



INTERNATIONAL JOURNAL OF ADVANCE RESEARCH AND DEVELOPMENT

(Volume2, Issue7)

Available online at www.ijarnd.com

To Study Epidemiology of Needle Stick, Injuries and Blood Born Pathogen Exposures among Health Care Workers in Public Hospital at Indore

Chandraprakash Shukla

Jodhpur School of Public Health

cpshuklapt@gmail.com

ABSTRACT

Occupational hazards are very common in health care setting. They are common in any area of work, including hospitals. Clients in all health care setting are at risk for acquiring infection because of exposure to number and types of diseases. Sharp used in hospitals include syringe, needle, scalpels, broken glass and other objects contaminated with blood form a source of infection. Due to NSIs, the risk of infections ranges from as low as 0.2–0.5% for HIV to as high as 3–10% for HCV and 40% for HBV. The purpose of this study is to examine awareness about the needle stick and splash related injuries among the health care workers in public health hospitals from June 2016 to December 2016 and classify the frequencies of those cases by job categories and location of the injury. We will also study the effect of certain variables such wearing protective equipment, job categories, and location of occurrence, type of Injury. We will also study the prevalence and associated factors of Needle Stick Injuries (NSI) among the health care workers of our hospital also to assess the level of awareness of the health care workers regarding NSI. Data will obtain from health care workers in public health hospitals in Indore, India from January 2017 to June 2017. A cross-sectional descriptive Study is plan and data was collected by using a pretested close ended structured questionnaire among the respondents of the health care workers of a tertiary care public hospital. We have used mean, Standard deviation (SD), p value and Z test and other statistical tools. We have taken z test as a test of significance with fixing the p value of 0.05 as significant.

Keywords: BBE, NSI, Occupational Health.

INTRODUCTION

Occupational hazards are very common in health care setting. They are common in any area of work, including hospitals. Clients in all health care setting are at risk for acquiring infection because of exposure to number and types of diseases. Health care workers can protect themselves from contact with infectious material or exposure to communicable diseases by having knowledge of the infectious process and appropriate barrier protection.

One of the most potentially hazardous procedures that every health care personnel face, is using and disposing of needles and sharps. Needle stick injuries present with greater risk for developing an infection with hepatitis B virus, hepatitis C virus, and HIV.

Sharp used in hospitals include syringe, needle, scalpels, broken glass and other objects contaminated with blood form a source of infection. The first reported case of needle stick transmitted HIV infection lead to increasing awareness and concern about the risk to health care workers posed by sharp injuries.

Now a day it is clear that percutaneous injuries to health care workers from needle stick and other sharps carry significant risks of transmitting blood borne infections such as HBV, HCV, and HIV.

Needle stick injuries may be defined as the parenteral introduction of blood or other potentially infectious material by a hollow bore needle or sharp instrument, including but not limited to needles, lancets, scalpels and contaminated broken glass

WHO reports in the World Health Report 2002, that of the 35 million health-care workers, 2 million experience percutaneous exposure to infectious diseases each year. It further notes that 37.6% of Hepatitis B, 39% of Hepatitis C and 4.4% of HIV/AIDS in Health-Care Workers around the world are due to needle stick injuries. It has been estimated by the CDC that every year more than three million HCWs are exposed to blood and body fluids via sharp and mucocutaneous injuries in the United States alone with an annual estimated 6 million NSIs

These blood borne diseases have serious consequences, including long term illness, disability, and death. In addition care workers by sharp injury including those that cause tuberculosis, diphtheria, herpes, and malaria.

Due to NSIs, the risk of infections ranges from as low as 0.2–0.5% for HIV to as high as 3–10% for HCV and 40% for HBV.

The number of cases of needle stick and sharps-related injuries among healthcare workers is difficult to estimate due to underreporting. Multiple types of research studies have been done in this area but the scale of the problem is substantial and requires further attention. This study focuses on the cases of needle stick injuries and blood born pathogen exposure among health care workers at a biggest public hospital in Indore. The purpose of this study is to examine awareness about the needle stick and splash related injuries among the health care workers in public health hospitals from June 2016 to December 2016 and classify the frequencies of those cases by job categories and location of the injury.

