

# FREQUENCY AND AWARENESS OF NEEDLE STICK INJURY IN PARAMEDICAL STAFF AND DOCTORS OF A TERTIARY CARE HOSPITAL

Kiran Fatima Farooq <sup>1</sup>, Nuwayrah Jawaid Saghir <sup>2</sup>, Sarah Anwar <sup>3</sup>, Umair Ali <sup>4</sup>, Saadia Rashid <sup>5</sup>

<sup>1</sup>Professor of Radiology, Foundation University School Of Health Sciences, Islamabad / Fauji Foundation Hospital, <sup>2</sup>Associate Professor, Department of Radiology, Fauji Foundation Hospital / Foundation University School Of Health Sciences, Islamabad, <sup>3</sup> Resident Radiology, Fauji Foundation Hospital, Rawalpindi, <sup>4</sup>Medical Officer, District Health Development Centre, Lahore, <sup>5</sup> Professor of Anatomy Department, Foundation University School Of Health Sciences, Islamabad.

---

## ABSTRACT

**Objective:** To determine frequency, response and awareness of needle stick injury (NSI) among healthcare workers.

**Design:** Descriptive, Cross-sectional

**Place and Duration of Study:** Fauji Foundation Hospital, Rawalpindi, 7 months (March to September 2019).

**Materials and Methods:** Study was conducted on the paramedical staff and doctors from one tertiary care hospital of Rawalpindi. After taking ethical approval and consent, a representative sample of 375 individuals was drawn by non-probability convenient sampling after applying inclusion and exclusion criteria. A validated questionnaire was used. Data was collected and analyzed on SPSS 21.

**Results:** Out of 375, two hundred and forty eight (66%) had experienced NSI, with a total of 129 female and 119 males. One hundred and forty six (59.3%) got NSI during recapping of syringes. Eighty seven (35.4%) got it while they were not wearing gloves. Five (1.3 %) got NSI during disposing off the syringe. Three (1.2%) were not well oriented due to increased work load. One hundred and forty (56.7%) claimed they were confident that their patient was not suffering from any blood-borne disease. Three hundred and forty one (90.9%) of total respondents knew about outcomes of NSI whereas sixty two (16.6%) attended a seminar/campaign regarding NSI. Three hundred and sixty nine (98.4%) of the respondents were aware of NSI and two hundred and eighty three (75%) of the total respondents knew the standard protocol. One hundred and seventy five (70%) allowed bleeding to occur after getting an NSI whereas fifty eight (23.5%) washed their hands immediately.

**Conclusion:** Needle stick injury is common in health care workers. Maximum use of disposable syringes, awareness of potential hazards of NSI, strict implementation of personal protection and NSI protocols, and rationalization of shift hours for health care workers will go a long way in preventing this potentially hazardous but preventable health care problem.

**Key words:** Needle stick injuries, Paramedical staff, Doctors, blood-borne diseases, recapping of needles.

**How to cite this article:** Farooq KF, Saghir NJ, Anwar S, Ali U, Rashid S. Frequency And Awareness Of Needle Stick Injury In Paramedical Staff And Doctors Of A Tertiary Care Hospital. HMDJ. 2023; 03(01): 21-23.

---

## INTRODUCTION

When skin is penetrated with a needle stick that was previously in contact with a body fluid, blood or soft tissue, an NSI results<sup>1</sup>. WHO reports that approximately 2 million out of 35 million healthcare workers experience exposure to infectious diseases by needle stick every year<sup>2</sup>. It is a major problem world over with an increasing frequency, stretching from 35% in Egypt to about 58% in Pakistan<sup>3,4</sup>. It has been noted that among

health care personnel, nursing staff have these injuries most frequently<sup>5</sup>. The Royal College of Nursing reported that 48% out of 4,407 nurses, had received injury by a needle or a sharp instrument that was previously used for another patient<sup>6</sup>. One study showed that out of 230 dental students, 53(23%) received an inoculation injury<sup>7</sup> while another study revealed NSI in 14.1% of medical students<sup>8</sup>.

