

Assessment of Knowledge, Attitude, and Practice of Prevention Modality among Health Care Workers Regarding Hazards of Needle Stick and Sharp Object Injuries in Armed Force Referral and Teaching Hospital, Addis Ababa, Ethiopia

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Abstract

Introduction: Health care workers are frequently exposed to occupational hazards through percutaneous injury such as needle stick or cut with sharps, contact with the mucus membrane of eyes or mouth of an infected person, contact with non-intact skin exposed with blood or other potentially infectious body fluid. One of the potential hazards for healthcare workers (HCWS) is needle stick and sharp object injuries (NSSIs).

Objective: This study aimed to assess the knowledge, attitude and practices among health care workers on needle stick and sharp object injuries.

Methods: Hospital based cross-sectional descriptive survey was conducted among HCWs in army force referral and teaching hospital AA, Ethiopia. Pre tested structured questionnaire were administered to health care workers on other hospital in the same professional. Data was entered in to a computer using EPI-3 Info version 5.4 and Data was analyzed using SPSS version 16.0.

Results: The response rate of the survey was 99.3% and the results showed maximum participant were in the age group of 20-53 years. 97.2% of health care workers were aware of the fact that hepatitis B, hepatitis C, and HIV could transmitted by needle-stick injuries. 82 (57.3%) had participated in any training related to infection prevention program. 40 (27.9%) and 38 (26.6%) were exposed blood /body fluids and had needle stick or sharp injuries in the last one year's respectively. 104 (72.8%) were of the impression that needle should be recapped after used. 24 (16.8%) had been vaccinated against hepatitis B. The prevalence of NSSIs was highest among nurses 21 (55.5%) and injuries had occurred while sudden movement of the patient was the most common source of NSSIs.

Conclusion: The survey revealed that over all knowledge of health care workers about the risk associated with needle-stick injuries and use of preventive measures was adequate, however, the domains of attitude and practices need to be improved.

Keywords: Needle stick • Sharp object injuries

Introduction

Health care workers are frequently exposed to occupational hazards through percutaneous injury such as needle stick or cut with sharps, contact with the mucus membrane of eyes or mouth of an infected person, contact with non-intact skin exposed with blood or other potentially infectious body fluid [1].

One of the potential hazards for healthcare workers (HCWS) is needle stick and sharp object injuries (NSSIs). NSIs are associated with a number of different health hazards for HCWs; the most important of which is the risk of acquisition of potentially fatal diseases such as hepatitis B virus (HBV), hepatitis C virus (HCV), and HIV/AIDS.

The National Institute for Occupational Health and Safety (NIOSH) has estimated that 600,000 to 800,000 needle stick and other percutaneous injuries occur annually in hospitals in the United States [2].

The risk associated with transmission after percutaneous exposure to infected blood varies according to the specific blood borne pathogen. For HBV, this risk can be up to 30% depending on the presence of various serological markers in the blood of the patient. For HCV, the transmission rate is around 3-4%. At 0.3%, this risk of transmission is lowest for HIV [3].

HBV and HCV infections are among the biggest health challenges facing the developing world today. An estimated one-third of the global population has been infected with HBV; approximately 350 million people are lifelong carriers. For HCV, the World Health Organization estimates that 170 million individuals worldwide are infected [4]. According to UNAIDS; around 39 million people worldwide are living with HIV as of December, 2006 [5]. A person who provides or receives health care service whether in hospital, clinic, or any other health care setting are the risk of acquiring and transmitting potential life treating infectious through accidental exposure to blood and body fluids or contaminated objects [6].

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Health care workers are considered necessary to study because they are essential in prevention and management of diseases. This study applies the concepts to HCWs as a group likely to be at risk due to the nature of their occupation, since they may expose to infection while on routine duty through either accident, negligence, inadequate protection or other unforeseen circumstances. Infection prevention is critically important to effective provision and management of health care services.

