

## A Questionnaire-Based Assessment of Knowledge, Attitude and Practices (KAP) among Healthcare Workers on Needle Stick Injury

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Conflict of interest: Nil

### Abstract

**Aim:** The aim of the present study was to assess healthcare workers' needle-stick injury (NSI) knowledge, attitudes and practices.

**Methods:** We carried out our study among male and female HCWs in Department of Microbiology, Madhubani Medical College and Hospital, Madhubani, Bihar, India. Infection control practices are routinely followed and taught in this hospital. All healthcare workers exposed to needle-stick injury risk with varying experience were included.

**Results:** A total of 260 healthcare workers: 100 doctors, 80 nurses, 30 technical staff and 50 attendants responded. Males and females were equally distributed. Most respondents were aged between 20-40 years, worked in the ICUs and were either graduates or postgraduates. Most respondents had a good work experience in their respective fields. Almost most of them had experienced an NSI and more doctors had been exposed to blood or body fluids. Regarding attitude related questions, appropriate responses varied amongst professional groups. More technical staff followed the NSI prevention precautions.

**Conclusion:** The most effective way to protect workers from infectious diseases transmitted by NSI is a comprehensive prevention program; including employee training, following recommended infection control practice guidelines, effective disposal systems, surveillance programs, improved equipment design and encouraging accident reporting. We should have a staff health service facility in place, which maintains records, registers NSI incidence and has protocols for managing and following-up NSI cases. This is most important in all large healthcare facilities with a high patient-turnover and NSI rates. Our study revealed important information regarding HCW knowledge, attitude and practice concerning NSI.

**Keywords:** healthcare workers, needle-stick injury, knowledge, attitudes, practices

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### Introduction

Health care workers who have occupational exposure to blood are at increased risk for acquiring blood-borne infections. The level of risk depends on the number of patients with that infection in the health care facility and the precautions the health care workers observe while dealing these patients. There are more than 20 blood-borne diseases, but those of primary significance to health care workers are hepatitis due to either the hepatitis B virus (HBV) or hepatitis C virus (HCV) and acquired immunodeficiency syndrome (AIDS) due to human immunodeficiency virus (HIV). [1]

The prevalence of HBsAg in healthy blood donors in Saudi Arabia ranges from 2.7% to 9.8%. [2,3] Sero-prevalence studies suggest that the overall anti-HCV positivity is about 3.5% to 5%. [4,5] Thalassemia and sickle cell disease are common in Saudi Arabia and prevalence of hepatitis C virus

antibodies among this high-risk group is about 40%. [6] The prevalence of HIV sero-positivity has been reported to be about 0.09% in the Kingdom. [7]

While hepatitis C transmission rate has been reported at 1.8 percent [8], but newer, larger surveys show only a 0.5 percent transmission rate. [9] The overall HIV-infection risk after percutaneous exposure to HIV-infected material in the healthcare setting is 0.3 percent. [10] Exposure to blood products in teaching hospitals is a common. But these incidents are usually under-reported [11], so NSI and blood exposure injury data are lacking.

The aim of the present study was to assess healthcare workers' needle-stick injury (NSI) knowledge, attitudes and practices.

### Materials and Methods

We carried out our study among male and female HCWs in Department of Microbiology, Madhubani Medical College and Hospital, Madhubani, Bihar, India for 3 months. Infection control practices are routinely followed and taught in this hospital. All healthcare workers exposed to needle-stick injury risk with varying experience were included.

### Study Design

Respondents were drawn using a stratified random sample from HCWs in operating theatres (OT), intensive care units (ICUs), clinical laboratories, radiology, major wards and bio-medical waste handling departments. Demographic factors such as age, sex, education, profession and service length were considered to derive the respondents' epidemiological background. Male and females were equally represented and were studied.

### Data Collection

An anonymous, self-reporting questionnaire structured specifically to obtain both qualitative and quantitative data to identify predictive factors associated with NSIs was used to collect data. The

questionnaire was divided into the following subscales: baseline data; and NSI knowledge, attitudes and practice. The questionnaire contained five questions; each pertaining to respondent knowledge, attitude and practice, so that these categories could be assessed. Each correct answer scored two and a zero was given to incorrect answers. Each category had a maximum ten marks. Zero to four meant poor performance; five and six an average performance; seven and above a satisfactory performance. The knowledge, attitude and practice scores were calculated for each respondent and grouped based upon their professional qualification. Each professional group's mean score was compared. Findings were analyzed under different headings to uncover various NSI aspects.

### Data Analysis

We used ratios, percentages, means, standard deviations, chi square and other data interpretation methods. Statistical data were analyzed using Statistical Package for Social Sciences v.12.0.

