **Methods:** descriptive cross-sectional research study with 400 healthcare workers from various health facilities. We gathered data using standardized questionnaires that focused on demographic factors, functional roles, awareness, practices, and NSI views. **Result:** The majority of participants were aged 20–29 years (62.5%), mostly male (70.8%), and resided in metropolitan regions (75.8%). Moderate awareness levels were seen in 54.8% of healthcare workers, accompanied by notable deficiencies in knowledge of viral survival periods. Good behaviors were noted in 59.2% of participants, especially for infection control measures such as hand cleanliness and sharps disposal. **Conclusion:** The study found that most healthcare workers have a moderate level of awareness about needle stick injuries.

Keywords: Awareness, Blood Borne Pathogen, HCWs, NSI

INTRODUCTION

Injuries brought on by needles accidentally puncturing the skin are known as needle stick injuries. For medical personnel using hypodermic needles and other sharp objects in clinical settings, needle stick injuries represent a serious risk [1]. The potential for the spread of blood-borne infections makes needle-stick injuries (NSI) a global problem.

Although NSI can spread up to 60 blood-borne illnesses, the most common and harmful illnesses are HIV, Hepatitis B, and Hepatitis C. [2] Due to needle stick incidents, healthcare workers (HCWs) are at a considerable risk of contracting blood-borne illnesses at work. Furthermore, anxiety, fear, depression, post-traumatic stress disorder, and low self-esteem are psychological effects

of NSI. [3]. Additionally, the costs associated with medical evaluation, treatment, follow-up care, and absenteeism from work are included in the annual economic effect of the NSI. [4]. According to estimates from the World Health Organization (WHO), more than 3 million of the 37 million healthcare workers (HCWs) sustain at least one needle stick injury (NSI) annually [5]. Approximately 66,000 HBV, 16,000 HCV, and 1,000 HIV infections are predicted to occur among healthcare workers worldwide each year as a result of occupational exposure to percutaneous injuries [6]. Healthcare workers (HCWs) must be aware in order to ensure patient safety, provide the right care, and reduce the likelihood of future health issues. Health awareness includes understanding a variety of health-related topics, such as illnesses, health hazards, and healthy lifestyle choices. To preserve or enhance one's well-being, it entails being aware of the elements that support optimal health and acting appropriately [7]. Studies have shown that healthcare workers' knowledge and preparedness can vary significantly based on a number of factors, such as their prior training, experience with certain medical emergencies, and the resources that are available. HCWs with specific training or prior experience dealing with epidemics, for instance, frequently demonstrate higher levels of vigilance and preparedness [8]. Therefore, this study aims to assess healthcare workers' awareness of needle stick injuries at Thi-Qar Hospitals and examine how well-suited the present safety regulations and prevention measures are to lowering the incidence of needle stick injuries in healthcare environments.

Material and Methods

Five hospitals in the Thi-Qar Governorate participated in the research by adopting a

cross-sectional descriptive design. There are five Souq Al Shuyoukh General Hospitals, four Al-Habboubi Hospitals, Muhammad Al-Moussawi Children's, Bint Al-Huda Teaching Hospital, and Al-Rifai Teaching Hospital. Data collection began on September 15, 2024, and ended on December 31, 2024. Five days a week are allotted for data collection. The sample size was determined using the (Epi_info) program, Version 7, which took into consideration the population, response distribution, confidence interval, and error margin. The sample consisted of at least 374 HCWs, with a 95% confidence level, a 50% response distribution, and a 5% error margin. After accounting for a 10% refusal-to-respond rate, the total number of participants was raised to 400 HCWs to boost accuracy.

Inclusion Criteria:

Each registered HCWs who work at the hospitals mentioned above.

Exclusion Criteria

1. Administrative staff working in the hospital.
2. Employees who contracted blood-borne diseases during their work.

Data Collection Method:

After converting the questionnaire into Arabic, the local language, and employing closed-ended questions, the data was gathered through in-person interviews with every healthcare worker. the researcher filled out a structured questionnaire, which was used to interview participants and gather data. The questions were asked in plain Arabic. Every interview lasted between 15 and 30 minutes.

Statistical Analysis

A Chi-square test (X^2 -test) was utilized to identify the significance of qualitative data percentage differences. The P-value was considered statistically significant when equal to or less than 0.05 [9].

Ethical considerations:

The researcher attached and explained each questionnaire in Arabic informed participants of the study's objective and substance, secured confidentiality, and utilized all data for research reasons. The researcher also informed the participants that they could leave any time they wanted if they were not convinced.

Result and discussion

In Table 1, the largest percentages of healthcare professionals were aware of questions "1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, and 13th" (62.5%, 59.0%, 82.5%, 58.0%, 59.5%, 71.0%, 92.0%, 77.0%, 54.8%, 74.0%, and 70.8%). Only 21.5% and 41.5% of HCWs knew the needle stay length for hepatitis B and C, respectively.

