



# Awareness and Practices Regarding Needle Stick Injuries Among Health Care Professionals: Findings at a Tertiary Care Hospital of Karachi

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## Abstract

Assesment of the knowledge, attitude and practices of healthcare professionals (HCPs) regarding needle stick injuries (NSIs) at a tertiary care hospital in Karachi. This was a cross-sectional study, conducted among 404 health care workers at a tertiary care hospital in Karachi. A self-administered questionnaire was used to collect the data which was analyzed by using SPSS version 22.0. Out of 404 HCPs, 83.17% were actively involved in the human activity of distributing any kind of injection during their duties. A total of 117 (29%) study participants were sufficiently educated regarding NSI practices ( $p < 0.001$ ). Among the HCPs, 64.9% had never read the institutional guidelines regarding NSIs. A total of 253 (62.7%) HCPs had sustained a needle stick injury at least once in the last one year; 75% of them were previously immunized with hepatitis B vaccination. The level of awareness among HCPs at tertiary health care level at Karachi is not satisfactory. Frequent training workshops, teaching sessions and symposia should be arranged to promote awareness regarding NSIs among HCPs.

**Keywords:** Needle Stick Injuries (NSI), Health Care Professionals (HCPs), Tertiary Care, Hospital, Karachi.

## Introduction

Health care professionals (HCPs) are at the highest risk to suffer needle stick injuries (NSIs). These injuries can transmit several viral infections, and can lead to serious morbidity and mortality<sup>1, 2</sup>. Studies have revealed that almost three million out of thirty five million HCPs experience needle stick injury every year, worldwide<sup>3</sup>. The issue is of concern among both the developed and developing countries<sup>4, 5</sup>. More than 20 types of pathogens have been reported to transmit through NSIs; the most feared ones are hepatitis B virus (HBV), hepatitis C virus (HCV) and Human Immunodeficiency Virus (HIV)<sup>6</sup>. According to World Health Organization (WHO) 40% of HBV, HCV and 2.5% of HIV infections among HCPs are attributed to NSIs<sup>3</sup>.

It has been, likewise, reported that HCPs do not stick with proper infection control techniques<sup>7-9</sup>. A majority of the inexperienced workers regularly perform recapping of needles; a majority of them, however, do not know the importance of utilizing personal protective measures<sup>10, 11</sup>. The most likely reason to this menace is inadequate professional training regarding NSIs<sup>11, 12</sup>. A basic aim of safe and efficient nursing care is to prevent and control infections. In the nutshell, NSIs pose a significant threat of infections to the HCPs in general. The issue is of special attention in communities which lack awareness and proper training in NSI handling. Gravity of this problem and the causative factors have not been investigated in local population as yet. Findings from this study would hence assist the authorities in taking appropriate preventive measures. Thus this study was designed to assess knowledge and practices regarding NSIs among HCPs.

## Methodology

The cross-sectional study was conducted among the health care workers in tertiary care hospitals at Karachi.

## Study Participants

Health care workers serving at tertiary health care hospitals in Karachi were randomly selected; those who consented were enrolled into the study. Health care workers of either gender and all age groups, dealing with

syringes in diagnostic or therapeutic interventions, were included into the study.

### Data Collection

Primarily incidence of NSI was assessed among different cadres of health care workers. Questionnaires depicting awareness regarding NSI, preventive techniques and history of infliction, if any, were filled out for each patient by pre-trained individuals. NSI was defined as any cut or prick sustained by a needle previously used on a patient during execution of a medical procedure sustained within the hospital premises.

### Data Analysis

The data was collected on questionnaires and transferred to the Statistical Package for Social Sciences (SPSS) version 22 for analysis. Arithmetic means and standard deviations were calculated from normally distributed continuous variables. Differences among the subgroups of variables were analyzed for statistical significance keeping the limit for confidence interval at 95%.