### Results

**Table 1: Healthcare worker baseline characteristics**

	Doctor (n=100)	Nurse (n=80)	Technician (n=30)	Attendant (n=50)
<i>Gender</i>				
Male	65	15	17	40
Female	35	65	13	10
<i>Age (years)</i>				
20-40	80	66	18	30
41-60	20	14	12	20
<i>Location</i>				
ICU	23	68	3	35
OT	15	0	0	0
Ward	27	12	0	5
Laboratory	19	0	27	5
Radiology	16	4	0	0
Others	0	8	0	5
<i>Education</i>				
Below 10th class	0	0	0	11
10th class	0	4	0	23
12th class	0	50	12	16
Graduate	40	28	17	0
Postgraduate	60	2	3	0
<i>Service (years)</i>				
0-1	7	0	0	1
2-5	33	30	12	1
6-10	32	26	8	18
≥10	28	24	10	30

A total of 260 healthcare workers: 100 doctors, 80 nurses, 30 technical staff and 50 attendants responded. Males and females were equally distributed. Most respondents were aged between 20-40 years, worked in the ICUs and were either graduates or postgraduates. Most respondents had a good work experience in their respective fields.

**Table 2: Healthcare workers answering questions assessing NSI “knowledge” on NSI correctly**

(	Doctors	Nurse (n= 80)	Technicians (n=30)	Attendants (n=50)	p-value
K1: What should you do after a needle-stick injury?	84	72	26	25	<0.001
K2: Is there more possibility transmission by NSI? True/false	98	74	12	7	<0.001
K3: To which department do you report NSI?	48	75	28	30	<0.001
K4: HCV can be transmitted by needle-stick injury? True/false	85	75	24	15	<0.001
K5: What is the percentage transmission of HIV and HBV owing to needle- stick injury?	50	10	0	1	<0.001

Almost most of them had experienced an NSI and more doctors had been exposed to blood or body fluids.

**Table 3: Healthcare workers answering questions assessing “attitude” on NSI practices correctly**

	Doctors (n=100)	Nurses (n=80)	Technicians (n=30)	Attendants (n=50)	P value
A1: Needles should be recapped/bent after use.	63	64	20	21	<0.001
A2: Post exposure prophylaxis is really necessary	89	65	28	34	0.005
A3: Needle-stick Injury should be reported.	92	72	27	45	0.011
A4: Needles should be discarded immediately after use.	88	72	26	50	<0.001
A5: Gloves provide protection against needle-stick injury.	66	46	10	15	<0.001

Regarding attitude related questions, appropriate responses varied amongst professional groups.

### Discussion

An occupational blood exposure injury is defined as occupational exposure that may place a worker at risk to HIV infection; it involves a percutaneous injury, contact with mucous membrane or skin (especially when the healthcare worker’s skin is chapped, abraded or afflicted with dermatitis or contact is prolonged or involves an extensive area) with blood, tissue or other body fluids to which universal precautions apply. [12]

A total of 260 healthcare workers: 100 doctors, 80 nurses, 30 technical staff and 50 attendants responded. Males and females were equally distributed. Most respondents were aged between 20-40 years, worked in the ICUs and were either graduates or postgraduates. Most respondents had a good work experience in their respective fields. Almost most of them had experienced an NSI and more doctors had been exposed to blood or body

fluids. [13] Regarding attitude related questions, appropriate responses varied amongst professional groups. More technical staff followed the NSI prevention precautions. Doctors and nurses scored better than technical and attendant staff possibly because NSI knowledge is in their academic curriculum and hence they are well aware of all hospital infection control practices and procedures. The HCWs answered most NSI knowledge questions correctly. There was significant knowledge deficiency regarding where NSIs should be reported. Most HCWs were also less aware about HIV and HBV infectivity, although doctors’ awareness was much better compared to other HCWs. Stein et al [12] (2003) measured Birmingham Teaching Hospital doctors and nurses’ knowledge and attitude towards and compliance with universal precautions. Overall knowledge of blood-borne viral transmission from an infected person after NSI was low. These deficiencies can be easily rectified by continuous medical education programs, banners and signboards in the OPDs,

wards, blood banks, biomedical waste department and other high risk areas.

HCWs were unaware that needles should not be bent or re-capped after use. Another question regarding protection that gloves provide against NSI, generated less acceptable responses. Mast et al [14] suggest that healthcare workers were frequently unaware that gloves may reduce blood contamination via NSI from the source to the recipient. Differences in adherence levels to infection control guidelines among HCWs has also been reported. [15,16] In our study, knowledge and attitude scores increase with the respondents' qualifications. This is expected as education imparts awareness about the significance of NSI prevention measures and the hazards related to blood and blood product exposure. Graduates have higher practice scores compared to postgraduates because postgraduates are not following the basic safety precautions despite understanding preventive measures.

### Conclusion

The most effective way to protect workers from infectious diseases transmitted by NSI is a comprehensive prevention program; including employee training, following recommended infection control practice guidelines, effective disposal systems, surveillance programs, improved equipment design and encouraging accident reporting. We should have a staff health service facility in place, which maintains records, registers NSI incidence and has protocols for managing and following-up NSI cases. This is most important in all large healthcare facilities with a high patient-turnover and NSI rates. Our study revealed important information regarding HCW knowledge, attitude and practice concerning NSI.

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