PATTERN OF OCCUPATIONAL EXPOSURE TO PATIENTS’ BODY FLUIDS AMONG HEALTH CARE WORKERS IN TIKURANBESA UNIVERSITY HOSPITAL, ADDIS ABABA, ETHIOPIA

by

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submitted in accordance of the requirements for the degree of

MASTER OF PUBLIC HEALTH

at the

UNIVERSITY OF SOUTH AFRICA

SUPERVISOR: PROFESSOR LI ZUNGU

FEBRUARY 2013
DECLARATION

I declare that this dissertation titled “PATTERN OF OCCUPATIONAL EXPOSURE TO PATIENTS’ BODY FLUIDS AMONG HEALTH CARE WORKERS IN TIKUR ANBESA UNIVERSITY HOSPITAL, ADDIS ABABBA, ETHIOPIA” is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references. This work has not been submitted before for any other degree at any other institution.

15 February 2013

_______________________________                    ____________________
SIGNATURE        DATE

WONDWOSEEN DESTA ATLAW
ABSTRACT

Background: Accidental exposure to patients’ body fluids (BFs) is an occupational hazard among health care workers (HCWs). The study aimed at describing the patterns of exposure to patients' BFs among HCWs at a university hospital in Ethiopia.

Methods: A contextual descriptive cross-sectional design was used for this study. Self-administered questionnaires were used to collect data.

Results: The one year and professional life prevalence of occupational exposure to patients’ BFs among HCWs was 33.5% and 66.5% respectively. Circumstances that led to participants’ exposures to patients’ BFs include needle stick injuries to fingers and splashes to the eyes (82.4%); conducting procedures included blood withdrawal (10.8%) and inserting intravenous infusions (8.1%) and recapping of used needles (12.2%).

Conclusion: Findings of this study generally indicated that occupational exposures to patients’ BF of different types and circumstances were common among all categories of HCWs in the study site. This high finding of BF exposure should not be over looked. HCWs should follow the universal precaution protocol and PEP need to be strengthened.

Keywords
Health care workers; body fluid; post-exposure prophylaxis; university hospital; Ethiopia.
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Dedication

To my wife Dr Mulu, My two daughters Bethel, Selam, and my son Yoseph.
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<td>AAUMFIRB</td>
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<td>AIDS</td>
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<td>BFs</td>
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<td>UPs</td>
<td>Universal precautions</td>
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CHAPTER 1

ORIENTATION OF THE STUDY

1.1 INTRODUCTION

Occupational exposures to patients’ body fluids (BFs) which contain blood borne pathogens pose a significant risk to the health and safety of health care workers (HCWs). Significant exposures to BFs could lead to acquiring blood borne infections such as hepatitis B virus (HBV), hepatitis C virus (HCV) and Human Immunodeficiency Virus (HIV) (Seyed & Kaveh 2009:101).

Such exposures could also cause anxiety among HCWs which could ultimately lead to occupational stress among these workers given the serious consequences of exposure to patients' BFs. Many of the viral infections transmitted through theses exposures have no curative management; therefore applying preventive measures are mandatory in such a situation where HCWs in health care settings are at high risk of exposure to patients’ BFs in their day-to-day practice.

This chapter gives the overall background of the study and highlights the prevalence of occupational BFs exposure and the associated factors amongst HCWs in a university hospital in Ethiopia. The chapter also describes the, aim and objectives of the study as well as the significance of the study. Definition of key terms, foundation of the study, the research design and scope and limitations of the study are also discussed in this chapter.

1.2 BACKGROUND INFORMATION ABOUT THE RESEARCH PROBLEM

1.2.1 Source and background to the research problem

Occupational BFs exposure of HCWs is a common work place problem particularly in hospital settings. The source of this study originated primarily from the investigator’s observation of hospital practices while rendering care to hospitalised patients with
chronic communicable diseases such as those having Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIVAIDS). Moreover, literature review on this topic also indicates that it is a research priority.

In developing countries where most of these occupationally acquired infections are believed to occur, the exact prevalence of the problem among HCWs is difficult to estimate. One of the reasons for this is under-reporting (Umayya, Abdul, Rahman, Nabil, Amal, Ali, Rita & Ghassan 2008:98).

In Ethiopia, previously published surveys were conducted mainly in regional health facilities and have reported an overall BF exposure prevalence rate of 31% and 35%. (Gessessew & Kahsu 2009:89; Tadesse & Tadesse 2009:111). However, data on occupational exposure to BFs particularly in teaching facilities was lacking. Therefore the need for investigating occupational exposure in some details among HCWs in specialised health care facilities is evident.

1.2.2 Background to research problem

According to World Health Organization (WHO) Report by (Prüss-Ustün, Rapiti & Hutin 2005:483), health care workers’ exposures to patients’ BFs is a common problem. For example, in developing countries, 40% to 65% of HBV and HCV infections in HCWs were attributable to occupational exposure. A global estimate indicates 40% of HBV and HCV infections and 2.5% of HIV infections among HCWs are due to occupational percutaneous exposure to BFs of patients. A number of studies have been conducted to assess the patterns of occupational exposure to BF of patients in hospitals worldwide.

One report by Smoliński Serafińska and Gladysz (2006:507–516) in Poland revealed that, of the 789 cases of BF occupational exposures, women predominated (78.9%), nurses made 65% and physicians 17.5%. Needles were the most frequent (75.2%) source of exposure during injections and left hand fingers (thumb and index finger) were the major targets. Post-exposure prophylaxis (PEP) with antiretroviral medications was introduced in about 60% of cases and no HIV transmission was registered.

In another study done by Lihan and Durukan (2006:563) on hospital nurses showed that the percentage of nurses experiencing needle stick injuries during their professional
time was 79.7% and the incidence of BFs exposure in one year was 68.4%. Age less than 24 years, less than 4 years of nursing experience, working in surgical or intensive care units and working for more than 8 hours per day were the factors identifies to increase injuries. According to a study by Frederich, Nubuga and Maritta (2005:773–781) which was done in Uganda, among the nursing staff working at national referral hospital, a high rate of needle stick injuries was observed (4.18 per person-year) and 57% of the participants had experienced at least one needle stick injuries in the last one year. Only 18% had not experienced any similar incident in their entire professional life.

Even though universal precaution (UP) measures have been shown to reduce BFs exposure to HCWs significantly, several reports (including the above) from both developed and developing countries showed a continued high prevalence of needle stick injuries, cut injuries splashes of patients' body fluids and related infections including HIV (Seyed & Kaveh 2009:101).

1.3 RESEARCH PROBLEM

1.3.1 Statement of the research problem

Lack of adequate information on the pattern of occupational exposure to BFs among HCWs in health care settings is one of the major obstacles in improving universal precautions and PEP and other preventive measures.

Exposure to BF among HCWs appears to be high in many health facilities in Ethiopia and, in a recent study in eastern health facilities by Reda, Fisseha, Mengistie and Vandeweerd (2010:2), it was found that the rate of occupational exposure is much higher in hospitals than other smaller health facilities. However, the rate in teaching university hospitals and circumstances around this high BFs exposure are not well known in Ethiopia and need to be examined to help hospitals managers, HCWs and policy makers of the country build a better approach to address this challenge.

The researcher speculates that the rate could be even higher in university teaching hospitals given the fact that there are interns, residents, specialised HCWs and where more sophisticated medical and surgical procedures are conducted, which further
increase the risk of occupational exposures to blood borne pathogens among these HCWs. In addition the researcher identified gaps in terms of lack of evidence based facts about the circumstances around these occupational BFs exposures, the resulting injuries and diseases in hospital settings of Ethiopia. Such data include the incidents of exposure to BFs, as well as the rate of resulting occupational incidents and diseases among the different categories of HCWs. Additional data related to exposure to occupational hazards among HCWs include the nature of procedures conducted, the nature and severity of BFs exposures, site of injuries, time of the occurrence of incidents, etc.

It should be noted that to date, there are no specific studies that have been conducted to determine the prevalence of occupational BFs exposures among HCWs on Ethiopian university hospitals. Therefore the research problem was coined from the fact that there is a need to determine the prevalence of occupational exposure incidents and also identify circumstances associated with these incidents among HCWs workers in the Tikur Anbessa University hospital with an aim of reducing the occurrence of these unwanted accidental incidents in the HCWs.

1.4 AIM OF THE STUDY

The aim of this study was to investigate the patterns of occupational exposures to patient’s BF among HCWs in a Tikur Anbessa University hospital in Addis Ababa, Ethiopia, and to recommend relevant measures to prevent occupational exposure to patient’s BFs among HCWs in the study site.

1.4.1 Research objectives

The objectives of this study were to:

- Identify and describe socio-demographic characteristics of HCWs exposed to patients’ BFs in a Tikur Anbessa University hospital in Addis Ababa, Ethiopia.
- Investigate the circumstances leading to the occurrence of occupational exposure to patient’s BFs among HCWs at the study site.
- Describe the nature of occupational exposures to BFs among HCWs at the study site.
• Describe the post-exposure management of occupational exposure to BFs in the study site.

1.5 SIGNIFICANCE OF THE STUDY

This study will provide information on the pattern of occupational exposure to patients’ BFs among HCWs in the study site and the related circumstances; as well as the existing procedures for management of such exposures. It is thus envisaged that the findings could be used to design and implement preventive programmes to reduce occupational exposures to patients BFs among HCWs at risk and prevent the resulting injuries and other related health and safety effects. Significantly such interventions would promote the quality of work life of HCWs in the study site.

Specifically the results of this study will be useful to health managers and planners by providing information on HCWs’ injury which will help them to develop appropriate preventive services, allocate resources, decide on priorities and target certain populations.

Furthermore, findings of the current study will serve as baseline information for comparison purposes in future studies on related topics.

1.6 OPERATIONAL DEFINITION OF CONCEPTS

1.6.1 Occupational body fluid exposure

Occupational BF exposure is the exposure to potentially harmful chemical, physical, or biological agents that occurs as a result of one’s occupation (Roland & Michelle 2009:373). An occupational BF exposure occurs during the performance of job duties and may place a worker at risk of infection.

Exposure is defined as a percutaneous injury (e.g., needle stick or cut with a sharp object), contact of mucous membranes, or contact of skin (especially when the exposed skin is chapped, abraded, or afflicted with dermatitis or the contact is prolonged or involving an extensive area) with blood or other body fluids to which universal precautions (Roland & Michelle 2009:373). In this study, the term ‘exposure to
occupational BF’ refers to a percutaneous injury (needle stick or other cut with a sharp object), mucous membrane or non-intact skin (e.g., chapped or abraded skin, dermatitis), or prolonged contact and/or contact involving an extensive area with blood, tissue, or certain other body fluids.

1.6.2 Body fluids (BFs)

The concept BFs are described as fluid contained in the three fluid compartments of the body: the plasma of the circulating blood, the interstitial fluid between the cells, and the cell fluid within the cells. BFs include the following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures and any body fluid visibly contaminated with blood (Cherie, Allen & Kevin 2010:4).

In this study BFs refers to patients’ body fluids containing visible blood or other body fluids that are potentially infectious including semen, vaginal secretions and saliva.

1.6.3 Health care workers (HCWs)

HCWs refer to persons whose activities involve contact with patients or with blood or other body fluids from patients in the healthcare settings (CDC 1987:36). In the present study HCWs include senior specialist doctors, such as surgeons, gynecologists, other specialists, interns, residents, nurses, laboratory technicians, and cleaners.

1.6.4 Post-exposure prophylaxis (PEP)

It refers to a medical response to prevent transmission of pathogens after potential exposure and refers to comprehensive management instituted to minimise the risk of infection following potential exposure to blood-borne pathogens (HIV, HBV, HCV). It includes first aid, counseling, risk assessment, relevant laboratory investigations based on the informed consent of the exposed person and source and depending on the risk assessment, the provision of short term (28 days) of antiretroviral drugs, along with follow-up evaluation (Manoj, Kavina, Pradeep Purohi & Asha 2011:9).
PEP in this study refers to antiretroviral drug treatment given to a HCWS within 72 hours of exposure to blood or other body fluids accidental occupational injuries.

1.6.5 Universal precaution

The term universal precautions refers to a method of blood borne disease control which requires that all human blood and other potentially infectious materials be treated as if known to be infectious with HIV, HBV or other blood borne pathogens regardless of the perceived low risk of a patient or patient population (Cherie, Allen & Kevin 2010:6).

1.6.6 University hospital

University hospital is a hospital that is affiliated with a university. University hospitals provide clinical education and training to future and current doctors, nurses, and other health professionals, in addition to delivering medical care to patients (English Dictionary 2002:23). Site of this study is Tikur Anbessa University hospital which is the largest general public hospital in Ethiopia.

1.7 RESEARCH METHODOLOGY

This section presents a short summary of the research method employed in the study, which with the design and methodology is treated in greater depth in chapter 3. A quantitative cross-sectional descriptive design is used in this study, which attempts to describe the occupational exposure of HCWs to BFs with the aim to improve the prevention and management of HCW injuries at the tertiary hospital in Addis Ababa.

1.7.1 Population

The target population of this study comprised of all HCWs working at Tikur Anbessa University hospital.
1.7.2 Study setting

The study was conducted in Addis Ababa at Tikur Anbessa University hospital which is university and teaching hospital for all regions of Ethiopia. It is situated in the capital city of Ethiopia, Addis Ababa.

1.7.3 Sampling

In this study, a purposive sampling method was employed to identify and recruit HCWs to participate in the study. The sample included various categories of HCWs.