In Ethiopia and specifically, in army force referral and teaching hospital published studies showing the clear picture concerning about HCWs regarding hazards of needle stick and sharp object injuries (NSSI) in the work place was non-existent. This study was undertaken to assess the knowledge, attitude of health care workers regarding hazards and practice of prevention modality for needle stick and sharp object injuries in army force referral and teaching hospital.

Research Methodology

A cross-sectional survey employing quantitative methods was conducted from December 2013 to May 2014. One hundred forty-three health care workers participated in the study. The data were entered and cleaned using Epi Info version 3.5.4 and analyzed using SPSS for windows version 16. Descriptive statistics and chi-square test was employed to assess association among variables. P-value less than 0.05 were considered statistically significant.

Socio demographic X-CS

A Total of 146 Health care workers participated giving a response rate of (97.9%). Among the respondents 85 (59.4%) were male and 58 (40.6%) were female. The age distribution of the respondents ranges from 20-53 years with the mean age of (+ SD) of 34.4 + 7.09 and median age was 35 years, 24.5% of the participants were age between 35-39 yrs (Figure 1).

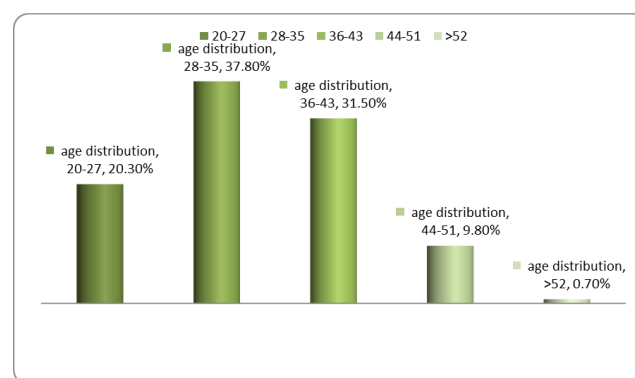


Figure 1. Age distribution of health care workers in Army Force Referral and Teaching Hospital, Addis Ababa, Ethiopia, 2014.

The majority of the respondents were nurses 75 (52.4%) followed by health officers 20 (14%). Among the respondents 139 (97.2%) of health care workers from each professional category were aware on the possibility of acquisition of HIV/AIDS, Hepatitis B virus, and Hepatitis C virus from exposure of dirty needle/ sharp injuries could transmit disease causing agents. The most common disease transmitted by dirty needle/ sharp injuries known by the respondents were HIV/AIDS, HBV and HCV 77 (53.8%) followed by HIV/AIDS and HBV 34 (23.8%), HBV 17 (11.9%), HIV/AIDS 9 (6.3%), HCV 4 (2.8%) and 2 (1.4%) were others. And 98 (68.5%) of the participants knew that HBV can persist for up to seven days on the surface of medical devices.

More than half of the respondents 82 (57.3%) had participated in trainings related to infection prevention program. Of these the majority of respondents were 48 (58.2%) received training within one to three years, 20 (24.4%) were attained within >3 years and 14 (17.1%) were received within one year (Table 1).

Table 1. Knowledge and attitude of health care workers on selected variables, Army Forces Referral and Teaching Hospital, Addis Ababa, Ethiopia, 2014.

Total (n=143)	Yes	%
Knowledge variables		
Aware that dirty needle /syringes can transmit disease causing agents	139	97.2
Ever attained training on IP/ Time of attained	82	57.3
One to three years	48	58.5
More than three years	20	24.4
Within one years	14	17.1
Which of the following diseases can be transmitted through dirty needles /sharps injuries?		
HIV/AIDs, HBV, and HCV	77	53.8
HIV/AIDs and HBV	34	23.8
HBV	17	11.9
HIV/AIDs	9	6.3
HCV	4	2.8
Others	2	1.4

Hepatitis B virus can persist for up to seven days on surface of sharp medical devices

Agree	51	35.7
Strongly agree	47	32.9

Attitude variables: The main reason for needle stick/sharp object injury (n=143)**		
Negligence	27	18.9
Due to work load	26	18.2
Lack of experience	4	2.8
Due to knowledge deficit	2	1.4
Have you reported the incident of NSI?	20	50

From the participants 81 (56.6%) gave multiple responses for the reason needle stick /sharp object injuries. The other respondents 62 (43.4%) gave single response, of these Negligence 27 (18.9%) was the most common reason followed by due to work load 26 (18.2%), lack of experience 4 (2.8%), and knowledge deficit 2 (1.4%).

