

Occupational Exposure to Blood and Body Fluids among Health Care Workers in Mizan Tepi University Teaching Hospital, Bench Maji Zone, South West Ethiopia

Tilahun Mekonnin*, Adane Tsegaye, Abraham Berihun, Haimanot Kassachew and Addisalem Sileshi

Department of Nursing, Mizan Tepi University, Mizan, Ethiopia

Abstract

Background: Occupational exposure to blood and body fluids refers to the exposure rate of Health care workers from patients' blood and body fluids that will lead to infections which can be hazardous chronic communicable diseases like hepatitis B virus, hepatitis C virus and human Immuno deficiency virus.

Objective: To assess prevalence of occupational exposure to blood and body fluids among health care workers in Mizan Tepi University Teaching Hospital, Bench Maji Zone, South Region, South west Ethiopia, 2018.

Methods: Hospital based cross-sectional study was conducted with interview administered structured questionnaires. The census was done to include all 223 respondents. The result presented by tables, graphs and texts.

Result: The participant's age groups ranged from 22-54 years. From 158 participants there were 87 (55%) males and 71 (45%) females. Among the 158 participants majority of the participants 78 (49.5%) were nurses. The prevalence of occupational exposure among HCWs to patients' blood and body fluids (BBFs) was 74%. The reported occupational exposure to patients' BBFs during the last 1 year was 75 (64.1%), and 42 (35.9%) had an exposure to BBFs before one year. From 117 who were exposed to BBFs majority of the participants 34 (29.0%) were exposed while collecting a blood sample, followed by 31 (26.5%) while setting IV line, 29 (24.8%) while conducting delivery, 18 (15.4%) during elective and emergency surgery and 5 (4.3%) during instrument processing. Anesthetists and Emergency surgeons were exposed to patients BBFs 100%, followed by 91.8% Midwives.

Conclusion: The reported prevalence of occupational exposure to patients' blood and body fluids was high among health professionals in Mizan Tepi University Teaching Hospital. Anesthetics, Emergency surgeons and Midwives were the highly exposed professionals to patients BBFs

Keywords: Blood; Body fluid exposure; Health professionals; Mtuth; Ethiopia

Introduction

Health care workers are at risk of getting blood and body fluid exposures which is a major risk factor in the transmission of infections such as human Immuno deficiency virus, hepatitis B virus (HBV) and hepatitis c virus (HCV) through percutaneous and muco-cutaneous routes [1-3]. These blood borne infections are communicable, chronic and have serious consequences, including long term illness, Disability and finally death [4,5]. The risk of accidental exposure to blood and body fluids is especially increased in the following situations while taking blood samples, during intravenous, intramuscular or sub cutaneous injections, recapping of already used needles, surgery especially during suturing in blood sinked wound closure, delivery, while giving emergency care, during clean up transportation of waste products and incase of instrument processing procedures [6,7].

The risk of transmission of chronic and communicable viral diseases from occupational exposure ranges 0.2%-0.3% following parental and less than 0.1% following mucous membrane for HIV, 1.8%-3% for HCV and up to 30% for hepatitis B virus [4]. The risk of transmission of blood borne pathogens among health care workers from patients' blood and body fluids is dependent on different factors including type and route of exposure type of virus and viral level in the infected individual, amount of virus in the infected blood during exposure, amount of infected blood involved in the exposure, whether post exposure prophylaxis was taken and specific immune status/response of the infected individual [8,9]. Additionally, reports indicate that universal standard precautions, post exposure prophylaxis and vaccines are effective in preventing both occupational exposure to blood and body fluids and resulting associated

infections in health care workers [6,10].

Worldwide occupational exposure to blood and body fluids is a major health care related problem. From 35 million HCWs, 3 millions are obviously exposed to blood borne pathogens [11]. More than 90% of infections occur in sub Saharan African countries [2]. Findings from developing countries have shown that there is no uniform adherence to SPs by HCWS [3]. For instance, in India almost two thirds (64.0%), Nigeria (38.8%), Iran (74%), and in Ethiopia (30.9%) [6,12-14]. The rates of occupational exposure to BBFs in developing countries ranges from 1.8% to 5.8%, due to insufficient and long working hours, lack of experience and educational programs, lack of safety equipments and sub optimal universal precautions compliance [15,16].

