ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

ASSESSMENT OF MAGNITUDE OF OCCUPATIONAL INJURIES AND ASSOCIATED FACTORS AMONG MICRO-ENTERPRISE METAL WORKSHOP WORKERS IN ADDIS ABABA, ETHIOPIA.

By:

Negesse Mulugeta (BSc.)

A THESIS REPORT SUBMITTED TO ADDISABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES, SCHOOL OF PUBLIC HEALTH, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE IN MASTERS OF PUBLIC HEALTH.

August, 2019 G.C.

ADDIS ABABA, ETHIOPIA

ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF PUBLIC HEALTH

ASSESSMENT OF MAGNITUDE OF OCCUPATIONAL INJURIES AND ASSOCIATED FACTORS AMONG MICRO-ENTERPRISE METAL WORKSHOP WORKERS IN ADDIS ABABA, ETHIOPIA.

Advisors:

D/r Abera Kumie (MD, MSc. PhD)

Ansha Nega (MPH, PhD fellow)

Acknowledgements

I would like to express my heartfelt thanks to my first advisor Dr. Abera Kumie (PhD) for his unreserved advice and unlimited support throughout the study. I also thank to my second advisor to Ansha Nega (MPH, PhD candidate) for her continuous and valuable comments and advice throughout the research work.

My gratitude goes to Addis Ababa University School of Public health staffs for facilitating me for my study in preparing legal letter for concerned bodies.

My heart-felt gratitude also goes to the Addis Ababa University School of Public Health College of Health Science library staff for their support while I was referring different proposal and thesis kept in the library

I would like to thank Sub city Micro and small scale Enterprise development offices for the baseline information and facilitation that enabled me to prepare and conduct my research.

Last but not least I would like to thank my family and my friends, especially Dawit Abebe, who have helped me throughout the study.

Acronyms

AAU	Addis Ababa University
ANOVA	Analysis of Variance
BOLSA	Bureau of Labor and Social Affairs
BSc	Bachelor Natural Sciences
CSA	Central Statistics Authority
EDRI	Ethiopian Development Research institute
ETB	Ethiopian Birr
FDRE	Federal Democratic Republic of Ethiopia
GC	Gregorian calendar
GNP	Gross National Product
GTP	Growth and transformation Plan
HSTP	Health Sector Transformation Plan
ILO	International Labor Organization
LMICs	Low and Middle Income Countries
MEs	Micro scale Enterprises
MMA	Manual Metal Arc
MOLSA	Ministry of Labor and Social Affair
MPH	Master of Public Health
OSH	Occupational Health and Safety
PhD	Doctor of Philosophy
PPE	Personal Protective Equipment
PPS	Probability Proportional to Size
SEs	Small scale Enterprises
SMEs	Small and Micro scale Enterprises
SPSS	Statistical Package for Social Science

TABLE OF CONTENTS

List of tables

List of figures

Abstract

Background: Injuries in small scale enterprises are becoming a public health problem in developing countries including Ethiopia. The prevailing injuries could be prevented if appropriate measures are taken. In developing countries including Ethiopia, the risk of having work related injury is 10 to 20 times higher than that of developed countries.

Objective: This study investigated the magnitude and associated factors of occupational injuries among microenterprise metal workshop workers in Addis Ababa.

Methods: work-site based cross sectional study was employed among 540 micro metal workshop workers in Addis Ababa. Thirty (30%) of the Sub cities with the highest number of labor force were selected and sample size was allocated for each sub city based on proportional probability sampling. Firms were selected by simple random sampling. Trained data collectors administered a standardized questionnaire through face- to-face interview to collect information regarding participants practice, work-related and socio-demographic factors and outcome variable. Observational checklist was used to ascertain the information with quantitative findings. Data were checked for its completeness and coded and entered into Epi Info version 7.2.1.0. Data were analyzed using SPSS version 22 where descriptive and logistics regressions were computed to see association between different factors and work related injuries.

Results: The overall annual prevalence rate of work related injury was 53.5% (95% CI: 49.4%, 57.7%). The significant contributing factors for work related injuries in metal workshops were work experience with five year or less (AOR: 4.85, 95% CI: 2.68, 8.79), working without shift (AOR: 8.93, 95% CI: 3.81, 20.97), work dissatisfaction (AOR: 3.25, 95% CI: 1.86, 5.66), alcohol drinking (AOR: 7.05, 95% CI: 4.07, 12.22) and not using PPEs (AOR: 2.94, 95% CI: 1.46, 5.91).

Conclusion: Occupational injuries were found to be high. Lack of work experience, educational status, taking excessive alcohol, lack of work shift, health and safety training and supervision and not using PPEs increased the risk of work related injuries.

1. Introduction

1.1. Background

Occupational safety and health concerned with health and safety in workplace and focus on: health promotion; working environment improvement; development of work organizations and working cultures (1,2). Development agencies recognize the role of employment in poverty reduction (3).

About 330 million accidents and 2.3 million deaths annually occur globally due to occupational injuries and work-related diseases. In Sub Saharan Africa loss of about 4% of GNP resulted due to work related injuries and fatalities. The risk of having work related injury is higher in developing counties than that of developed countries (4).

Safety and health problems are major challenges in Ethiopia because of low occupational hazards awareness, lack of workplace policy and inefficient safety management system (5). Governments in the developing countries has made tremendous efforts and establish policies to enhance the capacity of enterprises (6). In Ethiopia SMEs development Program has been given due attention by government since 2004/2005 G.C. CSA survey showed that there are 799,358 establishments employing 997,380 persons. SMEs account for 90% of all enterprises and over 99% in developing countries including Ethiopia. On the other hand, the survey of SMEs manufacturing industries indicated that it engages 97,782 persons, 91% of which were male (7).

In Ethiopia strengthening MSEs is among top development priorities in employment creation. MSEs are a means of lifting people out of poverty and accelerating development (8). But workers employed in MSEs are provided with insufficient, poor-quality occupational health and safety services and perform their duties under suboptimal working conditions (9). Occupational health problems also occur due to performance constraints such as lack of awareness of environmentally sound working environment, weak and non-facilitative policies and regulatory framework. Health risks usually result from exposure to harmful environmental conditions (10). Small scale industries particularly metalworking, woodworking and concrete block manufacturing industries are among the highest ranked small scale industries in terms of risks for occupational injuries (11).

1.2. Statement of the problem

Metal workshops are associated with various inherent occupational hazards which may result in severe consequences on health of workers performing this task. They can be potentially dangerous if employee don't closely adhere to safety practices (12). Studies in Ethiopia showed that the prevalence of work related injury reaches up to 78.3% (13). A number of papers related to occupational health and occupational health care providers have been published, but most have focused on large scale metal manufacturing factories (5,14). A study done in Easter Nepal indicated that 90.7% of welders were aware of at least one hazard of welding and a similar proportion of welders were aware of at least one PPE. However, only 47.7% used one or more types of PPE. Education and duration of employment were significantly associated with the awareness of hazards and of PPE and its use. The welders who reported using PPE during welding were two times more likely to have been aware of hazards compared with the welders who did not report the use of PPE (15). A study done in Mekelle city among small-scale industry workers showed that use of PPEs, age, work experience and number of hours worked per week were found to be significantly associated factors with occupational injury (11).

MOLSA of Ethiopia did not address well the prevention of OHS issues of workers in micro scale enterprises. Metal workers are part of heterogonous workforce employed in a variety of workplace setting; including open-air sites or poorly ventilated spaces (1). There is no clear strategy developed to prevent micro metal workers from injuries (16,17). The OHS services are not yet resilient enough to handle the growing demands of workers' health. Though there is limited information on the gaps and needs of occupational health services, there is a high level of workplace injuries that often leads to loss of productive working days in Ethiopia (13).

Majority of metal workers are aware of at least one type of welding hazard and PPEs. But, there are others who are not aware of anything related to their work that is harmful or of any PPE that they can use (12,18,19). Welders are often exposed to workplace hazards that can be injurious to their health especially when exposure is on a regular and cumulative basis (19). Potential source for occupational injury vulnerability is largely under-explored and there are serious data limitations in the area, especially in developing countries (20). ILO estimated that the global annual occupational fatal injury rates are 14 deaths per 100,000 workers (12).

1.3. Rational and significance of the study

Rational of the study

Evidence based occupational health and safety services are essential in Ethiopia. From occupational health point of view work related injury data can provide useful and essential information for the development of injury prevention strategies. Magnitude of workplace injury data have a critical part to play in identifying hazard and this in turn help identifying the most appropriate targets for prevention. They also have a critical role in benchmarking occupational health and safety performance. In recent years periodic or ongoing collection of data on work place injuries have been reported in an increasing number of countries. So this study will play its part in identifying, describing and understanding the existing magnitude of occupational injuries and associated factors, developing effective strategies to prevent and control injury among micro metal workshop workers.

Significance of the study

It can provide significant input for further detail study and valuable information for micro and small scale enterprise offices, programmers, governmental and nongovernmental organizations working on OHS for further improvements of micro metal workshop workers health and safety in Addis Ababa.