The findings from this study showed that 114 (79.7%) of health care workers who participated in this survey heard about post exposure prophylactics and from those who heard about PEP majority of the respondents were mentioned that the place where PEP service was given in ART clinic 56 (49.1%), followed by any ward of the hospital 8 (7%), Infection prevention office 7 (6.1%), ED 6 (5.3%), pharmacy 1 (0.9%) and 36 (31.6%) of them had no clue where PEP service was.

Among the participants 40 (27.9%) were exposed to blood /body fluids in the last one years. Nurses were the most frequent exposures 24 (60%) followed by anesthetist 5 (12.5%). Among those who were exposed 19 (48.7%) received PEP. Twenty (50.0%) of health care workers were reported they had splash to their consultant or infection control office. 20 (50.0%) never reported the incident to hospital authority to get post-exposure treatment. The most common reason cited by health care workers for not reporting splash to blood fluids to appropriate authority or concerned body were 5 (22.7%) taking some prophylactics measures on their own, 4 (18.2%) fear of getting trouble, 1 (4.5%) were direct ART clinic without reporting, and the majority of those who didn't report 12 (54.5%) mentioned they took their own measure by washing with water and antiseptic detergents after splash of the blood/body fluid.

Out of 143 participants 38 (26.6%) of health care workers they had needle stick or sharp injuries in the last one years. nurses 21 (55.2%) were the most frequent exposed followed by anesthetist 5 (13.2%) and 4 (10.5%) were health office (Figure 2).

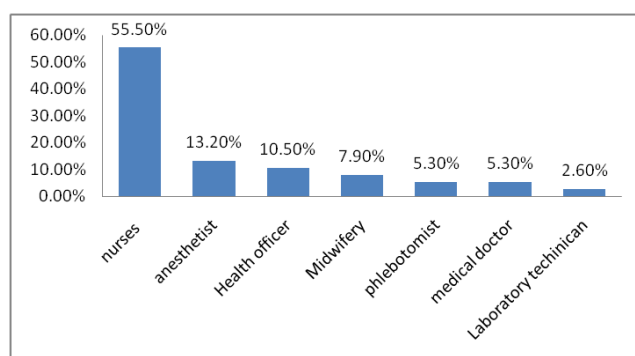


Figure 2. Distribution of needle sticks/sharp object injuries on Health care workers in Army Force Referral and Teaching Hospital Addis Ababa, Ethiopia, 2014.

The main reason of injury stated by health care workers were injuries that occurred while sudden movement of the patient during procedure 14 (36.8%), proceeded by recapping syringe 9 (23.7%), during injecting or drawing blood samples 7 (18.4%), while sharp collection showed up unexpected place like bed, sheet 6 (15.8%) and from glass equipment like broken vials 2 (5.3%). Of these 34 (89.5%) were received PEP and the majority of them 23 (67.7%) received PEP within 24 hrs, 6 (17.6%) were within 72 hrs, and 5 (14.7%) were received within 48 hrs.

Among those needle stick and sharp object injuries the majority of the victims 31 (81.6%) sustained one times, 5 (13.2%) sustained injury more than three times, and 2 (5.3%) injured two times. The type of injuries observed in this study were slight skin penetrations, superficial injuries, and deep injuries constituted 16 (42.1%), 12 (31.6%) and 10 (26.3%) respectively.

