

## Precautionary Measures Awareness Regarding Needle Stick Injuries Among Health Care Workers Of Public And Private Hospitals In Hyderabad

Allah Bachayyo Rajar<sup>1</sup>, Abdul Manan Soomro<sup>2</sup>, Tariq Feroz Memon<sup>3</sup>, Kumayl Abbas Meghji<sup>4</sup>, Hussain Bux Kolachi<sup>5</sup>, Zahid Saddar<sup>6</sup>

1. Dr. Allah Bachayyo Rajar (Associate Professor, Department of Community Medicine) Muhammad Medical College, Mirpurkhas [drabrajar@gmail.com](mailto:drabrajar@gmail.com)

2. Dr. Abdul Manan Soomro (Associate Professor, Department of Community Medicine) Peoples University of Medical and Health Sciences for women, shaheed benazirabad, Nawabshah, [drabdulmanan@gmail.com](mailto:drabdulmanan@gmail.com)

3. Dr. Tariq Feroz Memon (Assistant Professor, Department of Community Medicine) Isra University, Hyderabad, Pakistan [drtariqferoz@gmail.com](mailto:drtariqferoz@gmail.com)

4. Dr. Kumayl Abbas Meghji (Senior Lecturer, Department of Physiology) Isra University, Hyderabad. [dr.kumaylabbas@gmail.com](mailto:dr.kumaylabbas@gmail.com)

5. Prof. Hussain Bux Kolachi (Professor, Department of Community Medicine) Isra University, Hyderabad [kolachi83@gmail.com](mailto:kolachi83@gmail.com)

6. Dr. Zahid Saddar (Health education officer, DHO office Matiari) Department of Health, Sindh [zahidsaddar@yahoo.com](mailto:zahidsaddar@yahoo.com)

### Corresponding Author:

Dr. Tariq Feroz Memon (Assistant Professor, Department of Community Medicine) Isra University, Hyderabad  
Contact: 03223490040  
Email: [drtariqferoz@gmail.com](mailto:drtariqferoz@gmail.com)

### Abstract

**Background:** Needle stick injuries are amongst the most common occupational hazards and potential source of transmission of to more than 20 fatal blood borne infections including Hepatitis B&C and HIV etc.

**Objectives:** To ascertain the awareness of HCWs regarding needle stick injuries in public and private sector hospitals as well as to compare this awareness in both public and private sector healthcare facilities.

**Methods:** A cross sectional survey was conducted in public and private sector hospitals in Hyderabad, Pakistan from May 2019 to October 2019. HCWs include; nursing staff, midwives, Operation Theater and Intensive care unit technicians were interviewed. Data was collected using written questionnaire. Data was analyzed using SPSS ver. 23.

**Results:** Two hundred healthcare workers were participated in this study. Majority (53%) of participants belongs to private sector hospital. Moreover, 53% of them were aware of the precautionary measures of NSIs. Maximum (53%) of participants don't not use surgical trays to keep syringes while 58% do not use needle cutter for disposing used needles. There was a statistically significant difference p value < 0.05 in awareness level of HCWs in public and private sector hospitals.

**Conclusion:** It is concluded from the present study that a notable number of nursing staff in both public and private health sectors suffer from needle stick injuries. Healthcare workers from the public sector suffer most from such injuries and have lower awareness level regarding precautionary measures of needle stick injuries.

**Keywords:** Awareness, Health sector, Healthcare workers, Needle stick injuries

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### INTRODUCTION:

Needle stick injury (NSI) defined are the injuries or wounds caused as result of accidental penetration of skin by needles or sharps<sup>1</sup>. These are the commonest of all risk factors of accidental injuries that may occur anytime when people use, discard and dispose the syringes or sharps in hospital settings<sup>2</sup>. Such injuries are amongst the most common occupational hazards that may expose the health care workers (HCWs) to more than 20 fatal blood borne infections such as hepatitis B, hepatitis C and human immunodeficiency virus (HIV)<sup>3</sup>. Such conditions resulting from occupational blood-exposure through injuries with sharp instruments and syringes<sup>4</sup>. Majority of the HCWs contract the diseases in health care settings without being aware of them<sup>4</sup>. Sometimes if used needles improperly disposed or left unattended, they may conceal with patient's bed linen or garbage

and accidentally injure the HCWs or even common person. Globally around two million HCWs experienced NSIs every year<sup>5</sup>. Globally more than two third case of Hepatitis B & C and about 5% of HIV cases resulting from NSIs<sup>5</sup>. These injuries can also lead to serious psychological stress even in the absence of fatal infections. Such factor may pose more burden on health cost of person and resulting in loss of working time. Up to 12% of NSI cases may also leads to the psychiatric morbidity like post-traumatic stress disorder (PTSD)<sup>6</sup>. Centers for Disease Control and Prevention (CDC) estimates that approximately 385,000 injuries related to needles and sharps annually to HCWs in the United States alone<sup>7</sup>. To prevent such injuries among the HCWs, WHO recommends following the precautionary measures and recommends the governments to use the safety injecting devices exclusively by the year 2020. Developed

