

# Frequency of Needlestick Injury with Associated Risk Factors and Knowledge about Blood Borne Transmitted Diseases among Health Care Workers in Alnoor Specialist Hospital, Makkah, Saudi Arabia

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**Abstract:** Background: Needlestick and Sharps injuries (NSSIs) are wounds caused by sharps such as hypodermic needles, blood collection needles, intravenous cannulas or needles. Needlestick and sharps injuries (NSSIs) are one of the major risk factors for blood-borne infection among the health-care facilities. They are considered to be the single greatest hazard to medical personnel. Objectives: To determine the frequency of NSSI with associated risk factors among health care workers in OR and ER departments of Alnoor Specialist Hospital and to assess level of the knowledge about blood borne transmitted diseases. Material and methods: A cross-sectional study conducted among Health Care Workers of Alnoor Specialist Hospital, Makkah, Saudi Arabia from 9<sup>th</sup> of August to 28<sup>th</sup> of October 2015 with participation of 168 HCWs. A modified EPINet questionnaire used to determine the frequency and associated risk factors of NSSI. Results: Out of 168 participants, 61(36.3%) experienced Needlestick injuries at least once during working in a medical field; 85.2 % of them were vaccinated for hepatitis B . 36% of injuries occurred during recapping of needle. Conclusion: Health Care Workers are at risk of needlestick injury. Malpractice of Universal Precautions especially with recapping of used needles lead to needlestick injury. NSSI can be avoided by practice of Universal Precautions and introduce an educational program.

**Keywords:** Needlestick, blood borne, Alnoor Specialist Hospital

## 1. Introduction

Depending on the World Health Organization, around 3 million of health care workers out of 35 million experience NSSIs every year. Two million of those injuries was contaminated with HBV, 0.9 million was contaminated with HCV and 170, 000 with HIV. More than 90% of these infections occur in developing country . The WHO estimated that exposure to sharps in the workplace accounts for 40% of infection with HBV and HCV and 2%–3% of HIV infections among HCWs. Following NSI, the risk of transmission from infected patients to HCW are 3-10% for hepatitis B, 3% for hepatitis C, and 0.3% for HIV.

Makkah city as a holy place where Muslims from all around the world come for religious purposes . Alnoor Specialist Hospital has high capacity in ER and OR departments with different specialties serving citizens and people who come for Umrah and Hajj.

Our study will be conducted among HCWs in OR and ER departments in Alnoor Specialist Hospital because those staffs care for patients in stressful conditions and deal with sharp objects more frequently.

## 2. Aim of the Study

To provide up to date information on NSSI in Alnoor Specialist Hospital and to introduce an educational program in order to increase awareness about risk of NSSIs

## 3. Objectives

- 1) To determine the frequency of NSSI with associated risk factors among health care workers in OR and ER departments of Alnoor Specialist Hospital and King Faisal Hospital
- 2) To assess level of the knowledge about blood borne transmitted

## 4. Material and Methods

### Study design

A cross- sectional study will be conducted among health care workers of Alnoor Specialist Hospital and King Faisal Hospital

### Study population

Emergency and Operating rooms staffs will be targeted . HCWs in ER include physicians, interns, nurses, cleaners and paramedics, with the exclusion of HCW who are on vacation and doctors who come to ER department for consultation from other departments. The OR HCWs include Surgeons, interns, Anesthesiologists, anesthesia staffs, Nurses, and Cleaners. With exclusion of those who are on vacation. HCWs of OR and ER departments will be identified from OR and ER administration records offices.

### Study Sample

All HCWs in ER and OR departments will be included in this study at the time of data collection

#### Measurement tool:

A modified EPINetquestionnaire will be used to determine the frequency and associated risk factors of NSSI. The questionnaire will be given to HCWs during breaks and recollected at the same time or next four day for almostone month duration for data collection.

#### Data Analysis

Data entry and analysis will be carried out after data collection using SPSS.