2. Literature review

2.1. Overview of Work Process

The new SMEs development strategy of Ethiopia (published 2011) gave the working definition of MSEs based on capital and Labor. Accordingly MEs are industrial or service sectors that hired five or less labor force and having birr ≤ 100,000 capitals for industrial sector and birr ≤ 50,000 capital for service sector. According to Addis Ababa MSEs development bureau, manufacturing sectors such as metal workshops, textile and garment, wood work products, agro processing and handicraft products are getting maximum government support (21).

Micro metal workshops involve fabrication, machining, painting and welding activities. Sheet metal workers fabricate, assemble, alter and install sheet metal products using tools, machines and joining processes. Sheet metal workers perform ductwork, industrial sheet metal work, kitchen equipment, industrial consume systems, roofing and residential sheet metal work. Fabrication process involve measurement, layout, riveting, folding and brazing (7,12,21,22).

Machining (subtractive manufacturing) is the process of using cutting tools by physical action to remove some amount of a piece of metal to precisely shape it for an intended use. The primary machines used in machining are the engine lathe (metal lathe), milling machine, drill press, and abrasive grinders. These and other machines can be either manual or automated (7,12,22).

Welding is a process of joining two or more parts of metal at their touching surfaces permanently. MMA welding is used in low and medium income countries. Cutting metal stock such as bars, pipe, threaded rods using hacksaws and shearing sheet metals using foot squaring sheer to a desired length and width are common activity in metal workshops (22).

Work related injuries are very costly; they represent a burden which is constantly growing and affects standard of living; they involves worker temporary or permanent adverse consequences of objective and subjective nature or psychological impact (23,24). Metal work-shop works are stressful and physically damaging by exposing workers for prolonged hammering and cutting activities in excessive noise, discomforting body posture and heat which causes excessive strain and deterioration of physical work performance. Exposure to radiations also makes vulnerable to physical hazards like electric shocks, burns and heat stress (16,18).

2.2. Burden of Occupational Injuries in metal works

Occupational injuries can result from acute exposure which is exposure occurring over a short time, generally less than one day or from chronic exposure which is exposure over a long period of time. The effect of occupational injury can also be acute effect and/or chronic effect (25). The ILO estimated that total cost of occupational accidents and work-related diseases are 4% of the gross national product of a given country. Injuries are among leading causes of death. Most of the deaths are in LMICs. It has been estimated that the global annual occupational fatal injury rates are 14 deaths per 100,000 injured workers and the total estimated number of occupational accidents was 335,000. The rates are much lower in industrialized countries than in less industrialized countries and it is 10 deaths per 100,000 injured workers. Occupational injury fatalities, are estimated to be at least two to five times higher in the developing regions of the world, compared to North America and Western Europe (25,26).

Each year nearly 6,000 workers die and millions of others are injured in the United States alone. A statistic shows the total number of occupational injury deaths in the U.S. from 2003 to 2016. 5575 deaths in 2003, 5764 deaths in 2004, 5714 deaths in 2005, 5840 deaths in 2006, 5657 deaths in 2007, 5214 deaths in 2008, 4551 deaths in 2009, 4690 deaths in 2010, 4693 deaths in 2011, 4628 deaths in 2012, 4584 deaths in 2013, 4821 deaths in 2014, 4836 deaths in 2015, 5190 occupational injury deaths in 2016 in the United States (27). Asian countries and islands had an average of 23 deaths per 100,000 injured workers. In Korea, the rate was 33 deaths in 1964, 639 deaths in 1970, 1006 deaths in 1975. Changes in safety awareness at the workplace and the government's steady injury prevention activities may have helped lead to a gradual decline in fatalities after 1980. Then in 1980 it decreased to 33.9 deaths, in 2000 it was 16.6 deaths per 100 000 injured workers (26). Based on the number of fatal and non-fatal occupational accidents of the 5 geographical regions, Asia had the highest number of fatalities among the 5 regions and constituted more than 70% globally. The Asian fatal occupational rate was 12.7 per 100,000 persons in the labor force which was lower than Africa which had the highest fatality rate of 16.6 per 100,000 persons in the labor force. Europe had the lowest fatality rate among the 5 regions, with a rate of 3.61 (28). In developing countries like Ethiopia, the experience of recording work-related injuries in the practice of occupational health is limited and there is no well-organized injury recording system. In these countries, including Ethiopia, the risk of having work-related injury is 10 to 20 times higher than that of developed counties (29,30).

2.3. Factors Associated With Metal Working Workshop Injuries

Several factors contribute towards the occurrence of occupational injuries in work systems. Risk of occupational injuries may be associated with two major causes concerning the characteristics of work environment and practices and inherent and unique characteristics of the workers or individuals (31).

2.3.1. Socio demographics factors

Socio demographic factors are among the determining factors which are associated with the prevalence of injury. Studies conducted in USA and China showed that men had a higher risk of occupational injury than women. Younger workers suffer more occupational injuries than older workers. Studies indicated that increased educational levels of workers is associated with decreased work-related injuries (16,26,32).

Occupational injury risk among metal workers may depend on a host of factors including worker demographic factors such as age and education level; workplace factors such as mean job duration, shift work, manual material handling; traditional risk factors such as repetition, dynamic forces, awkward posture and environmental factors such as noise, lighting and temperature may be considered as occupational risk factors which may lead to work-related injuries and diseases (31).

2.3.2. Work environment factors

Metal workshop workers, during different activities, are exposed to various occupational risks generated by physical risk factors from machines and the heat of the flame from the burning of a gas mixture; chemical risk factors including contact with different metals, vapors, gas, dust, fumes; biological risk factors including inflammation of the ear due to the use and exchange of earplugs. Physiological risk factors are also incorrect posture during work. This characteristic of the work process causes the worker to have postures for better results of work which are not necessarily ergonomically correct (33).

A study done in Nigeria, Benin showed that duration of continuous work for more than 8 hours per day that is the longer the longer the duration of work, the more work related complaints; awareness of occupational health hazards among workers promote positive health; number of persons working together and overcrowding, lack of training and work experience less than five

years, low awareness on safety environment and irregular use of PPEs at the site are also associated with more number of morbidities(19).

The study in USA indicated working in jobs with overtime schedules was associated with a 61% higher injury hazard rate compared to jobs without overtime. A study also showed the likelihood of occupational injury is increased by 12% among respondents with no occupational training. Researchers revealed that work place injuries are caused by poor work environment which leads to increased job stress and which in turn results increased risk of occupational injury (34,35).

Emergency risk management: education and information to build culture of health, safety and resilience at all levels; regular risk assessment and early warning; development of risks profile maps; emergency preparedness and developing emergency workforce are associated with decreased work-related injuries or emergencies (35).

2.3.3. Behavioral factors

Association of work accidents with alcohol has been showed by a study done in India, Vellore. But study done in Ethiopia indicated that there was no significant association between chat chewing and cigarette smoking with occurrence of occupational injuries. Poor perception of working condition, risk taking behavior, emotional instability, job dissatisfaction, sleeping disorder and job stress are significantly associated with occurrence of occupational injury(36). Compared to females, the likelihood of occupational injury is 10% higher for male migrant workers in china. On the other hand a study done in India among workers revealed that workers who are highly satisfied with the existing jobs have lower risk of occupational injury (37,38).

2.4. Common Type of Physical Injuries in Metal Working Workshops

Common metal workshop injuries include eye injury due to welder's flash; flash burn due to ultraviolet light, sparks and hot metal particles; injury to the ears due to flying particles, burn from flammable materials; lifting heavy items without proper posture; tendon damage due to repetitive motions; cut due to sharps, sparks and hot metal spilled onto floor (39).

In a study done in India, the most common morbidities in metal workshop welders were wounds, abrasions, lacerations, watering and redness of the eyes and foreign body sensation in the eyes, flash burns and back ache. A study done in Nigeria reported arc eye injuries, foreign body sensation in the eyes and body pain are the most common morbidities (12,19).

2.5. Personal Protective Equipment Accessibility and Utilization

Despite best care and intentions, there is always a chance of injury in a workshop that is equipped with sharp and powerful tools and machines. So, implementation of supplementary measures such as the use of PPE is unavoidable. Engineering controls and work practice and administrative controls should come first of PPEs. PPEs are the last line of protection (25).

These PPEs include ear plugs, masks, goggles, boots, gloves, helmets, apron and safety belts which are recommended for the work settings to protect hearing, respiratory, eye, foot, hand, head, whole body and fall respectively (40).

A study done in India showed that positive response to Knowledge, Attitude and Practice survey is an indication of the employees having highest degree of awareness about PPEs. Negative responses indicate the future probability of occurrence of occupational injury. A study done Addis Ababa revealed that workers consuming alcohol during working days, perceiving their work highly stressful and not using PPEs were more likely to be injured than their counterpart. Work related injuries were decreased significantly by using PPEs, and workers who did not use PPEs were 3.61 times more likely to be injured than workers who use personal protective equipment (41).

2.6. Occupational Health and Safety Services in Ethiopia

The world continues to suffer from an enormous burden of morbidity, disability and premature mortality from injuries. Much of this burden is unnecessary and can be prevented by evidence-based, high-impact interventions that can be implemented in all countries (29). According to Ethiopian ministry of labor and social affair (MOLSA), there are fundamental obligations of an employer to put in place all the necessary measures in order to ensure work places are safe, healthy and free from any danger to workers (42).