## Results

A total of 500 health care workers were randomly selected of whom 404 consented and were enrolled into the study. These included 36 (8.91%) consultants, 77 (19.5%) house officers, 179 (44.3%) nurses, 77 (17.32%) TRNs/TRMs and 42 (10.39%) others. Table 1 presents general demographic and professional information of study participants. Among the study participants 269 were females while 135 were males. A majority of them, i.e. 52%, were from the age group 25 to 30 years. A total of 191 participants (47.3%) had a work experience of 2-4 years. Table 2 presents the proportion of at-risk healthcare workers and the NSI incidence rate among study participants. It was found that 88% (n = 358) were at risk of suffering from an NSI. A significant number of study participants, i.e. 251, had suffered from at least one incidence of NSI in the last 12 months. To elucidate the risk factors for infliction of NSIs, various administrative and intellectual factors were analyzed; these have been listed in Table 3. It was found that the participants lacked in their understanding of NSIs. is mainly pertained to the lack of proper education/training while at service. The incidences of NSIs were infrequently reported to the concerned department. The hepatitis B vaccination status among the healthcare workers was also unsatisfactory. Merely 28.70% participants were aware of the organizational/ hospital policies related to health and safety. Moreover, only 35.10% of the participants were following Personal Protective Equipment (PPE) guidelines, which is suggestive of a lack of knowledge among healthcare workers. Among the study participants, only 37.10% responded that they have a sharp box in the clinical setting they are working at; 25.2% of the respondents denied the presence of any such box in their work settings, whereas 37.7% admitted that they did not know if a sharp box exists in their setting or not. In the current study we found that nursing sta was the most common cader of healthcare workers suffering from NSI, however, house officers were the most at risk for NSI. Consultants, in the other hand were the least at risk for NSI. Among the various age groups, those from 25-30 years age comprised majority of the cases. Males were found to have significantly increased prevalence of NSI in comparison to the female participants. It was also found that the inexperienced ones were the most at risk for NSI (Table 4). Upon further elucidation, it was found that the inappropriate understanding of NSIs among healthcare workers was mainly due to lack of training and awareness about institutional policies regarding NSIs (Table 5). Unfortunately, only 25.5% HCPs sustained NSI were trained. And only 32.6% out of the population that had “Needle Stick Injuries” were aware of organizational policies.

**Table 1: Demographic and professional data of study respondents (n=404)**

Variable	Frequency	Percentage
<b>Age in Years</b>		
18-24 Years	100	24.79%
25-30 Years	210	52.00%
More than 30 Years	94	23.30%
<b>Gender</b>		
Female	269	66.60%
Male	135	33.40%
<b>Job category</b>		
Consultant	36	8.91%
House Officers	77	19.05%
Nursing Sta	179	44.30%
Trainee Nurses & Midwife	70	17.32%

**Table 2: Proportion of healthcare workers at-risk for NSI and frequency of NSI among study participants.**

Variables (n=404)	Yes	No	Don't Know/Don't Remember
Administration of injections during work	336 (83.17%)	68 (16.83%)	-
Assistance in Removal of Needle	358 (88.61%)	46 (11.39%)	-
Recapping Needles	357 (88.33%)	47 (11.67%)	-
Sustained any NSI during last 12 months	251 (62.10%)	153 (37.90%)	0%
≥2 NSIs in the last 12 months	135 (33.4%)	116 (28.7%)	153 (37.9%)

Others	42	10.39%
<b>Length of service in years (Study Hospital)</b>		
0-2 years	151	37.40%
2-4 Years	191	47.30%
4-6 Years	36	8.90%
> 06 years	26	6.40%

<b>Incident form filled</b>	<b>66 (16.3%)</b>	<b>153 (37.90%)</b>	<b>185 (45.80%)</b>
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**Table 3: NSI education level and prophylactic measures among study respondents.**

