ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

ASSESSMENT OF BIOSAFETY PRACTICE AND ASSOCIATED FACTORS IN CLINICAL LABORATORY WORKERS AMONG GOVERNMENT HOSPITALS IN ADDIS ABABA, ETHIOPIA

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Table of Contents

Content

Acknowledgment ..... **II**

Table of Contents ..... **III**

List of Tables ..... **V**

List of Figures ..... **VI**

Acronyms ..... **VII**

Abstract ..... **VIII**

1. Introduction **1**

1.1. Back ground **1**

1.2. Statement of the Problem **3**

1.3. Rationale of the study **5**

2. Literature review **6**

3. Objective of the study **9**

3.1. General objective **9**

3.2. Specific objectives **9**

4. Materials and Methods **10**

4.1. Study design **10**

4.2. Study area **10**

4.3. Study period **10**

4.4. Population **10**

4.4.1. Source population **10**

4.4.2. Study population **10**

4.4.3. Inclusion and exclusion criteria **11**

4.5. Sampling and Sample size **11**

4.5. Sampling Procedure **11**

4.6. Variables of the study **12**

4.7. Operational definition **14**

4.8. Data Collection procedure **15**

4.9. Quality Control and Quality Assurance **15**

4.10. Data Entry, Management and Analysis **15**

4.11. Ethical Consideration **15**

5. Results **16**

6. Discussion **26**

7. Strengths and Limitation of the study **29**

7.1. Strengths of the study **29**

7.2. Limitation of the study **29**

8. Conclusion **30**

9. Recommendations **31**

10.Reference **32**

11. Annex **34**

Annex I. Standard operating procedure (SOP) for Clinical laboratory safety **34**

Annex IIa. Participant Information sheet (English version) **39**

Annex IIb . Information sheet (Amharic version) **42**

Annex IIIa. Consent sheet (English version) **44**

Annex IIIb Consent form (Amharic version) **46**

Annex IV. Questionnaires **48**

Annex V. Declaration **59**

List of Tables

Title of the Table **Page No.**

Table 1. Socio demographic characteristics of laboratory personnel at the government hospitals, in Addis Ababa, May,2014(N=290)…….....……. ……**17**

Table 2. Biosafety policy perception towards Biosafety practice among laboratory personnel at the government hospitals, in Addis Ababa, May,2014(N=290)…..…..**.....18**

Table 3. Biosafety practice towards use of protective barrier of laboratory personnel at the government hospitals, in Addis Ababa, May,2014(N=290)…..……..**.....19**

Table 4. Biosafety practice towards facility design of laboratory personnel at the government hospitals, in Addis Ababa, May,2014(N=290)..…….**.....20**

Table 5. Managerial aspect for Biosafety practice of laboratory personnel at the government hospitals, in Addis Ababa, May,2014(N=290).…….**.....21**

Table 6. Factors affecting towards Biosafety practice among laboratory personnel at the government hospitals, in Addis Ababa, May,2014(N=290)**.....23**

- Result of Observational Cheek list toward biosafety practice of laboratory personnel at the government hospitals, in Addis Ababa, May, 2014**.....**……**25**

List of Figures

Figure **Page No.**

Fig 1. A Schematic frame work of Sampling for the study of Biosafety Practice in Clinical laboratory Workers in Government Hospitals in Addis Ababa, 2014...……...**12**

Fig 2. Conceptual frame work Relationship of Dependent and potentially independent Variables for Biosafety Practice in Clinical laboratory Workers in Government Hospitals in Addis Ababa,2014……..**13**

Acronyms

AAERC	AHRI/ALERT Ethics Review Committee
AAHB	Addis Ababa Health Bureau
AAU	Addis Ababa University
AAUCHS	Addis Ababa University Collage of Health Science
ALERT	All Africa Leprosy Tuberculosis and Rehabilitation Training Center
BSC	Biological Safety Cabinet
CDC	Center for Disease and Control
CI	Confidence Interval
CLS	Clinical laboratory safety
CSAE	Central Statistical Agency of Ethiopia
DRERC	Departmental research and Ethics Review Committee
FDF	Federal Defense Force
FMOH	Federal Ministry of Health
FP	Federal Police
GCLP	Good Clinical Laboratory Practice
GLP	Good Laboratory Practice
HBV	Hepatitis B virus
LAIs	Laboratory Acquired Infections
MSDS	Material Safety Datasheets
OHS	Occupational Health & Safety
OR	Odds Ratio
PPE	Personal protective equipment
QSE	Quality system essential
SD	Standard Deviation
SOP	Standard Operating Procedure
SPSS	Statistical Package for Social Science
TASH	Tikur Anbessa Specialized Hospital

Abstract

Background: Biosafety is an important practice in all laboratory settings especially in developing countries where standard operating procedures are lacking. There is only limited information about biosafety practices in government hospital laboratories in Addis Ababa.

Objective: To assess the situation of biosafety practice and associated factors in clinical laboratory workers among government Hospitals in Addis Ababa, Ethiopia

Method: Cross-sectional study design was conducted from March to May 2014; in all government Hospitals of Addis Ababa. A total of 290 laboratory professionals were participated about their biosafety practice and its associated factors using structured questionnaire to assess the structural and functional aspects of Biosafety Practice of laboratories. Data were coded and entered by Epi Info and Exported to SPSS V.20 for analysis. Bivariate and multivariate analysis were also used to identify factors that affect the outcome variable and to examine the effect of selected variables on laboratory personnel practice toward biosafety practice by using Odds Ratio (OR) with a 95% Confidence Interval. P- Value less than 0.05 were taken as statistically significant. Variables that were found with a statistically significant association ($p<0.05$) at bivariate logistic analysis were entered and analyzed by multiple logistic regression analysis.

Results: - In this study a total of 290 laboratory professionals were involved. Out of those subjects the biosafety practice rates of protective barrier were 76.2%. The major factor for biosafety practice were practice of performing a written procedure for the clean-up of spills (AOR=2.31; CI 1.21-4.42), those who were practice of decontamination and wastes before disposal (AOR=2.69; CI 1.49-4.86) and those who got information in Participating a biosafety practice (AOR=5.07; CI 1.66-15.52)

Conclusion: - This study revealed that there is an achievement of a minimum requirement of biosafety practice among studied laboratory personnel. Practice of performing clean-up of spills, practice of decontamination and wastes before disposal and information in participating a biosafety practice are a significant association with biosafety practice.

1. Introduction

1.1. Back ground

Biosafety is an important practice in laboratory settings especially in developing countries where standard operating procedures (SOPs) are lacking. Biosafety practice in all laboratory work flows and during transferring of lab material from one place to another is crucial in fighting against infectious diseases and exposures among laboratory staffs, particularly those working in microbiological laboratories as they are exposed to biohazards which may result in laboratory-acquired infections (1). Laboratory personnel safety is of the utmost importance when working with any potentially infectious pathogenic organism and it described as a safe method for managing infectious agents in laboratory environment where they are handled and maintained. Implementation of biosafety precautions decreases the exposure to the risk factors inside the laboratory (2).

Biosafety measures in the laboratory includes, safe handling of all specimens and infectious material during collecting, processing and testing of patient samples. This practice must ensure adequate safety conditions to avoid potential hazards associated with the handling of biologic materials, the manipulation of genomes, the creation of synthetic organisms, and the spread of multidrug-resistant bacteria, and threats of biologic terrorism. The essential competencies needed by laboratory personnel to work safely with biologic materials and other hazards that might be found in a biologic laboratory (e.g., those related to research animals, chemicals, radiologic materials, and the physical environment). (3).

Occupational injuries and illness toward the worker may result from, bad practices, Ignorance Inexperience and failure to follow established procedures. There are different factors that contribute for this occupational biohazard hazard in the laboratory which includes Overcrowding, heavy workload, incorrectly installed and poorly maintained equipment and badly designed infrastructure. As the result the basic principle of laboratory safety is the need to protect the worker and the environment (4).

Medical laboratories are potentially hazardous places and hazard containment should be a priority. It is therefore essential that a laboratory safety program should be in place in every medical laboratory. The laboratory safety programme will ensure that employers state unequivocally policies which operate in the work environment (5).

In this study, all governmental hospitals of Addis Ababa namely, Black lion specialized hospital, ALERT Center , St. Peter's TB Specialized Hospital, St. Paul's Referral Hospital, St. Amanuel Mental Specialized Hospital, Minilik II Referal Hospital, Yekatite 12 Hospital, Zewditu Memorandum Hospital, Gandi Memorandum Hospital, Ras Desta Hospital, Tirunesh Beijing Hospital, Federal Police Referral Hospitals, Federal Prison administration general hospital and Armed Force Referral and Teaching Hospital were selected. Previously, the assessment of biosafety practice and associated factors in clinical laboratory workers of these hospitals have not been assessed. Therefore, this study is designed to assess pattern of biosafety practice and its associated factors in clinical laboratory workers commonly used Biosafety agents in the hospitals.

1.2. Statement of the Problem

Laboratory acquired infections have become major concern all over the world. Published reports of Laboratory Acquired Infections (LAIs) first appeared around the start of the twentieth century. By 1978, four studies by Pike and Sulkin collectively identified 4,079 LAIs resulting in 168 deaths occurring between 1930 and 1978. These studies found that the ten most common causative agents of overt infections among workers were Brucella spp, Coxiella burnetii, hepatitis B virus (HBV), Salmonella typhi, francisella tularensis, mycobacterium tuberculosis, Blastomyces dermatitidis,Venezuelan equine encephalitis virus, Chlamydia psittaci, and Coccidioides. The fundamentals of containment include the microbiological practices, safety equipment, and facility safeguards that are meant to protect the individuals working in the labs (6).

Laboratory personnel are one of the risk groups for occupational infections. They are exposed to a variety of occupational health hazards including infectious materials, blood and other body fluids from patients including pus, urine, stool, sputum, secretion, saliva or equipment contaminated with agents in the laboratory environment. Additionally, laboratory procedures may generate low particle size aerosols, which are probably inhaled into the lungs of any exposed laboratory staff. Carelessness, poor technique in the handling of infectious materials, needle sting or infectious aerosol exposure are the cause of laboratory acquired infection (7).

Most of the laboratory personnel in the United States are at risk of exposure to infectious agents, especially tuberculosis and other air-borne or droplet transmitted agents. A previous study showed that inadequate ventilation, accidents with biological specimens and inadequate disposal of biological wastes enhanced risks of TB infection in laboratory staff. Another study on biosafety in clinical laboratories in Japan found that risk factors for laboratory associated tuberculosis were the lack of biological safety cabinets (BSC), and insufficiently developed procedure and equipment operation skill. Traditional laboratory biosafety guidelines have emphasized the use of optimal work practices, appropriate containment equipment, well-designed facilities, and administrative controls to minimize risks of unintentional infection or injury for laboratory workers and to prevent contamination of the outside environment (7).