Occupational health services have to meet special needs of the people employed and the needs of the undertakings. Because occupational health services may reduce morbidity and work related injuries both locally and nationally. In addition, fewer losses to employer and worker e.g. reduction of absenteeism means there will be reduction of wage losses and decreased compensation costs (23).

According to the FDRE constitution article 42/2, workers have the right to reasonable limitation of working hours, to rest, to leisure, to periodic leaves with pay, to remuneration for public holidays as well as healthy and safe work environment (43).

Occupational health service at workplace has to avail occupational health and safety regulations, monitor and control hazards to health, supervise and monitor of hygiene and sanitary facilities for health and welfare of the workers, inspect protective devices, provide First Aid, provide health education and safety training, report occupational deaths, diseases, injuries , disabilities, hazards and their related preventive measures (26). In cases where a health concern is identified but scientific data do not permit an evaluation of the magnitude of the risk, recourse to precaution should be used to reduce or prevent exposure of workers for injury. The first step for prevention of exposure should be to try and eliminate the hazard. If that is not possible, the hazard should be substituted by a less harmful agent. Then, engineering controls should be applied. If all these are not feasible, then administrative controls should be considered such as worker education (25).

3. Synthesis of the Review

Studies in Ethiopia showed that the prevalence of work related injury reaches up to 78.3%. According to different literatures reviewed above most of the occupational injuries in metal working workshops are associated with three major determinant factors namely socio demographic factors, behavioral factors and work environment. The common physical occupational injuries in metal workshops include noise, heat, vibration, cold, heavy physical work, radiation, abrasion, cut, burn, puncture, eye injury, ear injury, etc. Most activities and machines in metal workshop are dangerous and make workers prone for occupational injury. E.g. sheet metal workers use tools, machines and joining processes, machining involves cutting tools by physical action using engine lathe (metal lathe), milling machine, drill press, and abrasive grinders while welding involves cutting metal stock using hacksaws and shearing sheet metals using foot squaring sheer. All these activities threaten metal workers. Health inspectors need to check efficacy and compliance with safety devices at workshops periodically. The labor ministry should also enforce working guidelines and safe working environment for workers employed in micro metal workshops. Injury surveillance system would help in timely reporting, enquiry and implementation of preventive measures.

4. Conceptual Framework

Literatures showed that three determinant factors determine the occurrence of occupational injury. The main variables in this conceptual framework are taken from different previous studies. Socio demographic factors and work environment affect the behavioral factors. Behavioral factors are the most proximate factors while socio demographic and work environment are distant factors.

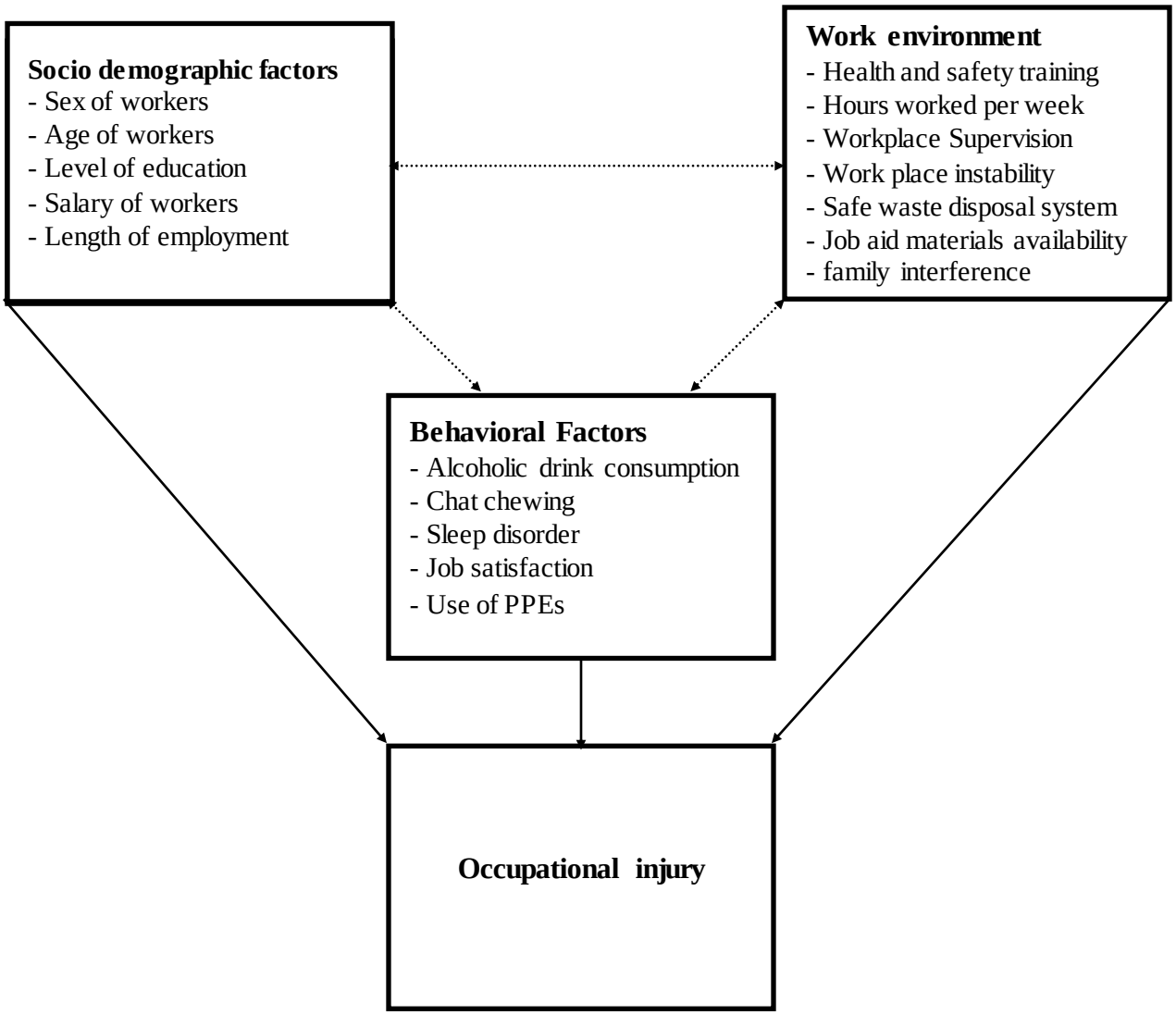

Figure 4.1. Determinants of occupational injury- A conceptual framework for study magnitude of occupational injury and associated factors (16,29).

5. Objective of the Study

5.1. General Objective

To assess magnitude of occupational injuries and associated factors among micro enterprises metal workshop workers in Addis Ababa.

5.2. Specific Objective

- ✓ To determine the prevalence of occupational injury among micro enterprises metal working workshop workers in Addis Ababa from February to March, 2019.
- ✓ To identify factors contributing for occupational injury among micro enterprises metal workshop workers in Addis Ababa.

6. Method of the Study

6.1. Study Area

This study conducted in Addis Ababa, capital city of Ethiopia. Addis Ababa comprises of a population of 3,384,569 (2007 population list). However, it is believed that this number was inaccurate when recorded and underestimated the population. The city has through recent years seen strong annual growth rate, and population counts as of 2017 are growing closer to 4 million, about 49.1% is male and 50.9% is female. Addis Ababa is geographically located at 9° 1' N latitude and 38° 44' E longitudes. It is found on elevation of 2355 meter above sea level. The total area of the town is 52700 hectare/527km2. The city has 10 sub-cities and 117 Woredas (20). According to a baseline survey done by the Ethiopian development research institute (EDRI) on entrepreneurship and small business development in Ethiopia, there are 12706 microenterprises in Addis Ababa. Among these metal working workshops are 2540 microenterprises. There are 7120 labor force engaged in these micro metal working workshops (44).

6.2. Study Design

A work site-based cross-sectional study was conducted to assess magnitude of occupational injury and associated factors among micro-enterprises metal working workshop workers in Addis Ababa, Ethiopia from January 2018 to February, 2019.

6.3. Source and Study Population

All workers working in micro metal workshops in Addis Ababa were source population and all workers in the selected micro metal workshops in Addis Ababa were the study population. The study units were the micro metal workshops/firms in selected woredas. The study subjects were workers who are directly engaged in micro metal workshops from whom data were collected.

6.4. Inclusion and Exclusion Criteria

The target population for the study was micro scale metal working workshop workers. So the study included all workers who are directly involving in micro metal working process. The study excluded workers who had been working for less than one year during data collection and who are not directly involving in metal working process, because they are not expected to have similar exposures status and health effects. Workers who were unable to respond the interview because they were ill or at annual leave during the data collection were also excluded.

6.5. Sample Size Determination

For specific objective 1: Single population proportion formula was used to determine the sample size to study prevalence of occupational injury among micro metal workshop workers. By taking 95% confidence interval and 34.2% prevalence of work-related injuries among microenterprise welders was used (39). And 10% none response rate was considered.

$$n = \frac{(Z\alpha/2)^2\, P(1-p)}{d^2} = \frac{(3.84)\, 0.342(1-0.342)}{(0.0025)} = 346$$, adding 10% none response rate n = 381

And design effect of 1.5 **n = 572**

Where**:** n = Initial sample size

Z α/2 = Confidence level at 95% = 1.96, using level of significance of α=0.05.