countries like Canada, USA, Brazil, UK and European Union (EU) countries have already endorsed legislation for the use of safety injection devices<sup>8</sup>. Despite an increased awareness and legislation in some countries, NSIs and their serious consequences still occur<sup>9</sup>. Pakistan comes in Eastern Mediterranean Region (EMRO), which unfortunately, has the highest rate of NSIs in comparison to the rest of the world<sup>10</sup>. Due to lack of awareness and proper legislation as well as overcrowding of the health facilities, NSIs are very common in hospitals of Pakistan<sup>11</sup>. Increased incidence of needle stick injuries in HCW is known to arise from a combination of high risk activities with low safety measures (activities including administering injections, drawing blood, recapping needles, disposing of needles, handling trash and dirty linen and transferring blood or body fluids from a syringe to a specimen container and missing the target)<sup>12</sup>.

To ascertain and compare the awareness of HCWs regarding needle stick injuries in public and private sector hospitals facilities.

#### **MATERIAL AND METHODS:**

The cross sectional survey was conducted at the Shah Bhattai Hospital, Latifabad, Hyderabad and Isra University hospital Hyderabad from May 2019 to October 2019. Selection of hospitals was done by the Non-probability convenient sampling technique. Sample size of healthcare workers was calculated by using Rao soft online sample size calculator, by assuming the margin of error of acceptance at 8%, confidence interval of 95% and 60% of response distribution, the sample size of **187** was drawn. To compensate the drop out, the sample was raised to **200**. For proportional

allocation of the healthcare workers in public and private sector hospitals, stratified sampling technique was used. The sample size was distributed among the three Nursing staff, Midwives and Technicians from operation theaters as well as Intensive care units (ICU) A self-administered semi-structured written questionnaire was used to collect data. Questionnaire comprises of questions related to socio-demographic features, participant's knowledge of needle stick injuries and their routine practices as well as precautionary measures they take for protecting themselves from NSIs.

Ethical approval was sought from the ethical review committee of Isra University while permission from medical superintendents of both included hospitals was also taken. Informed consent was taken from each participant after explaining study purpose. All study participants and hospital administration also assured about the confidentiality and anonymity of the information. Before filling out the questionnaire, the respondents explained in detail about NSI. Awareness level of HCWs was measured after calculating total correct replies of each participant.

The collected data entered in the SPSS version 23. Descriptive analysis presented in frequencies and percentages. While Chi square test was used to assess the difference in the awareness level. Significance level was set at p-value  $\leq 0.05$ .

#### **RESULTS**

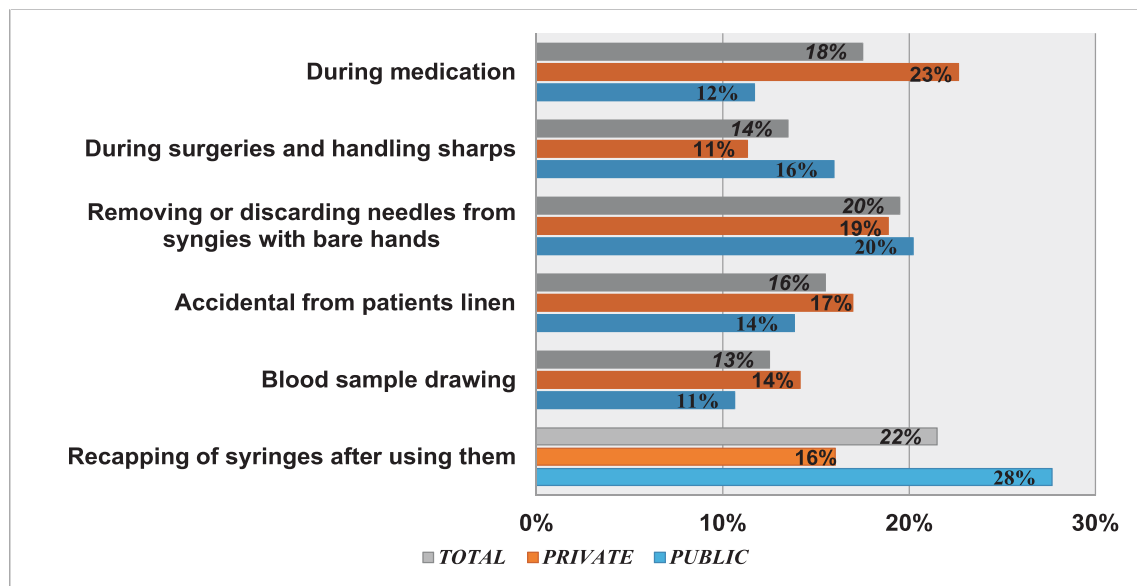
A total 200 HCWs from public and private hospitals of Hyderabad participated in the study. The mean age of HCWs was  $32.5 \pm 9.02$  years. Sociodemographic information of all the participants is demonstrated in Table1.