The risk of exposure to BBFs and needle stick injuries not only affects the safety and wellbeing of HCWs of victims but also compromises the quality of health care delivered to the community [17]. Health care workers in operating, delivery and emergency rooms, laboratories as well as intensive care units have an enhanced risk of exposure and they

*Corresponding author: Mekonnin T, Department of Nursing, Mizan Tepi University, Mizan, Ethiopia, Tel: +251913655772; E-mail: tilahunmekonnen69@yahoo.com

Received September 01, 2018; Accepted October 17, 2018; Published October 24, 2018

Citation: Mekonnin T, Tsegaye A, Berihun A, Kassachew H, Sileshi A (2018) Occupational Exposure to Blood and Body Fluids among Health Care Workers in Mizan Tepi University Teaching Hospital, Bench Maji Zone, South West Ethiopia. Med Saf Glob Health 7: 146. doi: [10.4172/2574-0407.1000146](https://doi.org/10.4172/2574-0407.1000146)

Copyright: ©2018 Mekonnin T, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

experience significant fear, anxiety and emotional distress. This at end can sometimes result in occupational and behavioral changes [18,19].

To break the chain of these occupational exposure to blood and body fluids among health care workers several studies are proposed on developed countries and there is more efficient success in implementing the recommended solutions depending on the effect of the problem. However developing countries are still in the challenge to full fill standard universal precaution options .to control as well as reduce occupational exposure to blood and body fluids among HCWS in service delivering health institutions [9,11]. Ethiopia is one of the countries in which its health care delivery system is still in full of problems .Even though little studies are done in fewer sites of the country still there is scarcity of literature in many referral, district and rural hospital health care settings [20]. This study will provide information on the pattern of occupational exposure to BBFS among health care workers in the study site. Thus, the aim of this study was to assess occupational exposure to blood and body fluids among health care workers in Mizan Tepi University Teaching hospital, Bench Maji zone, South Region.

Methods

Study area and period

This study was conducted in MTUTH which is located in Mizan Aman town, Bench Maji Zone SNNPR at a distance of 561 km from Addis Ababa and 849km from the regional town Hawassa. The hospital services 886, 986 people among those 433, 829 are males and 453, 157 are females. Relatively 200-300 patients per day may get the services. The hospital have mainly 5 inpatient wards: surgical 32 beds, medical 28 beds, pediatrics 21 beds, MDR10.beds gynecological ward and 37 beds. The hospital has total of 223 healthcare workers of which are 2 surgeons, 1 gynecologist, 1 optometrist, 38 general practitioners, 2 emergency surgeons, 6 Health Officers, 12 BSc nurses, 102 Diploma nurses, 24 Midwifery all types, 12 laboratory technicians, 18 Pharmacy all types, 2 anesthetists, 2 Environmental Heaths, and 3 X-ray technicians.

Study design

A hospital based census study was conducted from May 13-25, 2018.

Populations

All health care workers who were working in MTUTH hospital and had direct contact with patients were included to this study.

Inclusion criteria and exclusion criteria

All health care workers in Mizan Tepi University Teaching Hospital those were not critically ill during data collection were included.

Sample size determination

All health care workers who fulfill inclusion criteria without sampling were included in the study.

Dependent variables

Occupational Exposure to Blood and Body Fluids

Operational Definition

Occupational exposure to blood and body fluids

A health care professional was categorized as exposed to blood and body fluids if he/she had a history of one or more of a needle stick injury, sharps injury, a splash of blood and body fluids on to their mucous membrane or skin [21,22].

Data collection tools and procedures

Structured and self-administered questionnaire of English version was adapted after a review of different literatures [6,7,10,14]. After taking a list of health professionals from each department, the questioners were distributed.

Data Quality Control

Pre testing was done in Tepi hospital on health care workers to assess or rule out the presence of any sensitive issue two weeks before the actual data collection and for the time being necessary correction was made on the questionnaire based on the finding of the pre-test before the actual data collection. You cannot do pre-test on the study area.

Data Processing and Analysis

Data was analyzed by manual calculator and presented with text, figures and tables. Descriptive statistics were calculated for socio demographic and other related factors to assess occupational exposure to BBFs.

Ethical Consideration

Letter of ethical clearance was obtained from Mizan Tepi University, college of Health Science, department of Nursing. Letter of permission was obtained from MTUTH administrator, verbal consent was obtained from the individual respondents and we told them they have the right to be involved or not in the study. Confidentiality of information was assured and their privacy has been respected. To insure the confidentiality the name of the respondents was not written on the questionnaire paper.