P = prevalence of occupational injury (34.2%).

d = margin of error to be tolerated = 5%

Z = value of a standard normal distribution score= 1.96

Epi info stat_Calc → sample size and power → population survey is also used to check the sample size and it is the same as the above.

For specific objective 2:

Sample size for specific objective two was calculated using prevalence from literatures using double population proportion formula. In the first case we take CI=95%, power=80%, ratio=1 and OR=1.5 up to 2. So OR 2 was selected because of economical and time feasibility.

Relevant variables	CI	Power	Ratio	Proportion of outcome among unexposed	Proportion of outcome among exposed	OR	Sample size	Reference
Health & safety training	95%	80%	1:1	25.54%	28.1 %	2	328	21
Alcohol consumption	95%	80%	1:1	53.3%	78.9%	2	304	18
PPE use	95%	80%	1:1	31.9%	38.2%	2	300	21

Or using Epi info statCalc → sample size and power → cohort or cross-sectional is also same. Because of time and resource limitation, the first specific objective calculated sample size **572** was appropriate, so the first was selected to be the sample size.

6.6. Sampling Method

Simple random sampling was used to select study metal workshops. Because all firms perform almost same activities no need of selecting study participants, so all workers in a selected study workshops were included in the study till we get the required sample size. Stage by stage we divided these large populations into different groups to make the sampling process more practical. In stage one, we divided the population into sub cities and we selected three sub cities (30%) with the highest number of labor force. Stage two; by simple random sampling we took 4 woredas from each of those three sub cities. Then we allocated the calculated sample for each woredas by proportional to population size (PPS). Finally we performed simple random sampling on the metal workshops within the selected woredas to get our study subjects.

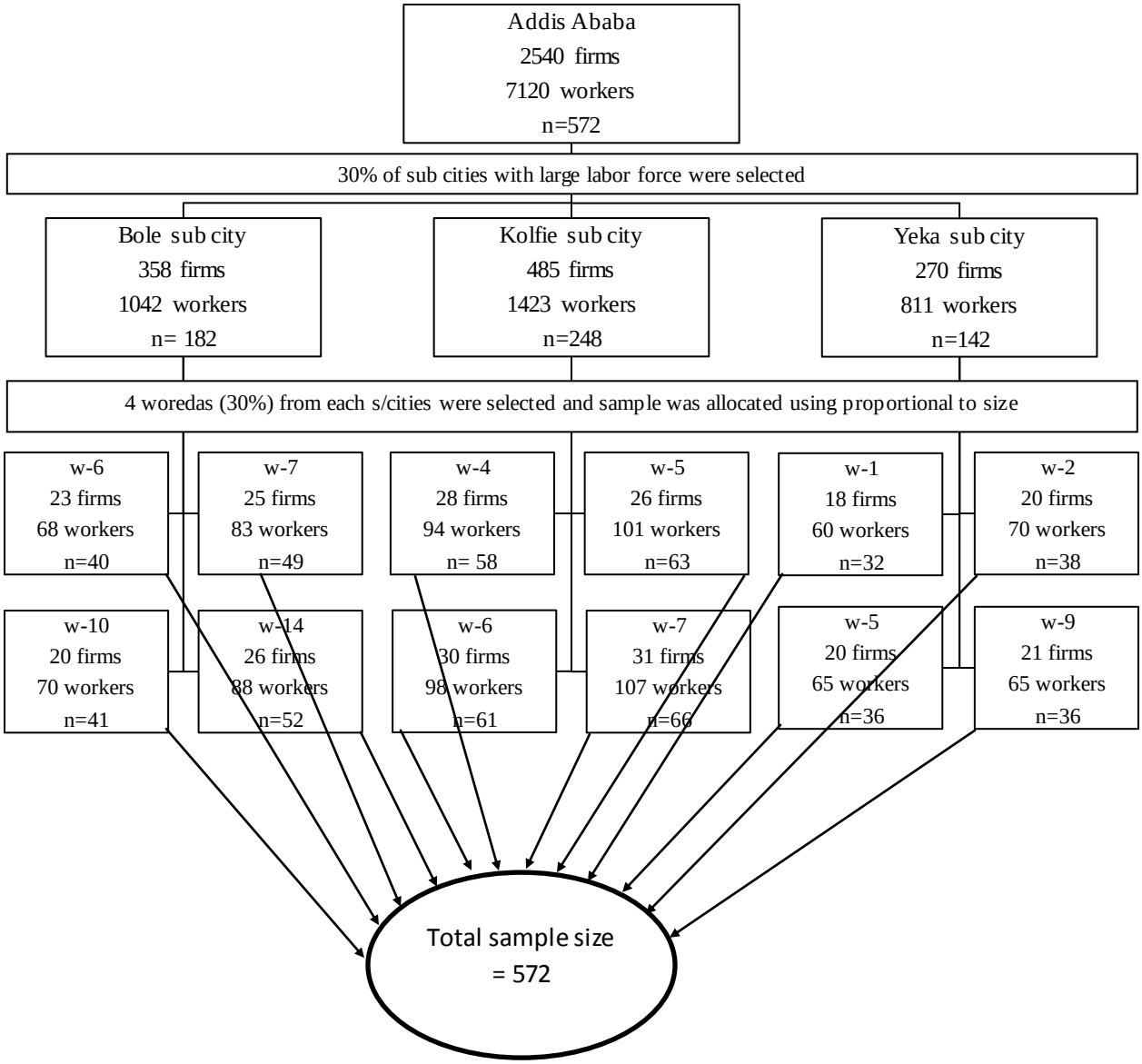

Figure 6.1. Schematic representation of sampling procedure

6.7. Data collection tool

Standardized Amharic version pretested questionnaire which was adopted from different literatures was used to collect data. The questionnaire focused on socio demographic (sex, age, education level, salary, employment length), behavioral (alcoholic drink, chat chewing, sleep disorder, job satisfaction, PPEs use) and environmental factors (health and safety training, work hours, workplace supervision) that can determine occupational injury in metal working process. Interviewer-administered in person questioner (face to face interview) was used. Observational checklist was also implemented.

6.8. Data collection team and procedure

Data were collected by 10 diploma nurses and supervised by 2 degree Environmental health professionals and one PI. Upon arriving at the data collection site, the owner of the firms was approached first before going to the workers, the purpose of the study and the population of interest was explained to them during the introductions. To avoid recall bias the research question was defined and articulated carefully, interviewers were trained and interviewees were allowed sufficient time for adequate recall and information given were verified with other available trustworthy sources. Observational checklist was also used to assess the existing work setup and PPE use.

6.9. Study variables

6.9.1. Dependent variable

- **Occupational injury**

6.9.2. Independent variable

- **Behavioral factors**
  - Alcohol consumption
  - Chat chewing
  - Sleeping disorder
  - Job satisfaction
  - Use of PPEs
- **Socio-demographic factors**
  - Sex
  - Age
  - Educational level
  - Monthly salary
  - Work experience
- **Work environment factors**
  - Health and safety training
  - Weekly working hours
  - Work place supervision

6.10. Operational Definitions

Occupational injury: Physical injury from abrasion to amputation on a worker external body that causes health facility admission/laid on bed at home in the last 1year prior to data collection.

Physical injury: is an injury that damages a metal worker's body and is caused by physical risk factors in the last 12 months prior to data collection.

Occupational hazards: Those exposures that pose imminent danger of causing injury to micro metal workers.

PPEs: Specialized clothing or equipment for protection of micro metal workers from health and safety hazards at work.

Job satisfaction: A self-report felling of study participants about their job as it is pleasurable for them.

Permanent workers: a person employed for indefinite period and has been working at least for 12 months at the time of data collection.

Temporary workers: a person employed for definite period and has been working for less thah 12 months at the time of data collection.

Sleeping disorder: taking more than 30 minute to fall asleep, awakening during sleep more than 3 times/week, or early morning awakening more than 3 times/ week during the last 1 year period.

Smoking: workers who smoke cigarette at least one cigarette/day.

6.11. Data Management

Preliminary checking, editing and adjusting responses was done in the completed questionnaires by a field supervisor on the same day to catch technical omissions, legibility of hand writing, and consistency and readying them for coding and storage. Each questionnaire was coded and stored in appropriate area and checked for completeness by principal investigator during and after data collection. So unusual/unexpected values that occurred in data during data collection, coding or data entry were identified and examined to decide if it was correct or if there was an error. Data entry and cleaning/editing was done by running simple frequency and cross tabulation to check for inconsistency and completeness, and sorting to identify outliers using Epi info software version 7.1.5.0 and it was exported to SPSS version 22 for analysis.

6.12. Data Analysis

6.12.1. For objective 1.

Descriptive statistics was done to determine the magnitude of work related injury among micro metal workshop workers and to characterize the variables frequency and percentage. Frequency distribution, mean, standard deviation, median and percentage of variables were also computed to describe the data. Descriptive statistics was used to describe the characteristics of the study population. SPSS Statistical software was used to analyze data.