We will also study the effect of certain variables such wearing protective equipment, job categories, and location of occurrence, type of Injury.

We will also study the prevalence and associated factors of Needle Stick Injuries (NSI) among the health care workers of our hospital also to assess the level of awareness of the health care workers regarding NSI.

METHODS

Data will obtain from health care workers in public health hospitals in Indore, India from January 2017 to June 2017. A cross-sectional descriptive Study is plan and data was collected by using a pretested close ended structured questionnaire among the respondents of the health care workers of a tertiary care public hospital. We have used mean, Standard deviation (SD), p value and Z test and other statistical tools. We have taken z test as a test of significance with fixing the p value of 0.05 as significant.

Objectives of the Study

1. To assess the level of awareness among the health care workers regarding NSI & BBE.
2. Examine the rates of needle stick injuries among health care workers of public hospitals Indore from January 2017 to June 2017.
3. Describe the distribution of needle stick injuries by job categories and location of occurrence in the health care setting
4. Assess predictive factors, such as year of exposure, previous exposure, wearing protective equipment, job categories, and location, for the risk of certain types of exposures (sharp, splash or both).

Research question

A cross sectional study to assess knowledge, exposure rates and preventive practice regarding needle stick injuries among health care staff working in Public health hospitals in Indore.

Research methodology

A cross-sectional descriptive Study is planned and data collected via using pretested close ended structured questionnaire among the respondents of the health care workers of a tertiary care public hospital.

Sample

Primary data collected from the biggest Public health hospital in Indore M.P. via pre tested close ended questionnaire. The data represent whole reported or non reported cases of blood and body fluids exposures among health care workers at the public Hospital Indore. The questionnaire has 3 parts, part one include demographic

information and informed concern, and part two- has job category, type of exposure and location of injury of NSI & BBE, Part three- has 6 questions regarding awareness and practice about NSI and BBE.

Sampling technique: Purposive sampling technique

Sample size: 400

Instrument intended to be used for data collection: Close ended questionnaire

Study design

A cross-sectional descriptive Study is plan and data was collected by using a pretested close ended structured questionnaire among the respondents of the health care workers of a tertiary care public hospital. Primary data collected via pre tested close ended questionnaire. The Data also include any type of needle stick related injury and BBE.

Data analysis

Collected data analyzed by using different statistical tools. We have used mean, Standard deviation (SD), p value and Z test and other statistical tools. We have taken z test as a test of significance with fixing the p value of 0.05 as significant. Collected data is presented in the form of figures and tables.

Variables

We will examine the effect of several variables such as Job category, Location of exposure, Number of exposure Type of exposure such as exposure type, Use of PPE.

Ethical consideration

Written permission will be obtained from hospital authority. Voluntary concern took from the respondent.

Limitation of study

The study is limited to

- 1) Health care Staffs who are willing to participate
- 2) Health care Staffs who are present at the time of data collection.

Our sample will represent the total number of cases for exposure (including repeated exposures) and not the number of exposed health care workers.

RESULT WITH TABLE AND FIGURE

A total of 400 HCW includes in a study out of them Doctors 27(7%), Nurses 200(50%), paramedic 113(28%), HK staff 59(15%) (Fig.1). Collected data also classified on the basis of Age of responded and on the basis of gender (tab.1&2). There were 69 responded from age 20to 30, 208 responded from age 30 to 40, 61 responded from age 40 to 50 and 61 responded above age 50. Classification also is done on the basis of gender. On collected data 160 was male and 240 was female.

NSI and BBE among the doctor in collected data show total 27 doctors were responded and maximum responded age was above 50 years (tab3). They were affected by NSI & other types of exposure like 13 were faced other category of exposure in last 6 months and only 6 faced splash and only 8 faced NSI in last 6 months.

Out of all response finger and hand contribute major location affected by NSI & BBE. Out of total collected data location of the finger is in 185 respondent and 125 is hand (Fig3). Only 43 responded location was leg and another area respectively. Type of exposure among the health care worker from the collected data was 273 was NSI, 93 was a splash, and 34 was another type of exposure (Tab.4).

