

Impact of Knowledge and Attitude Over Practices and Reporting of Needle Stick Injuries among Dental Healthcare Providers

Kiran Fatima Mehboob Ali BANA

ABSTRACT

OBJECTIVE: To assess unreported cases of needle stick injuries (NSIs) and to find association between awareness, attitude, practices with unreported odds of NSIs. It was hypothesized that more than 50% NSIs are unreported.

METHODOLOGY: It was cross sectional study design executed in Karachi among the dental care providers from July - September 2018. The calculated sample size was 281 which was augmented as 396. Total 312 questionnaires were completely filled. The data was analyzed on SPSS version 23. Association between categorical variable were assessed by Chi square/ Fischer exact test.

RESULTS: Total n=195(62.5%) subjects experienced NSIs during clinical practice; from which n=110 (56.4%) were unreported and n=85(43.5%) were reported cases in individual's working setup. Majority of the subjects were aware of the harms of NSIs but not reporting the cases in clinical settings. From the total sample (n=231-74%) were aware of the needle safety device but (n=139-60%) were not reporting the incidence at p-value of 0.043-graph-1. Total (n=294-92%) participants were in favor of the need of strong reporting system of NSIs. On the other hand; majority of the study participants were practicing the preventive measures against NSIs but more than 50% were not reporting the NSIs; there was significant difference found for wearing gloves for disposing contamination and bent needle before dispose but not reporting the NSIs at p-value of 0.012 and 0.003 respectively

CONCLUSION: It was inferred that more than 50% needle stick injury cases were unreported among dental personnel despite of having sufficient awareness, attitude and practices towards safe clinical practice.

KEYWORDS: Cross Infection Control, Dental Work Force, Needle Stick Injury, Unreported.

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INTRODUCTION

Needle Stick injury (NSI) is expressed as deep wound caused by the penetration of the sharp instrument or needle point which is already infected with the secretions of another person.¹ Worldwide; every year approximately two million healthcare workers were encountered with needle stick injuries (NSIs)² and were more prone to have the risk of infectious diseases like hepatitis C virus (HCV), hepatitis B virus (HBV) and human immune deficiency virus (HIV)³. Although there is an evidence of implementing cross infection control standards to mitigate occupational health hazards, new interventions can substantially prevent the occurrence of NSIs³ by minimizes the sero conversion of HIV, HBV and HCV⁴ but still an estimated 5% of HIV cases were resulted due to the NSIs².

The incidences of NSIs also demonstrated the transmission of other viral, fungal and bacterial infections such as syphilis, blastomycosis, diphtheria, malaria, herpes, mycobacteriosis and cryptococcosis^{3,5}. In addition to this, an estimated 12% incidences of NSIs can result in psychiatric disorders such as posttraumatic stress disorder (PTSD)⁶. Moreover the blood contaminated saliva augmented the probability

of blood born infections during the incidence of NSI⁷ which in turn adversely influence the professional and personal life and may restrict the career growth of the individual; as active carrier of blood born pathogens can transmit this pathogens to patients^{8,9}. The rate of HBV infection was 3-6 times more in dental work force than the general population in pre vaccination period¹⁰. Though the rate of HBV infection was dropped among dental work force in developed countries; on the other hand in developing countries (low and middle income countries), the rate of vaccination coverage and the post exposure prophylaxis (PEP) awareness is also not remarkable¹⁰.

The current evidence focuses upon the dental workforce being highly susceptible for NSIs¹¹ due to the sharp instruments used in dentistry, multiple injections and the difficulty of visibility in working zone². One of the important reason while estimating the accurate global prevalence of NSIs among dental work force is not reporting the cases of NSIs from developing countries; which is the noteworthy issue⁶. Unreported, underreported and fail to report are the similar terms used in the study which define as dental care providers were encountered with the incidence of

NSIs in their clinical working setup but did not report the incidence due to any reason. In literature the prevalence of NSIs is 38.7%¹⁰ and 76% dental care providers fail to report NSIs according to Baig M 2014¹¹ in 2007-2008 community national survey; the estimated prevalence of hepatitis C virus and hepatitis B surface antigen (HBsAg) in Pakistan was 4.8% and 2.5% respectively and approximately 13 million chronic hepatitis C and B carriers in Pakistan⁸. This figure is outdated now and would be considerably higher when considering the rate of not reporting of NSIs among dental workforce in Pakistan. Dental workforce/personnel comprised of dental assistants and practicing dentists who worked together as a team. However; there is dearth of data about the reasons of not reporting the NSIs cases, the prevalence of NSIs and the risk factors among dental workforce in Pakistan regardless of higher prevalence of NSIs⁹. The rationale of this study was to fill the gap in the present literature to find out the prevalence of unreported cases and NSIs simultaneously for future references. It was hypothesized that more than 50% NSIs are unreported among dental care provider. Therefore this study was aimed to assess unreported cases of needle stick injuries (NSIs) and to find the association between awareness, attitude, and practices with unreported odds of NSIs. It was hypothesized that more than 50% NSIs are unreported.