**Table1: Socio-demographic features of participants (n=200)**

		Public n(%)	Private n(%)	Total n(%)
		94(47)	106(53)	200
Age group	18-27	22(23.4)	20(19)	42(21)
	28-37	32(34)	40(37.7)	72(36)
	38-47	40(42.6)	46(43.3)	86(43)
Sex	Male	60(64)	46(43.4)	106(53)
	Female	34(36)	60(56.6)	94(47)
Designation	Nursing Staff	46(49)	59(55.7)	105(52.5)
	Midwives	22(23.4)	22(20.7)	44(22)
	Technicians	26(27.6)	25(23.6)	51(25.5)
Experience	0 to 5 years	47(50)	57(53.7)	104(52)
	6 to 10 years	24(25.5)	25(23.7)	49(24.5)
	11 to 15 years	23(24.5)	24(22.6)	47(23.5)
Ward Posting	Gynae/Obstetrics	20(21.3)	38(36)	58(29)
	Surgery	17(18.1)	15(14)	32(16)
	Medicine	16(17)	18(17)	34(17)
	Intensive Care Unit	21(22.3)	19(18)	40(20)
	Operation Theatre	20(21.3)	16(15)	36(18)

**Table2: Awareness related questions from participants (n=200)**

QUESTIONS	REPLIES	Public n (%) 94(47)	Private n (%) 106(53)	Total n (%) 200
Needle Stick Injuries (NSIs) include	- Correct	39(41.5)	67(63)	106(53)
	- Incorrect	55(58.5)	39(37)	94(47)
Diseases spread by NSIs	- Correct	51(54.3)	82(77.3)	133(66.5)
	- Incorrect	43(45.7)	24(22.7)	67(33.5)
Precautionary measures of NSIs	- Correct	45(48)	61(57.5)	106(53)
	- Incorrect	49(52)	45(42.5)	94(47)

**Figure 2: Replies of participants (public and private hospital) about the frequent causes of NSIs (n=200)****Table3: Distribution of replies of questions related to routine practice of participants (n=200)**

PRACTICE QUESTIONS		Hospital Setting		Total
		Public	Private	
		n(%)	n(%)	n(%)
		94(47)	106(53)	200
Do you regularly use tray to keep syringes?	Yes	41(43.6)	52(49)	93(46.5)
	No	53(56.4)	54(51)	107(53.5)
Do you regularly use sharp disposal containers?	Yes	48(51)	61(57.5)	109(54.5)
	No	46(49)	45(42.5)	91(45.5)
Do you discard needles properly in container after use?	Yes	48(51)	55(52)	103(51.5)
	No	46(49)	51(48)	97(48.5)
Do you enquire patients about their disease history prior injecting them?	Yes, always	45(48)	52(49)	97(48.5)
	Yes, sometimes	30(32)	30(28)	60(30)
	No	19(20)	24(23)	43(21.5)
Do you use needle cutter for disposing used needles?	Yes	30(32)	54(51)	84(42)
	No	64(68)	52(49)	116(58)
How often you use gloves when deal with needle	Always	11 (11.7)	31(29)	42(21)
	Most of times	14(15)	16(15)	30(15)
	Rarely	18(19)	43(40)	61 (30)
	Never	51(54.3)	17(16)	68(34)

**Table 4: Difference of awareness level of HCWs in public and private hospitals (n=200)**

AWARENESS LEVEL	HOSPITAL SETTING		P-value
	Public (94)	Private (106)	
<15 (low)	39	18	<0.05*
15-19 (average)	43	51	
20 and above (high)	22	27	

**\* Significant finding**

Majority of participants 91% Nursing staff, 52% Midwives and 69% technicians reported that they had suffered from NSI in last one year. Table 2 below is Participants from public and private hospitals were asked for their opinion about “which is the most frequent cause of NSI”? Replies of them are mentioned in figure 2. Questions related to the routine practices regarding handling of sharps and syringes also asked from the participants. (Table 3)

**DISCUSSION**

Needle stick injuries remain a potential source of infection among the health care workers (HCWs) and major cause of transmission of blood borne life-threatening infections<sup>13</sup>.