6.12.2. For objective 2.

Bivariate and multivariable logistic regression analyses were done to identify factors which were statistically significant with work related injury. All independent variables was fitted separately into bivariate logistic model to evaluate the degree of association with occupational injury. Crude odds ratio (COR) with 95% CI was computed to see the presence of association between independent variables and occupational injury. Then, variables with a p-value < 0.2 were export to multivariable logistic regression model to control confounders. The odds ratio (OR) with a 95 % confidence interval (CI) was used to test the statistical significance of variables.

6.13. Data Quality Assurance

To maintain the quality of data due attention was given starting from proposal development through data collection and analysis. To assure the quality of data during proposal development structured and standard questionnaire was prepared to collect information. Training manual was prepared to train data collectors and supervisors for two days. Accordingly issues such as the aim of the study, content, objective, data collection and interviewing technique, importance of quality and accurate data, data collection instruments, key terminologies, field methods, inclusion–exclusion criteria, ethical issues and record keeping were made clear for data collectors and supervisors. The questionnaire was prepared first in English and then translated into Amharic finally retranslated back to English by independent translator to check for consistency. Prior to the actual data collection the questionnaire was pre tested on micro metal workshop workers in Addis Ababa outside the identified sub cities to assure data quality.

During data collection the PI and supervisors coordinated the interview process, conducted regular supportive supervision, discussion with data collectors and reviewed questionnaires on a

daily basis to ensure the completeness and consistency of the data. Data were collected by face to face interview and supplemented by observational study. Data collectors and supervisors were familiar with the study area and experienced in data collection. In addition they had diploma and above educational achievements. As much as possible we tried to select appropriate time for data collection to avoid disturbance. Accordingly the time of data collection through interview was done morning and afternoon before beginning of the work, and observation was conducted at the time of performing their work.

During data analysis, the collected data was rechecked for its completeness and consistency by the principal investigator. Unusual values that occurred in data during data collection, coding or data entry were identified and examined. Data entry and cleaning/editing was done to check for inconsistency and completeness, and sorting to identify outliers.

6.14. Ethical Consideration

The study proposal was submitted for review and approval to Addis Ababa University collage of health science school of public health IRB and Addis Ababa health bureau. After Ethical clearance letter of support, recommendation and permission was obtained. Accordingly copies of this formal letter was submitted to all sub-city's micro and small enterprise development offices prior to data collection. Study participants were interviewed after informed consent. Their participation were voluntary based and they could withdraw from the interview at any time. Participants' responses were treated confidentially through the use of strict coding measures. Data reflecting personal identifications were not collected. Study participants who got injured at the time of data collection were referred to health center.

6.15. Dissemination and utilization of finding

The finding will be disseminated to Addis Ababa University, School of Public Health Department of Preventive Medicine, Addis Ababa regional health bureau and to the three sub cities micro and small scale enterprises through presentation and publication of the finding.

7. Results

A total of 288 micro scale metalworking workshops were visited in 3 sub cities and 12 woredas found in Addis Ababa. Out of 540 study subjects who responded to the interviews, 171 (31.7%) were from Bole sub city, 230 (42.6%) were from kolfie keranio sub city and 139 (25.7%) were from yeka sub city. There were 32 (5.6%) non-responses during the data collection.

7.1. Distribution of socio-demographic characteristics of the respondent

The 540 respondents included 524 males and 16 females of mean age (SD) 28.74 ±7.76 years (Range, 16-48 years). Thus, the total response rate was 94.5%. The male: female gender ratio was 32.75:1.

About 46 (8.52%) of the respondents were illiterate and can read and write only while 127 (23.5%) and 141 (26.1%) of the respondents have attended primary and secondary schooling respectively. The percentage of graduates from technical and vocational school or diploma level were 184 (34.1%) while 42 (7.8%) of the respondent were degree and higher holders.

Regarding marital status of the respondents, the majority 257 (47.6%) and 246 (45.6%) were single and married respectively while 34 (6.3%) were divorced.

A significant number 158(29.3%) of respondents had earned Birr 3000 or below per month. 121(22.4%) of the respondents reported that their monthly income was between Birr 3001 to 4000 while 159 (29.4%) respondents monthly income was between Birr 4001 and 6000. The median of monthly salary of respondents was Birr 4000.

Most 317 (58.7%) of the respondents had working experience of below five years. The socio demographic characteristics of respondents are summarized in Table 7.1.

Table 7.1. Micro metal workshop workers socio-demographic characteristics, Addis Ababa, February 2019

Variables		Number	Percentage (%)
Sex of the respondents			
	Male	524	97.00
	Female	16	3.00
Age group of the respondents (year)	16-32	369	68.3
	≥ 33	171	31.7
Educational level of the respondents	Unable to read & wright	8	1.50
	Read and write	38	7.00
	Primary school	127	23.50
	Secondary school	141	26.10
	Technical and vocational	184	34.10
	Degree or higher	42	7.80
Marital status of the respondents	Married	246	45.60
	Single	257	47.60
	Divorced	34	6.3
	Widowed	2	0.40
	Separated	1	0.20
Monthly salary of the respondents (Birr)	≤ 3000	158	29.30
	3001-4000	121	22.40
	4001-6000	159	29.40
	≥6001	102	18.90
Work experience the respondents (year)	< 5	317	58.7
	≥ 5	223	41.3

7.2. Prevalence of work-related injuries

Total of 289 that is 53.50% (95% CI: 49.4%, 57.7%) respondents were reported work related injuries during the last 12 months. One hundred forty nine (51.6%) of the injured respondents sustained more than one injury and 140(48.4%) sustained work related injury once.

7.2.1. Parts of the body affected by the injury

Hand fingers were the body part with the highest frequency of work-related injuries, 134 (28.4%), and Hands 89 (18.9%) and eye 62 (13.13%) were other sites frequently affected.

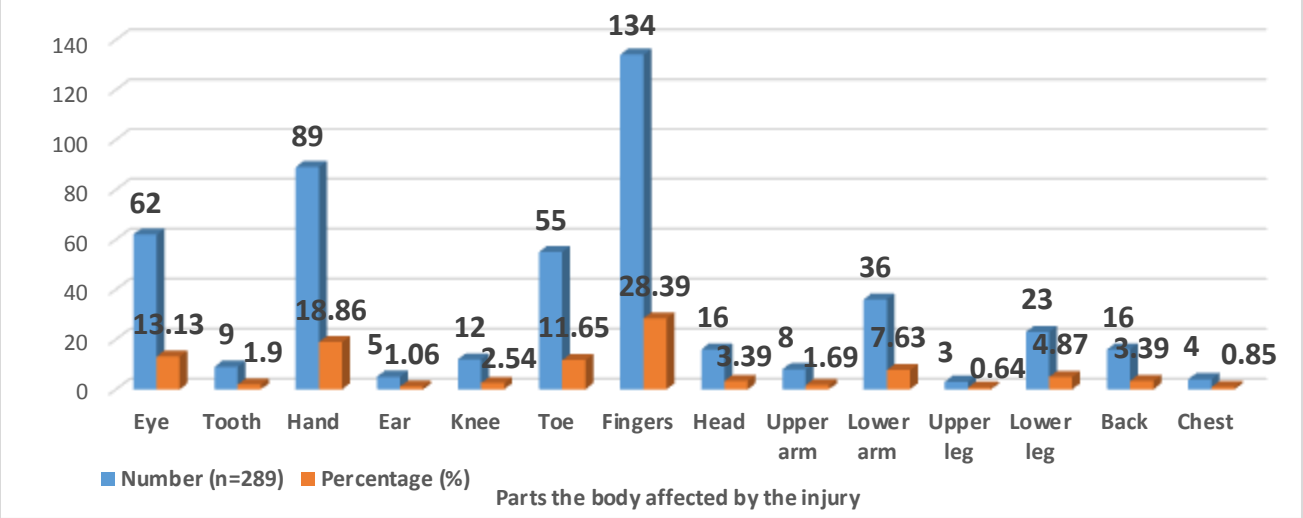

Figure 7.1. Parts the body affected by the injury, Addis Ababa, February 2019.

7.2.2. Distribution of the work related injury by types

The main types of injuries reported by the respondents were cut 154(34%), puncture 96(21.2%), abrasion 59(13.02 %) and eye injury 55 (12.14%).