METHODOLOGY

It was a cross sectional study design conducted among dental healthcare from July - September 2018. The sample size was calculated by the standard formula of sample size calculation ($N = Z^2 * P (1-P) / d^2$) by keeping the prevalence of underreporting as 76%¹¹. The calculated sample size was 281 which was augmented as 396; to consider 20% wastage and to bring more significant results. The probability cluster sampling technique was used. Karachi has a federation of eighteen autonomous towns varied in population and every town has more than 7 union councils. Therefore; approximately 22 dental care providers were selected from the 18 autonomous towns of Karachi city in which public and private dental Institutes are located. The participants having less than one year of professional experience were excluded from this study. The duration of data collection was three months.

The study was executed after approved from IRB-BUMDC numbered ERC 13/2018. The written and verbal consent was obtained from all the subjects and the verbal permission was asked from the administrator of every dental Institute. The rationale of the study was explained to the participants and they were reassured about the confidentiality of data before filling the questionnaire. This study was executed by following the ethical guidelines of

Helenski declaration and Pakistan Medical research Council (PMRC). The study questionnaire was formulated to assess the awareness, attitude and practices predictors of NSIs with the non reporting of NSIs among dental care providers. The questionnaire comprised of three sections; in socio-demographic section; age, gender, place of working, year since graduation and the job category were asked. The second section was about the number of times the NSIs occurred and was that case reported. The awareness predictors included were the knowledge of universal precautions guidelines, hepatitis B transmission, HIV infection from needle stick injury, history of immunization from HBV and opinion for the need of reporting of NSIs. In third section, the practices of safe clinical procedures were asked by wearing gloves during dental procedure, recap needle after use, wearing gloves while disposing contamination, separate needle from syringe before dispose and bent needle before dispose.

The responses were closed ended (Yes/No) for all the variables. The questionnaire was pilot tested on thirty subjects to validate the questionnaire followed by corrections which was incorporated in the final version of questionnaire. There were 396 questionnaires distributed among the dental care providers from which 312 questionnaires were completely filled and therefore were eligible for data analysis. The data was computed on SPSS version 23. Kolmogorov-Smirnov and Shapiro-Wilk test was used to check the normality of data. Frequencies and percentages were calculated for categorical variables. Association between different variables was assessed through chi square/ Fisher's exact test. P value less than 0.05 was considered as statistically significant.

RESULTS

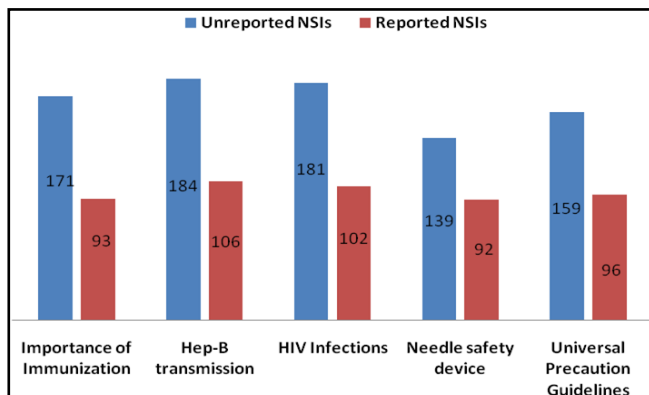
The response rate of this study was 78.78%. Total n=195(62.5%) subjects experienced NSIs in clinical practice; from which n=110(56.4%) were unreported and n=85(43.5%) were reported cases. The Table 1 provides the demographic details of reported and unreported cases of NSI among dental healthcare of Karachi. The mean age of the participants was 26 +/- 4.71 years with significance level at 0.048. Majority of dental personnel n=194(62.1%) have less than or equal to five years of experience in the field of dentistry but highest n=55 (70.5%) number of unreported cases were observed among those who were 5-10 years of experienced.