Several studies demonstrated the level of awareness of HCWs but still little known about the fact that awareness or lack of knowledge about the possible risk factors of NSIs can have any impact on the attitudes and behaviors or not. Majority of participants of our study were aware of term NSIs but amongst the HCWs from public sector hospital do not know about the NSIs properly. Approximately 66% of HCWs in this study were aware that Hepatitis B transmitted through blood. Much higher findings of awareness about the Hepatitis B transmission reported by Suliman et al. from Sudan (2016)<sup>14</sup>.

In the present study, prevalence of NSIs in the public hospital was 44% compared to 26.4% in the private one. This difference could be due to the high patient turnover in public settings as opposed to private settings.

Furthermore, highest rate (47%) of NSIs was observed among the HCWs of age group 18 to 27 years in our study. These findings are consistent with the studies conducted by Hosoglu et al. (2009)<sup>15</sup> and Muralidhar et al. 2010<sup>16</sup>. This difference in incidence of NSIs reflects the possible limited professional experience as well as these young professionals tends to be more enthusiastic and aggressive in their but they ignore the universal professional guidelines or they don't even aware of these guidelines. Our study also demonstrated that among HCWs, female staff predominated in NSIs. This similar difference of gender in NSIs

demonstrating the distribution of replies about the awareness of basic information regarding NSI. (Table 2).

There was statistically significant difference (p value < 0.05) of awareness found between health care workers in public and private sector hospital. HCWs of private sector hospital were more aware about the NSIs and its preventive/ precautionary measures. Table 4.

reported by Singu et al. 2008 in India<sup>17</sup>. This predominance of female gender may be due to the reason that majority of HCWs in the hospital are female gender.

More than two third (77%) of HCWs reported that they have suffered from NSIs during their career in the present study. Majority (91%) of them were nursing staff from public as well as private sector reported that they suffered from NSIs once or twice in their career. This may be due to the nature of job of nursing staff as they more frequently deals with the syringes and sharp instruments. One study conducted in Sudan by Suliman et al. in 2016<sup>14</sup> demonstrated that majority (40%) of nursing staff in their study suffered from NSI. Najma et al. 2013<sup>18</sup> from Karachi also reported that 77% of their HCWs suffered from NSIs once or twice in their career. Another study conducted at Alexandria Hospital by Hanafi et al. 2011<sup>19</sup> reported that 68% of the HCWs in their study had sustained at least one NSI in past one year duration. A study by Sharma et al from India in 2010<sup>20</sup> reported a bit high prevalence (79.5%) of HCWs in their study suffered from one or more NSIs in their career these findings are consistent with the findings of our study.

Wearing gloves is to be one of the most important precautionary method against NSIs but several of the HCWs had not been wearing them at the time of their injury, higher proportions among the nurses and the technicians. It is noteworthy that 34% of all HCWs in this study never used to wear gloves when handling the syringes or needles. While 30% of them rarely use gloves during their duty when handling patients. It may be due to non-availability of hand gloves for nursing staff, technicians or

midwives and improper attitude and behavior towards preventive measures of NSI.

Our study revealed that information of about 61% of injuries were not registered or reported into an official record. Similar findings that are closer to our study also reported by Cui et al. (66%) in 2018 <sup>21</sup> and Jahangiri et al. (60.2%) in 2016 <sup>22</sup>. While our study findings proportion is higher than reported by Makary et al. (51%) in 2007<sup>23</sup>. Foremost reason for failure to report such injury is non-serious and unprofessional attitudes of higher ups towards such reporting. Non-availability of appropriate guidelines in tertiary care hospitals in the city or even country especially in the public sector hospitals.

Along with strengths this study also have limitations, one of the potential problem in the study is selection bias. However, representation of both public and private sector hospitals but still all shift staff did not participated in the study. Inclusion of more private and public hospitals of the city would reduce any selection bias. Furthermore, restricted time and budget is another limitation in our study.

#### **CONCLUSION:**

NSIs were observed in all categories of HCWs. Prevalence of NSIs was high among the HCWs especially among the public sector HCWs. Majority of nursing staff suffered from NSIs. While the level of awareness in our study was found to be very low among the HCWs of Public sector hospital. Highest proportion of nursing staff were not aware of basic precautionary measures of NSIs.

#### **RECOMMENDATIONS:**

Hospitals and nursing institutes must organize and arrange preparatory courses about the prevention methods of NSIs and other occupation related injuries. Elimination of practices like recapping of used syringes need to discouraged by the health facilities. Availability of proper and safe disposal of needles, syringes and sharps must be ensured by the health facilities.

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