1.7.4 Data collection methods

A self-administered questionnaire was used to collect data among HCWs. In addition, the data collection instrument was pre-tested among few HCWs from another health facility with the aim to test the time required for the completion of the data tool and improve the contents of the questionnaire.

1.7.5 Data analysis

In this study after data was coded and entered into a computer, it was be analysed using descriptive statistics i.e. frequencies and percentages. Data collected were coded and entered into computer programs like Statistical Package for Social Sciences (SPSS) 10.0 and MS Excel for analysis. The results were presented in the form of tables, graphs, and pie charts.

1.8 ETHICAL CONSIDERATIONS

This study took into consideration the three basic principles outlined by Belmont Report, which are among those generally accepted in our cultural tradition, particularly relevant to medical ethics involving human subjects. These three principles are: respect for persons, beneficence and justice (Joubert & Katzenellenbogen 2007:31).
1.8.1 The participant

The participants were treated as autonomous agents in the study by; informing them about the objective of the study and its benefits in the occupational prevention of HIV and other blood born infections. In this study participants were told that their participation in the study is voluntary and they are free to decline to participate or that they can withdraw from the study at any time and would not be punished.

Additionally, participants were assured that information provided whether orally or written will be used only for the research purpose and will therefore be strictly anonymous and confidential. Anonymity was assured by using codes and not the participants’ names in the questionnaires and contact details of the researcher were given. Data from the participants are placed under lock and key at the centre where the researcher works. The researcher obtained the informed consent from the participants (see annexure 4).

1.8.2 The institution

The study protocol was presented to the Addis Ababa University Medical Faculty Institution Review Board (AAUMFIRB) as well as the Health Studies Higher Degrees Committee of University of South Africa (UNISA) for approval. Finally, the research was conducted after permission from the concerned authorities in the Tikur Anbessa University hospital.

1.9 SCOPE AND LIMITATION OF THE STUDY

The researcher acknowledges the following limitations of this study: The study was limited to Tikur Anbessa University hospital in the capital city Addis Ababa, where the faculty is large with several students. Research results therefore are limited to that particular hospital and may not be generalised to the all HCWs particularly in other health settings in the country.
1.10 STRUCTURE OF DISSERTATION

This dissertation is divided into the following five chapters and they are briefly described hereunder:

**Chapter 1 (Orientation to the study).** It gives an introduction to the study and it further highlights the research problem in terms of its background information. The significance of the study is dealt with the definition of terms. It also includes design, methodology, ethical consideration, scope/limitations of the study, structure of the dissertation and conclusion.

**Chapter 2 (Literature review).** It covers relevant literature that has been reviewed to give a background to this study.

**Chapter 3 (Research design and methods).** It describes the research design that was used and the methodology followed in terms of sampling and sample selection; data collection including approach, development and the characteristics of the data collection tool; and data analysis. Ethical considerations pertaining to sampling and data collection are highlighted. It also gives an account of measures taken to improve validity and reliability of the study findings.

**Chapter 4 (Analysis, presentation and description of the research findings).** It includes analysis, presentation and description of the research findings and the discussion of findings.

**Chapter 5 (Conclusions and recommendations).** It draws conclusions generated in line with the research objectives and the statement of the problem and makes recommendations based on the findings.

1.12 CONCLUSION

This chapter presented the overview of the current study and details of the research problem. The aim, objectives and significance of the study were also described. A highlight was also given about the methodology of the study, which included the research design, population, and sample as well as data analysis method used. Ethical
considerations, scope limitations of the study and the structure of the dissertation were also presented in this chapter. The next chapter will describe the findings of the reviewed literature based on the previous studies conducted on HCWs’ occupational exposure to BFs of patients.
CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents relevant literature that has been identified, reviewed and synthesised. In this section a review of the current situation on occupational body fluid exposures among HCWs is described, which included an overview of occupational body fluid exposures of HCWs globally and in Sub-Saharan Africa; causes of occupational body fluid exposures of HCWs and post-exposure consequences. The chapter also presents strategies for the management of HCWs’ exposures to patients’ BFs.

2.2 PURPOSE OF LITERATURE REVIEW

In research a literature review is a written summary of the state of evidence on a research problem (Polit & Beck 2008:136). According to Katzenllenbogen and Joubert (2009:65), the purpose of literature review is described as follows: “As the name suggests a literature review is a ‘review’ or ‘further look’ at what has previously been written on a particular subject. Ideally, it should not be merely a summary of previous findings but should involve a critical examination and synthesis of existing reports. A literature review is therefore intended to convey to the reader the current state of knowledge on the along with the strength and limitations of the underlying research.”

The purpose of this study was to explore and describe the patterns of occupational exposure to patients’ BFs among HCWs and the management of such exposures in specialised teaching hospital settings.

According to Boote and Beile (2005:3), while the form of the literature review may vary with different types of studies, the basic purposes remain constant:

- Provide a context for the research
• Justify the research
• Ensure the research has not been done before (or that it is not just a replication study)
• Show where the research fits into the existing body of knowledge
• Enable the researcher to learn from previous theory on the subject
• Illustrate how the subject has been studied previously
• Highlight flaws in previous research
• Outline gaps in previous research
• Show that the work is adding to the understanding and knowledge of the field
• Help refine, refocus or even change the topic

To prepare the literature review for the current study, electronic searches of data base such as Medline, Pubmed, Cochrane, electronic journals, books, theses and dissertations were utilised by the researcher. In conducting an internet search significant information has been obtained on occupational exposure of HCWs to BF and current management of such incidents. The researcher conducted an online search of the electronic databases that were published from 2005–2013.

2.3 OVERVIEW OF OCCUPATIONAL BODY FLUID EXPOSURES OF HEALTH CARE WORKERS GLOBALLY AND IN SUB-SAHARAN AFRICA

2.3.1 Review of Health care worker body fluid exposure globally

Worldwide, the World Health Organization (WHO 2007:1) estimated that, about 3 million of health care workers across the world were exposed to blood-borne pathogens each year; 2 million of those to HBV; 900,000 to HCV; and 170,000 to HIV. These injuries may result in 70,000 HBV; 15,000 HCV; and 500 HIV infections. A global estimate of, 37% of HBV, 3% of HCV and 4% of HIV infections in HCWs are due to occupational exposures (Prüss et al 2005:482).

During the past two decades this risk has become even more significant as the HIV epidemic has been growing and the prevalence of hepatitis B and C has increased significantly (Lachowiz & Matthews 2009:148).
2.3.2 Review of Health care worker’s exposure to patients’ body fluid in Sub-Saharan Africa

Prüss et al (2007:1) have revealed that more than 90% of HCWs' infections as a result of occupational exposure to patients' BFs occur in developing countries and 40% of them are attributed to hepatitis B virus (HBV) and hepatitis C virus (HCV) infections constituted 65% of the total.

In Ethiopia there are limited reliable data relating to the incidence of body fluid exposures or needle stick injuries among health care workers (Gessessew & Kahsu (2009:213–219; Tadesse & Tadesse 2010:111; Reda et al 2010:1). Only Gessesew and Kahsu (2009:213–219), in particular reported on hospitals and no study compares occupational exposure among HCWs between teaching university hospitals specifically.

Over the past three decades, due to the high incidence of HIV/AIDS and the risk of occupational exposures, a number of interventions have been put into practice in Ethiopian hospitals to reduce the frequency of occupational exposure to body fluids.

According to Reda et al (2010:1), since 2006 the governmental and non-governmental organizations have given attention to standard precautions by initiating PEP and increased supply of materials such as safety boxes. These interventions include hospital staff training on infection prevention and the provision of protective barriers such as gloves and gown and dispose of sharps, body fluids, and other clinical wastes properly.

Despite these efforts, a considerable number of occupational exposures still occur among HCWs at government hospitals (Personal communication: Dr Erdaw, A, ex-Director, Menlik Government Hospital). In addition full surveillance data on the extent of the problem in Ethiopia are scarce.
2.3.3 Studies on occupational exposures in hospital settings

Occupational exposure rate to body fluids varies significantly among different hospital settings and types of HCWs. The Exposure Prevention Information Network (EPINet™) surveillance program reported the rate of percutaneous injury, defined as the number of injuries per 100 occupied beds per year, to be 26.8 in teaching hospitals and 18.7 in non-teaching hospital (Bahadori & Sadigh 2010:2).

Literature reviewed has revealed that of 110 surgeons who practiced in 14 Sub-Saharan African countries, i.e. Cameroon, Ethiopia, Ghana, Kenya, Madagascar, Malawi, Mozambique, Nigeria, Rwanda, South Africa, Sudan, Tanzania, Uganda, and Zambia, a total of 91% reported one or more percutaneous injuries, 80% sustained one or more patients’ BF exposures (Elayne, Sats, Paul & Janine 2011:6).

Furthermore, data from the 2003 USA EPINet report shows that in hospital settings, the highest proportions of percutaneous injuries occurred in the operation rooms, with over 30 percent of all reported hospital sharps injuries occurring in this setting. In another EPINet study conducted in India, the results showed that sharp injuries occurred in highest proportions among HCWs working in patients’ room followed by operating theatres (Chakravarthy, Singh, Aror, Sengupta & Munshi 2010:540). Findings from another study showed that the exposures to patients’ BF notified in haemodialysis wards resulted from the needle stick injuries in 85 cases (70.2%), splashes to the eyes or non-intact skin in 30 cases (24.8%) and cuts in 6 cases (5.0%) (Tarantola, Lheriteau, Astagneau & Bouvet 2005:167).

Kessler, McGuinn, Spec, Christensen, Baragi and Hershow (2011:129) conducted a study at two University Medical Centres in Chicago, and Northwest Indiana, by distributing anonymous questionnaire among 505 HCWs. The target sample population including medical students; nursing professionals; dental professionals; and residents in internal medicine, emergency medicine, surgery, and obstetrics and gynaecology. The results showed that 22.6% of the HCWs reported exposures to used sharps during their professional careers and 33.0% of these sharp injuries were not reported.
Furthermore, 23.1% of the HCWs reported muco-cutaneous exposures during their professional careers and 82.9% of these exposures were not reported. Participants further reported that the most common year(s) of their exposures was during the intern years. The most common reason reported by participants for not reporting the exposures was the belief that the exposures were not significant, followed by the fact that they were too busy to report them.

In an Australian study conducted in a teaching hospital, findings showed that of the total of 931 patients’ BF exposures reported by HCWs; 594 were percutaneous exposures while 337 were muco-cutaneous exposures. Findings further revealed that the medical staff experienced sharps injuries at a higher rate, followed by nurses, scientists and laboratory technicians. Other non-medical staff included the paramedical staff and administration personnel (Peng, Tully, Pearce & Hiller 2006:465).

In another multicenter retrospective study involving many hospitals which was conducted in three West African countries by Tarantola et al (2005:276), findings showed that a total of 1241 HCWs participated in the survey from 43 hospital wards. Among the participants, 567 (45.7%) had sustained at least one occupational exposure to patients’ BF$s with an estimated incidence of 0.33 percutaneous injuries and 0.04 muco-cutaneous contacts. Needle stick injuries accounted for 80.1% of 567 cases, a cut in 3.4%, a splash or contact with non-intact skin in 87 cases 15.3%, and were undocumented in seven cases 1.2% (Tarantola et al 2005:276).

A more recent study in Congo by Ngatu et al (2012:68), the results indicated that the prevalence was higher among HCWs in the rural hospitals (91.7%, vs 40.5% in urban hospitals). Nurses and doctors accounted for a greater risk of exposure to BBF events compared to support personnel. The results further indicated that HCWs working during the night shift had a 7.2 times greater risk of sustaining percutaneous injury compared to HCWs working the day shift (Ngatu et al 2012:68).

The results from a study on occupational exposures of HWCs to patients’ BF conducted in Tanzania, by Manyele, Ngonyani and Eliakimu (2008:159) documented that of the total of 430 HCWs involved in their study, needle stick injuries accounted for the most
common accidents (52.9%); followed by splash of blood from patients (21.7%); burn injury from chemicals (10.6%); and slippery floors (5.9%).

According to a study conducted in northern Ethiopia among six hospitals, findings showed that of the total of 618 HCWs who were interviewed, 17.2% reported to have sustained a needle stick injury; 56.3% had contact with patients’ BF through their skin and 24.9% reported exposure to their mucus membranes. Findings further showed that HCWs who were working in the delivery rooms (80.4%) and gynaecological wards (75%) had higher risk of exposures to patients BFs (Gessessew & Kahsu 2009:213).

2.3.4 Occupational body fluid exposures of health care workers in relation to age and sex

The researcher searched several publications on the subject and found mixed findings reporting higher occupational exposures among young aged female HCWs and among elderly and males reported in others. For example, higher odds of experiencing an injury in male than female nurses were reported in studies conducted in Iran, France, Australia, and the United States of America (Mehrdad, Soheila & Marion 2008:517).

One particular study conducted in South Africa in Witbank hospital described that the youngest members of staff were at the highest risk as (61.9%) of HCWs of the age ranges between 20–29 years were mostly exposed to patients’ BF through needle stick injuries (Lachowicz & Matthews 2009:150). The results further revealed that the risk of experiencing such injuries first decreased with age, reaching the lowest level among the age group ranges between 40–49 years (34.2%). However, an increase in such injuries was noted again among HCWs older than 50 years (Lachowicz & Matthews 2009:150). The implication from these findings is that additional studies may be necessary to identify demographic exposure differences among HCWs exposed to patients BFs and recommendations for possible explanations among the different job category of HCWs be provided.
2.3.5 Occupational body fluid exposures among health care workers and the type of job category

Studies carried out in several countries have reported varying rates of needle-stick injuries or exposure to patients’ BF among different categories of HCWs (Karani, Rangiah & Ross 2011:462).