### 5. Results

**Table 1:** Age of Health Care Workers in Alnoor Specialist Hospital, Makkah, 2015

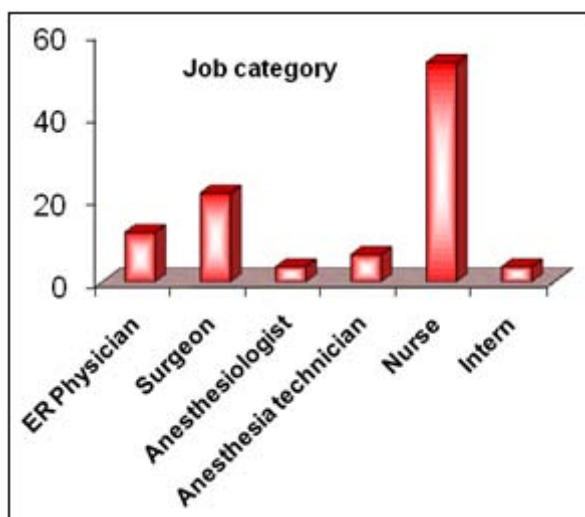
AGE	N	%
<25	10	5.95
25-35	111	66.07
>35	47	27.98
Range	20-58	
Mean±SD	32.178±6.909	

**Table 2:** Gender of Health Care Workers in Alnoor Specialist Hospital, Makkah , 2015

SEX	N	%
• Male	79	47.0
• Female	89	53.0

**Table 3:** Job category of Health Care Workers Participants in Alnoor Specialist Hospital, Makkah , 2015

Job category	N	%
• ER Physician	20	11.90
• Surgeon	36	21.43
• Anesthesiologist	6	3.57
• Anesthesia technician	11	6.55
• Nurse	89	52.98
• Intern	6	3.57



**Figure 1:** Job category of Health Care WorkersParticipants in Alnoor Specialist Hospital, Makkah , 2015

52.98% of Health Care Workers Participants were Nurses while 21.43% Surgeon and 11.9% ER Physician.

**Table 4:** Duration of working in a medical field of Health Care WorkersParticipants in Alnoor Specialist Hospital, Makkah, 2015

Duration of working in a medical field (years)	N	%
• Less than 1 yr	22	13.1
• 1-5 yrs	55	32.7
• 6-9 yrs	45	26.8
• More than 10 yrs	46	27.4

Most of Health Care Workers p Participants have experience of 1-5yrs in a medical field 32.7%

**Table 5:** Department of Health Care WorkersParticipants in Alnoor Specialist Hospital, Makkah, 2015

Department	N	%
• ER	79	47.02
• OR	89	52.98

Most of Health Care Workers Participants were from OR 52.98%

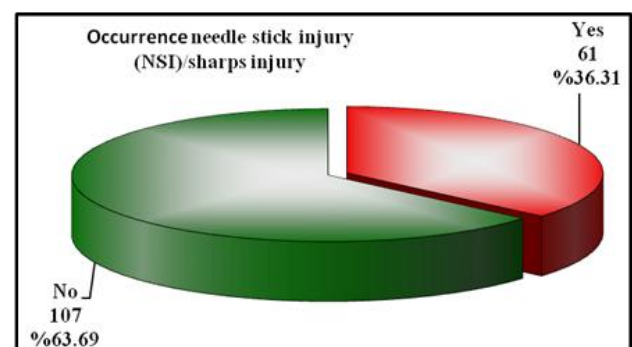
**Table 6:** Duration of working in this hospital of Health Care WorkersParticipants in Alnoor Specialist Hospital, Makkah, 2015

Duration of working in this hospital (years)	N	%
• Less than 1 yr	53	31.5
• 1-5 yrs	55	32.7
• 6-9 yrs	36	21.4
• More than 10 yrs	24	14.3

Most of Health Care Workers Participants worked at Alnoor Specialist Hospital for (1-5 yrs) 32.7% .

**Table 7:** Occurrence of needle stick injury (NSI)/sharps injury to Health Care WorkersParticipants in Alnoor Specialist Hospital, Makkah, 2015

Occurrence of needle stick injury (NSI)/sharps injury	N	%
Yes	61	36.3
No	107	63.7
Total	168	100.00



**Figure 2:** Occurrence of needle stick injury (NSI)/sharps injury to Health Care WorkersParticipants in Alnoor Specialist Hospital, Makkah, 2015

**Table 8:** Frequency of needle stick injury (NSI) /sharps injury of Health Care WorkersParticipants in Alnoor Specialist Hospital, Makkah, 2015

Frequency of needle stick injury (NSI) /sharps injury	N	%
• One time	27	44.3
• 2-5 times	28	45.9
• 6-9 times	4	6.6
• More than 10 times	2	3.3