Life threatening diseases like Hepatitis B, Hepatitis C, AIDS/HIV are spreading due to unawareness and negligence regarding NSI. NSI are the reason behind 37.6% of Hepatitis B, 39% of Hepatitis C, and 4.4% of HIV/AIDS cases seen among healthcare workers worldwide<sup>2</sup>.

Since NSI is a recognized occupational health & safety issue and is a significant risk faced by the health professionals, repeated awareness should be raised and cases should be reported as most of the times such events are considered unimportant or left unreported<sup>8</sup>. Our study will help us mark the risks factors leading to it in our own setting and also to identify the

---

Correspondence to: Dr. Kiran Fatima Farooq MBBS, MCPS, FCPS, EDiR, Professor of Radiology, Foundation University School Of Health Sciences, Islamabad / Fauji Foundation Hospital

Email: kiran.farooq@fui.edu.pk

Conflict of Interest: None

Financial Disclosure: None

Received: 05-06-2023

Accepted: 16-08-2023

occupational groups most susceptible to such injuries. NSI during massive vaccination campaigns is also common and the present scenario of massive vaccination related to covid<sup>9</sup> makes this study more relevant.

## MATERIAL AND METHODS

A descriptive, cross sectional study was carried out at Fauji Foundation Hospital Rawalpindi from March to September 2019. Permission of college ethical committee was taken prior to conducting the study. Non probability (convenience sampling) was done and 375 willing paramedical staff, house officers and post graduate doctors were included in the study. The study participants filled up a ten- item, structured questionnaire. Data were analyzed by SPSS version 21.

## RESULTS

Out of 375, two hundred and forty eight (66%) had experienced NSI, with a total of 129 females and 119 males. One hundred and forty six (59.3%) got NSI during recapping of syringes. Eighty seven (35.4%) got it while they were not wearing gloves. Five (1.3 %) got NSI during disposing off the syringe. Three people (1.2%) were not well oriented due to increased work load. One hundred and forty (56.7%) claimed they were confident that their patient was not suffering from any blood-borne disease. One hundred and seventy five (70%) allowed bleeding to occur after getting NSI whereas fifty eight (23.5%) washed their hands immediately. Three hundred and forty one (90.9%) of total respondents knew about outcomes of NSI whereas sixty two (16.6%) attended a seminar/campaign regarding NSI. Three hundred and sixty nine (98.4%) of the respondents were aware of NSI and two hundred and eighty three (75%) of the total respondents knew standard protocol.

## DISCUSSION

In our study 66% of health care workers had experienced a NSI, with a slight female preponderance. Global incidence of NSI has been documented at 44% with maximum occurrence in South East Asian region (58%)<sup>10</sup>. This figure is very near to outcomes of our study and establishes the fact that NSI has a high incidence in our part of world. In other studies, 66% of health care workers had either one or more than one episode of NSI and the incidence was highest amongst nurses, paramedical staff and doctors. Nurses and paramedical staff were at a higher risk in comparison to doctors<sup>11</sup>. While another study conducted in a private hospital showed doctors being more prone to get NSI in comparison with nurses<sup>12</sup>. Other studies show it to be more prevalent among the post graduate residents and junior doctors<sup>13</sup>. Dental students were at more

risk than the medical students, for obvious reasons<sup>8,10</sup>.

In our study 98.4% of the respondents were aware of NSI, 90.9% knew about the outcomes of NSI and 75% of the total respondents knew standard protocol. Only 16.6% had attended a seminar/campaign regarding NSI. Seventy percent allowed bleeding to occur after getting NSI whereas 23.5% washed their hands immediately. High incidence of NSI, despite adequate knowledge, points that other factors may be involved. Among the nursing staff, urgency, varying shift work, and inferior skill

levels (relating to years of experience, academic degree, and younger age) contributed towards the problem<sup>14</sup>. Reasonable shift hours and supervision of junior staff may help in minimizing the risk of NSI.