Findings from a review conducted by Bahadori and Sadigh (2010:2) showed that nurses, medical doctors, and laboratory technicians were the three most professional groups that most frequently reported exposures to patients’ BF. Similarly, Mehrdad et al (2008:517) reported unacceptably high levels of exposures to patients’ BF among nurses in Iran, Fars province hospitals. The authors concluded that the proportion of nurses experiencing exposure to patients’ BF in Iran is comparable to the findings from the developing countries (e.g. 55% in Uganda, 72% in India, and 82% in China) in contrast to the finding that only 9% of nurses were exposed to patients’ BF in the USA (Mehrdad et al 2008:517).

Explanations for high occurrences of exposures to patients’ BF particularly among nurses and physicians differ; however, there are various factors that have been identified as the leading causes for such exposures. Such factors include among others: a relatively higher number of nurses in health settings, reluctance of doctors to report needle stick injuries due to potential subsequent restrictions on their medical practices, the lack of experience in conducting some medical procedures, insufficient training on prevention of exposures to patients’ BF, work overload and fatigue, etc (Bahadori & Sadigh 2010:2).

2.3.6 Occupational exposures of health care workers in relation to health care settings

According to Chen, Sexton, Kaye and Anderson (2009:538), the mean rate of BF exposure ranged from 2.2 to 12.9 exposures per 10,000 inpatient days of care. Similar results were found in a study conducted in Brazil on among HCWs in primary health care centres where, the mean incidence rate of occupational exposures to patients’ BF was 11.9 per 100 full-time equivalent worker-years in primary health care centres.
Factors associated with an increased risk of occupational exposure to patients’ BFs among HCWs may differ from one health care setting to another. Similar factors were identified from a study conducted in Mulago hospital which is situated in Uganda, whereby factors such as completion of hepatitis B vaccination, access to PEP, using hands free passing technique, use of blunt suture needles, non-fluid resistant cotton gowns and masks worn by HCWs were below the acceptable quality standard to provide adequate protection (Kimuli, David, Tulsky & Schecter 2011:86).

Training of HCWs on infection prevention and control measures was identified as another factor which is crucial to reduce the risk of exposure occupational exposures to patients’ BFs among HCWs. Findings from another Ethiopian behavioural study among HCWs conducted by Reda et al (2010:4) revealed a low (39.9%) participation in standard precaution training and the associated high (3.5%) life time prevalence of needle stick injuries among HCWs who participated in the study.

In order to reduce the occupational risks associated with exposure to patient’s BFs measures such as establishing a 24 hours accessible formal post-exposure prophylaxis centre with proper guidelines along with raising awareness among HCWs were highly recommended (Bosena & Chemet 2010:55).

2.3.7 Recurrent exposures to patients’ body fluids among health care workers

According to a study conducted among South African HCWs in public hospitals, findings showed that the number of needle stick injuries reported by each HCW during the study period revealed that slightly more participants reported to have experienced needle stick injuries twice or thrice (45.59%) compared to those who reported to have experienced it only once (44.61%) (Lachowitz & Matthew 2011:148). Evidently, factors contributing to HCWs’ recurrent exposures to needle stick injuries has not been well studied, however literature has suggested that there are certain groups of HCWs who may be more prone to exposures to needle stick injuries by virtue of their attitudes towards adhering to
safety measures, work habits, individual psychomotor characteristics, etc (Lachowitz & Matthew 2011:150).

2.4 CAUSES OF OCCUPATIONAL EXPOSURES TO PATIENTS’ BODY FLUIDS AMONG HEALTH CARE WORKERS

2.4.1 Needle stick and other types of occupational incidents

According to the Centre for Disease Control and Prevention (CDC), the two main types of occupational exposures to patients’ BF are percutaneous or non-percutaneous exposures. A percutaneous exposure occurs where the skin has been cut or penetrated by a needle or other sharp object that may be contaminated with blood or other body fluid. A non-percutaneous exposure involves contact of mucous membranes (mouth, nose, eyes) or non-intact skin with blood, tissue or other body fluids that are potentially infectious (CDC 2009:9). The CDC report further stated that needle stick injuries are the leading type of occupational exposure to patients’ BF among HCWs and this finding is in agreement with the literature (Hadadi, Afhami, Karbakhsh & Esmailpour 2008:494).

According to Zungu, Sengane and Setswe (2008:48), needle prick injuries constitute the highest and the commonest way in which HCWs can contract HIV and other blood-borne infections from patients. Similarly findings from a study conducted by Umayya et al (2008:98) showed that needle stick injuries were the most common cause (75%) of occupational exposures to patients’ BF among HCWs that led to acquiring blood borne infections among these workers. Findings further revealed that most of these injuries occurred during clinical procedures such as (inserting an intravenous infusion, splash of fluid, restless patient and during handling or passing of medical and surgical devices during a procedure). On the contrary, the authors stated that needle stick injuries occurred less frequently among HCWs during the conduct of procedures such as improper disposal of sharps contaminated with patients’ blood and recapping of used needles (Umayya et al 2008:88).
2.4.2 Procedures associated with accidental occupational exposure among health care workers

A South African based study conducted by Zungu et al (2008:48) identified procedures that were associated with needle prick injuries among HCWs and were ranked in terms of the rates of the circumstances that led to the occurrence of such injuries. The authors further indicated that the findings of their study confirmed that needle recapping was the most circumstance leading to occurrence to needle prick injuries, taking of blood specimens was the second, suturing was the third one followed by disposing used sharps, and lastly the giving of injections.

Findings from another similar study showed that common causes of needle stick injuries include type and design of needle, recapping activity, handling/transferring specimens, collision between HCWs or sharps, during clean-up, manipulating needles in patient line related work, passing/handling devices or failure to dispose of the needle in puncture proof containers (Sumathi, Prashant, Meenakshi & Manju 2010:405). In another study findings showed that fingers were found to be the most commonly reported anatomical location (77%) for needle stick injuries (Bowman & Bohnker 2005:1034).

2.4.3 High risk place for occupational exposure to patients’ body fluids

In a hospital setting, surgical and emergency divisions are known to be high risk areas for exposure to patients’ BF. This is further aggravated by HCWs who have less working experience. These sentiments are supported by results of a study conducted by Hadadi, Afhami, Karbakhsh and Esmailpour (2008:492) which confirmed the notion of higher risk of exposure among those HCWs working in surgical and emergency units and those who were less experienced in their professions.
2.5 POST-EXPOSURE CONSEQUENCES

2.5.1 The sero-status of the source patient and laboratory investigation after exposure to patients’ body fluids

Sero-status of the source patient and the immediate post-exposure test for HIV and HBsAg must be done for all HCWs who report about the incident of exposure to patients’ BFs. According to Lachowicz and Matthews (2009:150), out 89 HCWs who underwent the initial ELISA test following exposure to patients BFs, 27 (30.3%) did not return for follow-up ELISA test to establish sero-conversion at 12 weeks and later thereafter. Only 19 (21.3%) HCWs underwent testing for HBsAG, and of those 11 (57.8%) had taken hepatitis B vaccination. The results further indicated that none of the HCWs studied tested HIV positive from the ELISA test. Four (36.3%) of the nurses who received testing for hepatitis B surface antigen (HBsAg) developed hepatitis B infection. However, there was insufficient evidence to link their hepatitis B infections to occupational exposures (Lachowicz & Matthews 2009:150).

2.5.2 Risk of transmission of pathogens among health care workers following accidental occupational exposure

It is known that HCWs are potentially at risk of exposure to patients’ BFs that contain pathogens which leads to an increased risk to occupationally acquire transmissible diseases (Catalani et al 2004:73) Significantly, the risk of HIV sero-conversion following an occupational blood exposure has been estimated to lie at 0.2 to 0.3 percent for parental exposures and at 0.1 percent or less for mucosal exposures (Gerberding 1995).

Furthermore, the risk of transmission of blood borne viruses among HCW from patients’ BFs is dependent on a number of factors; which include among others the pathogen involved, type and route of exposure, type of virus and viral level in the infected individual, amount of virus present in the infected blood during exposure, amount of infected blood involved in the exposure, whether post-exposure treatment was take and specific immune response of infected individual (United Kingdom Health Protection

2.6 POST-EXPOSURE PROPHYLAXIS MANAGEMENT

2.6.1 Under reporting of exposures to patients’ body fluids

Prompt reporting of occupational exposures to patients' BFs is essential for prompt management of the exposure, particularly where post-exposure treatment may be necessary. Under reporting rate has been estimated to be between 26% and 85% in previous studies (Trim & Elliott 2003:237). Similarly findings from a study conducted in West Africa, findings showed that over 60% of the exposures were not reported. (Tarantola et al 2005:167).

Reasons described for not reporting occupational exposures among HCWs include among others, too time consuming; low transmission risk; do not want to disrupt operating lists; accident reporting form too complicated; nothing useful can be done following exposure; and fear of embarrassment. (Kennedy, Kelly, Gonsalves & McCann 2009:298). Additional reasons for failure to report exposures to patients' BFs include perceived severity of the disease, perceived efficacy of reporting and overall motivation to maintain health (Tabak, Shiaabana & Shasha 2006:28). In addition other reasons reported by HCWs include the fact that personnel providing care to HCWs after exposures to patients' BFs were perceived as not prepared for this role and the place where care was provided for HCWs was not seen as ready for that purpose (Moayad Wahsheh, Maysoun & Atoum 2011:74).

In a study conducted by Hamlyn and Easterbrook (2007:329) which summarises the management of HCWs and others exposed to blood borne pathogens in an occupational setting, and the evidence behind it, findings revealed that no large prospective randomised controlled trials have been performed to determine the efficacy of occupational PEP and much of the evidence for prescribing PEP are derived from a CDC case control study of occupational exposure to HIV in HCWs. For effective In management of those exposed to patients' BF, the United States public health service
recommends the use of a dual therapy for PEP in low risk injuries (Panlilio, Cardo, Grohskopf, Heneine & Ross 2005:17).

In the case of HBV if the source of occupational exposure is a confirmed hepatitis B carrier or deemed to be of high risk, HBV immune globulins can also be administered, preferably within 24 hours from the exposure but no later than one week. Currently there is no available PEP following exposure to HCV. Post-exposure testing of the victim is, however, recommended though regimens for treatment vary (Puro, Carli, Cicalini 2005:260).

Follow-up is essential and should be arranged regardless of whether or not PEP is prescribed. Follow-up testing for HIV, and for other blood-borne viruses if necessary, should occur at 4–6 weeks, 3 months and 6 months. (Hamlyn & Easterbrook 2007:331).

2.7 PREVENTION OF HEALTH CARE WORKERS’ OCCUPATIONAL EXPOSURES TO PATIENTS’ BODY FLUIDS

Most exposures to patients’ BFs among HCWs in health care settings are preventable. Adherence to universal or standard precautions is the primary way to prevent occupational exposures of HCWs to blood borne pathogens. When primary prevention measures failed to prevent occupational exposures to patients’ BFs, then PEP remains the second line of defence (Beekmann & Henderson 2005:331).

Notably, the use of PEP has been suboptimal due to lack of knowledge and other related factors. Findings of a study conducted in Ethiopia among 254 HCWs showed that 81.6% of those exposed to patients BFs did not use PEP (Bosena & Chemet 2010:55). Reasons for not using PEP included among others, the lack of information about the existence of institutional PEP services (33.8%), fear of stigma and discrimination by co-workers (32.4%), lack of understanding of the value of reporting occupational exposures (23.2%) and lack of support and encouragement to report such exposures (20.4%) (Bosena & Chemet 2010:55). The authors further cited the non-existence of formal HIV PEP centre with proper guidelines on the appropriate use of available as other reasons reported by participants for not using PEP.
2.8 CONCLUSION

The review of the literature presented in this chapter has highlighted the global and Sub-Saharan Africa perspectives on occupational exposures of HCWs to patients’ BFs, the pattern and causes of such exposures, rate of reporting of exposure incidents as well strategies for management thereof. In conclusion, the review of literature clearly indicated that occupational exposures to patients’ BFs are very common among HCWs. The pattern of such exposures could also vary depending on the rate of exposure, the mode of exposure and other factors described in this chapter. Also, under reporting of exposures is very high and post-exposure management and preventive measures provided in most health care settings were not adequate. The next chapter will describe the methodology used to conduct the current study.
CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter discusses the methodology used to conduct the research on occupational exposure to patients’ BF among HCWs in Tikur Anbessa University hospital in Ethiopia. The research design, study population, sampling method and rationale as well as the setting in which the study was conducted are also described in this chapter. Data collection methods and analysis are also presented and lastly, details pertaining to measures of reliability, validity and ethical considerations applied in this study are also discussed.

3.2 RESEARCH METHODOLOGY

3.2.1 Research paradigm

The research approach used in this study was a quantitative research paradigm. This approach was used because it focuses on deductive reasoning which is essential to generate predictions, and also because the focus of this study was on quantifiable variables, i.e. to study the pattern of HCWs’ occupational exposure to patient’s BF in a targeted University hospital in Ethiopia.