Dissemination of the Results

The result of this study was presented and submitted to Mizan Tepi University College of Health Science department of Nursing and the copy of this finding was offered to Mizan Tepi University Teaching Hospital administrative office.

Result

Participant's response rate

One hundred seventy (170) questionnaires were distributed among HCWs in Mizan Tepi University Teaching Hospital and a total of 158 completed and useable questionnaires were returned, giving an overall response rate of 158 (92.3%).

Participants' socio demographic characteristics

Participants' age groups were summarized by calculating the mean, and standard deviation. The participant's age groups ranged from 22-54 years. Majority 96 (60.8%) of the participants was within the range of 20 and 29 years. From 158 participants there were 87 (55%) males and 71 (45%) were females. From 158 participants majority of the participants were nurses 78 (49.5%), there were 107 (67.7%) diploma in their current level of education, 116 (73.4%) of the participants had 1-5 years work Experience. Majority of the respondents 128 (81.1%) work 8 hours per day (Table 1).

Availability of personal protective equipments and awareness about occupational exposure

From 158 participants, 107 (67.7%) responded that there were no enough PPE in the hospital throughout the year and 129 (81.7%) of

Age	Frequency (N=158)	Percent (%)
22-29 years	102	64.5
30-39 years	56	35.5
Sex		
Male	87	55
Female	71	44.9
Religion		
Orthodox	81	51.3
Muslim	27	17.1
Protestant	50	31.6
Marital Status		
Unmarried	67	42.4
married and divorced	91	57.6
Profession		
Doctors	28	17.7
Nurses	78	49.4
Laboratory technologists and technicians	13	8.2
Midwives,	27	17.08
Emergency Surgeons	3	1.9
Anesthetics,	3	1.9
Health Officers	6	3.8
Educational Status		
Diploma	104	65.8
Degree	47	29.7
Others*	7	4.4
Work Experience		
6 month-5 years	116	73.4
6-10 years	27	17
>10 years	15	9.5
Working unit (ward)		
Medical	26	16.5
Surgical	19	12.02
Pedi	17	10.7
OR	11	6.9
Emergency	13	8.2
OPD	26	16.5
Gynecological and Obstetrics	33	20.9
Laboratory	13	8.2
Working hour		
8 h	128	81.1
>8 h	30	19.9
Others*-specialists, Masters		

Table 1: Participants socio-demographics characteristics of HCWs in Mizan Tepi University Teaching Hospital, south west Ethiopia, 2018.

the respondents concerned about occupational exposure to blood and body fluids and knows its impact. There were only 53 (33.5%) health care workers who have training on infection prevention and standard precaution. Only 68 (43.1%) respondents use personal protective equipment when they perform or assist any procedure. only 74 (46.8%) wash their hands before and after any procedure. Majority 119 (75.3%) of the participants responds there were no enough infection prevention methods in the hospital.

Circumstances of Occupational Exposures

Pattern of occupational exposure to patients' body fluids among participants

Majority 117 (74%) of the participants had an exposure to BBFs

while doing or assisting procedures. The reported occupational exposure to patients' BBFs during the last 1 year was 75 (64.1%), and 42 (35.9%) had an exposure to BBFs before one year (Figure 1).

From the exposure occurred 36.70% was blood splash, 31.60% both blood and body flood, and 27.50% incidences occurred at work (Figure 2).

From 117 who were exposed to BBFs majority of the participants 34 (29.0%) were exposed while collecting a blood sample, followed by 31 (26.5%) while setting IV line, 29 (24.8%) while conducting delivery,18 (15.4%) during elective and emergency surgery and 5 (4.3%) during instrument processing. From those who were exposed to BBFs 78 (66.6%) were exposed while assisting or doing more than 1 procedures such as suturing ,dressing of wound , recapping or disposing needle, IV medication administration and IM injections.

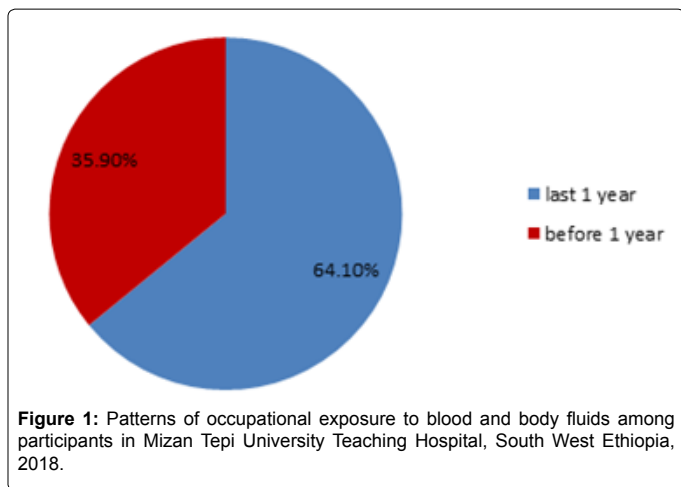


Figure 1: Patterns of occupational exposure to blood and body fluids among participants in Mizan Tepi University Teaching Hospital, South West Ethiopia, 2018.