45.9% of Health Care Workers Participants had NSI more than once (2-5 times)

**Table 9:** Procedure during needle stick injury of Health Care Workers Participants in Alnoor Specialist Hospital, Makkah, 2015

<i>procedure during needle stick injury</i>	<i>N</i>	<i>%</i>
Recapping of needle	22	36.1
Improper disposal of needle	4	6.6
Overflowing containers/ Sharps Bin	1	1.6
Passing of instrument / handling devices	2	3.3
IV Canulation/Setting IV line	8	13.1
Venepuncture (Collecting blood)	4	6.6
Administration of IV drugs or blood or IM or subcutaneous injection or intradermal injections	5	8.2
Checking blood sugar using a glucometer	4	6.6
Suturing	14	23.0
Concealed sharps/after disposal of needle	0	0.0
Clean up/cleaning	1	1.6
Restless patient	2	3.3
Splash of body fluids/blood	0	0.0
Collision or bumped into other member of staff	0	0.0
Withdrawing injection fluid or drugs	2	3.3
Operation/surgery	20	32.8

Most of Health Care Workers Participants injuries occur during Recapping of needle (36.1%).

**Table 10:** Hepatitis B Vaccination status at the time of injury of Health Care Workers Participants in Alnoor Specialist Hospital, Makkah, 2015

<i>Hepatitis B Vaccination status at the time of injury</i>	<i>N</i>	<i>%</i>
• Completed Hepatitis B vaccine [3doses]	52	85.2
• Incomplete Hepatitis B vaccine [1-2 doses received]	3	4.9
• Not immunized at all	4	6.6
• Not received any Hepatitis B vaccination	2	3.3

85.2% of Health Care Workers Participants Completed Hepatitis B vaccine [3doses]

**Table 11:** Last injury of Health Care Workers Participants in Alnoor Specialist Hospital, Makkah, 2015

<i>last injury</i>	<i>N</i>	<i>%</i>
• Last 1yr	35	57.4
• Last 2-5yrs	17	27.9
• Last 6-9yrs	6	9.8
• 10yrs or more	3	4.9

57.4% of Health Care Workers Participants had injury in last 1 year

## 6. Discussion

This is cross-sectional study done at Alnoor Specialist Hospital, Makkah, Saudi Arabia from 9<sup>th</sup> of August to 28<sup>th</sup> of October 2015 with participation of 168 HCWs. In order to assess the frequency of NSSI with associated risk factors among health care workers.

Out of 168 participants, 61(36.3%) experienced Needlestick injuries at least once during working in a medical field.

Most of participants were in the age group of (25-35).The

mean age of the HCWs was (32.1±6.9) years. The age range was between 20 and 58 years. It was found that majority of the HCWs participants were females 89(52.98%).

There was a significant difference in case prevalence of needles stick injury among various job categories, 89 (52.98%) were working as nurses followed by 36 (21.43%) as surgeons and 20(11.9%) as ER Physicians. The common place of occurrence of needles stick injury was in Operation Room - 89 (52.98%); followed by Emergency department - 79 (48.02%).

45.9% of Health Care Workers Participants had NSI more than once (2-5 times) which could be due to lack of experience or weak knowledge. 35 (57.4%) of them had Needle stick injuries in the past 1 year. The doctors and interns had better knowledge regarding the diseases spread through NSI when compared with nurses.

65.4% of injured HCWs have poor practice regarding NSSI. 73.8% of all participants have good knowledge about blood borne transmitted diseases. The most common circumstances during which the Needle stick injuries occurred was while recapping of needle (36%). 85.2 % of Health Care Workers Participants were vaccinated for hepatitis B.

## 7. Conclusion and Recommendation

Needle stick injuries can be preventable if safety is followed in the work place. An effective system for disposing of used needles and sharps is crucial to preventing injuries. These injuries can be avoided by eliminating the unnecessary use of needles, using devices with safety features, and promoting education and safe work practices for handling needles and related systems.

- Health workers who may come in contact with blood or body fluids should receive hepatitis B vaccinations.
- Follow all safety procedures in the workplace.
- Regularly undertake safety refresher courses.
- Minimise use of needles.
- latex gloves don't protect you against needlestick injuries.
- Don't bend or snap used needles.
- Never re-cap a used needle.
- Place used needles into a clearly labelled and puncture-proof sharps approved container.

## 8. Acknowledgement

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