Out of all the responded 70% of the HCWs received medical attention within 2 hours of the injury or incident. Only 17% did not receive the medical attention and 11% is not having any answer for the question. That is a significant improvement in NSI & BBE (Fig.4).

Out of all the responses collected 60% responded aware about the NSI and BBE. 31% is not aware of the NSI & BBE. 9% not given any response (Fig.5).

64% of HCWs is aware of the procedure follow after exposure. Means measure taken after the accident. 21% respondent is not aware of the procedure to follow after exposure and 155 not given any response (Fig. 6).

69% responded from HCW's are aware of the Personal protective equipment (PPE) only 165 is not aware of the PPE (Fig.7).

On reporting part related with incident 50% of HCWs reported the injury after the incident, 31% of responding not reported the incident and 19% not given any response to the question (Fig.8).

50% of healthcare worker is aware of the policy and procedure followed for reporting the injury while 31% is not aware of the procedure to follow for reporting after injury (Fig.9).

On a number of NSI & BBE in last 6 months, 300 respondents reported in between 2 to 5 injuries. While 51 responded is less than 2 (Fig10).

Mean of the sample collected was 11.2375, Standard Deviation (SD) of collected sample is 2.84, and value of Z-Test is 0.42, the P value is: 0.5778.

Hence calculated p value is lower than table value so we will accept research question that HCWs is aware of the NSI its importance and measure to prevent and report NSI & BBE.

DISCUSSION

Our collected data shows the rate of Reported and non reported cases of NSI & BBE rate of public health hospitals in Indore in last 6 months from January 2017 to June 2017. Classification of data done on the basis of Age, type of work, the age of responding, the gender of responded, type of exposure and location of the injury occur. The awareness about the NSI & BBE is significantly increased in last few years because of the implementation of quality control practices and Infection control measure in the hospitals, collected data also reveal the same that 60% of HCWs are aware of the injuries related with NSI & BBE. Also, they received medical attention within 2 hours of injury and data shows it is 72%. This is a significant factor in order to know the improvement in HCWs skills and knowledge about the safe medical practices and use of safety devices. 69% responses from HCWs are using safety devices in the form PPE but on another hand, more focus is required on reporting part of NSI and BBE because in collected data as well show only 50% responded reported injuries and rest either taking treatment by themselves or not reporting injuries because of fear or any other factor. Only 50% of responded aware about the procedure of incident reporting. So focus and intervention required in these two categories. Finger and hand is most common injury area so more use of safety technique and proper training required for prevention of injuries.

Nurses are commonly affected by the NSI because she is more involved in patient care work. So the rate of incidence is higher in nurses. Areas like OT, ICUs are a major contributor in NSI & BBE. So more emphasis and policy required for the improvement of practices and prevention of injuries.