A significant contributing factor to this high frequency is our inadequate understanding of blood-borne diseases and their modes of transmission. According to a study, 8.3% of healthcare workers who suffered NSI came into contact with Hepatitis B and Hepatitis C contaminated needles<sup>15</sup>. The picture is much worse in primary as well as secondary health care centers where health care providers do not have adequate information about its consequences and precautions<sup>15</sup>. In our study 56.7% claimed they were confident that their patient was not suffering from any blood-borne disease without any proof. Awareness regarding spread of these deadly diseases by NSI will alert the health care workers and will go a long way in prevention of this health care hazard.

Most frequent cases of NSI were seen during needle recapping, giving local anesthesia and carrying out scaling/polishing procedures in dental practice<sup>7</sup>. In another study, recapping of syringes was responsible for NSI in 55.1% cases<sup>13</sup>. One study done at the University of Virginia analyzed 326 cases of NSI. The injuries were caused by disposable syringes (35%), intravenous tubing & needle assemblies (26%), pre-filled syringes (12%), winged steel-needle intravenous assembly (7%), phlebotomy needles (5%), IV catheter (2%), and others (13%). Rate of injury in devices that required disassembly was 5.3 times more as compared to disposable syringes<sup>16</sup>. Phlebotomy / IV infusions were the most common cause<sup>17</sup>. In our study, 59.3% got NSI during recapping of syringes. The guidelines by Occupational Safety and Health Administration (OSHA)<sup>15</sup>, prohibit needle recapping still a large proportion of NSI happen as a result of it. As per our study, only 1.3 % suffered NSI using disposable syringes. Use of only disposable syringes may lead to a reduction in the incidence of NSI in health care workers.

Another important observation was that a limited number of healthcare workers wore gloves while using sharps and did not

## CAPSULE SUMMARY

In light of recent massive vaccination campaigns, needle stick injury (NSI) has gained importance. Frequency, response and awareness of NSI among healthcare workers was probed in a cross-sectional study. Most cases were associated with needle recapping, not wearing gloves, disposing off the syringe, consequent to disorientation due to work load and by considering their patient free from blood borne disease. Most were aware of NSI outcomes though. Following NSI protocols, and rationalization of shift hours for health care personnel can help prevent this health care issue.

use precautionary measures for the prevention of NSI. In our study 35.4% had NSI while not wearing gloves. This calls for immediate implementation of policy regarding the protection of healthcare workers.

### CONCLUSION

NSI is common in health care workers and its continuous awareness is the key to its prevention. Maximum use of disposable syringes, awareness of potential hazards, strict implementation of personal protection and NSI protocols and rationalization of shift hours for health care workers will go a long way in preventing this potentially hazardous but preventable health care problem.

### AUTHORS' CONTRIBUTION

Kiran Fatima Farooq	Conception and design, Drafting the Article
Nuwayrah Jawaid Saghir	Conception and design, Drafting the Article
Sarah Anwar	Analysis and interpretation of data
Umair Ali	Acquisition of data
Saadia Rashid	Critical revision

### REFERENCES

- World Health Organization (WHO). Needle Stick Injuries. (2019). Available online at: [https://www.who.int/occupational\\_health/topics/needinjuries/en/](https://www.who.int/occupational_health/topics/needinjuries/en/).
- Occupational Health [internet]. Eastern Mediterranean Regional Office: World Health Organization (WHO), Inc.; 2011. Available from: URL: [http://www.who.int/occupational\\_health/topics/needinjuries/en/index.html](http://www.who.int/occupational_health/topics/needinjuries/en/index.html).
- Talaat M, Kandeel A, El-Shoubary W, Bodenschatz C, Khairy I, Oun S, et al. Occupational exposure to needle stick injuries and hepatitis B vaccination coverage among health care workers in Egypt. *Am J Infect Control* 2003. Dec;31(8):469-74.
- Mujeeb SA, Khatri Y, Khanani R. Frequency of parenteral exposure and seroprevalence of HBV, HCV, and HIV among operation room personnel. *J Hosp Infect* 1998.Feb;38(2):133-7.
- Prüss-Üstün, Annette, Rapiti, Elisabetta & Hutin, Yvan J. F. (2003). Sharps

injuries: global burden of disease from sharps injuries to health-care workers / Annette Prüss-Üstün, Elisabetta Rapiti, Yvan Hutin. <https://apps.who.int/iris/handle/10665/42743>.