Studies indicated that most hospitals in developing countries, especially those in Africa, have rudimentary and highly compromised infection control programs owing to the lack of awareness of the problem; lack of personnel trained in infection control practices; inadequate and aging

infrastructure; irregular supply of gloves, masks, and disinfectants; and poor laboratory backup (8). The situation in private and public clinical diagnostic laboratories that constitute an integral part of most hospitals in Nigeria is unlikely to be any different. Laboratory biosafety has been described as the containment principles, technologies, and practices implemented to prevent unintentional exposure to pathogens and toxins or their accidental release (9).

Although diagnostic laboratories are important in the fight against infectious diseases, laboratory workers are generally faced with many occupational risks that may jeopardize their health (10). Evidence exists that compliance with universal safety precautions reduces the risk of infections and protects health care practitioners. Regular monitoring and assessment of diagnostic laboratories for the presence of biosafety devices and compliance rate with standard biosafety measures therefore will not only promote a safer working environment, but could also impact greatly on maintaining qualitative laboratory service delivery (11). In Ethiopia, there is currently legislative guideline for Biosafety Practice, but no enforcing biosafety in clinical laboratories.

1.3. Rationale of the study

The ultimate goals of Biosafety practice in assessment of health care laboratories is to assess its associated factors in Hospitals which is an essential asset of any society. Large amount of clinical laboratory test diagnosis are examined and at every test method with procedures there are daily used Biosafety Practice and precautions for patient care and control of infection in health institutions. Moreover, if there is unsafe laboratory practice, its laboratory result quality is compromised and impact on essential laboratory quality management systems. Biosafety precautions in diagnostic laboratories become a crucial issue that should be followed. These precautions included the practices, safe equipment and facility, protection of laboratory staff and public environment from exposure to infectious substances. These conditions become major public health problem especially in developing country (1).

To extend its public health impact in quality laboratory service due to adequate safety precaution in clinical laboratory environment is mandatory. Currently in Ethiopia, assessment of biosafety practice in clinical laboratory and associated factors in Hospitals are not assessed, therefore this study aimed to assess the practice of biosafety pattern and its associated factors in laboratory service, the findings which will be obtained from this study helps to update Hospital laboratory management on Biosafety practice. Proper biosafety precaution usage and quality laboratory service selection for hospital use. This research is highly valuable for policy makers and decision to insight the problem in the area.

There is limited information leading towards biosafety practices in a hospital laboratory which worsens the problem of quality laboratory service. Moreover, this study attempt to assess the current situation of biosafety practices among laboratory personnel of selected governmental hospitals in Addis Ababa.

2. Literature review

There are many studies in different part of the world regarding the biosafety practice in the laboratory among them a cross-sectional study which was conducted in 2010 among 223 laboratory personnel of 4 selected governmental hospitals in Bangkok showed that the mean scores ± standard deviation (SD) of administrative policy perception ranged from 6.1±1.8 to 6.9±1.0, those of work practices were 10.4±4.1 to 12.2±3.7, those of use of protective barriers were 3.7±2.0 to 5.6±2.1, those of facility design were 6.5±1.8 to 7.4±1.5 (7).

A quantitative cross-section survey was conducted by Sadia N. etal 2010 in Karachi, Pakistan on the level of awareness and biosafety measures taken by Public and private sector hospital-based laboratory technicians. There was about 61.7% having more than 5 years of work experience, 46.2% of the laboratory technicians did not use any kind of personal protective equipment, and almost 39.5% of the respondents recapped used syringes regularly while 10.7% recapped occasionally. To avoid the reuse of syringes before discarding; however, only about 36% of the respondents do this prior to discarding used syringes directly into municipal dustbins. In addition, about 65.2% of the respondents declare that there is no separate discarder for sharps so they throw these too into municipal dustbins. Although mouth pipetting is considered obsolete, 38% of the technicians continue to do so for various purposes. Additionally, standard operating procedures were not available in 73.9% of the laboratories, accident records were not maintained in 83.4%, No formal biosafety training had been provided to 85% of the respondents. There was a lack of awareness regarding good lab practices and biosafety measures. (1)

Another study was done by Sadia N. etal 2012 in Pakistan on Biosafety perspective of clinical laboratory workers showed that 28.4% of the laboratory technicians from Punjab, 35.7% from Sindh, 32% from Balochistan and 38.4% from Khyber Pakhtoon Khawa (KPK) did not use any personal protective equipment. Almost 46% of the respondents (34.2% from Punjab, 61.9% from Sindh, 25.2% from Balochistan and 85% from KPK) said they reused syringes either occasionally or regularly. Furthermore, 30.7% of the respondents said they discard used syringes directly into municipal dustbins. The majority (66.7%) claimed there are no separate bins for sharps, so they throw these in municipal dustbins. Mouth pipetting was reported by 28.3% technicians. Standard operating procedures were not available in 67.2% labs, and accident records were not maintained in 83.4%. No formal biosafety training had been provided to 84.2% of the respondents. There is a lack of awareness regarding good laboratory practices among the laboratory technicians in Pakistan (12).

A cross sectional study carried out to study the safety measures in clinical laboratories of India showed that the Response rate of safety measure was 44.8%, only 60% of laboratories had person in-charge of safety in laboratory and 73% of laboratories had safety education program regarding hazards. In 91% of laboratories staff is using protective clothing while working in laboratories, Hazardous material regulations are followed in 78% of laboratories. Regular health checkups are carried among laboratory staff in 43.4% of laboratories, Safety manual is available in 56.5% of laboratories, 73.9% of laboratories are equipped with fire extinguishers, Fume cupboards are provided in 34.7% of laboratories and they are regularly checked in 87.5% of these laboratories and 78.26% of laboratories suitable measures are taken to minimize formation of aerosols (13).

A study conducted to assess knowledge, attitude and practices of universal precautions in those Participants of Krishna Institute of Medical Science, showed that In this study 19 technicians from Biochemistry, Pathology and Microbiology were involved. Accordingly in knowledge in pathology 50% of study subjects were having average and 50% were having good scores while in biochemistry 25% had average and 75% had good scores and in microbiology 100% of study subjects had good grade. For attitude, in pathology dept 83.3% had average and 16.7% had good grades. In biochemistry 12.5% had poor grades, 75% had average grades and 12.5% had good grades and In microbiology 100% had good grades. For practice in pathology dept 16.7% had poor grades, 66.7% had average grades and 16.7% had good grades. In biochemistry 81.5% had average grade and 12.5% had good grades. In microbiology 100% of study subjects had good scores (14).

A Health and Safety survey was conducted by Javed A. etal. In Saudi Arabia among Laboratory workers in the Pathology Laboratory showed that 88% of respondents regularly worked with blood and blood products. It was found that 14% had suffered a needle stick injury and 8% had received splashes to the eyes or mouth, 2% had not reported these exposures, Full compliance of wearing gloves at all times when working with blood and blood products was 92% and Only 61% of respondents washed their hands after removing gloves. There was also a low compliance of using goggles/face shields when handling body fluids outside of a biological safety cabinet (17%). Reasons given were lack of availability (30%), not thought necessary (18%) and interfered with job (8%). Total compliance for safe disposal of sharps in a sharps container was 92%. These results are identified several deficiencies and strategies for improvement in formulating effective health and safety measures and provide relevant and focused education to reduce occupational related hazards and injuries (15).

Based on the research done by Bankole H. etal. 2013 in Nigeria on Bio risk Assessment of Medical Diagnostic Laboratories. A total of 80 diagnostic laboratories in biosafety level 3 were assessed for the presence of biosafety equipment, devices, and compliance rate with biosafety practices. The result showed that the presence of an isolated unit for microbiological work, leak-proof working benches, self-closing doors, emergency exits, fire extinguisher(s), autoclaves, and hand washing sinks in 21.3%, 71.3%, 15.0%, 1.3%, 11.3%, 82.5%, and 67.5%, respectively. Routine use of hand gloves, biosafety cabinet, and a first aid box was observed in 35.0%, 20.0%, and 2.5%, respectively, of all laboratories examined. Written standard operating procedures, biosafety manuals, and biohazard signs on door entrances were observed in 6.3%, 1.3%, and 3.8%, respectively, of all audited laboratories. No biosafety officer(s) or records of previous spills, or injuries and accidents, were observed in all diagnostic laboratories studied. There was marked deficiencies in the area of administrative control responsible for implementing biosafety (16).

A Study Conducted in 2012 by Adel Hussein E. In Khartoum were surveyed about their compliance laboratories with standard biosafety precautions showed that 32 (16.8%) of laboratories appointed biosafety officers. Only, 10 (5.2%) participated in training about response to fire emergency, and 28 (14.7%) reported the laboratory accident occurred during work. 45 (23.7%) laboratories had a written standard operation procedures (SOPs), and 35 (18.4%) had written procedures for the lean-up of spills. Moreover, biosafety cabinet was found in 11 (5.8%) laboratories, autoclave in 28 (14.7%) and incinerator in only two (1.1%) laboratories. Sharp disposable containers were found in 84 (44.2%). Fire alarm system was found in 2 (1.1%) laboratories, fire extinguisher in 39 (20.5%) laboratories, and fire emergency exit found in 14 (7.4%) laboratories. Furthermore, 19 (10%) laboratories had a hepatitis B virus vaccination programme, 5 (6.2%) applied BCG vaccine, and 2 (1.1%0) vaccinated the staff against influenza. There was very low standards biosafety precautions and very too low adopted laboratory personnel awareness towards biosafety principles and implementation (17).

Taking all these conditions into consideration, biosafety practice and associated factors in clinical laboratory workers were prepared using structured questionnaires and used to assess the practice associated with the laboratory professionals during the actual practice in different laboratories of government hospitals of Addis Ababa, Ethiopia.

3. Objective of the study

3.1. General objective

- To Asses of biosafety practice and associated factors in clinical laboratory among government Hospitals in Addis Ababa, Ethiopia.

3.2. Specific objectives

- To determine the situation of biosafety practice in clinical laboratory among government Hospitals in Addis Ababa, Ethiopia.

- To identify factors associated with biosafety practice in clinical laboratory among government Hospitals in Addis Ababa, Ethiopia.

4. Materials and Methods

4.1. Study design

- A Cross sectional descriptive study designs were conducted to assess the biosafety practice and associated factors in clinical laboratory

4.2. Study area

Addis Ababa is the capital city of Ethiopia with an area of 530 km^2 and a total population of 2.7 million and it has 10 sub-cities. The health service coverage of Addis Ababa is 71%. There are 5 Governmental hospitals, 24 health centers, 32 health posts & more than 500 private health institutions providing different health services (18)

The study was conducted in those selected governmental hospitals of Addis Ababa namely, Tikur Anbessa specialized hospital which is the largest tertiary and teaching referral hospitals in the country, St. Paul's Referral Hospital which is the second largest tertiary and teaching referral hospitals in the country , St. Peter's TB Specialized Hospital, ALERT Center , St. Amanuel Mental Specialized Hospital, Minilik II Referal Hospital, Yekatite 12 Hospital, Zewditu Memorial Hospital, Gandi Memorial Hospital, Ras Desta Damtew Memorandum Hospital , Tirunesh Beijing Hospital, Federal Police Referral Hospitals, Federal Prison administration general hospital and Armed Force Referral and Teaching Hospital. Addis Ababa, Ethiopia.