3.2.2 Research design

The design used in this study was a contextual descriptive cross-sectional design. This study attempted to describe the occupational exposure of HCWs to BF in order to improve the management of these incidents at a tertiary university hospital. A cross-sectional design is used to examine groups of subjects in various stages of development simultaneously with the intent to describe changes in the phenomenon across stages (Burns & Grove 2005:236). Also, a cross-sectional design describes the prevalence of particular exposures in a targeted population at a particular point in time.
In this study the pattern of HCWs’ occupational exposure to patients’ BFs as well as the related circumstances were investigated. Furthermore, in this study a cross-sectional design was selected for its advantage of being relatively less time consuming, less costly, its ease to apply in quantitative approaches and its accurateness in collecting data for the phenomenon under study.

3.3 RESEARCH METHOD

Research methodology refers to techniques and practices used in the course of sampling, data collection, data processing and analysis (Bowling 2009:158). The study setting, population, sample, sample size, method of data collection and data analysis are described in the next section.

3.3.1 The study setting

The study setting is referred to as the physical location and conditions in which data collection takes place in a study (Polit & Beck 2008:568). Therefore the setting for this study was Tikur Anbessa hospital, which is a referral and teaching center for all regions of Ethiopia. It is situated in the capital city of Ethiopia, Addis Ababa. The hospital was established in 1972 with a compound of 123,000 meter square area. It is built on 45,000 meter square area and the building has eight stories and 1,262 bed rooms.

Since its establishment as a public hospital it was run by the Ministry of Health until 1998 when it was transferred to Addis Ababa University. The outpatient morbidity statistics from 1996 to 2003 indicated that an average of more than 180,000 new outpatient clients had been served every year in the Tikur Anbessa University hospital. The hospital has four main departments that are internal medicine, surgery, pediatrics, gynecology and obstetrics and also, there are other several specialty units.

According to the database obtained from the hospital human resources department, Tikur Anbessa University hospital has 1,343 HCWs, of which 593 are physicians (specialist doctors, residents and interns), 420 are clinical nurses, 30 are laboratory technicians and 300 are cleaners or housekeepers as shown in table 3.1.
Table 3.1  Distribution of HCWs per category

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicians</td>
<td>593</td>
<td>44.2</td>
</tr>
<tr>
<td>Clinical nurses</td>
<td>420</td>
<td>31.2</td>
</tr>
<tr>
<td>Laboratory technicians</td>
<td>30</td>
<td>2.2</td>
</tr>
<tr>
<td>Cleaners/Housekeepers</td>
<td>300</td>
<td>22.3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1343</strong></td>
<td><strong>99.9</strong></td>
</tr>
</tbody>
</table>

3.3.2  Sampling procedure

3.3.2.1  Population

Population is a general term and it consists of two groups namely a target population and accessible or study population. According to Joubert and Katzenllenbogen (2007:94) the target population is the whole group about which we wish to gather information from and draw conclusions, and Polit and Beck (2008:338) described source or accessible population as part of the target population that was accessible to the researcher at the time when the study was conducted.

The target population for this study comprised of all HCWs employed at Tikur Anbessa University hospital in Ethiopia and HCWs who met the inclusion criteria set for this study and were available during the period of the study constituted the study population. In this study HCWs included the physicians, nurses, laboratory technicians and cleaners as defined in chapter one of this study.

3.3.2.1.1  Criteria of inclusion

The inclusion criteria set for this study include various categories of HCWs who were at risk of being exposed to patients’ BF while carrying out their duties. HCWs who were available (i.e. on duty during the conduct of the study) and those who were willing to participate in the study.
3.3.2.1.2 Criteria of exclusion

For this study, all HCWs who were not willing to participate in the study and those who were not on duty during data collection period were excluded from the study. HCWs who were not involved in direct management of patients were also excluded from the study.

3.3.2.2 Sampling

According to Polit and Beck (2008:339), sampling refers to the process of selecting a portion of the population to represent the entire population so that inferences about the population can be made. The sampling procedure and sample size calculation used in this study are explained in the section below.

3.3.2.2.1 Sampling procedure

The four major departments of the hospital (internal medicine, surgery, pediatrics and gynecology/obstetrics) were purposely selected in the assumption of finding almost all HCWs including those in subspecialty units who are under these departments. In addition the hospital has no other units such as dental, ophthalmology to include in the study. A stratified random sampling technique that considered a fair representation of all HCWs in the four departments was employed. The study samples that have been determined in the sample size determination technique were distributed in the four departments fairly according to their health worker number proportion HCWs registrations were used as sampling frame. To select the study subject the total number of HCWs in each department were categorised in to doctors, nurses, laboratory technicians and cleaners and further the doctors were grouped in to specialists, residents and interns and the study subjects were drown according to their number proportions. To determine sampling interval and select the first subject, the total number of HCWs was divided to the total sample size and the first person was selected by lottery method and follow the already determined sequences.
3.3.2.2 Sample size and characteristics

Sample size calculation

The sample size were determined using a single proportion formula taking proportion of 35% BF Exposure, a conservative estimate to obtain a sample size at 80% certainty and a maximum discrepancy of 5% between the sample size and the underline population.

Sample size was derived using the statistical formula described below:

\[ n = \left( \frac{Z_{\alpha/2}}{d} \right)^2 \times p (1-p) \]

Where,
\[ n = \text{sample size} \]
\[ p = \text{HCWs BF exposure proportion (35\%)} \]
\[ Z = \text{standard normal distribution curve value for the 95\% confidence interval (1.96)} \]
\[ d = \text{the margin of error or accepted error, 5\%} \]

\[ n = (1.96)^2 \times 0.5(1-0.35) \]
\[ (0.035)^2 \]
\[ n = 277 \text{ persons.} \]

With 20\% (n=55) contingency of the non-response rate, the total sample size were 332 persons.

Table 3.2 Proportion of HCWs per professional category

<table>
<thead>
<tr>
<th>Job category</th>
<th>Total numbers</th>
<th>Proportions required (%)</th>
<th>Sample size required*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctors</td>
<td>593</td>
<td>0.44</td>
<td>147</td>
</tr>
<tr>
<td>Nurses</td>
<td>420</td>
<td>0.31</td>
<td>104</td>
</tr>
<tr>
<td>Cleaners</td>
<td>300</td>
<td>0.22</td>
<td>74</td>
</tr>
<tr>
<td>Laboratory technicians</td>
<td>30</td>
<td>0.02</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1343</strong></td>
<td><strong>0.22</strong></td>
<td><strong>290</strong></td>
</tr>
</tbody>
</table>
Table 3.3 Proportion of HCWs per department

<table>
<thead>
<tr>
<th>Job category/strata by department</th>
<th>Total numbers</th>
<th>Proportions required (%)</th>
<th>Sample size required*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal medicine</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctors</td>
<td>160</td>
<td>0.25</td>
<td>41</td>
</tr>
<tr>
<td>Nurses</td>
<td>110</td>
<td>0.23</td>
<td>26</td>
</tr>
<tr>
<td>Cleaners</td>
<td>77</td>
<td>0.23</td>
<td>18</td>
</tr>
<tr>
<td>Laboratory technicians</td>
<td>9</td>
<td>0.22</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>356</td>
<td>0.24</td>
<td>87</td>
</tr>
<tr>
<td><strong>Surgery</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctors</td>
<td>158</td>
<td>0.22</td>
<td>37</td>
</tr>
<tr>
<td>Nurses</td>
<td>104</td>
<td>0.23</td>
<td>26</td>
</tr>
<tr>
<td>Cleaners</td>
<td>76</td>
<td>0.25</td>
<td>19</td>
</tr>
<tr>
<td>Laboratory technicians</td>
<td>8</td>
<td>0.25</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>347</td>
<td>0.24</td>
<td>84</td>
</tr>
<tr>
<td><strong>Gynae/obstetrics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctors</td>
<td>144</td>
<td>0.24</td>
<td>35</td>
</tr>
<tr>
<td>Nurses</td>
<td>105</td>
<td>0.23</td>
<td>25</td>
</tr>
<tr>
<td>Cleaners</td>
<td>75</td>
<td>0.25</td>
<td>19</td>
</tr>
<tr>
<td>Laboratory technicians</td>
<td>7</td>
<td>0.28</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>331</td>
<td>0.24</td>
<td>81</td>
</tr>
<tr>
<td><strong>Pediatrics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctors</td>
<td>131</td>
<td>0.27</td>
<td>35</td>
</tr>
<tr>
<td>Nurses</td>
<td>101</td>
<td>0.24</td>
<td>25</td>
</tr>
<tr>
<td>Cleaners</td>
<td>72</td>
<td>0.25</td>
<td>18</td>
</tr>
<tr>
<td>Laboratory technicians</td>
<td>6</td>
<td>0.33</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>311</td>
<td>0.25</td>
<td>80</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>1343</td>
<td>0.22</td>
<td>332</td>
</tr>
</tbody>
</table>

*Sample size calculated according to proportions

3.3.3 Data collection process

3.3.3.1 Data collection method

For the purpose of this study a structured data collection tool was used in order to ensure consistency and enhance objectivity of data collected among participants. Therefore, a self-administered questionnaire which was developed by the researcher based on the findings from the reviewed literature was used to collect data from the participants.
3.3.3.2 Data collection tool

Data for this study was collected by using a structured questionnaire. The data collectors collected the data from the different departments of the university hospital. The research instrument of this study was developed following the steps in questionnaire development described by Katzenellenbogen and Joubert (2009:107). These include among others the following activities:

- List the variables to be measured
- Formulate the question and answer option
- Decide the organization and structure of each question
- Determine the sequence of each question
- Plan the layout and design of the questionnaire
- Consider the scale of measurement of variables
- Consider what coding need to be done after data collection
- Consider the means of data analysis pilot (pr-test) the questionnaire

In addition, some item from instruments used in literatures and previous publications were also adopted, in the questionnaire items of this study. The main sources used by the investigators were the two previously used data tools from similar studies by CDC and India Mumbi hospital (CDC 2012:7) and Samir, Singru and Amitav (2008:26).

The investigator also discussed the draft protocol which was initially prepared in English (for most respondents) and Amharic version (for cleaners who do not read English) with the research supervisor who provided generous helpful comments. Both versions of the tool were then pretested by the investigator, the two data collectors and four other HCWs from another health facility (nearby hospitals) and the feedback was accommodated accordingly.

3.3.4 The data collection instrument

The questionnaire used to collect data for this study comprised of 20 main items which were categorized into four sections, namely:
Section A consisted of questions that collected data on participants; demographics such as age, gender, job category, years of working experience, etc.

Section B comprised of questions on the details of HCWs’ occupational exposure to patients’ BF. This section particularly focused on the characteristics of the occupational exposures including the type of body fluid that HCWs are exposed to and its sources, route of exposure and the procedure during which the exposure occurred, the place and time of exposure occurrence, and viral status of the source patient.

Section C collected data on existing procedures for post-exposure management. The section covered the type of procedure leading to BF exposure and how the incident was managed which includes notification of the incident, lab investigation done and the treatment received.

Section D included questions on HCWs’ perceptions and opinions on occupational exposure to patients' BF. The last section explored HCWs’ perception, opinion and practice such as concern about blood born infection, belief about avoiding exposures, risks of HIV, HBV and HCV, knowledge about gloves and syringe use. This section also inquires the use of protective measures by the HCWs, HBV immunisation status, and other preventive management.

3.3.5 Pre-testing of the instrument

The questionnaire was pretested on 6 conveniently selected HCWs from a neighboring hospital, comprising two doctors, two nurses, one laboratory technician and one cleaner. The pre test participants generously commented on what they feel about the data tool in general, what they thought the questions wanted to find out, and any questions they thought needed changes, and their suggestions on how this could be improved. Amendment was performed on the questionnaire based on the responses from the pretesting.

3.3.6 Data collection process

The researcher collected the data from the participants and informed consent was requested and obtained from participants prior to administering the questionnaires.
Participants were requested to return the completed questionnaires by dropping them off at the return boxes that were clearly marked and provided in designated areas in the hospital. The researcher then emptied the return boxes on alternate days until the period of data collection was completed.

3.4 DATA ANALYSIS

Before the process of data analysis started, data was checked by the researcher for possible errors that might have arisen from the original document during the process of data entry (Katzenllenbogen & Joubert 2007:107). After data was coded and entered into a computer, it was analysed by using the SPSS (Windows version 14). Descriptive statistics were used to summarise categorical data in terms of frequencies, means, percentages, etc. Tables, figures and pie charts were used to summarised information.

3.5 ETHICAL CONSIDERATION

In this study ethical considerations were addressed through the following measures:

3.5.1 Obtaining permission to conduct the study

Before the study was conducted, ethical clearance was obtained from the Research Ethics Committee of the Department of Health Studies of the University of South Africa (UNISA). Institutional consent was obtained from the Addis Ababa University Medical Faculty, after communicating with them through the formal letter from received from UNISA.

3.5.2 Participants’ informed consent

In this study informed consent was obtained from participants before they completed the questionnaires. Specifically, participants were informed about the objective of the study and its benefits in the prevention of occupational exposure to patients’ BF among HCWs and also how confidentiality, anonymity and privacy would be maintained in the study. Furthermore, participants were informed that their participation in the study was voluntary and they were free to decline to participate or that they could withdraw from participating in the study at any time without incurring negative consequences.
3.5.3 Protection from discomfort and harm

This study did not impose any discomfort, physical or psychological harm to participants; however any potential adverse effects were going to be addressed should they have occurred. Participants did not incur any financial costs by participating in this study and no incentives were given to them for their participation.