According to the current findings, most healthcare professionals (62.5%) knew that the first step after a needle stick injury should be to wash with water and soap immediately or use an antiseptic solution. This outcome is consistent with research by (10), which found that 56.7% of participants knew cleaning the wound with soap and water was a good idea after a needle stick injury.

The majority of healthcare workers in this research were aware of the tests that are conducted for AIDS, HBV, and HCV after a needle stick injury. This finding was in line with that of [10]. who discovered that almost half of the participants were aware that tests for HIV, Hepatitis B, and Hepatitis C should be performed after a needle stick.

According to the poll, 82.5% of healthcare professionals intended to promptly report a needle stick occurrence to the relevant authorities. According to study from a tertiary care facility in Southern India, these results are consistent [11]. study revealed that 96% of medical professionals said they would immediately disclose NSI. Most participants also understood that any accidents brought on by sharp items at work ought to be reported immediately, according to [12].

The hospital provides the hepatitis B vaccine, since more than half of the medical staff knew. The findings align with a study carried out in Abha City, Saudi Arabia [13], where the vast majority of medical professionals reported knowing that the Hepatitis B vaccination was available and the Hepatitis C vaccine was not.

Most research participants are aware that prophylactic treatment for HIV must start within 72 hours of exposure. According to a study done in Baghdad, Iraq [14], 64.2% of medical staff members knew that HIV post-exposure prophylaxis should be given within 72 hours. This result was consistent with that study. Most healthcare professionals knew what post-exposure prophylaxis was. according to another research by [15], implying the possibility of improving healthcare safety protocols.

Hepatitis C is the most common disease contracted via needle stick exposure in dialysis centers, yet only one-third of participants know this. Unintentional needle stick injuries (NSIs) are the most common form of blood exposure at work, which may help to explain these findings. This justification validated the Nigerian investigation's conclusions. [16]. Health care workers (HCWs) are more likely to get blood-borne infections from their employment because of things like

unintentional needle stick injuries (NSIs) and muco cutaneous contact with bodily fluids like blood. According to [17], NSIs are wounds brought on by an injection needle inadvertently penetrating the skin. 500 HIV, 70000 HBV, and 150000 HCV are acquired by HCWs as a consequence of these accidents. According to the [18], the majority of these illnesses happen in underdeveloped nations.

A significant portion of healthcare workers (71.0%) is aware of many required vaccination doses for complete protection against hepatitis B. These findings align with research undertaken at a Southern Indian tertiary care hospital [11], which found that 75% of healthcare workers knew the dosages of the Hepatitis B vaccine.

Ninety-two percent of healthcare personnel are aware that gloves are necessary while doing phlebotomy. This outcome was consistent with research conducted in a tertiary hospital in Patna, India (Dey et al., 2023) that indicated that nurses' phlebotomy expertise was enough. On the other hand, nothing was known about the accompanying "need to wear double gloves during phlebotomy procedure" remark [19]. The disparity between the two nations might be the cause of this discrepancy. Some of the differences may be related to the cost of different preventative supplies, which necessitates the loss of knowledge-based practice.

According to this survey, 77.0% of participants are aware that needle stick injuries might spread HIV, Hepatitis B, and Hepatitis C. According to research conducted at a tertiary care hospital in Karachi, Pakistan [20], the majority of healthcare workers think that needle stick injuries might spread hepatitis B, hepatitis C, and human immunodeficiency viruses.

In these results, the highest frequency of HCWs having awareness regarding Needle, Cannula, and Lancet were the most common cause of NSI. This finding differs from a study conducted in Iran [21], which discovered that the syringe with a needle was the most common cause of NSI (34.7%). This difference may be due to the research methodology, such as the type of sample and the design of specific options in the questionnaire.

The highest percentage (74.0%) of HCWs were aware of wearing personal protective equipment before drawing a blood sample from the patient. This result disagreed with the study findings done in Ghana [22], which found that knowledge of the use of PPEs was generally poor. A possible explanation for this difference between the two studies may be due to the difference in research methodology, such as the type of sample in our study, as this study above indicated that most of the participants have job titles such as medical assistant and medical technician, and among these two specialists specializes in community health, and this branch is usually concerned with Basic methods of prevention and control on injury, which makes most participants tend to have good awareness regarding wearing personal equipment. While 21.5%, 70.8%, and 41.5% of HCWs were aware of the stay duration of the hepatitis B virus on a needle, the stay duration of the hepatitis C virus on a needle, and the stay duration of the hepatitis C virus on a needle, respectively. It's concluded from our study that high education, those who live in urban areas, are married, with functional titles such as physicians, dentists, and Bacteriologists, and those who work in laboratory units, operation rooms, and dental units have good assessment scores for awareness about needle stick injuries. To our

knowledge, there is no similar study to compare these questions, as these questions were formulated based on reports from the World Health Organization and the Centre

for Disease Prevention and Control. These questions are considered a new option for other future studies.