4.3. Study period

The study was conducted between March and May 2014 at government hospitals of Addis Ababa, Ethiopia

4.4. Population

4.4.1. Source population

All Health professionals working in Addis Ababa government Hospitals

4.4.2. Study population

All clinical laboratory staffs working in the government Hospital of selected hospitals during the study period who fulfills the inclusion criteria

4.4.3. Inclusion and exclusion criteria

Inclusion Criteria

- All clinical laboratory professionals who have been working in government hospitals during the study period

Exclusion Criteria

- Laboratory professionals who were not willing to participate in the study.

4.5. Sampling and Sample size

Sample size

All laboratory professionals who are working in the selected hospitals during the study period were included.

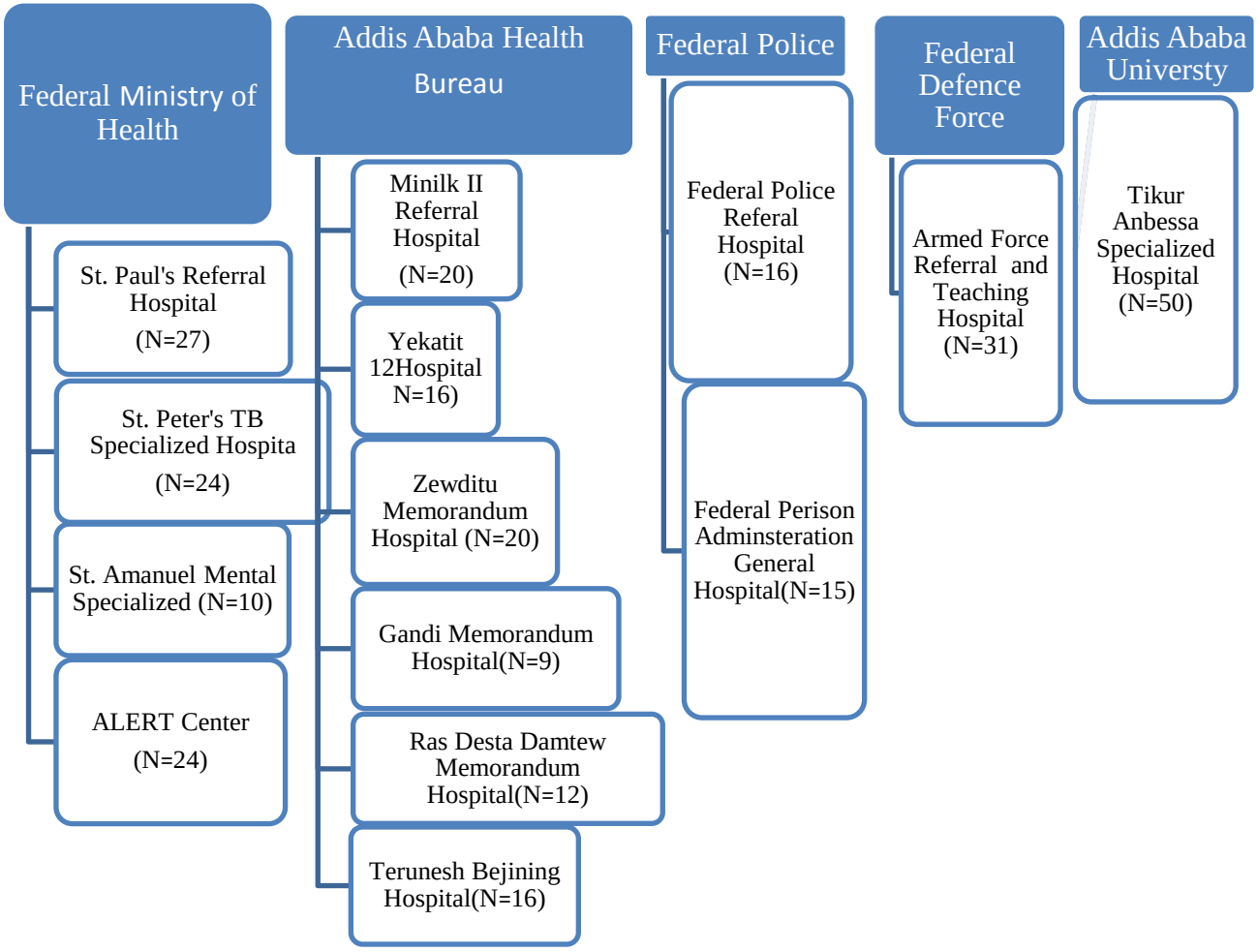
The total sample size of all clinical laboratory professionals were **290** subjects was applied among all government Hospitals

Sampling procedure

A convenient sampling method was conducted to assess the biosafety practice and associated factors in clinical laboratory workers

In Addis Ababa there are 14 Hospitals, out of them 6 were under Addis Ababa Health Bureau, 4 were under Federal Ministry of Health, 1 under AAUCHS, 2 under Federal Police and 1 under Federal Defense Force. These hospitals were selected based on Purposive sampling technique. All the 290 clinical laboratory workers, were approached during the data collection. From a total of 290 clinical laboratory workers, the numbers of workers were proportionally allocated based on the number of workers in the FMOH, AAHB, AAUCHS, FP, and FDF Hospitals. Schematic representation of sampling system was the following.

Fig.1 A Schematic frame work of Sampling for the study of Biosafety Practice in Clinical laboratory Workers in Governmental Hospitals in Addis Ababa, 2014. (Where N-number of laboratory staffs working in the hospitals, a total of 290 laboratory staffs).



Source:-from the human resource of the Hospitals, 2013.

4.6. Variables of the study

Dependant/ outcome Variable:

- Biosafety practice

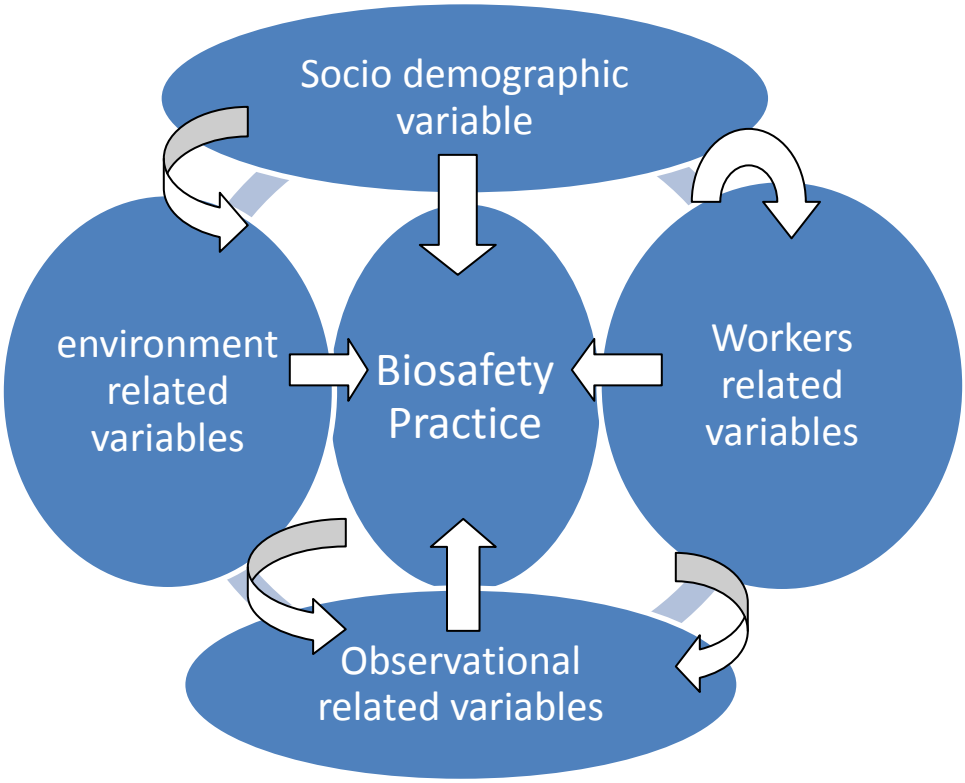
Independent/ Explanatory Variables:

- Socio demographic variable:
  - ✓ Age
  - ✓ Sex
  - ✓ Marital status
  - ✓ Level of education

- ✓ Work experience

- Working environment related variables:
  - ✓ Factors affecting towards Biosafety practice
  - ✓ Facility design
  - ✓ Managerial aspect
- Workers related variables:
  - ✓ Biosafety policy perception
  - ✓ use of protective barrier

Fig.2 Conceptual frame work for the relationship of Dependent and Potential independent Factors of Biosafety Practice in Clinical laboratory works in Governmental Hospitals in Addis Ababa, 2014.



This Conceptual frame work diagram showed that the relationship between those Dependent out comes of Biosafety Practice and Potential independent Factors of Biosafety Practice of Sociodemographic Variable, Environment related variable, workers related variable and observational related variables of Clinical laboratory works in Governmental Hospitals in Addis Ababa, 2014.

4.7. Operational definition

Biosafety practice: is a concept that promotes safe laboratory practices, procedures and proper use of containment equipment and facilities by laboratory workers.

Good Biosafety practice: is concerned with the organizational process and the conditions under which laboratory studies are planned, performed, monitored, recorded, and reported based on the standard operating procedure for clinical laboratory safety practice which was attached at the annex part. GLP is an evidence-based process that laboratories use to prevent microbial contamination, infection, or toxic reaction as they actively manipulate live microorganisms or their products, thus protecting themselves, other laboratory staff, the public, and the environment.

Poor biosafety practice: an improper method, procedure and principles that lower the established GLP data generation used in regulatory submissions relevant to the analysis of samples from a clinical trial. At the same time it, gives the unreliability and non integrity of data generated by analytical laboratories.

The following minimum conditions or practices must be observed for the most essential laboratory practices and procedures that may be used to develop written practices and procedures for safe laboratory operations. Each laboratory should adopt a safety or operations manual that identifies known and potential hazards, and specifies practices and procedures to eliminate or minimize such hazards.

- To adopt a good biosafety practices from those practice questions on affecting towards Biosafety practice who answered the mean scores ± standard deviation (SD) of 12.1±2.16 with 55% and above were as a minimum requirement for good laboratory practice(18).

4.8. Data Collection procedure

A standard structured self administered questioner was designed to extract data from the clinical laboratory professionals. A questionnaire including data on age, sex, address, and marital status, level of education, Biosafety Training and year of experience and other associated factors were included.

The studies were explained to each potential participant, and informed consent were obtained and the data were collected by data collectors after adequate training was given.

4.9. Quality Control and Quality Assurance

Pretesting the questionnaire and daily supervision of the data collectors during data collection were some of the actions that were taken for the quality of the data. One day training were given for the data collectors on how the data were collected. The principal investigator was expected to check up daily at least five filled questionnaire. if there are unfilled and missed question during data collection in the questionnaire, he/she was recheck with the data collectors and correct. Collections of the data were under supervision of investigator from the laboratory assistance and laboratory professionals by using a standard structural questioner form and to improve the quality of the data using double entry and the missing data was discarded.