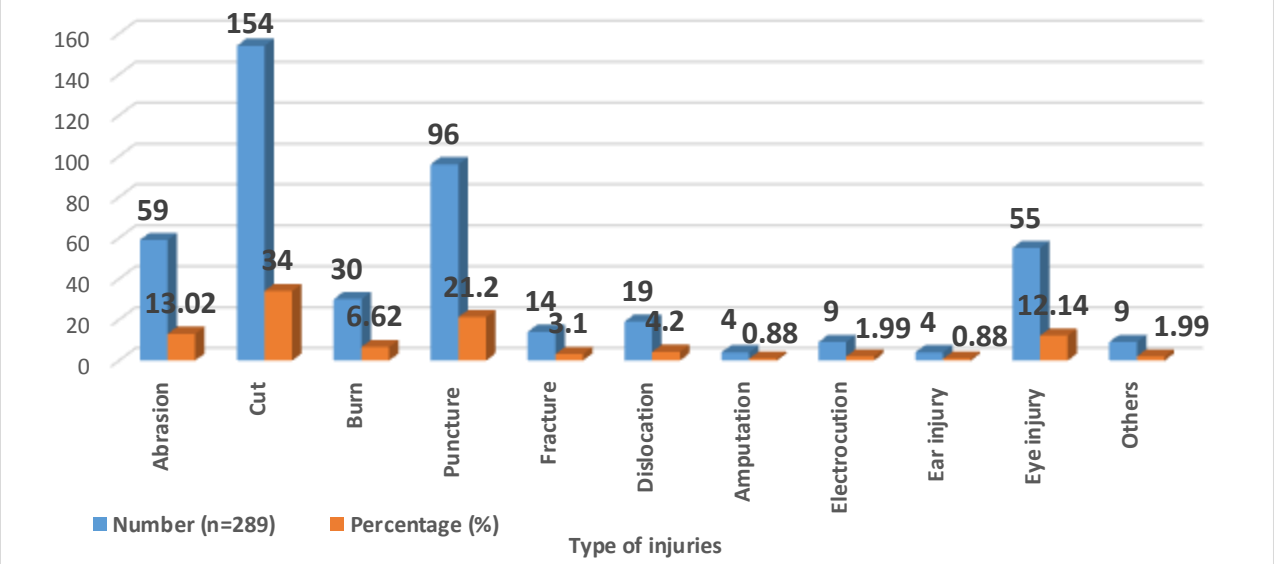

Figure 7.2. Distribution of work related injury by type, Addis Ababa, February 2019.

7.2.3. Distribution of the work related injury by respondents' personal condition

Most of injured respondents thought that work behavior 124 (32.38%) and not using personal protective equipment 122 (31.85%) were the reason of their injury. Being new for the work also accounted 46 (12.01%) of the respondents at the time of injury. Other personal condition of respondents during the injury include thinking about private affairs 36(9.4%), accident was beyond control 31(8.1%), medical problems 5(1.31%), didn't remember and others 3(0.78%).

7.2.4. Distribution of micro metal workshop workers injury by source of the injury

The most common source for occupational injury were machinery 114 (26.15%), hand tools 95 (21.79%), splinting objects 56 (12.84%) and collision with objects 53 (12.16%).

Table 7.2. Distribution of micro metal workshop workers injury by source, Addis Ababa, February 2019.

Variables		Number (n=289)	Percentage (%)
Source of injury	Machinery	114	26.15
	Hit by falling objects	47	10.78
	Electricity	8	1.83
	Splintering objects	56	12.84
	Collision with objects	53	12.16
	Fire	12	2.75
	Hand tools	95	21.79
	Falls	22	5.05
	Hot substances	17	3.90
	Lifting heavy objects	11	2.52
	Others	1	0.23
	Total	436	100

7.2.5. Distribution of work related injury by the time of occurrence

Regarding times of occurrence of injury, most 144 (44.04%) of the injuries occurred at afternoon. Evening time was also accounted 102 (31.19%) of injuries. Morning time 79 (24.16%) was another time when injury occurred.

7.2.6. Distribution of work related injury occurrence by the day of the week

Most 178 (55.97 %) of the injured respondents did not remember the days of the week that injury occurred. Among days which were memorized by injured workers, Saturday 68 (21.38%), Monday 35 (11%) and Friday 15 (4.72%) were the first three days of the week.

7.2.7. Distribution of work related injury and hospitalization and/or home staying

About 276 (95.50%) of injured participants responded that they were hospitalized and/or stayed on bed at home due to injury. Thirteen (4.5%) injured workers had lost no working day but working with sufferings while 42(14.53%) lost one day and 234(80.97%) were absent from work for two or more working days. A total of 1399 working days were lost due to injury in one year period or an average of 5 days per injured workers per year.

7.3. Distribution of working environment variables

7.3.1. Weekly working hour, work shift, workplace supervision and safety and health training distribution among participants

Among study participants 440(81.50%) of respondents reported that they were at work for 48 or more hours per week. Only 182 (33.7%) of respondents said that they had been regularly supervised at work on safety and health. Regarding safety and health training, 270 (50%) respondents had not ever taken safety and health training. Only 191(35.37%) of participants had work shift in their work.

Table 7.3. Weekly working hour, safety and health training and supervision distribution among participants, Addis Ababa, February 2019.

Variables		Number (n=540)	Percentage (%)
Weekly working hours	<48 hours	100	18.50
	≥48 hours	440	81.50
	Total	540	100
Safety and health supervision	Yes	182	33.70
	No	358	66.30
	Total	540	100
Safety and health training	Yes	270	50.00
	No	270	50.00
	Total	540	100
Work shift			
	Yes	191	35.37
	No	349	64.63
	Total		100

7.3.2. Distribution of work related Disagreement, safe and adequate water supply, safe waste disposal system and participation in decision making

Only 49(9.1%) of participants faced work related disagreements at work in one year period. Participants were also asked about sanitation components which may contribute for the injury. 444(82.2%) and 507(93.9%) of them had safe water supply and proper waste management system, respectively. some 72 (13.3%) of the participants responded that they had never participated in decision making that affect them.

Table 7.4. Distribution of work related factors (disagreement, safe and adequate water supply, safe waste disposal system and participation in decision making among participants), Addis Ababa, February 2019.

Variables		Number (n=540)	Percentage (%)
Work related disagreement	Yes	49	9.10
	No	491	90.90
	Total	540	100
Safe and adequate water supply	Yes	444	82.20
	No	96	17.80
	Total	540	100
Safe waste disposal system	Yes	507	93.90
	No	33	6.10
	Total	540	100
Participate in decision making	Yes	468	86.70
	No	72	13.3
	Total	540	100

7.3.3. Distribution of family interfere on job, job interfere on family life, worker treatment, supervisor concern on workers welfare & way of performing job.

Most 311 (57.6%) of the respondents reported that their families' demand always interfere with their job while 303 (56.1%) of the respondents reported the reverse. 6(1.1%) of the respondents believed that they were not treated with respect at work. 87(16%) of participants reported that their supervisor didn't concerned about workers welfare. Most of the participants 474(87.80%) did their work both by hand and machines.

7.3.4. Distribution of mobile devices usage, warning signs functionality and maintenance of machines when old or unsafe

Regarding usage of devices to move/lift objects 359 (66.5%) of respondents revealed 'yes'. Only 129(23.9%) of participants reported functional danger signs while 426(78.9%) of respondents said 'yes' to a question do machines maintained immediately when old and/or unsafe?

7.4. Distribution of behavioral characteristics of the respondents

Among respondents 269(49.8%), 78(14.4%), and 61(11.3%) were used to drink alcohol, chew chat, and smoke cigarette respectively while 54(10%) had sleeping disorder at work places and 291(54.1%) were not satisfied with the current job excluding other psychosocial characteristics outside the working environment. Significant number 413(76.5%) of the respondents were using PPEs at their workplace. On the other hand among those who were not using PPEs 63(50%), 32(25.4%), 24(19%) and 8(5.6%) reported the reason as organization provided no PPEs, PPEs are not comfortable to use, lack of awareness and other reasons respectively.

7.5. Observation of the work environment

Seven occupational hazards were evaluated based on the operational definition given on the observational checklist in 288 micro metal workshops. Based on that only 2 workshops were found with excessive heat and 29 with excessive noise. Similarly, Warning signs or posts, availability and use of personal protective devices, appropriate or protective arrangements of materials were evaluated. Accordingly only 43(14.9%) of workshops had warning signs and posts. Forty two (14.6%) of them showed lack of personal protective devices. Most 158 (54.9%) of the micro metal work shops were lacking protective arrangements of production equipment and materials.

None of the micro metal workshops had completed the required occupational health services such as specified preventive measures, copy of safety and health regulation and written plan of safety and health services. Only 13(4.5%) of the workshops had no first aid equipment that might serve if injury occurs at work before reaching to the clinics.

7.6. Factors associated with occupational injury

7.6.1. Binary logistic regression

7.6.1.1. Socio demographic related factors

Table 7.5. Socio-demographic variables tested for association of occupational injuries among respondents in micro metal workshop in Addis Ababa, January 2019.

Variables	Occupational injury		p-value	Crude OR (95%CI)
	Yes	No		
Sex				
Male	285	239	0.03	3.58(1.14,11.24)*
Female	4	12		1
Age				
16-32	209	160	0.03	1.49(1.03,2.14)*
≥33	80	91		1
Educational status				
Primary & below level	141	32	0.00	18.23(10.99,30.22)
Secondary school	104	37	0.00	11.63(7.06,19.15)
Technical/vocational & above	44	182		1
Marital status				
Ever married	100	183		1
Never married	189	68	0.00	5.09(3.52,7.36)*
Monthly income				
≤ 3000	136	22	0.00	22.64(11.79,43.48)
3001-4000	81	40	0.00	8.43(4.56,15.58)
4001-6000	50	109	0.00	1.77(0.99,3.18)
≥6001	22	80		1
Work experience				
< 5years	237	80	0.00	9.74(6.53,14.54)*
≥ 5 years	52	171		1

7.6.2. Work environment related factors

Table 7.6. Work environment related variables tested for association of occupational injuries among respondents in micro metal workshop in Addis Ababa, January 2019.