The researcher envisaged that participants might be reluctant to report on issues that might reflect that their practices in the past have been below the expected standard of practice. In order to protect them from any potential physical and psychological harm, the researcher prepared a covering letter explaining the aim and objective of the study and emphasizing the fact that confidentiality would be maintained with regards to the information provided.

3.5.4 Confidentiality and anonymity

In this study, the researcher assured each participant that all their responses would be kept confidential and would not be disclosed to anyone else other than the statistician. Anonymity was assured by using codes instead of participants’ names, thus participants were requested not to write their names or any other identifiable information on the questionnaires.

3.5.5 Beneficence

The benefits for participating in this study were explained to participants in terms of the significance for conducting the study, the aim and objectives as well as the recommendations that would emanate from the findings of the study. It was explained to participants that their participation in the study would provide the required data to determine the pattern of exposure to biological hazards which would lead to implementing safety measures to protect HCWs from occupational exposure to patients’ BF. This would significantly promote the quality of their work life.
3.6 INTERNAL AND EXTERNAL VALIDITY OF THE STUDY

3.6.1 Validity

Burns and Grove (2005:376) referred validity as the degree to which an instrument measures what it is supposed to measure. Furthermore, measures to enhance external validity included using a large sample, which was representative of the total population and also literature validations which enabled the researcher to compare the findings of the current study with those from other previous similar studies.

3.6.2 Reliability

Reliability refers to the tendency towards consistency found in repeated measurements (De Vos, Strydom, Fouché & Delport) the research instrument of this study was compiled and adapted by the researcher after reviewing the literature and consulting experts in the field, which included among other, the study supervisor.

In this study, reliability of the instrument was ensured through pre-testing it among HCWs from another hospital who were not involved in the main study. The pre-tested findings showed that the questionnaire was well developed and well understood by participants and thus, no modifications were made.

3.7 CONCLUSION

This chapter highlighted the research methodology used in the conduct of this study. Research design selected for this study was also explained. Outlined in the methodology were the research design and setting; sampling procedure followed; including the inclusion and exclusion criteria, sample size and data collection method and process. Also, ethical considerations complied with in this study were explained. Data analysis procedures and methods were described as well as also looked into. The next chapter will present and discuss the findings of the current study.
CHAPTER 4

DATA ANALYSIS, PRESENTATION AND DISCUSSION
OF RESEARCH FINDINGS

4.1 INTRODUCTION

This chapter presents the analysis of the findings of this research. Data analysed was obtained from HCWs at Tikur Anbessa University hospital by means of a self-administered questionnaire. Data is presented in tables, pie diagrams and bar graphs. The results are presented in four sections as in line with the study objectives as outlined chapter 1, namely; (1) Participants’ demographic data, (2) Circumstances leading to HCWs exposure to patient’s BF's, (3) Nature of occupational exposures experienced by HCWs and (4) Management of exposure incidents. The discussion of the research results is also presented at the end of this chapter.

4.2 STATISTICAL ANALYSIS AND INTERPRETATION OF RESULTS

4.2.1 Participant’s response rate

Three hundred and thirty two questionnaires were distributed among HCWs at Tikur Anbessa University hospital and a total of 290 completed and useable questionnaires were returned, giving an overall response rate of 290 (87.3%).

4.2.2 Participant’s demographic data

4.2.2.1 Age distribution

Participants’ age groups were summarised by calculating the mean, median, standard deviation, as well as minimum and maximum values. The results indicated that participant’s age groups ranged from 20–59 years. The mean age was 28 years and the median was 25 years. The minimum age value was 20 and the maximum age value was 59, with a standard deviation of 6.09 as shown in table 4.1.
Table 4.1  Analysis of age with the means procedure (N=290)

<table>
<thead>
<tr>
<th>Frequency (n)</th>
<th>Mean</th>
<th>Median</th>
<th>Standard deviation</th>
<th>Minimum age</th>
<th>Maximum age</th>
</tr>
</thead>
<tbody>
<tr>
<td>290</td>
<td>28</td>
<td>25</td>
<td>6.08</td>
<td>20</td>
<td>59</td>
</tr>
</tbody>
</table>

Participants’ demographic characteristics are summarised, in figure 4.1, showing each variable, the frequency and the response rate in percentage. The results showed that the majority of the participants were within the age bracket of 20 and 29 years 172 (59.3%), followed by those within the age group of 30–39 years 67 (23.1%). Participants who belonged to the age group from 40–49 years were 34 (11.7%) and lastly those within the age group of 50–59 years were 17 (5.9%).

![Figure 4.1 Participants’ age group distribution (N=290)](image)

4.2.2.2  Gender distribution

With regards to participants’ gender distribution the analysis showed that there were more females 195 (67.2%) compared to males 95 (32.8%), resulting in overall male to female ratio of 1:2.05.
4.2.2.3 Distribution of participants’ job category

As shown in table 4.2 the results showed that the majority of the participants were nurses 119 (41.0%). This was followed by 96 (33.1%) who were physicians (i.e. 9 specialists, 60 residents, 27 interns), 67 (23.1%) were cleaners, and 8 (2.8%) were laboratory technicians as shown in table 4.2.

Table 4.2 Distribution of participants per job category (N=290)

<table>
<thead>
<tr>
<th>Job category</th>
<th>Frequency (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurses</td>
<td>119</td>
<td>41.0</td>
</tr>
<tr>
<td>Physicians*</td>
<td>96</td>
<td>33.1</td>
</tr>
<tr>
<td>Cleaners</td>
<td>67</td>
<td>23.1</td>
</tr>
<tr>
<td>Laboratory technicians</td>
<td>8</td>
<td>2.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>290</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

*9 specialists, 60 residents, 27 interns

4.2.2.4 Distribution of participants’ years of service

Figure 4.3 presents the results which showed that the majority of the participants had total years of service of less than 10 years and constituted 215 (74.10%). The second highest group had between 11–20 years of working experience 42 (14.50 %), followed by those who worked for 21–30 years and they constituted 20 (6.90%). The least represented were those participants who worked from 31–40 years (4.10%), only 1 (0.30%), person served for over 40 years as shown in figure 4.3.
4.2.3 Circumstances of occupational exposures

4.2.3.1 Pattern of occupational exposure to patients’ body fluids among participants

Of the total 197 exposure incidents reported by participants, the incidence of occupational exposure to patients’ BF during the last 1 year was 66 (33.5%) and the in professional life was 131 (66.5%) as shown in table 4.3.

<table>
<thead>
<tr>
<th>Table 4.3 Occupational exposure to patients’ body fluids (N=290)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency of exposures among HCWs*</td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td>Last 1 year</td>
</tr>
<tr>
<td>Professional life time</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

*11% HCWs reported multiple injuries which consist of two to five incidents

4.2.3.2 Participant’s response on occupational exposure by job category

Only 131 (45.1%) participants responded to this question. All senior specialist doctors had reported accidental exposure to patients’ BF, followed by cleaners 34 (50.7%), residents at 26 (43.3%); and nurses at 49 (41.2%). Exposure was less common among
laboratory technicians and interns 3 (37.5%) and 10 (37.0%) respectively) as shown in figure 4.4.

![Figure 4.4 Exposure to patients body fluids per job category (N=131)](image)

**4.2.3.3 Participants’ responses on the type of occupational body fluid exposures**

The types and proportions of HCWs who experienced exposure to patients’ BFs in the past are shown in table 4.4. In total, there were 131 exposures reported by participants, and most of them were due to needle stick injuries 63 (48.1%), followed by splashes of patient's BFs 45 (34.3%). The rest were due to incidences like cut injuries 16 (12.2%) and others such as blood contact with open skin wound, contact with plastic and non sharp devices e.g. when securing urine catheter or intravenous delivering system constituted 7 (5.3%).

All specialist doctors, 26 (43.3%) of residents, 49 (41.2%) of the nurses, 30 (37.7%) of the laboratory technicians, 10 (37.0%) interns and 34 (50.7%) cleaners reported to have experienced exposures to patients’ BFs which were related to accidents during their professional lifetime.
<table>
<thead>
<tr>
<th>HCWs job category</th>
<th>Needle stick injury</th>
<th>Body fluid splash</th>
<th>Cut Injury (%)</th>
<th>Other exposures*</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialist doctors</td>
<td>5 (71.4%)</td>
<td>2 (28.6%)</td>
<td>1 (0%)</td>
<td>1 (0%)</td>
<td>9 (100%)</td>
</tr>
<tr>
<td>Residents</td>
<td>11 (42.3%)</td>
<td>9 (34.6%)</td>
<td>4 (15.4%)</td>
<td>2 (7.6%)</td>
<td>26 (43.3%)</td>
</tr>
<tr>
<td>Nurses</td>
<td>25 (51.0%)</td>
<td>18 (36.7%)</td>
<td>4 (8.2%)</td>
<td>2 (4.2%)</td>
<td>49 (41.2%)</td>
</tr>
<tr>
<td>Lab technicians</td>
<td>2 (66.6 %)</td>
<td>1 (33.3%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>3 (37.5%)</td>
</tr>
<tr>
<td>Interns</td>
<td>4 (40.0 %)</td>
<td>5 (50.0%)</td>
<td>0 (0%)</td>
<td>1 (10%)</td>
<td>10 (37.0%)</td>
</tr>
<tr>
<td>Cleaners</td>
<td>16 (47.1%)</td>
<td>10 (29.4%)</td>
<td>7 (20.6%)</td>
<td>1 (2.9%)</td>
<td>34 (50.7%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>63 (48.1 %)</td>
<td>45 (34.3%)</td>
<td>16 (12.2%)</td>
<td>7 (5.3%)</td>
<td>131 (100%)</td>
</tr>
</tbody>
</table>

*Blood contact with open skin wound, contact with plastic and non sharp device e.g. securing urine catheter or IV delivering system

**4.2.3.4 Participants’ anatomic sites of exposure or injury**

The most common anatomical sites of exposures to patients’ BFIs were needle and sharp injury of fingers 65 (49.6%). As shown in figure 4.5 among the mucocutaneous exposures, eye exposures were the most frequent 30 (23.0%). Other less frequent sites included exposures to hands and forearms 11 (8.4%), feet and legs 4 (3.1%); splashes to nose and mouth 14 (10.7%); and the remaining included non-intact skin exposures of fingers, hands and face 7 (5.3%).

![Figure 4.5 Participants’ anatomical sites of injury (N=131)]
4.2.3.5 Procedures leading to exposure to patients’ body fluids

Participants were also asked what they were doing at the time of the accident i.e. the procedures and devices they used which led to splashing of patients’ BF or to experiencing needle stick or cut injuries. As shown in figure 4.6, out of 131 occupational exposure incidents reported by HCWs, 18 (13.7%) resulted from needle disposal or recapping, taking of a blood specimen was the second common procedure as reported by 16 (12.2%) of the participants and lastly putting up of intravenous infusions was reported by 12 (9.2%) of the participants. Of the 28 injuries that occurred during surgical theatre procedures, 23 (17.6 %) were from emergency surgical procedures while 28 (21.4%) occurred during elective surgical and obstetric procedures.

In addition procedures such as biopsy, suturing, dressing of wounds, administering of intramuscular injections constituted 13 (9.9%) and other exposures occurred during cleaning of surgical instruments and surgical clothing 11 (8.4%).

![Figure 4.6](image)

**Figure 4.6 Procedures leading to accidental exposure to patients’ BF (N=131)**

4.2.3.6 Occupational exposures to body fluids per department

Figure 4.7 shows the distribution of department of HCWs who reported accidental exposures to patients BF. Significantly, the highest number of exposures occurred in inpatient wards 45 (34.4%), followed by the emergency department 26 (19.8%), then the operating theatre 18 (13.7%) and lastly the labor ward 17 (13.0%). Departments
where less exposures were reported included the outpatient department 11 (8.4%) and the laboratory 4 (3.1%) as shown in figure 3.6.

![Figure 4.7 Distribution of HCWs exposures per division (N=131)](image)

4.2.4 Management of occupational exposure to patients’ body fluids

4.2.4.1 Testing of source patient sero-statuses

Participants were asked to indicate if the source patients’ HIV sero-status (Elisa) was investigated. The analysis showed that only 44 source patients were tested for HIV and of those 17 (38.6%) were positive and 27 (61.4%) tested negative for HIV. Furthermore, only 15 source patients were also tested for HBV and only 3 (20%) tested positive and none were tested for HCV (table 4.5).

<table>
<thead>
<tr>
<th>Type of lab test</th>
<th>Positive (%)</th>
<th>Negative (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interns HIV test (Elisa)</td>
<td>17 (38.6%)</td>
<td>27 (61.4%)</td>
<td>44 (100.0%)</td>
</tr>
<tr>
<td>HBV test(HBsAg)</td>
<td>3 (20.0%)</td>
<td>12 (80%)</td>
<td>15 (100.0%)</td>
</tr>
</tbody>
</table>
4.2.4.2 Participant’s action after exposure

Participants were asked what they did post-exposure to patients’ body fluids. Table 4.6 showed that, all participants reported that they washed their hands or the body part(s) exposed to patients’ BFs with soap and water immediately after exposure. However, only 55 (42.0%) reported that they notified the hospital authorities about the incidents and 20 (15.2%) reported that they did not report it. One participant who is a laboratory technician stated that he/she applied alcohol and bleaching agents on the exposed body part and another participant who was a nurse stated that she squeezed the injured site to allow for more bleeding, particularly if it was a needle stick injury.