Tables 1. Awareness of healthcare workers

Awareness		No.	%
1. What is the first procedure following a needle stick injury?	apply pressure on the site	112	28.0
	Wash quickly with water and soap or use an antiseptic solution	250	62.5
	Washing the site with running water	25	6.3
	Not mention above	13	3.3
2. What tests are conducted following a needle stick injury?	General urine test	3	0.8
	General stool test	50	12.5
	AIDS, HBV	67	16.8
	(AIDS, HBV, HCV) tests	236	59.0
	Not of above	44	11.0
3. Should you immediately inform the pertinent committees following a needle stick injury?	No	70	17.5
	Yes	330	82.5
4. Which immunizations are offered at the hospital?	Hepatitis B Vaccine	232	58.0
	Hepatitis C Vaccine	36	9.0
	HIV Vaccine	11	2.8
	All of above	121	30.2
5. After exposure, HIV prophylactic treatment must begin within ____ hours.	24 hours	108	27.0
	48 hours	54	13.5
	72 hours	238	59.5
6. Which illnesses are most frequently contracted in dialysis facilities as a result of needle stick exposure?	HIV	85	21.3
	Hepatitis B	158	39.5
	Hepatitis C	146	36.5
	Hepatitis A	11	2.8
7. What vaccination doses are advised for complete hepatitis B protection?	One	16	4.0
	Two	76	19.0
	Three	284	71.0
	Four	22	5.5
	Five	2	0.5
8. Do gloves have to be worn when doing phlebotomy?	No	32	8.0
	Yes	368	92.0
	Hepatitis A	25	6.3

Awareness		No.	%
9. Which disease is brought on by the spread of needlestick injuries?	Hepatitis E	5	1.3
	HIV	25	6.3
	Hepatitis B, Hepatitis C	37	9.3
	HIV, Hepatitis B, Hepatitis C	308	77.0
10. Which devices caused NSI the most frequently?	Needle	163	40.8
	Cannula	5	1.3
	Lancet	13	3.3
	All of above	219	54.8
11. What precautions should be taken before taking a patient's blood sample?	Wear personal protective equipment	296	74.0
	Make sure the venipuncture site is moist	10	2.5
	Use lancet and needles more than once	9	2.3
	All of above	85	21.3
12. What is the average duration of the AIDS virus on a needle?	30 days	197	49.3
	40 days	117	29.3
	42 days	86	21.5
13. What is the average lifespan of the hepatitis B virus on a needle?	7 days	283	70.8
	10 days	55	13.8
	20 days	62	15.5
14. What is the average lifespan of the hepatitis C virus on a needle?	Up to 6 weeks	201	50.2
	Up to 10 weeks.	166	41.5
	up to 20 weeks	33	8.3

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الوعي بإصابات وخز الإبر وانتقال الأمراض المنقولة بالدم: دراسة مركزة

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الخلاصة:

الخلفية: تُعرّض إصابات وخز الإبر العاملين في مجال الرعاية الصحية لفيروسات منقولة بالدم، بما في ذلك فيروس نقص المناعة البشرية (HIV) والتهاب الكبد الوبائي (ب) والتهاب الكبد الوبائي (ج)، وتُشكّل خطرًا مهنيًا جسيمًا. للحد من هذه المخاطر، يجب فهم إجراءات الوقاية من العدوى واتباعها. **أهداف الدراسة:** يسعى هذا البحث إلى تقييم فهم العاملين في مجال الرعاية الصحية وعاداتهم ووجهات نظرهم بشأن إصابات وخز الإبر وتحديد المتغيرات التي تؤثر على امتثالهم للتدابير الوقائية. **المنهجية:** دراسة بحثية وصفية مقطعية مع 400 عامل في مجال الرعاية الصحية من مختلف المرافق الصحية. جمعنا البيانات باستخدام استبيانات موحدة ركزت على العوامل الديموغرافية والأدوار الوظيفية والوعي والممارسات ووجهات نظر. **النتيجة:** تراوحت أعمار غالبية المشاركين بين 20 و29 عامًا (62.5٪)، ومعظمهم من الذكور (70.8٪)، ويقومون في المناطق الحضرية (75.8٪). لوحظت مستويات وعي متوسطة لدى 54.8٪ من العاملين في مجال الرعاية الصحية، مصحوبة بنقص ملحوظ في معرفة فترات بقاء الفيروس. لوحظت سلوكيات جيدة لدى 59.2٪ من المشاركين، وخاصةً فيما يتعلق بإجراءات مكافحة العدوى، مثل نظافة اليدين والتخلص من الأدوات الحادة. **الاستنتاجات:** وجدت الدراسة أن معظم العاملين في مجال الرعاية الصحية لديهم مستوى وعي متوسط بشأن إصابات وخز الإبر.

الكلمات المفتاحية: الوعي، مسببات الأمراض المنقولة بالدم، العاملون في مجال الرعاية الصحية، إصابات الوخز بالإبر