TABLES & FIGURES

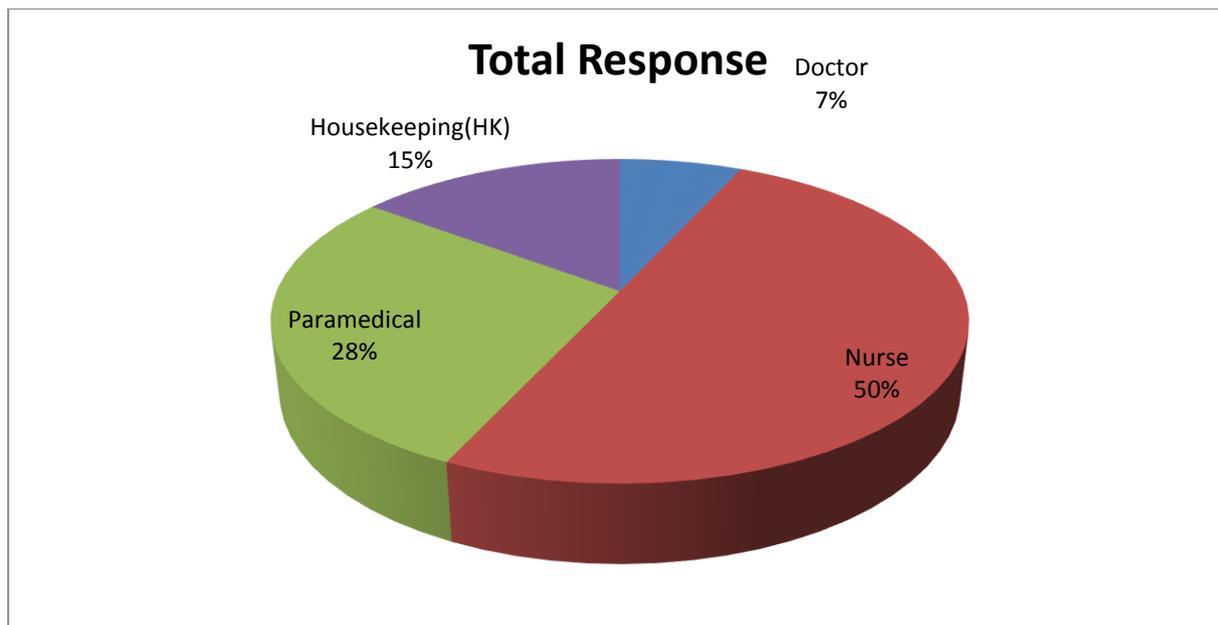


Fig 1: Percentage of total Response collected

TABLE1: AGE OF RESPONDED

Age of Responeded				
Age	20 to 30	30 to 40	40 to 50	50 & Above
Total no of participants	69	208	61	61
Doctor	7	0	0	20
Nurse	43	139	8	10
Paramedical	0	69	44	0
Housekeeping(HK)	19	0	9	31

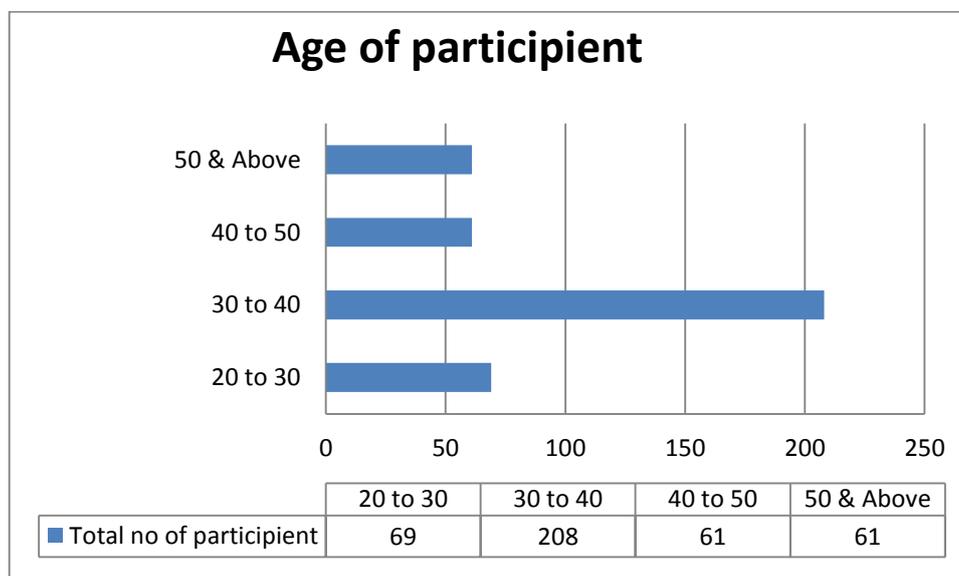


FIG 2: AGE OF RESPONDED

Table2: Gender of Responded

Classification on the basis of gender		
Category	Male	Female
	160	240
Doctor	19	8
Nurse	67	134
Paramedical	33	80
Housekeeping(HK)	41	18

TABLE3: EXPOSURE WITH CATEGORY OF WORKER

Type of exposure with Category of worker			
Category	Needle Stick	Splash	Other
Total Response	273	93	34
Doctor	8	6	13
Nurse	182	8	10
Paramedical	59	54	0
Housekeeping(HK)	23	25	11

Table 4: Distribution of needle stick injuries by job categories and location of occurrence