The highest numbers of participants were graduates and our result showed statistically significant higher number of unreported cases of NSIs among dental assistants when compared to graduates at p value of 0.001. The unreported NSIs were observed from n=78 (66.1%) males and n=119(61.3%) females participants. Majority of dental work force were from private sector and from which n=157(61%) NSI cases

were unreported and statistically significant difference was found between the dental work force working in government and in private sector at P-value= 0.069. From the total sample n=68 (21.7%) participants had encountered NSIs more than three times or at least once during their life of practicing dentistry and the statistically significant difference was found between frequency of NSIs and unreported cases of NSI and the calculated p value was 0.001.

Majority of the subjects were aware of the harms of NSIs but not reporting the cases in clinical settings. From the total sample (n=231-74%) were aware of the needle safety device but (n=139-60%) were not reporting the incidence at p-value of 0.043 Graph-I. Total (n=294-92%) participants were in favor of the need of strong reporting system of NSIs. On the other hand; majority of the study participants were practicing the preventive measures against NSIs but more than 50% were not reporting the NSIs; there was significant difference found for wearing gloves for disposing contamination and bent needle before dispose but not reporting the NSIs at p-value of 0.012 and 0.003 respectively Graph-II. Hence we fail to reject the research hypothesis that more than 50% needle stick injury cases were unreported among dental personnel despite of having sufficient awareness, attitude and practices towards safe clinical practice.

GRAPH I: ASSOCIATION OF AWARENESS OF NSIS AND UNREPORTED NSIs



GRAPH II: ASSOCIATION OF PRACTICES OF UNIVERSAL PRECAUTIONS AGAINST NSIs AND NON REPORTING OF NSIs

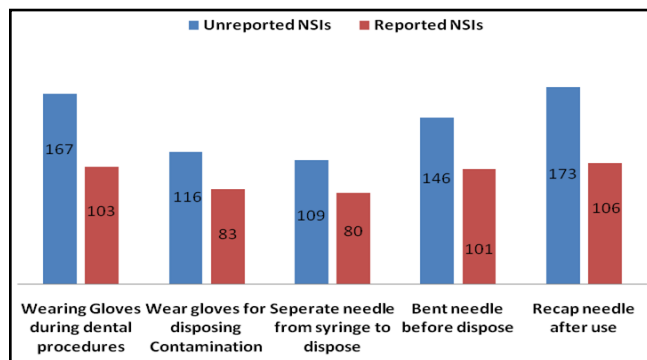


TABLE I: ASSOCIATION OF DEMOGRAPHIC CHARACTERISTICS WITH THE UNREPORTED NSIs

Demographic Characteristics	Reported NSI n=115(%)	Non reported NSI n=197(%)	Total (n = 312)	P-value
Age in years			26.11±4.71*	0.048**
Age Categories				
21-30 years	100 (37)	170 (62.9)	270 (86.5)	
31-40 years	14 (37.8)	23 (62.1)	37 (11.85)	0.839**
41-50 years	1(25)	3(75)	4(1.2)	
51-60 years	0	1(100)	1(0.32)	
Place of Working				
Govt Sector	15 (27.2)	40 (72.7)	55 (17.62)	
Private Sector	100(38.9)	157(61)	257 (82.3)	0.069**
Years since graduation				
≤ 5 years	78 (40.2)	116 (59.7)	194 (62.1)	
5-10 years	23(29.4)	55 (70.5)	78 (25)	0.245**
≥ 10 years	14 (12)	26 (65)	40 (12.8)	
Job Category				
Consultants	25(67.5)	12(32.4)	37(11.8)	
Post graduates	13(34.2)	25(65.7)	38(12)	
Graduates	49(33.7)	96(66.2)	145(46.4)	0.001**
Dental Assistants	28(30.4)	64(69.5)	92(29.4)	
Encountered NSIs				
Yes	85(43.5)	110(56.4)	195(62.5)	
No	30(25.6)	87 (74.3)	117 (37.5)	0.001***
Number of times NSI Occurred				
Once	36(52.9)	32(47)	68(21.7)	
Twice	36(57.1)	27(42.8)	63(20.1)	
Thrice	6(30)	14(70)	20(6.4)	0.000**
Many Times	28(41)	40(58.8)	68(21.7)	
Never	9(9.6)	84(90.3)	93(29.8)	