Variables		Occupational injury		p	Crude OR (95%CI)
		Yes	No		
Weekly working hours					
	< 48 hours	32	68		1
	≥ 48hours	257	183	0.00	2.98(1.88,4.73)*
Safety and health supervision					
	Yes	28	154		1
	No	261	97	0.00	14.79(9.29,23.57)
Safety and health training					
	Yes	57	213		1
	No	232	38	0.00	22.82(14.54,35.80)
Work shift	Yes	43	148		1
	No	246	103	0.00	8.22(5.46,12.39)*
Work related disagreement					
	Yes	40	9	0.00	4.32(2.05,9.09)*
	No	249	242		1
Family interfere on job					
	Yes	197	114	0.00	2.57(1.81,3.65)*
	No	92	137		1
Way of performing job					
	By hand	18	7	0.76	1.09(0.59,2.02)
	Mixed	271	244		1

7.6.2.1. Workers' behaviors related factors

Among works' behavioral factors cigarette smoking, alcohol taking, job satisfaction and PPE usage of workers showed statistically significant association with occupational injuries in the bivariate analysis.

Table 7.7. Workers' behaviors related factors tested for association of occupational injuries among respondents in micro metal workshop in Addis Ababa, January 2019.

Variables		Occupational injury		p-value	COR(95%CI)
		Yes	No		
Smoke cigarette					
	Yes	54	7	0.00	8.01(3.57,17.96)*
	No	235	244		1
Take alcohol					
	Yes	209	60	0.00	8.58(5.68,12.36)*
	No	79	190		1
Sleeping disorder					
	Yes	35	19	0.08	1.69(0.94,3.01)
	No	253	232		1
Job satisfaction					
	Yes	106	186		1
	No	183	65	0.00	4.94(3.4,71.15)*
Use PPE					
	Yes	187	226		1
	No	102	25	0.00	4.93(3.06,7.96)*

7.6.3. Multivariable logistic regression

Variables with *P*-value ≤ 0.2 in the bivariate analysis were entered into the final multivariable logistic regression analysis to control potential confounding factors and to get estimates of the association between factors and dependent variables. Hosmer-Lemeshow goodness-of-fit test was used to check the model fitness with and a *p*-value of >0.05 was taken as the model fit.

In the multivariable logistic regression about 6 independent variables, namely, education level, safety and health supervision, work shift, alcohol intake, chat chewing and PPEs usage were having significant association with occupational injuries among micro metal workshop workers.

Micro metal workshop workers who used to drink alcohol were 7.05 times more likely to face occupational injuries (AOR 7.05: 95% CI 4.10, 12.22) when compared to those who did not take alcohol. Moreover, micro metal workshop workers who had worked without work shift were 8.9 times more likely to get occupational injuries (AOR 9.93: 95% CI 3.81, 20.97) than compared to those who had work shift. The multivariable logistic regression analysis result is shown in the following table.

Table 7.8. Associated factors of occupational injuries, micro metal workers, AA Jan 2019.

Variables	Crude OR (95% CI)	Adjusted OR (95% CI)		
		Model 1	Model 2	Model 3
Model 1: **Socio demographic variables**				
Age (year)				
16-32 Vs ≥ 33 [RG]	1.49 (1.03,2.14)*	1.32 (0.80,2.20)		
Educational status				
≤1^0 Vs ≥ Technical [RG]	18.23 (10.99,30.22)*	7.00 (3.71,13.21)**	2.60 (1.12,6.06)**	2.78 (1.11,6.95)**
2^0 Vs ≥ Technical	11.63 (7.06,19.15)*	6.23 (3.52,11.02)**	3.07 (1.41,6.66)**	2.99 (1.30,6.90)**
Monthly income (Birr)				
≤ 3000 Vs ≥ 6001 [RG]	22.48 (11.71,43.16)*	2.97 (1.28,6.87)**	5.00 (1.73,14.61)**	2.65 (0.90,7.81)
3001-4000 Vs ≥ 6001 [RG]	7.36 (4.02,13.49)*	2.14 (1.02,4.46)**	1.69 (0.69,4.15)	
4001-6000 Vs ≥ 6001[RG]	1.67 (0.94,2.98)*	0.78 (0.40,1.54)		
Employment status				
Permanent [RG] Vs temporary	1.29 (0.81,2.07)			
Work experience (year)				
1-4 years Vs ≥ 5 years [RG]	9.74 (6.53,14.54)	2.72 (1.63,4.53)**	2.38 (1.26,4.48)**	2.78 (1.44,5.39)**
Model 2: **Socio demographic variables + work environment variables**				
Weekly working hours				
≥ 48hrs Vs < 48hrs [RG]	2.98 (1.88,4.73)*		12.48 (5.3,29.4)**	6.48 (2.79,15.0)**
Safety & health supervision				
Yes [RG] Vs No	14.79 (9.29,23.57)		5.04 (2.72,9.37)**	4.43 (2.32,8.44)**
Safety and health training				
Yes [RG] Vs No	22.82 (14.54,35.80)		4.01 (1.85,8.66)**	4.28 (1.86,6.88)**
Functional warning signs				
Yes [RG] Vs No	1.09 (0.73,1.62)			
Always get safe/adequate water for hygiene				
Yes [RG] Vs No	1.34 (0.85, 2.09)			
Always have safe waste disposal system				
Yes [RG] Vs No	0.71 (0.35,1.44)			
Machines maintained immediately when old/unsafe				
Yes [RG] Vs No	1.25 (0.82,1.90)			
Family interfere on job				
Yes Vs No [RG]	2.57 (1.81,3.65)*		1.00 (0.18,5.55)	

Variables	Crude OR (95% CI)	Adjusted OR (95% CI)		
		Model 1	Model 2	Model 3
Job interfere on family life				
Yes Vs No [RG]	2.6 (1.82,3.66)*		0.32 (0.06,1.80)	
Participate in decision making				
Yes [RG] Vs No	1.10 (0.73,1.64)			
Trust owner/management				
Yes [RG] Vs No	1.67 (0.96,2.90)		1.54 (0.57,4.12)	
Treated with respect				
Yes [RG] Vs No	4.4 (0.51,37.93)*		0.29 (0.02,3.49)	
Your job requires you learn new things				
Yes [RG] Vs No	0.88 (0.56,1.35)			
Work place is running in smooth & effective manner				
Yes [RG] Vs No	1.46 (0.82,2.59)*		0.82 (0.3,2.22)	
Faced work related disagreement				
Yes Vs No [RG]			3.81 (1.33,10.92)**	2.14 (0.74,6.19)
Way of performing job				
hand Vs hand &machine [RG]	2.32(0.95,5.64)*		0.90 (0.27,3.00)	
Machines are guarded & installed with safety				
Yes [RG] Vs No	1.40 (0.90,2.17)*		0.56 (0.25,1.26)	
Use mobile devices to move heavy materials safely				
Yes [RG] Vs No	0.80 (0.56,1.14)			
Raw materials stored & color marked to prevent accident				
Yes [RG] Vs No	1.02 (0.73,1.44)			
Model 3: **Socio demographic variables + work environment variables + behavioral variables**				
Take alcohol				
Yes Vs No [RG]	8.40 (5.68,12.36)*			6.94 (3.8,12.63)**
Sleeping disorder				
Yes Vs No [RG]	1.69 (0.94,3.04)*			1.00 (0.33,3.03)
Use PPEs				
Yes [RG] Vs No	4.93 (3.06,7.96)*			2.98 (1.33,6.67)**

Note: RG Reference Group. **Significant at p-value < 0.05.

8. Discussion

8.1. Magnitude and characteristics of injuries

Occupational injury is a global public health and economic burden in addition to other public health challenges in both industrialized and less industrialized country including Ethiopia. More specifically metal work is an occupation involving tremendous health risks. The severity of this risk is determined by several work related issues (18,45).

This work site based study attempted to assess the prevalence of work-related injuries in 12 months among micro scale metal working workshop workers in Addis Ababa. In addition, the study tried to investigate the associated factors of work-related injuries. So far, few studies were done only on large, medium and small scale industry workers in Ethiopia.

The response rate of this study was 94.5% that seems equal to previous similar studies 95% (14) and slightly lower than 97.9% (45) and 97.8% (46). This could be resulted because of the differences in the socio demographic characteristics of the study participants. In this study the number of male workers (97.1%) was by far higher than female workers. When we compare it with some other studies the same scenarios 98.2%, 97.1% and 98.3% were revealed in this sector. The main reason for large number of male workers in this study might be because of some cultural and traditional factors and this work sector is labor intensive.

The prevalence rate of work related injury among micro metal workshop workers within the past 12 months was 289 (53.5%) (95% CI: 49.4, 57.7), which is comparable with 48.9% (45) and 50% (16), but higher as compared with study done in Bahir Dar 34.2% (39) and north Gondar zone 33.5% (23) and lower than studies done in Mekelle 58.2% (45) and Arba Minch 80.8% (32) towns. This difference could possibly be due to variation in the pattern of PPE availability and utilization. In addition to this, it could probably be due to lack of safety training and non-availability and non-practice of Safety measures. In this study one hundred and forty (48.4%) of the injured respondents sustained at least one injury in a one year period while one hundred and forty nine (51.6%) of the injured respondents sustained injury more than once. The finding is consistent with studies conducted in Addis Ababa small medium scale industries 50.9% and 49.1% once and more than once respectively. But studies conducted at Mekele small scale industries 67.4% and 32.6%, at Addis Ababa large scale metal manufacturing factories 31.2%

and 68.8%, at Arba Minch small and medium scale industries 59.8% and 40.2% and at Addis Ababa large iron and metal industries 21.6% and 78.4% showed that the frequency of occupational injury was once and more than once respectively in one year. This discrepancy could be resulted from the variation and nature of activities performed at different work sectors.