Distribution of needle stick injuries by job categories and location of occurrence				
Location	Finger	Hand	Leg (lower)	other
TOTAL	185	129	43	43
Doctor	0	27	0	0
Nurse	148	53	0	0
Paramedical	21	34	15	29
Housekeeping(HK)	16	15	28	14

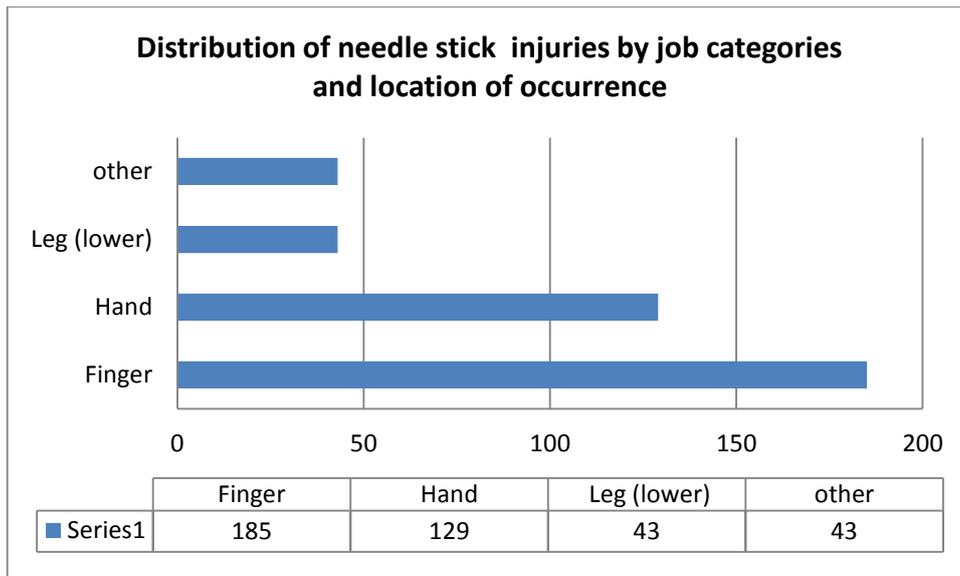


Fig 3: Distribution of needle stick injuries by job categories and location of occurrence

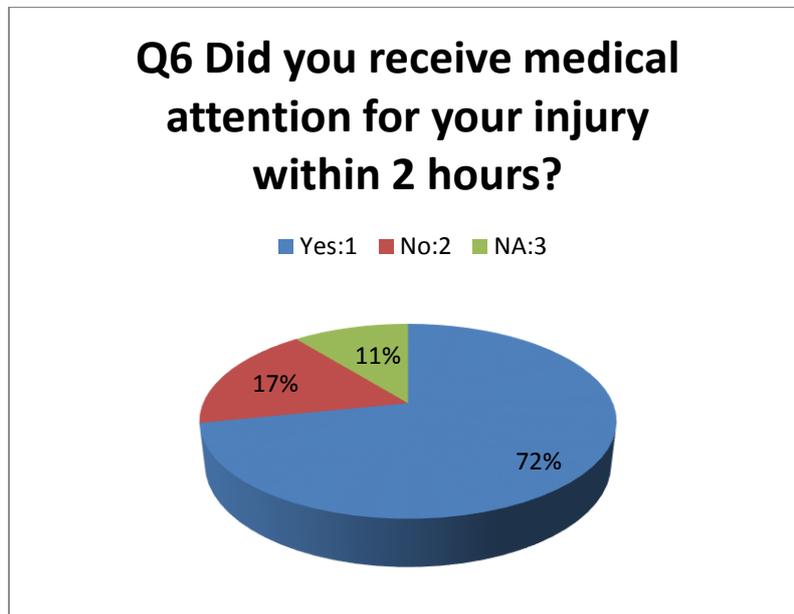


Fig 4: Receive medical attention for your injury within 2 hours?