*Mean ± SD, ** Chi square, ***Fischer exact test

DISCUSSION

The unreported cases of NSIs placed a huge burden on healthcare system of Pakistan and the professional/personal life of the individual due to transmission of blood born pathogens to patients¹². The response rate was 78.8% which was lower than the study conducted by Pervaiz M in 2018 in which reported response rate was 81%³. This study reported 62.5% prevalence of NSIs among dental care providers and this figure is coherent with the study conducted in Pakistan which depicted 30%¹³ and 73%³ prevalence of NSIs. In this study; unreported NSIs was 56.4% and in literature the

highest recorded number of unreported cases of needle stick injuries was 76%.¹¹ There are multiple reasons of not reporting the cases of NSIs in literature included lack of awareness regarding where to report^{13,14}, awareness regarding the need of reporting NSIs. Among dental students the fear of blame game is one of the reason of not reporting the incidence of NSIs¹⁵ and not willingness to report the incidence of NSIs with the belief that it is worthless¹³. The reported cases of needle stick injuries were 43.5% and these results were congruent with the study of Mahmood H 2018¹⁶; which revealed that the reporting of NSI was between (15% and 76%). The study revealed that; 21.7% population had encountered needle stick injuries many a times or at least once during their life while practicing dentistry and these results were quiet lower as compare to local study¹³.

The mean age of the participants was 26 years in present study and majority of the dental workforce were between 20-30 years of age and these results were similar with the researches of Ali I et al¹⁷ and Gichki AS 2015¹⁸ from Pakistan. There were 37.8% males and 62.1% females' making the ratio of 1:2 dental work force in this study and these results were opposite with the study of Jan et al which revealed 86% were males dental care provider from a survey conducted in Karachi and Hyderabad¹³. The variation in results were due to the single study center in Karachi; where majority of female dental care providers are practicing dentistry as ample opportunities are available in Karachi due to mega city.

The highest numbers of dental personnel were graduates but majority of unreported cases of NSIs were found among dental assistants (69.5%) and statistically significant result was revealed and these results were in accordance with the study of Mehboob B 2012¹⁹ which reported that 92% of dental assistants were fail to report the incidences of needle stick injuries, these results can be due to the lack of understanding of the reporting system.

Experience makes man perfect. Highest (70.5%) numbers of unreported cases were from the dental personnel; despite of having five to ten years of clinical experience in this study. These results were contradictory with another study in which experienced and qualified dental workforce encountered lower rate of NSIs¹¹.

Despite of the cluster sampling technique we are unable to generalize the results to entire dental fraternity of Karachi due to uneven distribution of job category, place of working, study design and limited sample size. The limitations of the study were the recall bias and the parameters of policy and training aspects of prevention of NSIs which would be incorporated in future study²⁰. Our study has highlighted the need for a centralized reporting cell at every centre for occupational health injuries such as

NSIs which is lacking in our hospitals and ensures the proper implementation of policy. It is recommended that awareness sessions regarding the importance of the reporting of the NSIs should be incorporated in continuing medical education and in training content of undergraduates and post graduates. It is suggested that the supervisors should train the mechanism of reporting for NSIs to their trainees in initial years of training. To reduce the occurrences of the incidences of NSIs; stringent policy should be formulated and implemented.

CONCLUSION

It was inferred that more than 50% needle stick injury cases were unreported among dental personnel despite of having sufficient awareness, attitude and practices towards safe clinical practice.

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AUTHOR CONTRIBUTIONS

Bana KFMA: Entire Manuscript writing from conception to finish.

REFERENCES

1. AlDakhil L, Yenugadhathi N, Al-Seraihi O, Al-Zoughool M. Prevalence and associated factors for needlestick and sharp injuries (NSIs) among dental assistants in Jeddah, Saudi Arabia. *Environ Health Prev Med.* 2019; 24(1): 60. doi: 10.1186/s12199-019-0815-7.
2. Al-khudhair H, Al-Joudi F, Al-Rafie K, Abduljawad H, Ansari SH. Knowledge and Experience of Needle Stick Injuries among Male and Female Dental Students of a Dental School in Riyadh, KSA. *Donnish J Dent Oral Hyg.* 2018; 4(2): 040-045.
3. Pervaiz M, Gilbert R, Ali N. The prevalence and underreporting of needle stick injuries among dental healthcare workers in Pakistan: A systematic review. *Int J Dent.* 2018; 2018: 9609038. doi:10.1155/2018/9609038.
4. Marnejon T, Gemmel D, Mulhern K. Patterns of needle stick and sharps injuries among training residents. *JAMA Intern Med.* 2016; 176(2): 251-2. doi:10.1001/jamainternmed.2015.6828.
5. Singh S, Singh B, Singh S, Khurana A, Verma R. Study of knowledge, attitude and practice among nurses regarding needle stick and sharp item injuries. *Int J Community Med Public Health.* 2019; 6(5): 2064-2068. doi:10.18203/2394-6040.ijcmph20191819.
6. Yazie TD, Chufa KA, Tebeje MG. Prevalence of