4.10. Data Entry, Management and Analysis

After data collection the data was coded manually and double data entry was done using Epi Info V 3.2.2 soft ware after double data entry entered, the data cleaned and exported to SPSS for descriptive and inferential analyses. Frequencies and cross tabulations were checked for missed values and variables. The necessary assumption of the logistic regression was used to assess the relative effect of the explanatory variables on the outcome variable. For all data analysis level of significance was set at 5% α value and 95% confidence intervals.

4.11. Ethical Consideration

The study was ethically approved by Addis Ababa University, College of Health Science, School of Allied Health Science, Departmental Research and ethics review committee (DRERC).

Formal permission was asked from senior manager of the selected government Hospitals of Addis Ababa and this was supported by informed consent.

Consent was taken from each laboratory staffs, to take questionnaire from each laboratory staffs. The objective, benefit and method of the study were clearly explained to the participants. All of the study subjects were informed that, their response were kept secret. Finally they were done in a way that was not violating their privacy and confidentiality of information. Thus, name and address of the participant were not incorporated at any stage of data processing and also in dissemination of the results.

The respondents were informed that their participation in the study were on voluntary basis even after consent was obtained. They are free to withdraw from the study at any time without losing any benefits they were supposed to obtain.

5. Result

5.1. Socio demographic Characteristics of Laboratory Personnel

A total of 290 laboratory personnel were studied in fourteen public hospitals. Among the total study participant 171(59%) were male and the majority of 163(56.2%) were single. Regarding age, 98(33.8%) studied personnel were 26-30 years age groups. The majority 155(53.4%) of the studied personnel had finished undergraduate degrees which is followed by Diploma 123(42.4%). Regarding position, the majority 225(77.6%) of them were Laboratory Staffs and Biosafety Officer were 12(4.1%). The means of working experience among hospital laboratory personnel ranged from 2.39 ± 1.034 years and the majority of 96(33.1%).

The studied personnel had with the experience of 3-5 years and the majority (64.1%)of the studied personnel had worked in hematology department but (Table 1).

Table 1. Socio demographic characteristics of laboratory personnel at the governmental hospitals, in Addis Ababa, May,2014(N=290).

Variables		Frequency	Percent
Gender	Male	171	59.0%
	Female	119	41.0%
Age	20-25	75	25.9%
	26-30	98	33.8%
	31-35	55	19.0%
	36-40	29	10.0%
	41-45	17	5.9%
	Above 45	16	5.5%
Marital Status	Single	163	56.2%
	Married	123	42.4%
	Divorced/separated	4	1.4%
Education	Diploma	123	42.4%
	Degree	155	53.4%
	Second Degree	12	4.1%
Duration of working (years)	1-2	67	23.1%
	3-5	96	33.1%
	6-10	74	25.5%
	more than 10	53	18.3%
Position	Laboratory Head	14	4.8%
	Section/Department Head	26	9.0%
	Quality Officer	13	4.5%
	Biosafety Officer	12	4.1%
	Laboratory Staffs	225	77.6%
Disciplines of working	Microbiology	41	14.1%
	Parasitology/ Urinalysis	49	16.9%
	Clinical Chemistry	54	18.6%
	Hematology	64	22.1%
	Immunology/Serology	29	10.0%
	Specimen Collection	40	13.8%

5.2.Biosafety Perception of Laboratory Personnel

The majority 260 (89.1%) of laboratory personnel had information about the biosafety perception and about 123 (42.4%) participant received an appropriate immunization for potential infection. The majority 194(66.9%) of them had good biosafety perception (Table 2).

Table 2. Biosafety perception of the Study participants among laboratory personnel at the governmental hospitals, in Addis Ababa, May,2014 (N=290).

Variables	Yes	
	Frequency	Percent
Availability of Policy and procedure of the potential hazards	222	76.6%
Availability of west disposal protocol	253	87.2%
Information of biosafety practice during laboratory experiment	193	66.6%
Planed appropriate biosafety precaution and procedure	237	81.7%
practice of policies for the safe handlings of sharps	249	85.9%
Availability of Biosafety guideline	240	82.8%
practice of a protocol and standard of laboratory personnel	220	75.9%
Information of laboratory biosafety practice	260	89.7%
Appropriate biosafety practice for the patents/clients	209	72.1%
Information of Practice of receiving an appropriate immunization	123	42.4%
stored the protective laboratory clothe with that of street clothe in the same lockers or cupboards	152	52.4%
Total	2358	73.9%

5.3. Biosafety practice towards use of protective barrier of laboratory personnel

The majority 275 (94.8%) of laboratory personnel wear protective coats or gowns for working in the laboratory and 139(47.9%) of the participants said that the BSC did not properly maintained and certified annually, But 222(76.6%) of the study participants argue that there are provision of adequate personal protective equipment. Similarly, 230 (79.3%) of the participants use safe protective barriers (goggles and masks) for splashing or spraying of infectious micro-organisms. In general, the majority of 180(62.1%) of the study participants had good biosafety practice towards using protective barrier (Table 3).

Table 3. Biosafety practice towards use of protective barrier of laboratory personnel at the governmental hospitals, in Addis Ababa, May,2014(N=290).

Variables	Yes	
	Frequency	**Percent**
Maintain the BSC properly and certified annually	139	47.9%
Use of BSC regularly for potential procedures	157	54.1%
Use of safe protective barriers (goggles and masks).	230	79.3%
Use of regular personal protective equipments	230	79.3%
Use of disposable gloves & do not wear outside the laboratory	232	80.0%
Remove protective clothes before leaving for non-laboratory areas	230	79.3%
Wear protective coats or gowns for working in the Laboratory	275	94.8%
Wear gloves when hands may contact potentially Infectious materials.	271	93.4%
Good Biosafety Practice(Total)	1764	76.2%
	mean scores ± standard deviation (SD) 6.09±0.72	

5.4. Biosafety practice towards facility design of laboratory personnel

The majority (65.5%) of the participants said that the laboratory facility has a supply of good quality water . About half, (50.3%), of the study participants said that there is no facility for providing of active or passive immunization. Similarly, 146(50.3%) of the participants said that there is no provision of mechanical ventilation systems. While, 53(18.3%) of the laboratory worker claimed that there were no Enough benches and cabinets accessible for cleaning. In addition, 53(18.3%) of the participants said that there is no sink for hand washing in each laboratory (Table 4).

Table 4. Biosafety practice towards facility design of laboratory personnel at the governmental hospitals, in Addis Ababa, May,2014(N=290).

Variables	Yes	
	Frequency	Percent
Well designed laboratory for easily cleaned	236	81.4%
Biological safety cabinets located away from doors & windows	175	60.3%
Availability of Open windows	163	56.2%
Available of illumination of light for all activities	204	70.3%
Availability of a sink for hand washing in each laboratory	237	81.7%
Availability of a Bio safety system to cover fire, electrical emergencies and emergency shower	185	63.8%
Availability of a first-aid areas or rooms suitably equipped and readily accessible	183	63.1%
Provision of mechanical ventilation systems	144	49.7%
Provision of a supply of good quality water	190	65.5%
Provision of a reliable and adequate electricity supply and emergency lighting to permit safe exit	177	61.0%
Total	1894	65.3%

5.5. Managerial aspect for Biosafety practice of laboratory personnel

According to the majority 239(84.4%) of the study participants, there is a copy of biosafety or operations manual in their laboratory. Similarly, 239(84.4%) of the participants said there is appropriate place for chemical waste containers and these stored sharp containers were properly stored and disposed. The majority 235(81%) of the study participants had a practice of wastes segregated in proper containers. In addition, according to 133 (45.9%) study participants, there is a regular training in laboratory bio safety that was provided by the hospital management body and laboratory managers. While, almost half 154 (53.1%), of the participants said that there were no appropriate medical evaluation, surveillance and treatment for all laboratory personnel (Table 5).

Table 5. Managerial aspect for Biosafety practice of laboratory personnel at the governmental hospitals, in Addis Ababa, May, 2014(N=290).

Variables	Yes	
	Frequency	**Percent**
Provision of adequate personal protective equipment	222	76.6%
Availability of biological safety cabinet (BSC)	200	69.0%
Availability of an eyewash station and Spill kit material	216	74.5%
Availability of Policies and procedures established for potential hazards	175	60.3%
Adoption and development of a safety operations manual	206	71.0%
Regular training in laboratory bio safety	133	45.9%
practice required to adhere the safety manual	194	66.9%
Availability of A copy of the safety or operations manual	239	82.4%
Practice of wastes segregated in proper containers	235	81.0%
Chemical waste containers tagged, labeled and closed properly	209	72.1%
Place chemical waste containers appropriately and stored Sharps containers properly	239	82.4%
Total	2136	71.1%

5.6. Factors affecting toward biosafety practice of laboratory personnel

In bivariate analysis, factors that affect the biosafety practice of laboratory personnel showed statistically significant association with a written procedure for the clean-up of spills, Decontaminate wastes before disposal, Participating by providing biosafety practice ($p<0.05$) with the outcome variable of biosafety practice. However, our data did not show a significant association between the Facility design, Management aspect, Socio demographic characteristics and the outcome variable of biosafety practice.

When adjusted odds ratios were calculated among these variables, significant associations were found between a written procedure for the clean-up of spills, Decontaminate wastes before disposal, Participating by providing biosafety practice result with $p<0.05$.

Moreover laboratory personnel who perform a written procedure for the clean-up of spills were 2 times more likely to practice than those with non practice of performing clean-up of spills (AOR=2.31; CI 1.21-4.42) with P =0.04

Those laboratory personnel who were perform decontaminate all cultures, stocks and wastes before disposal were 2.7 times more likely to have good laboratory practice than those who were not practicing of decontamination (AOR=2.69; CI 1.49-4.86) with P =0.017

and Laboratory personnel who got information in Participating a biosafety practice were 5 times more practice than those who did not got the information (AOR=5.07; CI 1.66-15.52) with P =0.04 (Table 6).