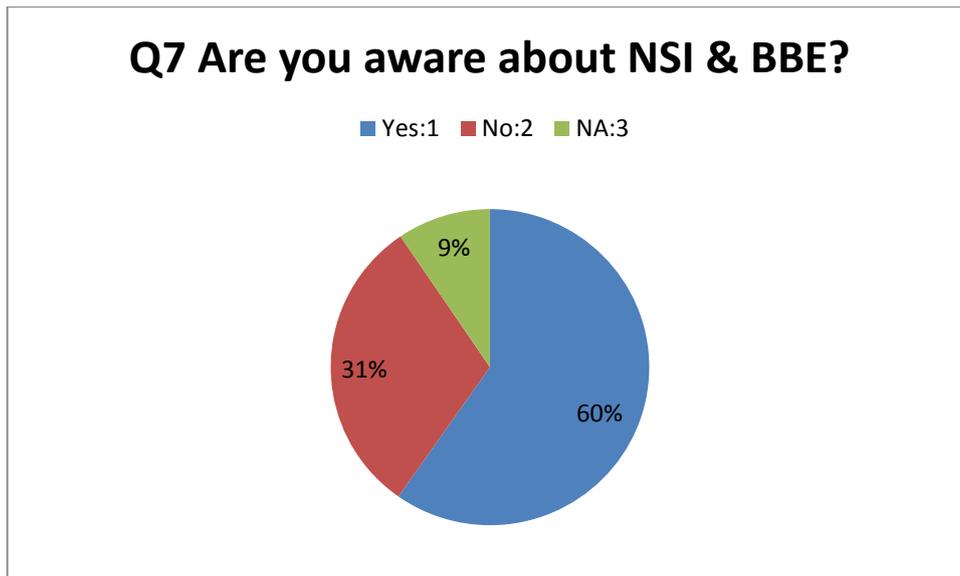


Fig 5: Aware about NSI & BBE?

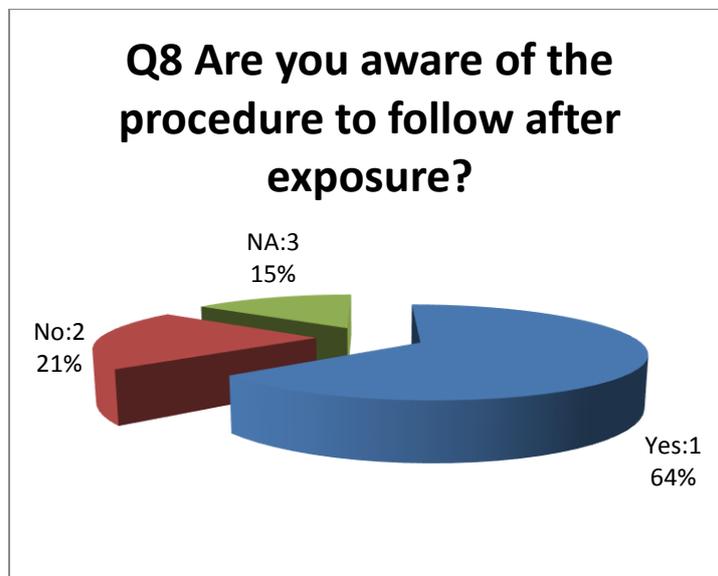


Fig 6: Aware of the procedure to follow after exposure?

Q9 Are you aware of the wearing Personal protective equipment (PPE)?

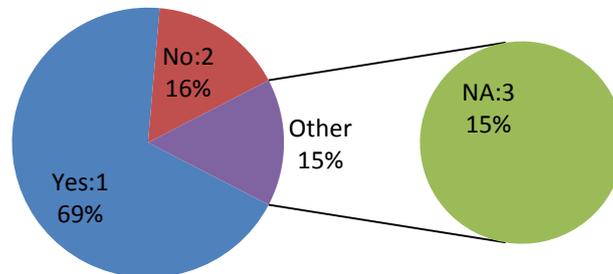


Fig 7: Aware of the wearing Personal protective equipment (PPE)?

Q11 Did you report the incident/injury?

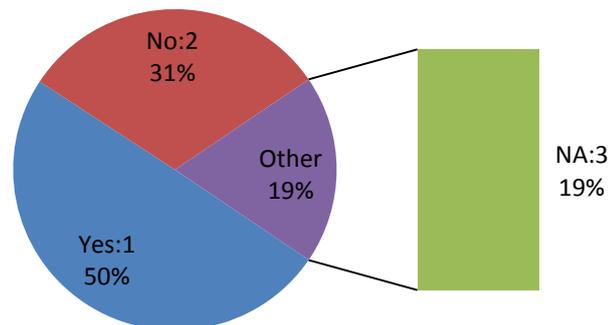


Fig 8: Report the incident/injury?