Table 4.6 Management of exposures by participants (N=131)

<table>
<thead>
<tr>
<th>What did you do after exposure to patients’ BFs?</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washed hands with soap and water</td>
<td>131</td>
<td>0</td>
<td>131</td>
<td>100</td>
</tr>
<tr>
<td>Notify incident to hospital authorities</td>
<td>55</td>
<td>76</td>
<td>131</td>
<td>100</td>
</tr>
<tr>
<td>Did nothing</td>
<td>20</td>
<td>111</td>
<td>131</td>
<td>100</td>
</tr>
</tbody>
</table>

4.2.4.3 Participants’ responses on notification of exposures

Participants were asked if they reported their experiences of exposures to patients’ BFs. Of the total 131 exposure incidents that occurred, only 55 (42.0%) of the participants indicated that they notified the incidents of their exposures to the concerned hospital authorities. The reasons for not reporting the exposure incidents as reported by participants are depicted in table 4.7 and they include the assumption of “low risk of infection” which was the commonest reason reported by 28 (21.4%) of the participants. This was followed by 19 (14.5%) of the participants who indicated that “reporting was not important.” Other reasons reported by participants include “I do not know the reporting procedures” 16 (12.2%), “I had no time to report” 14 (10.7%) and “I thought I may be blamed” 7 (5.3%). Only one participant reported a concern about confidentiality of disclosing the information on exposure to patients’ BFs.
Table 4.7  Participants’ reasons for not reporting exposures to BFs (N=131)

<table>
<thead>
<tr>
<th>If you didn’t report the incident. Why not?</th>
<th>Did you report?</th>
<th>Did you report?</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>%</td>
<td>No</td>
</tr>
<tr>
<td>I assumed low risk of infection</td>
<td>28</td>
<td>21.4</td>
<td>103</td>
</tr>
<tr>
<td>I thought reporting was not important</td>
<td>19</td>
<td>14.5</td>
<td>112</td>
</tr>
<tr>
<td>I don’t know the reporting procedure</td>
<td>16</td>
<td>12.2</td>
<td>115</td>
</tr>
<tr>
<td>I had no time to report</td>
<td>14</td>
<td>10.7</td>
<td>117</td>
</tr>
<tr>
<td>I was worried about confidentiality</td>
<td>7</td>
<td>5.3</td>
<td>124</td>
</tr>
<tr>
<td>I thought I may be blamed</td>
<td>1</td>
<td>0.8</td>
<td>130</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>64.9</td>
<td>–</td>
</tr>
</tbody>
</table>

4.2.4.4 Proportion of health care workers who undergone laboratory investigations

As shown in figure 4.8, of the total 131 occupational exposures to patients’ BFs, only 40 (33.9%) of the participants reported that they underwent laboratory testing for HIV. The highest proportion was for those who tested for HBV 32 (27.1%) compared to those who tested for HIV 8 (7.6%). None of the participants who underwent initial HIV testing came through for follow-up HIV testing. In this study, the researcher did not request participants who underwent testing for HIV and HBV to disclose the results of their tests. hence no results could be reported regarding the outcomes of the tests conducted.

Figure 4.8  Proportion of HCWs who undergone lab investigations
4.2.4.5 Proportion of health care workers who took post-exposure prophylaxis

As illustrated in table 4.8, only 21 (16.0%) of the participants took PEP for HIV out of the 131 HCWs who were exposed to patients’ BFs. The analysis further showed that the proportion of nurses 10 (20.4%) who took PEP was more than for cleaners 6 (17.6%) and physicians 5 (11.1%). The results further showed that none of the three laboratory technicians who were exposed to patients’ BFs took PEP.

Regarding the completion of the course of PEP, the results showed that five participants did not complete the full treatment course of PEP. The main reasons given by participants for discontinuing the medication was the intolerable side-effects from some of the drugs.

Table 4.8 Proportion of HCWs who took PEP per job category (N=131)

<table>
<thead>
<tr>
<th>Job category</th>
<th>Took PEP (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurses</td>
<td>10 (20.4%)</td>
<td>49 (100)</td>
</tr>
<tr>
<td>Cleaners</td>
<td>6 (17.6%)</td>
<td>34 (100)</td>
</tr>
<tr>
<td>Physicians</td>
<td>5 (3.2%)</td>
<td>45 (100)</td>
</tr>
<tr>
<td>Laboratory technicians</td>
<td>0 (0%)</td>
<td>3 (100)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>21 (16.1%)</strong></td>
<td><strong>131 (100)</strong></td>
</tr>
</tbody>
</table>

4.2.4.6 HCWs awareness to exposure, HBV vaccination and training on IP

As shown in table 4.9, the majority (256; 88.3%) of the participants are aware of and concern about exposures and the impact of the resulting injuries. The analysis also showed only 11 (3.8%) of the participants reported taking HBV vaccination in all their professional life. The results further showed that 76 (33.1%) of the received training on infection prevention (IP).

Regarding the participants’ compliance to universal precautionary measures, the results showed that 22 (34%) of the participants reported consistent use of hand gloves and face masks.
Table 4.9  Proportion of HCWs awareness to exposure, HBV vaccination and training on IP (N=290)

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness and concern about exposures and the impact of the resulting injuries</td>
<td>256 (88.3%)</td>
<td>290 (100%)</td>
</tr>
<tr>
<td>HCWs reported taking HBV vaccination</td>
<td>11 (3.8%)</td>
<td>290 (100%)</td>
</tr>
<tr>
<td>receiving training on IP</td>
<td>76 (33.1%)</td>
<td>290 (100%)</td>
</tr>
<tr>
<td>consistent use of hand gloves and face masks</td>
<td>96 (49.4%)</td>
<td>290 (100%)</td>
</tr>
</tbody>
</table>

4.3 DISCUSSION OF FINDINGS

This study was conducted among 290 HCWs from Tikur Anbessa University hospital in Addis Ababa Ethiopia. Major findings are discussed below.

4.3.1 Pattern of occupational exposure to patients' body fluids

In this study two thirds (66.5%) of HCWs reported to have experienced accidental exposure to patients’ BF in their professional life which is higher than those reported in a previous Ethiopian based study conducted by Gessessew et al (2009:89). The authors of the previous study reported that (31.7%) of HCWs had accidental exposure to patients’ BF during their professional life. The rate of exposures reported in the later study was also slightly higher than that reported by a South African based study that was conducted among HCWs in a public hospital by Lachowicz and Matthews (2009:148). The authors reported a rate of 46.7% occupational exposures to patients’ BF among HCWs. Similar findings were revealed in studies conducted among HCWs in India with a rate of 32.7% (Kermode et al 2005:12) and in Iran with a of rate 43% (Hadadi et al 2008:492).

The difference could reflect variation in defining population type. For example our study included cleaners due to the nature of their job are high risk for BF exposure in Ethiopia. The discrepancy could also be attributed to the study design or study settings. However, our finding is within the range of WHO estimation for developing countries (Prüss et al 2005:482).
This continued high rate of exposures to BF of patients is a concern especially to sub-Saharan African countries where HIV, HBV and related infections are still common. The finding of the high rate of occupational exposure to patients’ BF (66.5%) in the current study indicates problems such as lesser attention given or lack of efficient occupational infection prevention system in the hospital.

4.3.2 Occupational exposure per job category

According to Elliott, Keeton and Holt (2005), Falagas et al (2007) and Boal, Leiss, Sousa, Lyden and Jagger (2008), nurses are the group of HCWs who are mostly at high risk of occupational exposure to patients’ BF and they were followed by the group of residents. Similarly findings among resident doctors in Turkey teaching hospital showed that 59.3% of the residents were exposed to patients’ BF (Irfan, Idris & Nuray 2004:204). However, due to a large number of nurses in hospital settings, they are mostly exposed to occupational hazards such as patients’ BF and hence making them most at risk. The high proportion (50.7%) of exposures to patients’ BF among cleaners/housekeepers revealed by the findings of the current study is closely comparable to the findings of a similar study conducted by Kuruüzüm, Elmali, Günday, Gündüz and Yapan (2008: 61) who reported a rate of 57.8% exposures among cleaners from Turkey hospital.

A study by Falagas, Karydis and Kostogiannou (2007:194), identified the reason for a higher number of exposures to patients’ BF among doctors and these were attributed to their reluctance to report the incidents of such exposures. The authors further argued that some of the reasons put forward by the doctors for not reporting the exposures could be attributed to potential subsequent restrictions on their practice and the belief that they could handle or manage the exposures themselves without reporting them as expected. Other explanations could be attributed to the lack of experience in many conducting certain medical procedures, insufficient training received, work overload and fatigue, particularly because residents and interns are students who are expected to carry most of the burden of work in teaching hospitals (Askarian, Malekmakan, McLaws, Zare & Patterson 2006:99).
4.3.3 Type of occupational body fluid exposure

Findings of this study showed that needle stick injuries were the leading cause of occupational exposures to patients’ BFs among participants (48.1%) which was followed by exposures due to splashes from patient’s BFs (34.3%). In accordance with findings of this study, Newson and Kiwanuka (2002:517) found that needle stick injuries were the commonest (55%) route of exposure to patients BFs among HCWs in Uganda hospital. Furthermore another similar Canadian study indicated that needle stick injuries are the commonest among HCWs in hospitals, particularly in teaching settings where there are students and many paramedics (Sabine & Holger 2007:60).

On the contrary findings from a similar study conducted in Ethiopia in 2009 showed that exposures to participants’ skin and mucus membrane had the highest proportion (71.2%) compared to exposures due to needle stick injuries (17.2%) (Gessessew & Kahsu 2009:213).

4.3.4 Anatomical site of exposure to patients’ body fluids

The findings of this study showed that the most common site of exposure to patients’ BFs as reported by the HCWs was the fingers (49.6%), followed by eye splashes exposures (23.0%). A review paper by Bahadori and Sadigh (2010:2) reported similar findings as the authors reported that while splashes often involved multiple parts of the body (e.g. eyes, face and mouth) but fingers were the most commonly reported anatomical location (77%) for needle stick injuries.

4.3.5 Procedures or instruments leading to exposure to patients’ body fluids

The results of this study showed that most exposures resulted from the disposals of used needles or recapping, drawing of blood specimens and inserting an intravenous infusion. Similarly an Indian teaching hospital reported in order of frequency recapping of needles, drawing of blood samples, setting up intravenous lines and giving injections, conducting surgical operations as the most common circumstances leading to exposure to patients’ BF among HCWS (Samir, Singru & Amitav 2008). Conversely in developed countries such as Canada, literature has revealed that hypodermic needles, suture needles, winged needles, venous catheter needles, and blood collection needles
caused two-thirds of the percutaneous exposures among HCWs (Bahadori & Sadigh 2010:2).

Findings from another similar study conducted in Lebanon hospital showed that occupational exposures were attributed to procedural intervention (29%), improper disposal of sharps (18%), to recapping (11%) and to other causes (5%) (Umayya et al 2008:96). The implication from these findings is that a better understanding of the variety of procedures performed in different departments of specialised hospitals is a crucial in order to identify the risks factors of exposures to patients’ BF s and plan relevant preventive interventions. Hence, specific studies in Ethiopia which discusses hospital procedures in detail are needed.

4.3.6 High risk departments for accidental exposure to patients' body fluids

Findings of this study showed that the highest numbers of exposures to patients’ BF s among HCWs in the study site were from inpatient or wards (34.4%), the emergency department (19.8%) operating theatre (13.7%) and the labour ward (13.0%). On the other hand, findings from another study conducted in hospitals of the Northern Ethiopia reported that gynaecological wards (75%) and labour rooms (80.4%) are among the areas with the highest rate of accidental injury or exposure to patients' BF s (Gessessew & Kahsu 2009:213). In addition, other similar hospital reports found that splashes and needle stick injuries occurred predominantly in acute settings and operation rooms (Treakle, Schultz, Giannakos, Joyce & Gordin 2011:903) at the patient’s bedside (Askarian, Malekmakan, McLaws, Zare & Patterson 2006:99); while sharp injuries occurred most frequently in the operating rooms (Alamgir, Cvitkovich, Astrakianakis & Yassi 2008:12).

4.3.7 Source patient sero-status

In this study the findings showed that the source patient's HIV sero-status was positive in (38.6%) of the 44 tested cases, only 3 HBV test were positive and none were tested for HCV. Findings from a similar study conducted in Indian showed that the source patient tested HIV negative in (52.87%) of the occupational exposures; and in only 6.97% of the exposures, the source patient was HIV positive (Samir, Singru & Amitav 2008 :26)
Therefore, barriers to testing source patients need to be studied because evidently the results of the current study and other similar studies are indicative of a lack of a co-ordinated system and procedures for adequate laboratory investigations post-exposure to patients’ BFs.

### 4.3.8 Reason for not reporting exposure

The results of this study showed only (64.9%) of the exposures to patients’ BFs among HCWs were notified to the concerned hospital authorities. The HCW assumption of “low risk of infection”, was the commonest reason for not reporting the exposures followed by the reason that “reporting was not important”. Literature has revealed that the under reporting rate has been estimated to be between 26% and 85% in previous similar studies (Trim & Elliott 2003:237) and variable reasons for not reporting exposures are mentioned, including those that were found in the current study.

### 4.3.9 Proportion of health care workers undergone lab investigations

The results of the current study confirmed a low reporting rate (33.9%) of exposures to patients’ BFs by HCWs in the study site. This finding is viewed as a contravention of the National PEP Guidelines of Ethiopia which mandates HCWs to undergo HIV testing at stipulated intervals following exposure to patients’ BFs (Ministry of Health 2005:15). The finding of low rate of testing in this study may indicate that exposed HCWs are not practicing the correct national protocol in the university hospital.