Table 6. Factors affecting toward biosafety practice of laboratory personnel at the governmental hospitals, in Addis Ababa, May, 2014(N=290)

Variables		Dependent Variable		Crude odds ratio (95%CI)	PV	Adjusted OR (95% CI)	PV
		Good Practice (fre.)	Poor Practice (fre.)				
Sex	Male	106 (62%)	65 (38%)	1		1	
	Femle	74 (62.2%)	45 (37.8%)	1.008(0.62-1.63)	0.97		
Facility design	Poor D	63(50%)	63 (50%)	1		1	
	Good D	117 (71.3%)	14 (28.7%)	2.48(1.53-4.04) *	0.00	0.46(0.17-0.17)	0.12
Management Aspect	Poor M	72(49.7%)	73 (50.3%)	1		1	
	Good M	108 (74.5%)	37 (25.5%)	2.95(1.80-4.85) *	0.00	1.96(0.71-5.38)	0.18
Bio safety manual in the laboratory	No	16 (37.2%)	27 (62.8%)	1		1	
	Yes	164 (66.4%)	83 (33.6%)	3.33(1.70-6.53) *	0.00	0.53(0.13-2.44)	0.45
SOP for perform the biosafety practice	No	22(39.3%)	34 (60.7%)	1		1	
	Yes	158 (67.5%)	76 (32.5%)	3.21(1.76-5.86) *	0.00	0.49(0.14-1.69)	0.26
Record and document	No	40(61.8 %%)	51 (38.2%)	1		1	
	Yes	140 (70.4%)	59 (29.6%)	3.02(1.81-5.05) *	0.00	1.09(0.31-3.82)	0.89
Eat and drink in the work areas	No	157(44.0%)	97 (56%)	1		1	
	Yes	23 (63.9%)	13(36.1%)	1.09(0.52-2.25)	0.81		
Post Biohazard sign	No	24(60%)	16 (40%)	1	1		

	Table 6. Continue						
	Yes	156 (62.4%)	194(37.9%)	1.106(0.55-2.18)	0.77		
Incident/Accident report system	No	41(58.6%%)	29 (41.4%)	1		1	
	Yes	139(63.2%)	81(36.8%)	1.21(0.70-2.10)	0.48		
Mechanical pipette to replace mouth pipette	No	48(60 %%)	32 (40%)	1		1	
	Yes	132(62.9%)	78(37.1%)	1.12(0.66-1.91)	0.65		
Biosafety Perception	Poor	41(22.8)	55(50)	1		1	
	Good	139(77.2)	55(50)	3.39(2.034-5.65)*	0.00	0.82(0.25-2.71)	0.75
A written procedure	NO	69(62.7)	41(37.3)	1		1	
	Yes	154(85.6)	26(14.4)	3.52(1.99-6.20)*	0.00	2.31(1.21-4.42)*	0.04
Decontaminate before disposal	NO	69(62.7)	41(37.3)	1		1	
	Yes	151(83.9)	29(16.1)	3.09(1.77-5.38)*	0.00	2.69(1.49-4.86)*	0.01
Seal rotor heads and centrifuge	NO	16(37.2)	27(62.8)	1		1	
	Yes	164(66.4)	83 (33.6)	3.33(1.70-6.53)*	0.00	1.68(0.55-5.09)	0.35
Participating by providing biosafety practice	NO	32(42.7)	43(53.3)	1		1	
	Yes	148(68.8)	67 (31.2)	2.96(1.72-5.09)*	0.00	5.07(1.66-15.52)*	0.04

Note: fre. means frequency; Reference categories are indicated by 1. Significant Associations are indicated by * Adjustment was done for A written procedure for the clean-up of spills, Decontaminate all cultures, stocks and wastes before disposal and Participating by providing biosafety practice.

Observational Cheek list toward biosafety practice of laboratory personnel

From my observational cheek list tools that was attached in the annex part. The majority the study participants had well Biosafety practicing among those gowns or uniforms worn at all times during the laboratory work practice, Hand-washing sink available near laboratory exit, Policies for the safe handling of sharps instituted, work surfaces are decontaminated on completion of work were perform according to the standard of health biosafety guidelines to medical laboratory. Even though, most of the Laboratory professionals worn gowns or uniforms away from the laboratory like Cafes and Rest room/Toilet, there is a post of a sign "only authorized persons should be allowed to enter the laboratory" but not well practiced in all areas. In addition, Persons wash their hands after they handle viable materials also low practiced.

6. DISCUSSION

Among 290 studied laboratory personnel, the majority , 98(33.8%) of them were between the age of 26-30, this finding was similar with the study conducted by Pipat Luk,et al the majority , 94(37.8%) of the study participants were found between this age group. (20).

The study found that 12 (4.1%) of laboratories appointed biosafety officers among 14 laboratories. this study is incomparable with the study conducted in Sudan, among 190 diagnostic laboratories there was 32 (16.8%) laboratory safety officer. This may be associated with difference in sample size (17). similarly it is also incomparable with study conducted in Nigeria it is indicated that there is no biosafety officers among 80 diagnostic laboratories. This great difference in our case may be due to implementation Stepwise laboratory Standard process towards accreditation (16).

This study has revealed that biosafety practice of laboratory personnel in the laboratory services were 76.2 % which were strongly comparable with my observation which were 75.03% this study was higher than the study conducted in Bangkok and Pakistan were 57.7 % and 66.4% (20, 21). However, our finding was lower than with finding in Islamabad, Pakistan with personal protective barrier level of 80.9% (22). This may be due to better awareness about the biohazard practice from exposure to the potential harms as background of the study participants.

According to this study, the majority (79.3%) of the study participants use safe protective barriers (goggles and masks) for splashing or spraying of infectious micro-organisms, when they are doing outside the biological safety cabinet (BSC). There is wide variation between this study and study conducted in Saudi Arabia, which was 17%, this may be due to the fact that weekly safety audits are minimum in all areas of the Laboratories (23).

Our study, about 47.9% of the study participants said that there is annual maintenance and certification of their BSC. This finding is almost similar with study conducted in Bangkok were 35.3%. In addition it is also indicated that 54.1% of the study participants use BSC regularly for potential procedures, this is also supported by the above study were 44.5%. This minor difference could be due to carelessness, poor technique of laboratory personnel in the handing of BSC and, In some situations in which it is impractical to work with a BSC (20).

In this study 79.3% of the study participants used of personal protective equipments regularly for potential procedures, this finding is higher than a study conducted in Bangkok were 44.5%. This

difference could be due to less awareness level on safety practice. Similarly, 80% of the study participants use disposable gloves for touching clean surfaces and do not wear outside the laboratory , This study was also higher than the study conducted in Bangkok were 48.4%%, which could be due to low adherence to the standard protocol of biosafety (7).

About half, (54.1%) of study participants did not get regular training on laboratory safety. But it is not comparable with the study done by Javed A.etal, which indicated 30% of the subjects did not get training (23). But this finding is higher than the study conducted by Sadia N.etal, was indicate 85% of the study subjects did not take formal biosafety training (24). This difference could be due to lack of awareness on good laboratory practices to biosafety measures, and it also faces a lack of adequate resources. In our situation may be there is no strong formal training system for biosafety for all laboratory workers.

According to this study 57.6% are not received immunization for infectious disease. This study showed that there was low practice of immunization service in the studied laboratory personnel of the hospitals when compared with the studied conducted by Jyotsna V and Pipat L were 21% and 42.9% are not immunized respectively, this could be associated with lack adequate resource and lack of attention by the concerned bodies (24,25).

In this study, about 14.1% of the study participants said that there are no separate policies for safe handlings of sharps and they do not discard them properly. This finding was similar with study conducted in Thailand and Saudi Arabia which were 6% and 8% respectively (20,23). While it is incomparable with the study conducted by Adel H, Nasim et al, Arif et al and Sadia N etal. Were 44.2%, 66.7% , 47.5% and 65.2% respectively, this difference could be due to lack of adherence towards waste management policy in our case(17, 21,22,24).

According to this study, 37.3% of the study participants said that there is no written procedure for the clean-up of spills. This finding is similar with study conducted by Sadia N. etal and Arif etal., which were 33.7% and 31.7%.(21, 22). While it is higher than study conducted in Sudan and Pakistan, were 18.4% , this could be due to aveleblity and accessibility of spill kits in most study laboratories due to step wise laboratory standard process towards accreditation (26).

According to 19.3% of the study participants, did not adhere to use standard operating procedure for biosaftey which were more incomparable with the study conducted in Sudan, Pakistan and Nigeria

were 76.3%, 73.9% and 93.7%, respectively. This could be associated with lack of awareness on how to use the Standard operating procedure (17, 21, 26).

In this study, 37.3% , of the study subjects did not practice of decontamination of wastes before disposal . This finding is comparable with study conducted in Bangkok and Saudi Arabia, which were 41.4% and 48% respectively (20, 23). While, this finding is higher than the study conducted in Islamabad, Pakistan and Karachi, Pakistan were 10.4% and 24.2% respectively (22, 24) .

According to this study, 24.5%, of the study participants did not practice a regular seal rotor heads and centrifuge cup. This finding is almost comparable with similar study conducted by Pipat L were 37.3% (20).

As indicated in the result there is significant association between some associated factors with biosafety practices. These factors include a written procedure for clean-up of spills, decontamination of waste before disposal and Participating by providing a biosafety practice When adjusted odds ratios were calculated among these variables, significant associations were remaining significant.

7. Strengths and limitation of the study

7.1. Strengths of the study

- The study has tried to cover all public hospitals and all laboratory personnel which make more representative.

- The study has provided base line information for laboratories to strength the Biosafety practice and facilitates in the health institutions.

7.2 .Limitation of the study

- Lack of similar studies in Ethiopia made difficult for getting information and for possible comparison in our situation.

8. Conclusion

This study revealed that the biosafety practice of protective barrier was 76.2% and. Based on this finding we can conclude that there is a minimum requirement to achieve a biosafety practice among study laboratory personnel.

Regarding factors associated with biosafety practice, there is significance association between Practice of performing clean-up of spills, Practice of decontamination and wastes before disposal and Participating by providing biosafety practice are factors that affect biosafety practice.

9. Recommendations

Based on the finding of this study, the following important points are recommended to improve the biosafety practice in clinical laboratories:-

- Since the biosafety practice of protective barrier is minimum, all laboratory professionals should adhere with standardized laboratory safety practice.
- Laboratory managers and the concerned bodies should arrange a training program on specimen management to improve the Practice of decontamination and wastes before disposal
- Since there is significance relationship between biosafety practice and availability of written procedure for clean up spills, the biosafety officers should develop and prepare a written procedure.
- As indicated in the finding, there is significance relationship between biosafety practice and Participating by providing biosafety practice , the biosafety officer should aware the importance of these practice for all laboratory professionals.

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11. Annex

Annex I. Standard operating procedure (SOP) for Clinical laboratory safety

Procedure name

- **CLS (Clinical laboratory safety)**

Purpose

This procedure is written to provide safety responsibilities, guidelines and contact information for the employees / visitors in the Laboratory.

The goal is to promote and protect the health and wellbeing of every person working in the Laboratory.

Abbreviations

- ✓ SOP – Standard Operating Procedures, PPE-personal protective equipment, MSDS - Material Safety Datasheets, OHS – Occupational Health & Safety, TB – Tuberculosis.

Equipment

- ✓ This procedure applies to all equipment necessary to function safely and efficiently in the Laboratory.

Supplies

- ✓ This procedure applies to all supplies necessary to function safely and efficiently in the Laboratory.

Special safety precautions

- ✓ Observe universal blood and body fluid precautions.
- ✓ Wear personal protective equipment (PPE) when handling samples and reagents.
- ✓ Abstain from smoking, eating, drinking, manipulating contact lenses or applying make-up in the laboratory.
- ✓ Do not pipette by mouth.
- ✓ Clean up biological spills with freshly-prepared 10% solutions of bleach.

- ✓ Discard all waste into autoclave bags. Place the autoclave bags into appropriate containers.
- ✓ Hard waste items (pipette tips, tubes, reagent bottles, etc.) are discarded into autoclave pans.
- ✓ Soft waste items (paper towels, counter pads, gloves, etc.) are discarded into biohazard trashbins.
- ✓ Do not recap, bend, break, re-sheath, or remove contaminated needles from disposable syringes.
- ✓ Place disposable sharps such as needles, syringes, scalpels, etc. in a rigid puncture-resistant disposable "Sharps Container" with a lid. Vacationer holders (complete with attached needle) are considered disposable.