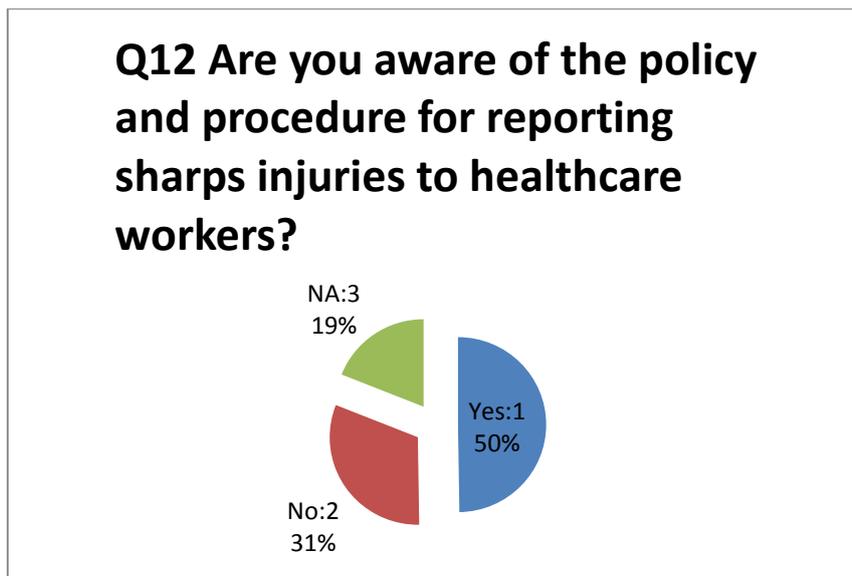


Fig 9: Aware of the policy and procedure for reporting sharps injuries to healthcare workers?