Variables (n=404)	Yes	No	Don't Know/ Others
Knowing Hospital policies	28.70%	71.30%	0
Following universal precautions (Following complete PPE)	35.10%	64.90%	0
Sharp box placed in clinical area	37.10%	25.20%	37.7%
Incident Reported to Infection Control Dept.	15.3%	53.8%	30.9%
Received training in the prevention and/ or treatment of needle stick injury	29.0%	71%	0
Read any copy of the hospital's "Health and Safety Policy", on the safe and ethical disposal of clinical wastes during the last two years	35.1%	64.9%	0
Hepatitis B vaccination	75%	11.1%	13.9%

**Table 4: Frequency of NSI in the last 12 months among various cadres of HCPs in context of various study parameters.**

Variable	Yes %	No %	P.Value
<b>Job category</b>			
Consultant (n=36)	2.9%	5.5%	p < 0.001
House Officers (n=77)	15.3%	3.2%	
Nursing Sta (n= 179)	26.7%	15%	
TRNs /TRMs (n= 70)	13.6%	10.5%	
Others (n= 42)	4.2%	3.1%	
<b>Age in Years</b>			
18-24 Years (n=100)	10.3%	12.9%	p < 0.001
25-30 Years (n=210)	43.8%	8.5%	
More than 30 Years (n=94)	8.6%	15.9%	
<b>Gender</b>			
Female (n=269)	37.1%	29.0%	p < 0.001
Male (n=135)	25.6%	8.3%	
<b>Years of experience in the industry</b>			
0 - 2 Years (n= 151)	26.4%	10.2%	p < 0.001
2 - 4 Years (n=191)	25.4%	21.6%	
4 - 6 Years (n=36)	7.7%	1.8%	
More than 6 Years (n=26)	3.2%	3.7%	

**Table 5: Knowledge and training regarding NSIs among HCPs (n=404)**

Variables	Yes %	No %	Don't Know/ Others	P Value
Knowledge of filling incident form	26.2%	60.7%	13.1%	p < 0.001
A practice of reporting the injury	73.7%	26.3%	0%	p < 0.001
Training	25.5%	74.5%	0%	p < 0.001
policies	32.6%	67.4%	0%	p < 0.001

## Discussion

In this study a higher prevalence rate of NSIs (n = 251, 62.10%) among HCPs was identified. This rate is significantly higher in comparison to studies conducted in the developed countries<sup>13</sup>. However, similar incidence rates have been reported in studies from the developing countries<sup>14,15</sup>. A previous study conducted in Karachi also reported similar findings<sup>16</sup>. Low socio-economic status is related to inadequate training of HCPs, lack of resources and a higher patient to HCP ratio. All these factors may hence be implicated in the higher incidence rates of NSIs.

It was found that nurses comprise the majority of NSI cases at the tertiary healthcare centers of Karachi. Similar findings were reported in contemporary studies<sup>17,18</sup>. The higher numbers pertain to the relative majority of nurses in strength as compared to professionals of other cadres. Besides, nurses are in close contact with patients and more at

risk of inflicting NSI<sup>17,18</sup>. In the current study, house officers were found to be the most at risk. In a study conducted at the Aga Khan Hospital of Karachi Pakistan, almost similar findings were observed<sup>19</sup>. Similar findings were also reported by studies conducted in India<sup>14,15</sup>. The higher frequency of NSIs among the young doctors is possibly due to the relative naiveness, lack of professional experience and overwhelming enthusiasm in comparison to the experiences HCPs of other cadets<sup>20</sup>. Professional experience has previously been found to inversely correlate with frequency of NSIs among HCPs<sup>16,21</sup>. The current study also endorses this fact.

Lack of training and unawareness about NSIs has been reported to be the most important risk factor for NSI among HCPs<sup>22</sup>. In the current study we also found that the HCPs lacked in appropriate training for tackling NSIs. It is hence suggested that such training sessions and seminars be regularly conducted in tertiary health care centers and a minimum level of necessary understanding of the issue be rendered mandatory.

## Conclusion

It is concluded that NSIs are frequent in local HCPs of Karachi Pakistan. Young doctors are the most at risk, whereas nursing staff comprise the major bulk of affectees. Lack of awareness and immunization against HBV are issues of concern and need attention.

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