Procedure

Managers and Supervisors Responsibilities

- ✓ Provide a safe workplace for all employees.
- ✓ Ensure that all new employees, on-site contractors and long-term visitors are adequately trained, oriented and have required medical clearances and personal protective equipment before beginning work.
- ✓ Participate in health, safety and environmental training for supervisors at least once a year.
- ✓ Ensure compliance with all regulations, procedures, policies and permits.
- ✓ Ensure an appropriate structure is in place (designated safety representatives, safety committees, etc.) to carry out health, safety and environmental responsibilities.
- ✓ Cooperate fully with OHS in developing and operating Health, Safety and Environmental Program, including participation and cooperation in audits, surveys and inspections.
- ✓ Correct non-conformances found during audits, surveys and inspections within an appropriate amount of time.
- ✓ Encourage the participation of employees in safety committees and related activities.
- ✓ Allow employees to make suggestions without fear or reprisal.
- ✓ Permit employees to halt work they believe presents a serious health, safety or environmental risk until their concern can be thoroughly considered by appropriate management and OHS officials.
- ✓ Report and document all work-related injuries, illnesses and near miss incidents to OHS.

Safety Representative

Divisional safety representative

- ✓ Attend scheduled divisional meetings.
- ✓ Print and file minutes from meetings in "Meeting Minutes" binder under safety tab.

Unit safety representatives

- ✓ Provide guidance to management who, in fact, has the responsibility for providing safe workplaces for all employees.
- ✓ Attend scheduled case team safety meetings.
- ✓ Update unit on safety issues.
- ✓ Communicate information discussed during case team safety meeting to entire unit.
- ✓ Update unit-specific safety and chemical hygiene plans.
- ✓ Update unit-specific Material Safety Datasheets.
- ✓ Make sure new employees have taken safety courses and regular employees are up to date.
- ✓ Provide unit-specific safety training and tours.
- ✓ Schedule "Hands on" Fire Extinguisher Training with OHS for new employees.
- ✓ Make sure OHS is monitoring safety equipment (i.e. emergency showers, eyewashes, fire extinguishers, fire alarms).
- ✓ Obtain copies of safety audits and inspections.
- ✓ Identify quality indicators (i.e. hand washing techniques and appropriate PPE use) in the unit and document results.

Laboratory Employee

- ✓ Comply with applicable safety training, regulations and procedures.
- ✓ Attend all safety courses as directed by safety representative or management.
- ✓ Know the proper location, operation and maintenance of laboratory safety equipment.
- ✓ Be familiar with emergency and evacuation procedures for the laboratory facility.
- ✓ Report all work-related injuries, illnesses and near misses to the assigned Safety officer.
- ✓ Report all unsafe conditions to safety officer.
- ✓ Take required vaccinations (unless exempted by the clinic) and prophylactics.
- ✓ Use assigned personal protective equipment appropriately.

- ✓ Read and follow guidelines in MSDS when handling chemicals and materials.
- ✓ Cooperate fully during OHS audits, surveys and inspections.
- ✓ Visit the Occupational Health Clinic to have all injuries and work-related illnesses evaluated.

Safety Orientation

- ✓ Attend "Hands On" Fire Extinguisher Training Course with OHS (initial employment).

Complete Checklists and Forms

- ✓ Employee Emergency Contact Information
- ✓ Hepatitis B Vaccination Form
- ✓ Employee Entrance Checklist Form
- ✓ Laboratory Worker Health and Safety Checklist
- ✓ Notice of Intent to Work with Infectious Agents
- ✓ Receive Tuberculin Skin Test and Respiratory Training (TB Dept).

Read Laboratory Procedures annually

- ✓ Clinical Laboratory Waste Management Procedure
- ✓ New Employee Orientation Procedure
- ✓ Ergonomics Procedure
- ✓ Disaster Recovery Plan Procedure
- ✓ Blood Borne Pathogen Safety

Review Site Specific Plans annually

- ✓ Chemical Hygiene Biosafety Plan

Acquire Safety Guides from Quality Assurance or OHS

- ✓ Laboratory Safety
- ✓ Laboratory Waste Disposal Guide
- ✓ Biological Spill Response Guide
- ✓ Emergency Pocket Guide

Related documents

- ✓ Clinical Laboratory Waste Management Procedure
- ✓ New Employee Orientation
- ✓ Ergonomics Procedure
- ✓ Disaster Recovery Plan Procedure
- ✓ Blood Borne Pathogen Safety
- ✓ Notice of Intent to Work with Infectious Agents
- ✓ Quality Indicator Development Form
- ✓ Hepatitis Vaccination Form
- ✓ Employee Entrance Checklist Form
- ✓ Employee Emergency Contact Information
- ✓ Laboratory Worker Health and Safety Checklist

Source:

- ✓ OSHA CDC Health, Safety and Environmental Policy. 2004.

Annex IIa. Participant Information sheet (English version)

Information sheet for participants of the study entitled Assessment of Biosafety Practice and associated factors in clinical laboratory workers in Governmental Hospital Addis Ababa, Ethiopia.

Addis Ababa University, College of Health Science, School of Allied Health Science, Department of Medical laboratory Science

Addis Ababa, Ethiopia

Principal Investigator: Alexsander Seyoum (BSc)

Advisors: Fatuma Hassen (BA, BSc, MPH), Walelegn Worku (BSc, MPH, PhD Follow)

Name of the sponsor: Self

First of all we would like to thank you in advance for your cooperation and consent in participation in this study. Please read or listen when it is read for you about the general information of the study. If you have any question regarding the study please ask freely.

Background information

Background: Biosafety is an important practice in laboratory settings especially in developing countries where standard operating procedures (SOPs) are lacking. Biosafety in all laboratory work flows and during transferring of lab material from one place to another is crucial in fighting against infectious diseases and exposures among laboratory staffs. Safety measures in the laboratory includes, safe handling of all specimens and infectious material during collecting, processing and testing of patient samples. Careful handling and disposal of syringes, needles, pickers, and dispose of all biohazard waste appropriately are consider as the way of preventing biohazards, as the result of this laboratory biosafety is consider as one of the indicator in quality laboratory services.

Many studies in different parts of the world show the outcome in the lack of biosafety practices and indicate the factors that contribute for poor biosafety practices and the practice in developing countries is little. Currently, in Ethiopia there is no legislative guideline enforcing biosafety in clinical laboratories and no documented studies have been conducted. There is only limited information about

biosafety practices in a hospital laboratory which worsens the problem of quality laboratory service. Therefore, this studies have been conducted that tried to assess the overall practice of Biosafety throughout the governmental Hospital of Addis Ababa, Ethiopia. Moreover, I was also told that the result will be reported timely to physician or the hospital manager about any change of laboratory biosafety practice due to adequate safety practice from pre analytical up to post analytical for appropriate management depending on the quality laboratory service and this study will be used as baseline information to initiate nationwide program of biosafety practice among laboratory workers.

Aim of the study

The study is design to assess the biosafety practice and associated factors in clinical laboratory workers in governmental hospitals Addis Ababa Ethiopia.

Purpose of the study

The study is designed to analyze the biosafety practice in clinical laboratory and its associated factors in clinical laboratory workers.

Role of participant

The participants are expected to be volunteer for the data collection, which will be collected using structural questioners and observational method with all safety issues.

Risk association with participation

The risk associated with the study for data collection is discomfort during data collection using questionnaires.

Benefit

The benefit from this study may be of valuable importance for Laboratory Staffs specially who serves in the clinical laboratory department and for the appropriate management and providing adequate quality laboratory service using standard biosafety practice in all laboratory area.

Confidentiality

All the information will be kept confidential.

Right

Participants have the right to keep hold of information. Decide to participate in the study or with draw from the study after with full information of the consent form.

Who to contact

This study protocol is reviewed and approved by College of Health Science, School of Allied Health Science, Department of Medical laboratory Science Departmental research and ethics review Committee at Addis Ababa University Graduate Study Program. The purpose of the review by the committee is to make sure that research participants are protected from harm. For more information you can contact the chairman of the committee_____

Assurance of Principal Investigator

I put my signature below to confirm you that I take over the responsibility for the scientific ethical and technical conduct of the research project and for provision of progress reports for all stakeholders of the research project.

Alexsander Seyoum (PI): Signature: _____ Date: _____

Note:-To know more information about the study you can contact any of the following individuals by contacting:

PI Address: Alexsander Seyoum: Department of Medical Laboratory Sciences, Collage of health sciences, Addis Ababa University, Addis Ababa, Ethiopia
Alexsander Seyoum (principal investigator):-

Phone number: 0911005666/0913092775 E-mail: alexlov12@gmail.com

Fatuma Hassen (BSc,MPH) .....(Mobile tel.No. 0911418062)

Walelegn Worku /BSc, MPH, PhD Follow/.....(Mobile tel.No. 0911969579)

Annex IIb. Information sheet (Amharic version)

አዲስ አበባ ዩኒቨርሲቲ የህክምና ፋኩልቲ፣ የላቦራቶሪ ሳይንስ ዲፓርትመንት

አዲስ አበባ፣ ኢትዮጵያ

ዋና ተመራማሪ ፡- አሌክሳንደር ስዩም

አማካሪዎች ፡- ፋጡማ ሀሴን / ስ.ቁ 0911418062/

ዋለልኝ ወርቁ /ስ.ቁ 0911969579/

ምርምሩን የሚካሂደዉ ተቋም ፡- አዲስ አበባ ዩኒቨርሲቲ የህክምና ፋኩልቲ፣ የላቦራቶሪ ሳይንስ ዲፓርትመንት

ጥናቱን ስፖንሰር ያደረገው ተቋም ፡- በግል

1. <u>የጥናቱ ዓላማ</u>

በላቦራቶሪ ክፍል በማሪት ላይ ለከሰቱ የሚችሉ የጥንቃቄ ጉድለት ለከሰቱ የሚችሉ አስፈላጊ የባዮሴፍቲ አሰራር እና ልምድ ምን እንደሚሞላ በላብራቶሪ ባለሙያዎች ላይ ያላቸውን የእወቀት፣ የልምድ እና ዝንባሌ ምን እንደሚሞላ በሚሩበት ክፍል እንደናመ ማሳብሰብ፣ በምርመራ ጊዜ፣ ውጤት በሚመጣበት ጊዜ እና በአጠቃላይ በተዛማጅ በሽታዎች በተጨማሪም በተገልጋዩ ላይ የሚከው አስፈላጊው የናመ አወሳሰድ እና ምርመራ የተሻለ እንዲሁም በምርመራ ጊዜ ላይ አስፈላጊውን የህክምና መከላከያ መሪያ እቃ አለማድረግ፣ የአገልግሎት መቆራረጥ የመሳሰሉትን በህክምና የላቦራቶሪው አገልግሎት የሚመጣው የጥራት መዳደል ሴፍቲን በተመለከተ ማጥት፡፡