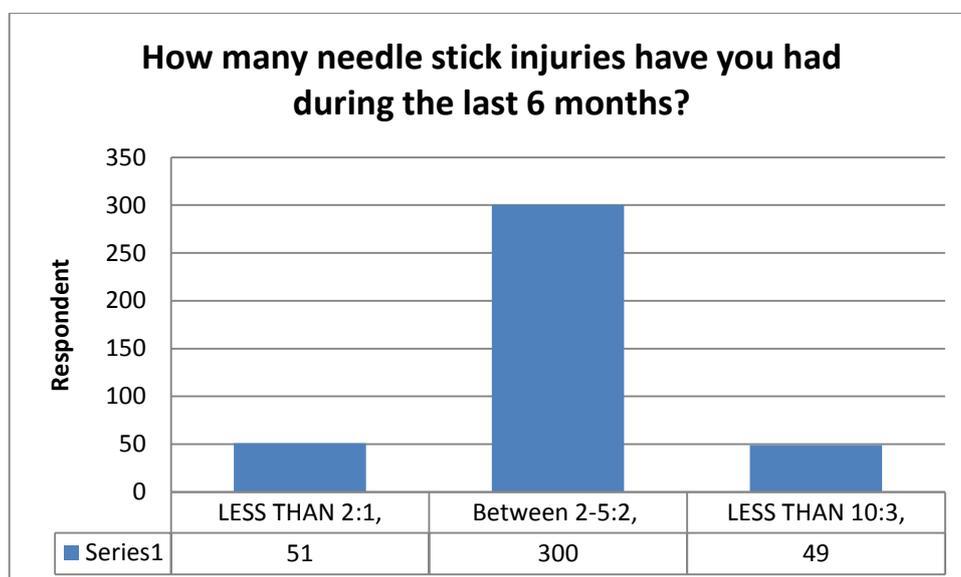


Fig 10: Number of needle stick injuries have you had during the last 6 months

REFERENCES

1. Needle stick Injuries among Health Care Workers. The magnitude of the Needle Stick Injury Problem; Epidemiology and Economic Burden. <http://ehs.umn.edu/current/6120/needle/magnitude.html#Anchor-47857> (accessed 20 January 2015)
2. Using the Haddon matrix: introducing the third dimension. <http://injuryprevention.bmj.com/content/4/4/302.full> (accessed 20 January 2015).
3. Healthcare Wide Hazards. Needle stick/Sharps Injuries. <https://www.osha.gov/SLTC/etools/hospital/hazards/sharps/sharps.html> (accessed 20 January 2015)
4. Safe in common. Needle stick Statistics. <http://www.safeincommon.org/needlestick-statistics> (accessed 20 January 2015)
5. Makary MA, Al-Attar A, Holzmüller CG, et al. (June 2007). "Needle stick injuries among surgeons in training". N. Engl. J. Med. 356 (26). (Accessed 20 January 2015).
6. The National Institute for Occupational Safety and Health. STOP STICKS CAMPAIGN. www.cdc.gov/niosh/stopsticks (accessed 20 January 2015)

7. Clinical microbiology review. Risk and Management of Blood-Borne Infections in Health Care Workers. <http://cmr.asm.org/content/13/3/385.full> (accessed 20 January 2015).
8. Butsashvili M, Kamkamidze G, Kajaia M, Morse DL, Triner W, Dehovitz J, et al. Occupational exposure to body fluids among health care workers in Georgia. *Occupational medicine (Oxford, England)*. 2012;62(8):620-6.
9. Mathews R, Leiss JK, Lyden JT, Sousa S, Ratcliffe JM, Jagger J. Provision and use of personal protective equipment and safety devices in the National Study to Prevent Blood Exposure in Paramedics. *American journal of infection control*. 2008;36(10):743-9.
10. Gershon RR, Sherman M, Mitchell C, Vlahov D, Erwin MJ, Lears MK, et al. Prevalence and risk factors for bloodborne exposure and infection in correctional healthcare workers. *Infection control and hospital epidemiology : the official journal of the Society of Hospital Epidemiologists of America*. 2007;28(1):24-30.
11. Trape-Cardoso M, Schenck P. Reducing percutaneous injuries at an academic health center: a 5-year review. *American journal of infection control*. 2004;32(5):301-5.
12. Do AN, Ciesielski CA, Metler RP, Hammett TA, Li J, Fleming PL. Occupationally acquired human immunodeficiency virus (HIV) infection: national case surveillance data during 20 years of the HIV epidemic in the United States. *Infection control and hospital epidemiology : the official journal of the Society of Hospital Epidemiologists of America*. 2003;24(2):86-96.
13. Clarke SP, Sloane DM, Aiken LH. Effects of hospital staffing and organizational climate on needlestick injuries to nurses. *American journal of public health*. 2002;92(7):1115-9.
14. Gershon RR, Flanagan PA, Karkashian C, Grimes M, Wilburn S, Frerotte J, et al. Health care workers' experience with postexposure management of bloodborne pathogen exposures: a pilot study. *American journal of infection control*. 2000;28(6):421-8.
15. Quinn MM, Markkanen PK, Galligan CJ, Kriebel D, Chalupka SM, Kim H, et al. Sharps injuries and other blood and body fluid exposures among home health care nurses and aides. *American journal of public health*. 2009;99 Suppl 3:S710-7.
16. Rogowska-Szadkowska D, Stanislawowicz M, Chlabicz S. Risk of needle stick injuries in health care workers: bad habits (recapping needles) last long. *Przegląd epidemiologiczny*. 2010;64(2):293-5.
17. Elisabetta Rapiti, Annette Pruss-Ustun, Yuvan Hutin – WHO protection of the human environment – Geneva 2005.
18. Samir A. Singru, Amitav Banerjee. Occupational exposure to blood and body fluids among health care workers. *Indian Journal of community medicine*, vol. 33, No. 1, Jan 2008.
19. Alamgir H, Cvitkovich Y, Astrakiahakio G, Yu S, Yassi A, *American journal of infection control*, vol. 36, Issue I, pp. 12-21 (2008).
20. Varma M, Mehta G. *Journal of the Indian medical association*, 2000, vol. 95, pp. 436-438