### 4.3.10 Proportion of health care workers who have taken post-exposure prophylaxis (PEP)

The current study showed that only few (16.0%) of the 131 HCWs exposed to patients’ BFs took PEP for HIV as recommended in the Ethiopian National PEP Guideline for implementation of antiretroviral therapy (Ministry of Health 2005:15).

PEP is recommended to all HCWs after exposure to patients’ BFs for a maximum 28 days and according to the laboratory results. The finding of low rate of administering PEP for HIV in this study is an indication that HCWs exposed to patients’ BFs were not
optimally administering PEP for prevention purposes. Findings of the current study also showed that five HCWs did not complete the full treatment course of PEP. Such non-compliances to PEP is an indication of the lack of knowledge about the CDC Guidelines and National recommendations for immediate and follow up periods of PEP.

4.3.11 HCWs awareness to exposure, HBV vaccination and training on IP

In the face of high prevalence of occupational exposure to patients' BFs among the participants, findings of this study showed a high level (88.3%) of awareness about such exposures and also a concern about such exposures and the impact of the resulting injuries. However, a small proportion of HCWs reported taking no HBV vaccination (3.8%) and receiving training on IP (33.1%).

Findings in this study showed that participants’ compliance to universal precautionary measures (as measured by participants’ consistent use of hand gloves and face masks) was low. This is evidenced by the fact that half of the participants reported lack of consistent use of hand gloves and face masks when conducting procedures that involve exposure to patients’ BF. Similarly, previous Ethiopian studies reported positive associations between the lack of awareness about and compliance to precautionary measures and high prevalence of exposures to patients' BFs.

4.5 CONCLUSION

This chapter presented the findings of the study and they were discussed using relevant literature. Clearly, the results of this study indicated that occupational exposure to body fluids of patients is common in all types of health care workers and post-exposure management is sub optimal. Many of the health workers did not report even after the injury. The result implies that hospitals need to incorporate a standardised written protocol and reporting system the incidents of BF exposures. Hospitals also need to develop a better work atmosphere and proper management of exposed HCWs. In the next chapter, findings will be summarized, limitations of the study will be highlighted, conclusion and recommendations will also be described.
CHAPTER 5

SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS OF THE STUDY

5.1 INTRODUCTION

This chapter lays out the summary of the research findings, conclusions drawn from the research findings and contributions of this study are also described. Conclusions are drawn with reference to the study objectives and are based on the findings of this study. The study limitations have been described as well as the recommendations which emanates from the research findings are also presented in this chapter.

5.2 SUMMARY

The purpose of this study was to describe the pattern of occupational exposure to patients’ BF among HCWs. The study was conducted in Tikur Anbessa University hospital in Ethiopia. A quantitative, descriptive survey was used to conduct the study. Data collection was through a structured self-administered questionnaire which was handed out to HCWs in the university hospital to respond to.

Findings from the reviewed literature showed that the prevalence of occupational BF exposures of HCWs (with consequent risk of HIV, HBV and HCV infection) has been estimated to be high in Sub-Saharan Africa.

The prevalence of BF exposure varies between 31–35% in some studies in Ethiopia and rate of occupational exposure is much higher in hospitals than other smaller health facilities (Reda et al 2010:4). The Tikur Anbessa University hospital HCWs face daily challenges of fear, anxiety while trying to help different patients including HIV/AIDS in hospitals of many countries including in Ethiopia.

The researcher assumed that the rate could be even higher in university teaching hospitals given the fact that there are interns, residents who are students and more
sophisticated medical and surgical procedures are conducted, which further increase the risk of occupational exposures to blood borne pathogens among these HCWs.

The aim of this study was to describe the patterns (the frequency, epidemiological characteristics and management of incidents) of occupational exposure to patients’ BFs among HCWs in a Tikur Anbessa University hospital in Ethiopia and the objectives of the current study were to:

- Identify and describe socio-demographic characteristics of HCWs exposed to patients’ BFs in a Tikur Anbessa University hospital in Addis Ababa, Ethiopia.
- Investigate the circumstances leading to the occurrence of occupational exposure to patient’s BFs among HCWs at the study site.
- Describe the nature of occupational exposures to BFs among HCWs at the study site.
- Describe the post-exposure management of occupational exposure to BFs in the study site.

The methodological approach employed to execute this research was a quantitative, cross-sectional, descriptive design, where the appropriateness of the design assessed in terms of whether it addresses the research objectives and produce interpretable and meaningful results.

The study population was all HCWs working at Tikur Anbesa University hospital. The required sample size was calculated by applying standardised statistical formula. Then a purposive sampling method was employed to get the HCWs from each occupational category till the calculated sample size was achieved.

The data collection tool was a fully structured questionnaire. The tool was self-administered by the respondents. The data tool was self-formulated and pre-tested on few HCWs working in a different area than the university hospital. Data collection tool was divided into sections and was intended to elicit the information that would enable the researcher to address the study objectives which included data on participants’ socio-demographic characteristics, data on the prevalence and details of HCWs’ occupational exposure to patients’ BFs. Also, data concerning the post-exposure
management of incidents after accidental exposure and data on HCWs’ perceptions and opinions on the occupational BF exposure were obtained.

Data was analysed using the Microsoft Excel and Epi 6.04 Dos Version 2001 software. The necessary permission to collect data was obtained from concerned institutions and prospective participants of the study. Confidentiality and anonymity of data were also ensured during the process of collecting and utilising participants’ data.

5.3 SUMMARY OF FINDINGS

The following conclusions were drawn after analysis, interpretation and findings of the research:

5.3.1 Demographic findings

The results of participants’ socio-demographic data showed that the majority were females compared to males and most of the participants’ age group ranged from 20–29 years. The majority of the participants were nurses and physicians and a large number of the participants had a work experience of less than 10 years; and only a third of the participants had received training on infection prevention.

5.3.2 Findings on prevalence of occupational exposures to body fluids (BFs)

Findings of this study showed that the one year and professional life prevalence of occupational exposure to patients’ BF among the participants was 33.5% and 66.5% respectively.

5.3.3 Findings on circumstances around occupational exposure to patients’ body fluids (BFs)

Findings of this study indicated that a large proportion of patients’ BF exposures were due to needle stick injuries to fingers and splashes to the eyes (82.4%); blood withdrawal and recapping and intravenous infusions constituted over a third (35.1%) of the procedures leading to needle stick injuries.
Furthermore the results showed that HCWs working in inpatients divisions or wards had the highest prevalence of exposure to patients’ BFs and they were followed by those in the emergency room and operation theatre.

5.3.4 Findings related to the management of occupational exposure to patients’ body fluids (BFs)

Findings of this study showed that the management of incidents relating to occupational exposure to patients’ BFs in general is sub optimal. Only a third of exposed HCWs had notified the incident to the concerned hospital authorities. The same proportion (33%) of HCWs followed the source patients and undergone laboratory investigation for HIV. Rapid test for HIV was done in all those who underwent the laboratory investigations. However, the findings showed that close to half of the participants did not undergo repeat or follow-up HIV testing at 12 weeks or later as expected. Furthermore, less than a quarter of the HCWs exposed to patients’ BFs took PEP for HIV, and half of those stopped medications later before the stipulated time.

5.3.5 Findings related to HCWs’ knowledge and perception

In the face of high prevalence of occupational exposure to patients’ BFs among the participants, findings of this study showed a high level (88.3%) of awareness about such exposures and also a concern about such exposures and the impact of the resulting injuries. However, a small proportion of HCWs reported taking no HBV vaccination (3.8%) and receiving training on IP (33.1%).

Findings in this study showed that participants’ compliance to universal precautionary measures (as measured by participants’ consistent use of hand gloves and face masks) was low.
5.4 RECOMMENDATIONS

The following recommendations were made based on the findings of the current research:

- There is a need to strengthen and implement appropriate preventive occupational health interventions aimed at reducing the prevalence of occupational exposures to BFs among HCWs. In addition there is a need to develop written protocols at a facility level for the prompt reporting, evaluation, counselling, treatment, and the follow-up of occupational exposures among HCWs.

- Ensuring and promoting a safe working environment and conditions, and providing the necessary equipments for all departments of the hospital. This includes encouraging compliance with standard/universal precautions, avail PEP drugs during duty hours, weekends and holidays and it must be complemented with appropriate counselling and testing of HIV for immediate use by HCWs. Also, to establish separate, PEP centres, develop and avail proper guidelines for effective use of PEP along with raising awareness and compliance among HCWs on preventing occupational exposures to patients’ BFs.

- Strong attempts from the employer’s side need to be exerted in order provide appropriate and adequate personal protective materials and equipment as well as availing compensation funds for HCWs in Tikur Anbessa University hospital.

- Provision of ongoing training and workshops on prevention of exposure to patients’ BFs and in this regard attention should be paid to providing training on aspects such as the correct usage and disposal of surgical instruments in theatres, when administering injections (e.g. avoiding recapping needles), prevention of sharps injuries by enforcing appropriate disposal of the used sharp objects.

5.5 FURTHER RESEARCH

In this study the prevalence of Occupational exposure to patients’ BFs among HCWs was found to be high and therefore further research could be conducted in order to investigate the impact of preventive interventions recommended in the current study. Research should also be carried out on the factors affecting HCWs’ exposures to
patients’ BFs and the use of PEP among different job categories of health workers particularly, cleaners and students among others.

5.6 CONTRIBUTIONS OF THIS STUDY

The findings of this study generally indicated that occupational exposures to patients’ BF of different types and circumstances were common among all categories of HCWs in the study site; clearly indicating that the infection prevention programmes currently in place need improvements. Though the research findings were locally based in a particular university hospital in Addis Ababa, but they can be utilised as a reference point for further research in other hospital settings both in the city and in rural areas. The findings of this study can also be used by relevant stakeholders to inform decisions related to protection of HCWs’ health and safety at work.

5.7 LIMITATIONS OF THE STUDY

The study was limited to Tikur Anbessa University hospital in Addis Ababa, where the research results are limited to that particular hospital and may not be generalised to all HCWs particularly those in other health settings within the country. The findings in this study may be prone to recall bias as they are based on participants’ reported experiences. Lastly, some HCWs could have been poorly represented in the sample due to the fact that in teaching hospitals, specialists are low in numbers and most of the services are provided by residents and interns professionals.

5.8 CONCLUSION

The study determined the prevalence of occupational exposure among the HCWs to patients’ BFs in Tikur Anbessa University hospital and identified the high rate of exposure among participants.

Findings from the current study revealed that the most common circumstances for exposure to patients’ BFs among HCWs included the needle stick injuries and splashes on the face and they need immediate attention. On the contrary findings showed that the HBV vaccination rate and training on IP were reported to be low among HCWs of the hospital in this study.
LIST OF REFERENCES


*English Dictionary* 2002. University hospital definition:


Personal communication: Dr A Erdaw, ex-Director, Menlik Government Hospital: January 10 2012.


ANNEXURE 1

Request to conduct a research project
ANNEXURE 1

Application Form for Initial Review

<table>
<thead>
<tr>
<th>Protocol Title:</th>
<th>-</th>
<th>Total Participants to be included</th>
<th>34±7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol number:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**STUDY TYPE:** (Mark ☐ whichever apply to the study)
- ☐ Survey
- ☐ Social
- ☐ Medical
- ☐ Community based
- ☐ Individual based
- ☐ Screening
- ☐ Observational
- ☐ Epidemiology
- ☐ Intervention study
- ☐ Clinical Trial:
  - ☐ Phase I
  - ☐ Phase II
  - ☐ Phase III
  - ☐ Phase IV
- ☐ Genetic Study
- ☐ Retrospective
- ☐ Prospective
- ☐ Others...stress related stress

**STUDY POPULATION:**
- ☐ Healthy
- ☐ Patient
- ☐ Vulnerable groups
- ☐ Animals

**CHARACTERISTICS of PARTICIPANTS PARTICIPATED:**
- ☐ Age Range:
  - ☐ 0 - 17 yrs
  - ☐ 18 - 44 yrs
  - ☐ 45 - 65 yrs
  - ☐ ≥ 66 yrs
- ☐ Pediatric
  - ☐ None
  - ☐ < 1 yr
  - ☐ 1-3 yrs
  - ☐ 4-14 yrs
- ☐ Impaired
  - ☐ None
  - ☐ Physically
  - ☐ Cognitively
  - ☐ Mentally

- ☐ Specify the age range as 0-17 to ≥66

**REQUESTED EXCLUSION OF PARTICIPANTS:**
- ☐ None
- ☐ Male
- ☐ Female
- ☐ Children
- ☐ Other (specify)

**SPECIAL RESOURCE REQUIREMENTS (check all that apply):**
- ☐ Intensive Care
- ☐ Isolation unit
- ☐ Surgery
- ☐ Pediatric Intensive Care
- ☐ Transfusion
- ☐ CAT scan
- ☐ Gene therapy
- ☐ Controlled substances (Narcotics/Psyhotropic)
- ☐ Prosthetics
- ☐ Gynecological services
- ☐ Others, specify: ____________________________

**IONIZING RADIATION USE (X-rays, radionuclides, etc):**
- ☐ None
- ☐ medically indicated only

**INVESTIGATIONAL NEW DRUG (IND) / DEVICE (IDE):**
- ☐ None
- ☐ IND
  - ☐ FDA No.: __________
  - ☐ Name: __________________________
  - ☐ Sponsor: _______________________
  - ☐ Holder: _________________________
- ☐ IDE
  - ☐ FDA No.: __________
  - ☐ Name: __________________________
  - ☐ Sponsor: _______________________
  - ☐ Holder: _________________________