የጥናቱ ዓላማ በህክምና ላቦራቶሪ ወስጥ አስፈላጊውን የመከላከያ መንገዶች ባለማድረግ ለከሰቱ የሚችሉ የላቦራቶሪ አገልግሎት መቀነስን ይታያል ፡፡ የተለያዩ ጥናቶች እንደሚያመለክቱት በላቦራቶሪ አገልግሎት ተገቢው የህክምና መልገያ መሪያዎች በአግባቡ ጥንቃቄ ባለው በማከም ለማከቀረት ይቻላል፡፡ ስለዚህም የዚህ ጥናት አላማ በላቦራቶሪ አገልግሎት በተሚጡ ሆስፒታሎች በተጨማጭ ለመወቅ እና ለመለየት ነው፡፡

2. <u>በጥናቱ ውስጥ የተሳትፎ ሁኔታ</u>

ለመሳተፍ ከተስማሙ የላቦራቶሪ ባለሙያ ፈቃደኛ ለመሆንዎ ለሚጋገጥ የስምማት ማከይቅ ያደርግልዎታል፡፡ ከዚያም መሣተፍ እንደሚችሉና እንደሌችሉ ይነግርዎታል፡፡ በጥናቱ መሣተፍ ከቻሉ፣ ጥናቱ መሠረት የሚደርግበት ማከይቆች በጠፍ ባለሙያ ይጠይቅዎታል፡፡ የማከይቁ አወሳሰድ በጠፍ ባለሙያ ሜኛውንም የላብራቶሪ ምርመራ ለማድረግ ከሚወሰደዉ የተለየ አይደለም፡

3. <u>ሊከሰቱ ሰለሚችሉ ሰጋቶች እና የምቾት መጓደል</u>

በዚህ ጥናት ተሣታፊ መሆንዎ እንደተለመደው ባለሙያ የህክምና ደንብ በሚቅደው አግባብ ያለው የማከይቅ መንገድ በመሆኑ ይህ ነው የሚል ስጋት የለም፡

4. <u>ጥቅማጥና ማካካሻ</u>

ከላብራቶሪ የተገኘው ውጤት በዚህ ጥናት የተለየ ወይንም ያልተጠበቀ ሁኔታ አስፈላጊውን ምላሽ ይመቻችልዎታል፡፡

በዚህ ጥናት ተሣታፊ በመሆንዎ የተለየ ጥቅም አያገኙም፡ ነገር ግን ከጥናቱ ጋር በተያያዘ ለሚደረግልዎ አጠቃላይ የጥናቱ ወጪ በተመራሚው ይሸፈናል፡፡

5. ***<u>ሚስጥር ስለመጠበቅ</u>***

ሁሉም የሰጡኝ መልሶች በሚስጥር ይጠበቃሉ፡፡ የ ባለሞያ ኮድ የያዘው የሚጃ ቅፅ ተቆልፎ ይቀመጣል፡፡ ይህ ሚጃ በምንም ዓይነት ከዋናው ተመራሚ በስተቀር ለማንም አይገለፅም፡ የተሰበሰበው መልሶች ዓላማ ወጪ ለሌለ ዓላማ አይወልም፡ የጥናቱ ሪፖርት ይፋ በሚሆንበት ጊዜ የእርስዎ ስም አይገለፅም፡

6. ***<u>በጥናቱ ያለመሣተፍና እራስ የማግለል መብት</u>***

በጥናቱ ያለመሣተፍ መሉ መብት አለዎት፡፡ ጥናቱ ከተጀመረ በኃላ በማንኛውም ሰዓት ራስዎን ከጥናቱ ማግለል ይችላሉ፡፡ ይህን በመድረግዎ ምንም ዓይነት ችግር አይደርስብዎትም፡ ለሚመለኑት ውሣኔ ማንም ሰው ምክንያቱን እንዲገልፁ አያስገድዱትም፡

7. ***<u>ሚጃ ስለማግኘት</u>***

በማንኛውም ጊዜ ጥያቄዎች ማጣየቅ ከፈለጉ ከዚህ በታች ከተጠቀሱት ሰዎች አንዱን ማገናር ይችላሉ፡፡

1. አሌክሳንደር ስዩም /ስ.ቁ. 0911005666/0913092775/
2. ፋጡማ ሀሴን / ስ.ቁ 0911418062/
3. ዋለልኝ ወርቁ /ስ.ቁ 0911969579/

Annex IIIa. Consent sheet (English version)

Addis Ababa University, College of Health Science, School of Allied Health Science

Department of Medical Laboratory Sciences, Graduate Study Program

For participation as a volunteer in the research undertaking

Code number_____

I have been informed about the study, which plans to determine the assessment of biosafety practice and associated factors in clinical laboratory at governmental Hospitals, Addis Ababa. The objective and application of the study were explained to me.

I am also informed that all information contained within the questionnaire is to be kept confident. More over I have also been well informed of my right to keep hold of information, decline to cooperate and drop out of the study if I want and none of my actions will have any bearing at all and my overall health care and hospital access.

It is therefore with full understand of the situation that I agreed to give the written voluntary to the research to use the data taken from the written questioners; for investigation. I also have had the opportunity to ask questions about the project and have got the clarification to my satisfaction.

More over I was also told that the result will be reported timely to physician or the hospital manager about any change of laboratory biosafety practice due to adequate safety practice from pre analytical up to post analytical for appropriate management depending on the quality laboratory service. And hence I agreed that I am contributing to the management of my fellows and myself by contributing in this project.

I the invited participant , given all relevant information the purpose of this particular study, participants to be included the study procedure, benefits and risks of the study, consent and confidentiality read and explained to me, **I decided to agree or disagree** to participate in this particular study.

Therefore, I kindly request your agreement by indicating any of your response agree or disagree by marking ‘’ √ ’’

Agree ☐ **Disagree** ☐

Signature _____ Signature _____ _____

(Laboratory personnel) (Investigator) Date

If you have any questions about the study, please contact

Alexsander Seyoum, Tel. 0911005666, E-mail= alexlov12@gmail.com

Annex IIIb. Consent form (Amharic version)

አዲስ አበባ ዩኒቨርሲቲ ፣ ሜዲካል ፋኩልቲ ፣ የላቦራቶሪ ሳይንስ ትምህርት ክፍል

የድህረ ምረቃ ሞርሀ ግቡር

የላቦራቶሪ ባለሞያ የፈቃደኝነት መግለጫ ቅጽ

ከዚህ በታች እንደተመለከተው በአዲስ አበባ ዩኒቨርሲቲ፣ ሜዲካል ፋኩልቲ፣ የላቦራቶሪ ሳይንስ ትምህርት ክፍል በህክምና ላቦራቶሪ ክፍል ወስጥ ያለው ናሙና በሚወሰድበት ጊዜ እስከ ውጤቱ መመለሱ ባለው ጊዜ የሚፈረግ አስፈላጊ የጥንቃቄ እና

የህክምና መካላከያ ዕቃዎች በማጠቃም የተሻሻለ የላቦራቶሪ አገልግሎት መስጠት ምክንያትን ለማወቅ ጥናት እየተካሄደ ነው::

የተከበሩ የላቦራቶሪ ባለሞያ

እርስዎ ከዚህ በላይ በተጠቀሰው የጥናት ምርምር ለመሳተፍ እና ማንኛውንም መረጃ ለማገኘት ፈቃደኝነትዎን እንዲያስታወቁን ያስፈልጋል፡፡

በዚህ ጥናት ተሳታፊዎች መጠይቆች የሚፈረግላቸው ሲሆን በተጨማሪም የላቦራቶሪ ስራ ላይ የሚፈረጉ የጥንቃቄ አሰራር እንዲሁም የጥራት አገልግሎት ለሚፈረገው መጠይቅ ያደርጋሉ:: በመሆኑም ለላቦራቶሪ ምርመራ ላይ የሚሰጡ የጥንቃቄ አገልግሎት እና አስፈላጊ የሚሆን መጠይቅ የሚሰጡ ሲሆን በወቅቱም ለየትኛውም አይነት የላቦራቶሪ ምርመራ ሲሰጡ የሚሰሙው ምንም ዓይነት ጉዳት የሌለው መሆኑ:: ሆኖም መጠይቁ የሚወሰደው በተመራማሪው ወይም የህክምና ባለሞያዎች ስለሆነ ምንም አይነት አደጋ አይኖረውም::

የሚሰጡ ማንኛውም መረጃ በሚስጥር የሚጠበቅ በመሆኑ በማንኛውም መንገድ ለሶስተኛ አካል አሳልፎ አይሰጥም ወይም አይገለጥም::

እርስዎ ከመጀመሪያ በጥናቱ ላይ ላለመሳተፍ እንዲሁም መሳተፍ ጀምረው በመሃል ለመተው መቢታቸው መጨ በመጨ የተጠበቀ ነው::

በቅድሚያ ለሚደርጉት የስምምነት ምላሽ እያመሰገንን ሊሰጡን የፈለጉትን የመስማማት ወይም ያለመስማማት ምላሽዎን በተዘጋጀው የሚልስ ሳጥን ወስጥ ይህንን ‘’ √ ’’ ምልክት በማድረግ ይግለጹ::

ተስማምቻለሁ ☐ **አልስማማም** ☐

የወል ተቀባይ ፊርማ ---------- የወል ሰጪ ፊርማ ----------

ቀን ----------

ጥናቱን በተመለከተ ማንኛውም አይነት ጥያቄ ቢኖርዎት በሚቀጥለው አድራሻ በነጻነት መጠየቅ ይችላሉ::

አሌክሳንደር ስዩም, ስልክ. 0911005666/0913092775, E-mail= **alexlov12@gmail.com**

Annex IV. Questionnaires

Addis Ababa university, College of Health Science

Department of Medical Laboratory Science

For Assessment of Biosafety Practice and Associated Factors in Clinical Laboratory Workers among governmental Hospitals in Addis Ababa, Ethiopia.