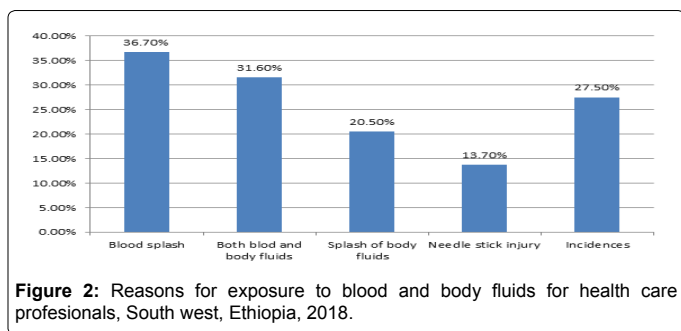


Figure 2: Reasons for exposure to blood and body fluids for health care professionals, South west, Ethiopia, 2018.

From those who were exposed to BBFs 25 (21.5%) of the participant were exposed in gynecological and obstetrics ward, followed by emergency room 19 (15.9%), laboratory room 15 (13.1%), surgical ward 14 (12.1%), OR 14 (12.1%), pediatrics ward 11 (9.3%), medical ward 11 (9.3%) and outpatient department 8 (6.5%) (Figure 3).

Participant's response on occupational exposure by professions

From 117 participants who were exposed to BBFs Anesthetics and Emergency surgeons were exposed to patients BBFs 100%, followed by 91.8% Midwives (Figure 4).

Discussion

In this study prevalence of occupational Exposure to BBFs was 74% which indicated that high proportion of the Health care workers were affected. This is higher than the study done in china which was 66.3% [23] and in India which was 32.75% [24]. This may be due to variations in the availability of PPEs in health care facilities as evidenced by the majority of this study participants reported that there was a lack of PPEs in their hospital. In other way the finding of this study was lower than the finding of systematic reviewed done among 14 Sub Saharan African countries (cameroon, Kenya, Ethiopia, Ghana, Madagascar, Malawi, Mozambique, Nigeria, Rwanda, SouthAfrica, Sudan, Tanzania, Uganda and Zambia) of 110 surgeons that was a total of 91% one or more percutaneous injuries, 80% sustained one or more patients body fluid exposures [25,26]. This is might be due to the time of study that means the knowledge and skills of professionals may update know days by different trading and so on. Additionally, since the former study was done only on surgeons as this group have chance of exposure to BBF of patients; the finding was higher than this study [27-29].

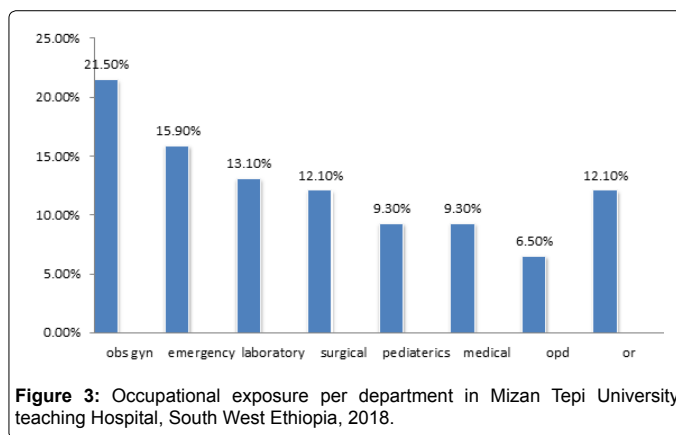


Figure 3: Occupational exposure per department in Mizan Tepi University teaching Hospital, South West Ethiopia, 2018.