**PROCEDURE USE:**
- ☐ Invasive
- ☐ Non-Invasive
- ☐ Not applicable

**MULTI-SITE COLLABORATION:**
- ☐ YES
- ☐ NO

**FINANCIAL DISCLOSURE:**
- ☐ YES
- ☐ NO

**Conflict of Interest:**
- ☐ Yes, specify or declare it to the chairperson.

**INSTITUTE RESEARCH CONTACT:**
- Name: __________________________
- E-mail: _________________________
- Address: _________________________
- Telephone: ______________________
- Fax: ____________________________
## APPLICATION FORM for INITIAL REVIEW

### PARTICIPATING INVESTIGATORS:

<table>
<thead>
<tr>
<th>First / Last Name</th>
<th>License No.</th>
<th>Institution</th>
<th>Telephone / Fax No.</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dr. unamed</td>
<td></td>
<td>Sr. Luke</td>
<td>0911404008</td>
<td></td>
</tr>
<tr>
<td>2. Dr. unamed</td>
<td></td>
<td>AAU - SFH</td>
<td>0813306282</td>
<td></td>
</tr>
<tr>
<td>3. Prof. unamed</td>
<td></td>
<td>UNISA</td>
<td></td>
<td>Supervisor</td>
</tr>
</tbody>
</table>

### TYPE OF REVIEW:

- [ ] Initial Review
- [ ] Resubmission Review
- [ ] Amendment Review
- [ ] Expedited Review
- [ ] Emergency Review
- [ ] Continuing Review
- [ ] Report Review
- [ ] Protocol Termination

### SIGNATURES:

- **Principal Investigator**: [Signature]
  - Date: 15/10/2012
- **Protocol Chairperson (if applicable)**: [Signature]
  - Date: [ ]

### COMPLETION:

- **Secretary, IRB, AAUMF**: [Signature]
  - Date: 15/10/2012

### APPLICATION NUMBER: [ ]
ANNEXURE 1

SOHRI
Basic Health Service Project
Luke Clinic

Tikur Anbasa Specialized Hospital
Addis Ababa Ethiopia

Dear Dr Rezene

SUBJECT: PERMISSION TO CONDUCT RESEARCH

I am a director of Luke clinic, addiss Ababa Ethiopia. I am registered MPH student at the University of South Africa (UNISA). The title of my thesis is "Patterns of occupational exposure of blood/body fluids (BBF) among health care workers (HCWs) in a university (tertiary) hospital and Addis Ababa, Ethiopia. TASH".

The purpose of this study is to describe the patterns of occupational exposure of health care workers (HCWs) to blood and body fluids (BBF) of patients and the management of exposure incidents in order to suggest strategies for improved management of cases.

I am writing to seek permission to undertake research in TASH. I have awarded special leave for the month of November and December, and would like to commence with data collection in November 2012. The sample will be drawn from Tikur Anbasa specialized hospital in Addis Ababa Ethiopia.

Please find the attached copy of the IRB clearance of the proposal for your perusal.

Your favorable consideration is much appreciated.

Yours sincerely

Dr wondwossen Desta Atlaw MD, wdestaap@yahoo.com

Proff. Zungu (supervisor)
ANNEXURE 2

Permission from the study site to conduct the research
ANNEXURE 2

Addis Ababa University College of Health Science Institutional Review Board

Title:
3.2. Use of Study Assessment Form

ANNEX 3
Form AAUMF 03-008

IRB's Decision

Meeting No: 047/2012 Date (D/M/Y): November 07/2012
Protocol number: 033/12/Ext Assigned No.................

Protocol Title: Patterns of Occupational exposure to blood/body fluid of patents among health care workers in a university /Tertiary/ Hospital, AA Ethiopia TASH.

Principal Investigators: Dr. Wondwosen Desta

Institute: External

Elements Reviewed (AAUMF 01-008) □ Attached □ Not attached

Review of Revised Application Date of Previous review: September 19/2012
□ Yes □ No

Decision of the meeting: □ Approved □ Approved with Recommendation □ Resubmission □ Disapproved

I. Elements approved:
1. Protocol Version No. ...........................................
2. Protocol Version Date ...........................................
3. Informed consent Version No. .................................
4. Informed Consent Version Date ...............................  

II. Obligations of the PI:
1. Should comply with the standard international & national scientific and ethical guidelines
2. All amendments and changes made in protocol and consent form needs IRB approval
3. The PI should report SAE within 10 days of the event
4. End of the study, including manuscripts and thesis works should be reported to the IRB

III. TO ESTM □

Institution Review Board (IRB) Approval: Period from 08/11/2012 to 07/11/2014

Follow up report expected in  
3 Months ____  6 months ____  9 months ______ one year____

Chairperson, IRB    Associate Director of
Dr. Yimtubezenash WeAmanuel Research and Technology Transfer
Signature __________________________ Signature __________________________
Date: 08/11/12          Date __________________________
ANNEXURE 3

Ethical Clearance Certificate from the University of South Africa
UNISA

UNIVERSITY OF SOUTH AFRICA
Health Studies Higher Degrees Committee
College of Human Sciences
ETHICAL CLEARANCE CERTIFICATE

HSHDC/60/2012

Date of meeting: 6 June 2012  
Student No: 4610-B51-7

Project Title: Pattern of occupational exposure to blood/body fluids (SBF) among health care workers (HCWs) in a tertiary hospital of Addis Ababa, Ethiopia

Researcher: Wand Wasson Desta Atlow

Degree: Masters in Public Health (MPH)  
Code: DLM1995

Supervisor: Prof Li Zungu

Qualification: PhD
Joint Supervisor: -

DECISION OF COMMITTEE

Approved [ ]  
Conditionally Approved [ ]

Prof E Patgeier
CHAIRPERSON: HEALTH STUDIES HIGHER DEGREES COMMITTEE

Dr MM Moleki
ACTING ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRIES
ANNEXURE 4

Participants’ informed consent letter
ANNEXURE 4

COVERING LETTER

Participants' informed consent letter University of South Africa (UNISA)

Dear Participant

I am a student registered for a Masters in Public Health Degree at the University of South Africa, College of Human Sciences, Department of Health Studies. I am conducting a study titled: “Pattern of occupational exposure to patients’ body fluids among health care workers (HCWs) in Tikur Anbesa University hospital, Addis Ababa, Ethiopia” in partnership with the Tikur Anbessa University hospital Addis Ababa Ethiopia.

The aim of this study is to describe the patterns of occupational exposure of BBF of patients among HCWs in Tikur Anbesa University hospital and to assess the management of exposure incidents. Based on the finding of the research, recommendations will be made to prevent occupational exposure to body fluids among HCWs.

You are thus requested to participate in this study whereby will be given self administered questionnaire to fill. By signing the consent form you are, providing informed consent to participate in the study. Thank you for your time and cooperation. Your shared experiences will be treated with great respect and confidentiality.

Participant declaration: “The study and the contents of this informed consent form have been explained to me. I have been given an opportunity to ask questions and I am content with the answers to all my questions. I agree to participate in this study since I know that the information obtained will be kept confidential and I may withdraw from the study anytime without any prejudice to me.

Signature of Participant:                  Date:
Witness:                                     Date:
ANNEXURE 5

Questionnaire
ANNEXURE 5

QUESTIONNAIRE FOR HEALTH CARE WORKERS

SECTION A: QUESTIONS ON PERSONAL INFORMATION

Please give your answer to each of the following questions. Read all answers and choose the appropriate answer box by circling only one number of each question.

1. Could you tell your age category

<table>
<thead>
<tr>
<th>Age Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 years</td>
<td>1</td>
</tr>
<tr>
<td>20-29 years</td>
<td>2</td>
</tr>
<tr>
<td>30-39 years</td>
<td>3</td>
</tr>
<tr>
<td>40-49 years</td>
<td>4</td>
</tr>
<tr>
<td>50-59 years</td>
<td>5</td>
</tr>
<tr>
<td>60 years or over</td>
<td>6</td>
</tr>
</tbody>
</table>

2. Could you please tell your gender category?

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>2</td>
</tr>
</tbody>
</table>

3. What is your job category as health care worker?

<table>
<thead>
<tr>
<th>Job Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intern</td>
<td>1</td>
</tr>
<tr>
<td>Resident</td>
<td>2</td>
</tr>
<tr>
<td>General practitioner</td>
<td>3</td>
</tr>
<tr>
<td>Surgeon and / or subspecialist</td>
<td>4</td>
</tr>
<tr>
<td>Orthopaedic surgeon and / or subspecialist</td>
<td>5</td>
</tr>
<tr>
<td>Gynaecologist and / or subspecialist</td>
<td>6</td>
</tr>
<tr>
<td>Internist and / or subspecialist</td>
<td>7</td>
</tr>
<tr>
<td>Paediatrician and / or subspecialist</td>
<td>8</td>
</tr>
<tr>
<td>Anaesthetists and/or subspecialist</td>
<td>9</td>
</tr>
<tr>
<td>Nurse and / or subspecialist</td>
<td>10</td>
</tr>
</tbody>
</table>
Lab technician and / or subspecialist in lab  |  11  
--- | ---  
Cleaners  |  12  
Other (mention)  |  13  

4. Indicate how long have you been working as health worker?

| <10 years | 1  
| 11-20 years | 2  
| 21-30 years | 3  
| 31-29 years | 4  
| 30 -40 years | 5  
| >40 years | 6  

5. Answer questions on awareness to exposure, HBV vaccination & training on IP

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are you Aware of and concerned about exposures and the impact of the resulting injuries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have you ever taken HBV vaccination as professional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have you ever received training on Infection prevention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did you consistently use of hand gloves and face masks</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION B: QUESTIONS ON DETAILS OF OCCUPATIONAL EXPOSURE TO BBF

6. Have you ever had injury while doing or assisting procedures (in your professional life time)?

|  | 1  
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>2</td>
</tr>
</tbody>
</table>
7. Have you ever had injury while doing or assisting procedures in the last 1 year?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
</tr>
</tbody>
</table>

If your answer is yes (answer question 8-15); if no jump to question 16

8. How many times you had exposure? (e.g. 1, 2, 3)_____________

9. What was type of accidents leading you to occupational exposure?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Needle-stick injury</td>
<td>1</td>
</tr>
<tr>
<td>body Splashing of fluid/blood</td>
<td>2</td>
</tr>
<tr>
<td>Cut</td>
<td>3</td>
</tr>
<tr>
<td>Other (mention)</td>
<td>4</td>
</tr>
</tbody>
</table>

10. Mention the site of your exposure (e.g. Non-dominant index finger, on-dominant thumb, eye splash, forearms, legs? ________________

11. What were you doing at the time of accident (the procedure lead you to exposure)?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Setup IV lines</td>
<td>1</td>
</tr>
<tr>
<td>Needle disposal, and or recapping...</td>
<td>2</td>
</tr>
<tr>
<td>Blood collection(drawing blood samples)</td>
<td>3</td>
</tr>
<tr>
<td>Emergency surgeries</td>
<td>4</td>
</tr>
<tr>
<td>Elective surgeries</td>
<td>5</td>
</tr>
<tr>
<td>Conduct labour</td>
<td>6</td>
</tr>
<tr>
<td>Cleaning instruments and cloths (21.4%)</td>
<td>7</td>
</tr>
<tr>
<td>Procedures like biopsy, suturing, dressing of wounds, IM injections</td>
<td>8</td>
</tr>
<tr>
<td>Other procedure(mention)</td>
<td>9</td>
</tr>
</tbody>
</table>
12. Where did accidental exposure occur on you?

<table>
<thead>
<tr>
<th>Location</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the wards</td>
<td>1</td>
</tr>
<tr>
<td>Operation theatre</td>
<td>2</td>
</tr>
<tr>
<td>Emergency room</td>
<td>4</td>
</tr>
<tr>
<td>Outpatient departments</td>
<td>5</td>
</tr>
<tr>
<td>In labour ward</td>
<td>6</td>
</tr>
<tr>
<td>In the laboratory</td>
<td>7</td>
</tr>
<tr>
<td>Other places (mention)</td>
<td>8</td>
</tr>
</tbody>
</table>

13. Did you follow the status of the source patient?

<table>
<thead>
<tr>
<th>Follow Status</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>No</td>
<td>2</td>
</tr>
</tbody>
</table>

If yes, what was the sero-status of the source patient?

<table>
<thead>
<tr>
<th>Sero Status</th>
<th>Yes</th>
<th>No</th>
<th>Unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV sero +ve</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HCV sero +ve</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HBV sero +ve</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (mention)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION C: MANAGEMENT OF POST EXPOSURE

14. What did you do after the exposure?

<table>
<thead>
<tr>
<th>Action</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nothing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wash the exposure site with soap and water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notify (report) to the concerned authority of the hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undergo lab investigation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Receive post-exposure prophylaxis (PEP) for HIV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (mention)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
15. If you did not report your injury why not?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>No time to report</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don’t know the reporting procedure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worried about confidentiality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May be blamed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low risk for infection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not important to report</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (mention)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16. If you underwent laboratory investigation, which one?

<table>
<thead>
<tr>
<th>Investigation</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate post-exposure ELISA for HIV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ELISA at 12 weeks or later</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Immediate post-exposure serology for HBsAG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other tests (mention)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

17. Have you completed the treatment?

<table>
<thead>
<tr>
<th>Response</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>2</td>
</tr>
</tbody>
</table>

18. If no, why not? __________________________________________________________