- needle stick injury among healthcare workers in Ethiopia: a systematic review and meta-analysis. *Environ Health Prev Med.* 2019; 24(1): 52. doi:10.1186/s12199-019-0807-7.
7. Tripathi S, Singh RD, Singha R, Khanna R, Arya D, Parlani S. Sharps Safety and Management among Dental Practitioners. *J Dent Probl Solut.* 2017; 4(2): 015-8. doi: 10.17352/2394-8418.000041.
 8. Qureshi H, Bile KM, Jooma R, Alam SE, Afridi HU. Prevalence of hepatitis B and C viral infections in Pakistan: findings of a national survey appealing for effective prevention and control measures. *Eastern Mediter Health J.* 2010; 16(Supp): 15-23.
 9. Shahzad M, Hassan SG, Memon MR, Bashir U, Shams S. Needle stick injuries among dental students, house officers and parodontal staff working at Liaquat Medical University Hospital, Hyderabad. *Pak Oral Dent J.* 2013; 33(1): 23-25.
 10. Gheshlagh RG, Aslani M, Shabani F, Dalvand S, Parizad N. Prevalence of needlestick and sharps injuries in the healthcare workers of Iranian hospitals: an updated meta-analysis. *Environ Health Prev Med.* 2018; 23: 44. doi: 10.1186/s12199-018-0734-z.
 11. Baig M, Baloch S, Muslim M. Estimation of risk of needle stick injury and the level of awareness of prophylaxis among the students, house officers and supporting staff of dentistry. *New York Sci J.* 2014; 7(1): 120-3.
 12. Punjabi SK, Banglani MA, Priya, Mangi N. Needle stick injuries, concept and handling among junior dentist. *Professional Med J.* 2017; 24(01): 177-81. doi:10.17957/TPMJ/ 17.3567.
 13. Jan S, Akhund T, Akhtar MJ, Shaikh JM. Needle Stick Injuries Among Dental Health Care Providers: A Survey Done At Hyderabad And Karachi. *Pak Oral Dent J.* 2014; 34(2): 339-43.
 14. Moodley R, Naidoo S, van Wyk J. The prevalence of occupational health-related problems in dentistry: A review of the literature. *J Occup Health.* 2018; 60(2): 111-125. doi: 10.1539/joh.17-0188-RA.
 15. Pavithran VK, Murali R, Krishna M, Shamala A, Yalamalli M, Kumar AV. Knowledge, attitude, and practice of needle stick and sharps injuries among dental professionals of Bangalore, India. *J Int Soc Prev Community Dent.* 2015; 5(5): 406-12. doi: 10.4103/2231-0762.165932.
 16. Mahmood H, Awan J, Chaudhry A. Frequency of needle stick injury among dental care personnel in Islamabad Dental Hospital. *Pak Oral Dent J.* 2018; 38(2): 234-6.
 17. Ali I, Hameed F, Maqbool A, Kazim M, Aslam MA, Siddiqui S, et al. Incidence of Needle Stick Injury among The Dental Students and Dental House Officers of Bhitai Medical and Dental College, Mirpur Khas. *Ann Jinnah Sindh Med Univ.* 2019; 5 (1): 26-30.
 18. Gichki AS, Islam A, Murad W. Knowledge and Awareness about Needle Stick Injuries among Dental Students of Bolan Medical College, Quetta. *Pak Oral Dent J.* 2015; 35(4): 562-6.
 19. Mehboob B, Khan M, Ud-Din F, Khan AA, Qiam F. Professional hazards among dentists of the two public sector teaching hospitals of Khyber Pakhtunkhwa province of Pakistan. *Pak Oral Dent J.* 2012; 32(3): 376-80.
 20. Alwabr G. Assessment of knowledge about standard precautions and nosocomial infection among nurses working in hospitals of Sana'a city, Yemen. *Int J Caring Sci.* 2017; 10(1): 169-175.



AUTHOR AFFILIATION:

Dr. Kiran Fatima Mehboob Ali BANA

Senior Lecturer

Department of Dental Education

Bahria University Medical and Dental College

Karachi, Sindh-Pakistan.

Email: kiranbana291@gmail.com