Laboratory Personnel ID----------

Name of facility----------

General Direction: encircles the answer of your choice and please put a number in the column of **"code"** for the answer in cases where the responses other than mark are required in the space provided and also more than one answer is possible

S. No.	Questions	Response	Code
100	**Section One:** **Socio Demographic Characteristics Information**	**Response**	**Code**
101	**Your age group (years)?**	**20-25y = 1** **26-30y = 2** **31-35y = 3** **36-40y = 4** **41-45y = 5** **Above 45y =6**	
102	**Sex**	**Male = 1** **Female =2**	
103	**Your marital status?**	**Single = 1** **Married = 2** **ivorced/Separated = 3**	
104	**What is your qualification?**	**1. Diploma = 1** **2. Degree = 2** **3. Second degree = 3** **4.Other = 4**	

105	**How many years have you been working in the medical laboratory fields?**	**1-2 years = 1** **3-5 years= 2** **6-10 =3** **more than 10years = 4**	
106	**What is your position in this health institution?**	**lab head= 1** **section/department head= 2** **quality officer= 3** **Bio Safety officer= 4** **laboratory staffs= 5** **other specify= 6**	
107	**What disciplines do your work?**	**Microbiology = 1** **Parasitology/** **Urinalysis = 2** **Clinical Chemistry= 3** **Hematology = 4** **Immunology/Serology=5** **Specimen Collection= 6** **other specify = 7**	
200	**Section Two:** **Biosafety Policy Perception towards Biosafety Practice**	**Response**	**Code**

201	**Is there any restriction of access during experiments in progress?**	**Yes = 1** **No = 0**	
202	**Is there any receiving of an appropriate immunization to the laboratory staffs?**	**Yes = 1** **No = 0**	
203	**Is there any policy and procedure of the potential hazards in the laboratory?**	**Yes = 1** **No = 0**	
204	**Is there practice of a waste disposal protocol in place of laboratory?**	**Yes = 1** **No = 0**	
205	**Is there appropriate Biosafety precautions and procedures in the laboratory?**	**Yes = 1** **No = 0**	
206	**Is there practice of the policies for the safe handlings of sharps in the laboratory?**	**Yes = 1** **No = 0**	
207	**Is there follow a guideline of bio safety in the laboratory?**	**Yes = 1** **No = 0**	
208	**Is there practice of the protocol of biosafety standard in the laboratory?**	**Yes = 1** **No = 0**	
209	**Do you know or have information about laboratory biosafety practice?**	**Yes = 1** **No = 0**	
210	**Do you believe that your laboratory apply appropriate biosafety practice for the patents/clients?**	**Yes = 1** **No = 0**	
211	**Do you stored the protective laboratory clothe with that of street clothe in the same lockers or cupboards?**	**Yes = 1** **No = 0**	

300	Section Three: Factors affecting towards Biosafety Practice	Response	Code
301	Is there any Bio safety manual in your laboratory?	Yes = 1 No = 0	
302	Do you adhere to the Standard Operating Procedure (SOP) when you perform the biosafety practice in the laboratory?	Yes = 1 No = 0	
303	Have you ever participated to improve quality of laboratory Service by providing adequate biosafety practice?	Yes = 1 No = 0	
304	Do you record and document all laboratory information related with biosafety issue?	Yes = 1 No = 0	
305	Do you believe that your laboratory is providing good biosafety practice?	Yes = 1 No = 0	
306	Do you monitor your laboratory activates to takes an action to avoid accidents in your laboratory?	Yes = 1 No = 0	
307	Do you eat and drink in the working areas?	Yes = 1 No = 0	
308	Do you post a biohazard sign at the entrance of laboratory?	Yes = 1 No = 0	
309	Do you close laboratory doors when laboratory are in progress?	Yes = 1 No = 0	
310	Do you have an incident/accident report system in the laboratory?	Yes = 1	

		No = 0	
311	**Do you have any procedure that reported all spills, accidents and exposures of any potential infectious materials to the Bio safety officer?**	**Yes = 1** **No = 0**	
312	**Do you have a written procedure for the clean-up of all spills?**	**Yes = 1** **No = 0**	
313	**Do you have any practice to decontaminated (chemically or physically) contaminated liquids before discharge to the sanitary sewer?**	**Yes = 1** **No = 0**	
314	**Do you have any written documents that are expected to be removed from the laboratory for protection during contamination while in the laboratory?**	**Yes = 1** **No = 0**	
315	**Do you decontaminate all cultures, stocks, and wastes before disposal, such as autoclaving?**	**Yes = 1** **No = 0**	
316	**Do you use of mechanical pipette to replace mouth pipette?**	**Yes = 1** **No = 0**	
317	**Do you seal rotor heads and centrifuge cup regularly?**	**Yes = 1** **No = 0**	
318	**Do you remove broken glassware mechanically by manual?**	**Yes = 1** **No = 0**	
319	**Do you use of disposable needles?**	**Yes = 1** **No = 0**	

320	**Do you recap the needle after sample collection?**	**Yes = 1** **No = 0**	
321	**Do you have any practice of decontamination for used materials in the laboratory?**	**Yes = 1** **No = 0**	
322	**Do you wash your hands before leaving the laboratory?**	**Yes = 1** **No = 0**	
323	**Do you store food outside the work area of laboratory?**	**Yes = 1** **No = 0**	
324	**Do you wash your hands after handing biohazards materials?**	**Yes = 1** **No = 0**	
325	**Do you wash your hands after removing gloves?**	**Yes = 1** **No = 0**	
326	**Do you clean and decontaminate your work surface at least once a day?**	**Yes = 1** **No = 0**	
327	**Do you perform samples carefully to minimize the creation of Splashes?**	**Yes = 1** **No = 0**	
328	**Do you place cultures and specimens in a container with a cover during transportation?**	**Yes = 1** **No = 0**	
400	**Section Four:** **Biosafety Practice towards Use of Protective Barrier**	**Response**	**Code**
401	**Do you maintain the biological safety cabinet (BSC)**	**Yes = 1**	

	properly and certified annually?	**No = 0**	
402	**Do you use the biological safety cabinet (BSC) regularly for aerosol potential infectious samples?**	**Yes = 1** **No = 0**	
403	**Do you use Bio safety protective barriers (goggles and masks) outside the biological safety cabinet (BSC)?**	**Yes = 1** **No = 0**	
404	**Do you use standard personal protective equipments (gowns, aprons, vision protection, gloves. closed shoes, etc. as applicable to the specific lab) in the laboratory?**	**Yes = 1** **No = 0**	
405	**Do you use disposable gloves outside the laboratory?**	**Yes = 1** **No = 0**	
406	**Do you remove protective clothes before leaving for non- laboratory areas?**	**Yes = 1** **No = 0**	
407	**Do you wear protective coats or gowns for working in the laboratory?**	**Yes = 1** **No = 0**	
408	**Do you wear gloves when hands may contact potentially infectious materials?**	**Yes = 1** **No = 0**	
500	**Section Five:** **Biosafety Practice towards Facility Design**	**Response**	**Code**
501	**Is the laboratory well designed for easily cleaned?**	**Yes = 1** **No = 0**	
502	**Are the biological safety cabinets located away from doors and windows?**	**Yes = 1** **No = 0**	

503	**Do you have opening the window to reduce the microbial counts in air?**	**Yes = 1** **No = 0**	
504	**Is there adequate illumination for all activities?**	**Yes = 1** **No = 0**	
505	**Do you have a sink for hand washing in each laboratory?**	**Yes = 1** **No = 0**	
506	**Is there an eyewash station and Spill kit material readily available?**	**Yes = 1** **No = 0**	
507	**Do you have a Bio safety system to cover fire, electrical emergencies, emergency shower and eyewash facilities?**	**Yes = 1** **No = 0**	
508	**Are there a first-aid areas or rooms suitably equipped and readily accessible?**	**Yes = 1** **No = 0**	
509	**In there any provision of mechanical ventilation systems?**	**Yes = 1** **No = 0**	
510	**Do you have a supply of good quality water?**	**Yes = 1** **No = 0**	
511	**Do you have a reliable and adequate electricity supply and emergency lighting to permit safe exit ?**	**Yes = 1** **No = 0**	
600	**Section Six:** **Managerial aspect for Biosafety Practice**	**Response**	**Code**
601	**In there any policies and procedures established by laboratory director for potential hazards?**	**Yes = 1** **No = 0**	

602	**Is there any Provision of adequate personal protective equipment?**	**Yes = 1** **No = 0**	
603	**Is there availability of biological safety cabinet (BSC) in the laboratory?**	**Yes = 1** **No = 0**	
604	**Is there availability of an eyewash station and Spill kit material in the laboratory?**	**Yes = 1** **No = 0**	
605	**In there any development, adoption of a biosafety management plan and a safety operations manual by the laboratory director?**	**Yes = 1** **No = 0**	
606	**Do you have a regular training in laboratory bio safety that is provided by the laboratory supervisor?**	**Yes = 1** **No = 0**	
607	**In there any practice required to read the safety manual?**	**Yes = 1** **No = 0**	
608	**Is your laboratory have a copy of the safety or operations manual?**	**Yes = 1** **No = 0**	
609	**Is there any practice of wastes segregated in proper containers?**	**Yes = 1** **No = 0**	
610	**Is there any chemical waste containers tagged, labeled, dated and kept closed in your laboratory?**	**Yes = 1** **No = 0**	
611	**Do you place chemical waste containers appropriately and stored Sharps containers used and disposed of properly?**	**Yes = 1** **No = 0**	
700	**Section Seven:** **Observational Check List for Biosafety Practice**	**Response**	**Code**
701	**Persons wash their hands after they handle viable**	**Yes = 1**	

	materials, after removing gloves, and before leaving the laboratory.	**No = 0**	
702	**Eating, drinking, smoking, handling contact lenses, and applying cosmetics are not permitted in the work areas.**	**Yes = 1** **No = 0**	
703	**Food is stored outside the work area in cabinets or refrigerators designated for this purpose only.**	**Yes = 1** **No = 0**	
704	**Policies for the safe handling of sharps are instituted.**	**Yes = 1** **No = 0**	
705	**All procedures are performed carefully to minimize the creation of splashes or aerosols.**	**Yes = 1** **No = 0**	
706	**Work surfaces are decontaminated on completion of work or at the end of the day and after any spill or splash of viable material with disinfectants.**	**Yes = 1** **No = 0**	
707	**Only authorized persons should be allowed to enter the laboratory working areas.**	**Yes = 1** **No = 0**	
708	**Laboratory coveralls, gowns or uniforms must be worn at all times for work in the laboratory.**	**Yes = 1** **No = 0**	
709	**The laboratory should be kept, clean and free of materials that are not pertains to the work**	**Yes = 1** **No = 0**	
710	**Appropriate gloves must be worn for all procedures.**	**Yes = 1** **No = 0**	
711	**After use, gloves should be removed aseptically and hands must then be washed.**	**Yes = 1** **No = 0**	
712	**Policies for the safe handling of sharps are instituted.**	**Yes = 1** **No = 0**	
713	**Work surfaces must be decontaminated after any spill of potentially dangerous material and at the**	**Yes = 1** **No = 0**	

	end of the working day.		
714	**Hand-washing sink available near laboratory exit**	**Yes = 1** **No = 0**	
715	**Waste disposal procedures posted in laboratory**	**Yes = 1** **No = 0**	
716	**Evidence of proper waste disposal in the laboratory**	**Yes = 1** **No = 0**	
717	**No trash on floor of the laboratory**	**Yes = 1** **No = 0**	
718	**Laboratory gowns or uniforms must not be worn away from the laboratory lack Cafes and Rest room/Toilet.**	**Yes = 1** **No = 0**	
719	**No chewing games and No eating/drinking/smoking inside the laboratory**	**Yes = 1** **No = 0**	
720	**The laboratory should be kept neat and clean before and after doing the work using antiseptics.**	**Yes = 1** **No = 0**	

Annex VI. Declaration

I the undersigned, declare that this is my original work and has not been presented for a degree in this or any other university and all sources of materials used for this thesis have been acknowledged.

Name: Alexsander Seyoum Hagos (BSc, MSc candidate)

Signature: _____

Place:, Tikur Anbessa Hospital ,Addis Ababa University

Date of submission: June 30, 2014

This thesis has been submitted with my approval as University advisor.

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Date of submission: June 30, 2014

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Signature: _____

Place: School of Public Health, College of Health Science, Addis Ababa University

Date of submission: June 30, 2014