From the total respondents 24 (16.8%) received hepatitis B vaccinations. Of those 18 (75.0%) were received all three doses, 4 (16.9%) received two doses, and 2 (8.3%) received one dose. And 72.8% (104) the participants stated they recap used needles; from those who recap needles 82 (78.8%) of them used one hand recapping technique and the others 22 (21.2%) used two hand recapping technique. In addition to this 141 (98.6%) of health care workers reported that safety box was used to collect needles and other sharp materials in their hospital and the rest 2 (1.4%) used open container material.

Results and Discussion

This study shows an overall good knowledge level of health care workers regarding the transmission of important diseases through NSSIs. The response rate of the survey was 99.3%. On average 97.2% of health care workers were aware that HBV, HCV, and HIV can be transmitted through NSSIs. This was higher than the study done in India only 50.2% HCWs, gave correct answers regarding disease transmission through needle stick and sharp injury [7] and 95.5% of the participants were aware of the Universal Precaution principles, this is consistent to the study conducted in India five years ago which was 94.7% [8].

Large number of health care workers 38 (26.6%) reported as they had been exposed for needle stick injuries in the last one year and nurses were the most frequent victims for needle stick/sharp object injuries and blood/body fluids. This finding was less than the result found in a study conducted in Iran, Pakistan, and in Ethiopia at South nation nationalities and people region (SNNPR) that was 47.3%, 45%, 32.4% had sustained needle stick injuries respectively [9-11]. However when compared to similar study conducted in Ethiopia in north Wollo eight years ago showed that 16% of HCWs had sustained needle stick injuries in one year which was lower than the percentage of needle stick and sharp object injuries in this study [12].

The difference between this study and the others might be due to the variation in the setting and study time.

The findings from this study demonstrated that 36% accidents had occurred while sudden movement of the patient, this result was higher than the study done in north Wollo 27.4% on health workers [12]. Followed by 23% while recapping and 18.4% during drawing blood or injection, it is less when comparing this findings with other studies which done in Pakistan while recapping syringes 32% and injecting or drawing blood samples 27% [10]. And avoidance of needle recapping as well as breaking needles by hand was also reported.

Eight two (72.8%) of health care workers reported that needle should be recapped after use. 22 (21.2%) of them used two hand recapping technique; this is high when it compared to WHO report which was 6% [13]. This high rate could be due to lack of knowledge and negligence of the health care workers to the Occupational Safety standard it says recapping of needles has been strictly prohibited [14].

From the total participant 50% of health care workers reported to infection control office they had splash, this is consistent with the study which was conducted in Pakistan 53% and America College of midwives 50.1% [10]. The majority of the respondents in this study show that 42.1% of them were sustained slight skin penetration. Numbers of reasons were cited by health care workers for not reporting a NSIs which need to be addressed for better reporting statistics as well as for effectiveness of interventions to reduce NSIs in health care occupations.

In this study 79.7% of participants had heard about PEP. This was lower than the study which was conducted in Gondar university hospital before two years (92.8%).31 the lower rate could be due to poor information dissemination strategy in the hospital. 67.7% of those had sustained needle stick injuries or exposed to blood /body fluids received PEP within 24 hrs, this shows that delay in initiation of post exposure prophylaxis when compare to similar study conducted in Gondar university Hospital in 2012 where 50.8% received within one hr [15]. However none of the respondents started PEP after 72 hours and knowledge of participants on the initiation time of PEP was high in our setting because 89.5% of the respondents stated it is better to start PEP before 72 hours.

Most health care workers reported using glove and sharp disposal container to reduce the occurrence of NSI. In these studies the majority of health care workers 98.6% affirmed they dispose sharp objects in safety box. Prevention of NSIs can be achieved through elimination of needle recapping and the use of safer needle devices and sharps collection boxes [16].

Conclusion

This survey revealed that from the total respondents only 24 (16.8%) received hepatitis B vaccinations and from those who started immunization 18 (75.0%) were received all three doses, 4 (16.9%) received two doses, and 2 (8.3%) received one dose. From all respondents in this survey only 12.6% had received all three doses of Hepatitis B vaccination. This finding is in controversy with the principle to decrease incidence of infection of HBV largely due to the widespread immunization with hepatitis B vaccine. This may result in an increased Hepatitis B prevalence in the hospital, due to HCWs are not routinely vaccinated.