- Needle stick injuries: The point of prevention [Internet]. London: Royal College of Nursing, Inc.; 2009 Jan. Available from: URL: [www.rcn.org.uk/\\_data/assets/pdf\\_file/0007/230884/003313.pdf](http://www.rcn.org.uk/_data/assets/pdf_file/0007/230884/003313.pdf).
- Huang J, Li N, Xu H, Jiang Y, Guo C, Li T, Cai Z, An N.J. Epidemiology of needlestick injury exposures among dental students during clinical training in a major teaching institution of China: A cross-sectional study. *Dent Sci*. 2022 Jan;17(1):507-513. doi: 10.1016/j.jds.2021.07.018.
- Norsayani MY and Hassim IN. Study on incidence of Needle stick injuries and factors associated with this problem among medical students *J Occup Helath* 2003. May;45(3):172-8. doi: 10.1539/joh.45.172.
- Moran-González JD, Padilla-Orozco M, Guzman-Lopez A, Ochoa-Bayona HC, Camacho-Ortiz A. Frequency of needle stick injuries among healthcare providers during large-scale SARS-CoV-2 vaccination brigades. *Front Public Health*. 2023 Feb 14;11:1084812. doi: 10.3389/fpubh.2023.1084812. PMID: 36866097; PMCID: PMC9971916.
- Bouya S, Balouchi A, Rafiemanesh H, Amirshahi M, Dastres M, Moghadam MP, et al. Global prevalence and device related causes of needle stick injuries among health care workers: a systematic review and meta-analysis. *Ann Glob Health*. 2020; 86(1):35. doi: 10.5334/aogh.2698.
- Gillen M, McNary J, Lewis J, Davis M, Boyd A, Schuller M, et al. Sharps related injuries in California healthcare facilities: pilot study results from the Sharps Injury Surveillance Registry. *Infect Control Hosp Epidemiol*. 2003 Feb;24(2):113-21. doi: 10.1086/502181.
- Zafar A, Aslam N, Nasir N, Meraj R, Mehraj V. Knowledge, attitudes and practices of health care workers regarding needle stick injuries at a tertiary care hospital in Pakistan. *J Pak Med Assoc*. 2008 Feb;58(2):57-60.
- Brasel KJ, Mol C, Kolker A, Weigelt JA. Needle sticks and surgical residents: who is most at risk? *J Surg Educ*. 2007 Nov-Dec;64(6):395-8. doi: 10.1016/j.jsurg.2007.04.003.
- Rohde KA, Dupler AE, Postma J, Sanders A. Minimizing nurses' risks for needle stick injuries in the hospital setting. *Workplace Health Saf*. (2013) 61:197-202. doi: 10.1177/216507991306100503.
- Domin MA, Smith CEJ. OSHA's final rule on occupational exposure to bloodborne pathogens. *Healthc Mater Manage*. 1992 Mar;10(2):36, 38, 40 passim. PMID: 10116766.
- Jagger J, Hunt EH, Brand-Elnaggar J, Pearson RD. Rates of needle-stick injury caused by various devices in a university hospital. *N Engl J Med*. 1988;319:284-288. doi: 10.1056/NEJM198808043190506.
- Elmiyeh B, Whitaker IS, James MJ, Chahal CAA, Galea A, Alshafi K. Needle-stick injuries in the National Health Service: a culture of silence. *J R Soc Med*. 2004 Jul;97(7):326-7. doi: 10.1177/014107680409700705.