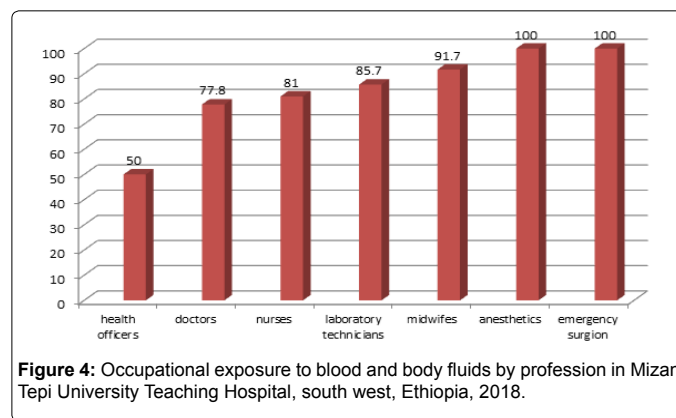


Figure 4: Occupational exposure to blood and body fluids by profession in Mizan Tepi University Teaching Hospital, south west, Ethiopia, 2018.

In this study 34 (29%) were exposed while collecting a blood sample, followed by 31 (26.5%) while setting IV line. Irrespective of the figure, this pattern is similar with a study conducted in the Tikur Anbessa Hospital that was 16 (12.2%) of exposure is as a result of taking blood specimen, 12 (9.2%) exposure is during intravenous infusions and in addition procedures such as suturing, dressing of wounds, administering of intramuscular injections constituted 13 (9.9%) and other exposures occurred during instrument processing [7].

The finding of this study showed that participants exposed to BBFs were from gynecological and obstetrics ward 25 (21.5%), followed by emergency 19 (15.9%) and laboratory room 15 (13.1%). This is similar with the study conducted in the northern Ethiopia among six hospitals of Tigray that indicated that was delivery room (80.4%) and gynecological wards (75%) had higher risk of exposure [10,30].

In this study Anesthetists and Emergency surgeons were exposed to patients BBFs 100%, followed by 91.6% Midwives, 85.7% laboratory technicians and 80% nurses, this distribution is not consistent with the study conducted in Bahir Dar town that showed 62.2% nurses, 17.7% laboratory technicians, and 10.0% midwives [6]. This might be due difference in distribution of participants in the study and the access of training infection prevention, and I PPEs among in the health facilities.

In this study including the all health care professionals who have direct contact with patients to assess occupational exposure to BBF could be taken as the strength of the study. But viral infection like HIV and hepatitis for HCWs was not screened in this study. Since the study was based on self-report about previous one life time occupational exposure to BBF the result might be affected by recall bias this was the limitation of our study.

Conclusion

The prevalence of occupational exposure among HCWs to patients BBFs was high in the study area. Anesthetics, Emergency surgeons and Midwives were the highly exposed professionals to patients BBFs. Gynecological and obstetrics and emergency department were a high risk working unit to have occupational exposure to BBFs.

Declarations

Ethics approval and consent to participate

This study was not involved in any experiment on human subjects. The written consent was taken from the respondents just before data collection. Ethical approval was obtained from Mizan Tepi University College of Health Sciences, Institutional Review Board to communicate with hospital administrative body. Permission letter was obtained from administrative body of Mizan Tepi University teaching hospital.

Competing Interests

The authors declare that they have no competing interests.

Funding

The study was funded by Mizan Tepi University.

Authors' Contributions

The authors' responsibilities were as follows: All authors designed, supervised the study, ensured quality of the data and assisted in the analysis and interpretation of the data. All authors critically reviewed the manuscript. The corresponding authors did the analysis & drafted the manuscript and had the responsibility to submit the manuscript for publication.

Acknowledgements

We wish to express our gratitude to Mizan Tepi University for providing the opportunity and our study participants.