Recommendations

Special and comprehensive measurements for preventing the needle-stick and other sharps injuries should be taken actively such as:

Anticipate and take measures to prevent sudden patient movement during and after procedures.

Avoid recapping and others hand manipulation of needles. If recapping is necessary, use a single-handed scoop technique.

Reporting accidental exposure to blood and body fluids including needles sticks injuries and proper management of accidental injuries.

Using safety box for any sharp object in any setting.

Advice health care workers to avoid using their hand to break needles and ampoules.

We also recommend onsite training for better management of health care workers who sustained needle and sharp object injuries like early PEP.

Hospital based hepatitis B immunization program should also be started.

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References

1. Ministry of Health and Family Welfare. Government of India National AIDS Control Organization: Antiretroviral Therapy Guidelines for HIV-infected Adults and Adolescents including post-exposure prophylaxis none. NACO, New Delhi, India (2008).
2. Paul Leigh, J., Marion Gillen, Peter Franks, and Susan Sutherland, et al. "Costs of needlestick injuries and subsequent hepatitis and HIV infection." *Curry Med Res Open* 23 (2007): 2093-2105.
3. Bank, Hazardous Substances Data. "Canadian Centre for Occupational Health and Safety." (1998).
4. Hamid, Saeed, Faisal W. Ismail, and Wasim Jafri. "Hepatitis and the healthcare worker-a pakistani perspective." *J Coll Physicians Surg -- Pakistan: JCPSP* 17 (2007): 240-245.
5. UNAIDS (2009) The Joint United Nations Program on HIV/AIDS. UNAIDS/WHO Epidemiological Fact Sheet. (Online) 2009 (Cited 2008 Nov 10).
6. Collins, C. H. "Microbiological hazards of occupational needlestick and sharps' injuries." *J Appl Bacteriol* 62 (1987): 385-402.
7. Arora, A., A. Gupta, and S. Sharma. "Knowledge, attitude and practices on needle-stick and sharps injuries in tertiary care cardiac hospital: A survey." *Indian J Med Sci* 64 (2010): 396.
8. <https://www.medwcm.com/ress/index/hp/middle-East/-health/641oct.10,2008>.
9. Ghannad, Masoud Sabouri, Mohammad Mehdi Majzoobi, Marjan Ghavimi, and Mohammad Mirzaei. "Needlestick and sharp object injuries among health care workers in Hamadan Province, Iran." *Iran. J Emerg Nurs* 38 (2012): 171-175.
10. Saleem, Taimur, Umair Khalid, Sidra Ishaque, and Afia Zafar. "Knowledge, attitudes and practices of medical students regarding needle stick injuries." *J Pak Med Assoc* 60 (2010): 151.
11. Tietjen, Linda, Debora Bossemeyer, and Noel McIntosh. Infection prevention: guidelines for healthcare facilities with limited resources. Jhpiego Corporation, 2003.
12. Bosena, T., and H. Chernet. "assessment of HIV exposure prophylaxis among health workers of governmental health institute in jimma zone, Oromia Region, south west Ethiopia." *Ethiop J. health sci* 1 (2010): 55-64.
13. WHO (2005) Safe injection global network, 14-16 November, 2005.
14. Occupational safety Administration. Final rule on occupational exposure to blood borne pathogens. 56 Fed Reg. 64004 (1991).

15. Mathewos, Biniam, Wubet Birhan, Sebesbe Kinfu, and Meaza Boru, et al. "Assessment of knowledge, attitude and practice towards post exposure prophylaxis for HIV among health care workers in Gondar, North West Ethiopia." *BMC public health* 13 (2013): 508.
16. Poole, C. J. M., S. Miller, and G. Fillingham. "Immunity to hepatitis B among health care workers performing exposure prone procedures." *BMJ* 309 (1994): 94-95.

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