References

1. Sepkowitz KA (1996) Occupationally Acquired Infections In health care workers part II. *Ann intern med* 125: 917-928.
2. World health organization (2002) The world health report: Reducing risks, promoting healthy life, who Geneva Switzerland.
3. Hutin Y, Havari A, Caltin LCM, Sitwel B (2003) Best infection control practices for intradermal, subcutaneous and intra muscular needle injections. *Bull world health org* 81: 491-500
4. Rapti E, Prussuston A, Hutin Y (2005) sharps injuries assessing the burden of disease from sharps injuries to health workers at national and local level. *Environmental burden of disease series*: 11: 1-58
5. Prus Vestun A, Raptie E, Hutin Y (2005) estimation of the global burden of disease attributable to contaminated sharps injuries among health care workers. *Am J Ind Med* 48: 482.
6. Muluken A, Gedefaw A (2014) Occupational exposure to blood and body fluids among health care workers in bahir dar town hospital and health centers, North West Ethiopia. *Saf Health Work* 5:17-22.
7. Atlaw WD (2013) Pattern of occupational exposure to patients body fluids among health care workers in tikur anbessa hospital. Ethiopia. University of South Africa.
8. Novetchognou JS (2016) Accidental exposures to blood and body fluids among health care workers in Referral Hospital of Cameroon. *BMC research notes* 9: 94.
9. Iachowicz R, Mathews PA (2009) The pattern of sharps injury to Health Care Workers at Witbank hospital South Africa. *South Afri fami prac jou* 51: 148-151.
10. Gessessew A, Kahsu A (2006) Occupational exposure of health care workers of Tigray region 47: 213-219.
11. WHO (2013) health care worker safety: Aid memory for a strategy to protect health care workers from infection with blood born virus infection.
12. Vaz KMc, Growder D, Alexander-Lindo R, Gordon L, Brown P, et al. (2010) Knowledge awareness and compliance with universal precautions among health care workers Atthe University Hospital of west Indies Jamaica. *Int J Occup Environ Med* 1: 171-181.
13. Bamigboye AP, Adesaniya AT (2006) Knowledge and practice of universal precautions among Qualifying Medical and nursing students in case of university teaching hospitals 1: 112-116.
14. Taddese T (2010) Epidemiology of needle stick injuries among health care workers in Awassa city.southern Ethiopia. *Trop Doct* 40:2:111-113.
15. Serinken M, Karciglo O, Kutu SS (2009) A survey of needlesticks and sharp instrument injuries in emergency health care in Turkey. *J Emerg Nurs* 35: 205-210.
16. Shiva F, Saniel A, Shamshri AR (2011) Survey of needle stick injuries in pediatric health personnel of 5.University Hospital in Tehran 61:127-131.
17. Reda AA (2010) standard precautions occupational exposure and behavior of health care workers in Ethiopia. *PLoS One* 5: e14620.
18. Awsas MJ, Noyoni AG, Chatora R (2004) WHO Regional Office for Africa. Migration of health care workers in six countries Synthesis Report. Congo Brazzaville.
19. Lee JM, Bottemann F, Xanthakos N, Nicklasson L (2005) Needle stick injuries in USA Epidemiologic, Economic and quality of life issues. *AAOHN J* 53:117-133.
20. Ayas NT, Barger LK, Cade BE (2006) Extended work duration and the risk of self reported percutaneous injuries in Interns. *Jama* 296: 1055-1062.
21. Tarantola A, Lheriteau F, Astagneau P, Boubet E (2005) Occupational exposure to blood and body fluids in haemodialysis health care workers: Epidemiological data and prevention in France. *Nephrologic and therapeutic* 1: 167-173.
22. Azap A, Ergonul O, Memikoglu KO (2005) Occupational exposure to blood and body fluids among health care workers in Ankara Turkey 33: 48-52.
23. Zhang M, Wang H, Miao J, Dux LW (2009) Occupational Exposure to blood and body fluids among health care workers in General Hospital, China 52: 89-98.
24. Sanmir AS, Amitav B (2008) Occupational exposure to blood and body fluids among health care workers in teaching hospital in Mumbai. *India* 33: 26-30.
25. Phillips EK, Pillay SS, Goldberg P, Jaggerblood JC (2011) Borne pathogens risk among south African Surgeons. *South african gastro review* 9: 6-9.
26. Zhang M, Wang H, Miao J, Du X, Li T, et al. (2009) Occupational exposure to blood and body fluid among health care workers in General Hospital,China. *Am J Ind Med* 52: 89-98.
27. Naghavi SHR, Sanati KA (2009) Accidental blood and body fluid exposure among Doctors. *Occup Med* 59: 101-106.
28. Markovic D, Marsusic V, Ostric I (2015) Occupational exposure to blood and body fluids among health care workers in Serbia. *Med Princ Pract* 24: 36-41.
29. Sencan I, Sahin I, Yildirim M, Yesildal N (2004) Unrecognized abrasions occupational exposure to blood borne pathogens among health care workers in Turkey. *Occup Med* 54: 202-206.
30. Mbaisi EM, Wanzala P, Omolo J (2013) Prevalence and factors associated with percutaneous injuries and splash exposures among health care workers in a provincial hospital, Kenya 2010. *Pan Afric Med Jou* 14: 10