The main reported occupational injury types were cut 34%, puncture 21.2% and abrasion 13.02% which is lower than findings in Addis Ababa, cut 60% and puncture 32% (16) and cut 57.7% and puncture 38.1% (47). But the finding is slightly higher than other findings in Addis Ababa cut 19% and puncture 14.4% (5). This difference could be due to variation in work types and safety and health supervision, training and other occupational and health services.

Fingers were the most commonly 28.4% injured body part followed by hands 18.9% which is consistent with the study conducted among welders in Zambia, Lusaka (12). Similarly, these two body parts were the first to be injured in other studies in north Gondar (23). But when we compare it in other large scale metal work sectors the prevalence is slightly higher (14). In addition a study conducted in Brazil, Rio Grande revealed that the most frequently reported occupational accident was skin burn (35). This might be due to the fact that micro scale enterprises organizational structure is not well organized and lack different hygiene and sanitation facilities.

This study showed machinery 26.15%, hand tools 21.79% and splinting objects12.84% were the commonest sources of injury. This study is in agreement with other studies which pointed out the above mentioned causes of injury were frequent and common in most working areas. But in large scale metal manufacturing factories machines, burn by hot substances, electricity and falling objects are common source of injuries (14,35). The discrepancies between studies could be due to job aid materials differences lack of trainings. As shown in the result part almost half of the respondents learned their occupation by working in metal workshops as apprentices or helpers.

Most 44% of the injuries in this study occurred in the afternoon time. Evening time injuries accounted 31.2% while 24.2% injuries occurred in the morning time. This finding is not consistent with the findings from other settings. The possible explanation for this could be absence of work shift in most of micro metal workshops that could result fatigue which may be associated with increase the likelihood of work related injuries in the afternoon.

The result of this study indicated that among injured respondents 56% didn't remember the date of injury occurrence. The second largest proportion 21.4% of injury occurred on Saturday and 11% occurred on Monday. This fact is also supported by other studies in Addis Ababa (14,45).

8.2. Determinants of occupational injury

Several factors contribute towards the occurrence of injuries in micro metal workshop work systems. Over the years, a large number of individual related, job-related, and organizational-related factors are examined in different studies. Individual related factors include age, work experience, educational status, marital status, income, sex and behavior of the worker. Job related factors include occupation, hazards in work system, shift of working and workplace factors like poor housing. Organization related factors include facilities, working group, supervisory support, management's commitment to safety and work place safety status (9,33,36,48–50).

In this study weekly working hours, experience, alcohol consumption, training, supervision, educational status & PPE usage were major factors that contributed to the occurrence occupational injury among micro metal workshop workers.

Those who were secondary school or below had 2.99 times (AOR=2.99; 95%CI: 1.30, 6.90) more likely to have work related injury as compared to technical/vocational or above level. This finding was similar to studies on small and large scale manufacturing enterprises in Addis Ababa and Tokyo. The possible explanation for this could be lack of life experience and responsibility among the low educated group might increase exposure for injuries (14, 16, 48).

Regarding weekly working hours this study revealed that it was significantly associated with injury when adjusted to other variables. Accordingly workers who worked for more than 48hrs per week had 6.48 times (AOR 6.48; 95%CI: 2.80, 15.0) more likely to have work related injury as compared to those who had work for less than 48hrs per week. A study done in Addis Ababa on iron and steel factories support this finding, but with different odds ratios (ORs). Other studies depicted that weekly working hrs. had no significant association with occupational injury (14,16,45). This difference could be due to the difference in the work conditions of the sectors.

The multivariable logistic regression analyses suggested that shorter work experience were significantly associated with increased risk of occupational injury or having increased work

experience had a protective effect. Accordingly respondents those who had less than five year work experience had 4.85 times (AOR 4.85; 2.68, 8.79) higher occupational injury than those who had five and more years work experience. This is consistent with findings from other settings (32,34).

In relation to individual related factors, alcohol drinking was strongly associated with occupational injury. Those who used to drink alcohol had about 7 times (AOR 7.05; 4.07, 12.22) more likely to experiencing occupational injury than nondrinker workers. Although in different odds ratio, studies conducted on small scale manufacturing enterprises in Japan and Arba Minch, on textile industry workers in Dukem and on garment factories in Addis Ababa also supported this finding. But other studies conducted on small and medium scale industries (north Gondar), solid waste collectors (Addis Ababa) and large scale metal manufacturing industries (Addis Ababa) showed that alcohol consumption had no significant association with occupational injury. This discrepancy could possibly be due to not identifying the level of alcohol consumption like heavy drinkers, moderate drinkers and low level drinkers.

Holding other associated factors constant, respondents who were not satisfied by their work were 3.25 times (AOR 3.25; 95%CI, 1.86, 5.66) more likely to have work related injury as compared to those who are satisfied by their job. This finding was consistent with findings of other similar studies (5,20,32). This could be linked to the fact that when workers are satisfied in their job they could experience greater responsibility and better use of their knowledge and skill in their job.

Respondents who did not use Personal Protective Equipment were more likely to have work related injury as compared to those who used Personal Protective Equipment (AOR 2.98; 95%CI, 1.33, 6.67) and the association was statically significant. Other studies are also in line with this finding in which non-users of Personal Protective Equipment had increased occurrence of work related injuries (11,15,47). This could be explained by the fact that proper utilization of PPE highly reduces the occurrence of unexpected injuries in the metal workshops. Findings of observation also supported this finding.

9. Conclusion and recommendation

9.1. Conclusion

This study presented the assessment results of magnitude of occupational injury among workers in micro scale metal workshops and associated factors in Addis Ababa. Occupational injuries were found to be high (53.5%) when compared to some other studies in developing countries. Among variables; educational status, PPE usage, work experience, safety and health training, safety and health supervision, weekly working hours and alcohol drinking were found to be significantly associated with occupational injury. Major bodies affected by the injury were Fingers (28.4%), Hands (18.9%) and Eyes (13.13%). It was also found that the highest self-reported type of injuries were cut (34%) and puncture (21.2%). On the other hand workers who didn't have work shift had about 9 times more likely to have work related injury as compared to those who had work shift. Among injured respondents 31.85% showed negative responses for the use of PPEs. More surprisingly about 32.4% of injured respondents were not aware of the fact that injuries could be prevented if appropriate measures were taken and they didn't realize that they were exposed to different risk factors, rather they perceived that they were injured simply because it was the work's behavior. Generally respondents who did not use PPEs were about 3 times more likely to have work related injury as compared to those who used Personal Protective Equipment. About 50% and 66% of workers work without any formal training and lack regular supervision respectively, as a result they could be oblivious to safe working practice to protect their health. Work experience also had its effect on occupational injury; shorter work experience were significantly associated with increased risk of occupational injury or having increased work experience had a protective effect. Some individual related factors were more significant than others. Study participants who used to drink alcohol had about 7 times more likely to experiencing occupational injury than nondrinker workers. Respondents who were not satisfied by their work were 3.25 times more likely to have work related injury as compared to those who are satisfied by their job.

9.2. Recommendation

This study provides a baseline for elaborative studies in the future. It is instrumental in health status evaluation of workers in informal and self-employed micro-scale enterprises. The findings of this study can be used to update the health and safety conditions at micro metal workshops, achieving many health benefits. Intervention plans like education, awareness, and regular supervision should be advocated which help in prevention and minimizing workplace risk exposures. Generally; this study found the following gaps and recommendations are accordingly:

- **Researchers**: Can use this as a baseline for further research, qualitative study
- **MOLSA**: Should develop rules, regulation & monitoring mechanisms. Intervention plans like behavioral change communication & regular supervision for owners should be strengthened. Some group of people are found to be affected more than others, so due attention should be given for these group of people.
- **Owners:** Activities in micro metal workshops need intensive muscle power and job aid materials are lacking, therefore shifting workers should be taken into consideration. They should guarantee availability and utilization of PPEs.
- **Workers:** unhealthy life style (e.g. alcohol drinking) should be identified & discouraged by providing behavioral change communication programs on these factors.

10. Strength and limitations

10.1. Strength

- Primary data: so it is more accurate b/c it is directly collected from the study population.
- Face to face interview supported by supervision should have minimized error.
- Both questionnaires and observational checklists tools were used to complement data.
- Owners can implement the result of the study easily to impact occupational injury.
- Training manual was prepared for data collectors & supervisors assure the quality of data.

10.2. Limitation

- The study depends on subjective report which can possibly be biased in some cases.
- Multiple data collectors (mutual differences) may incur inter observer variation
- Shortcomings of the employed cross-sectional design can be another limitation.
- The reported injury and use of PPEs might reflect the attitude and perception of participants.

11. References

1. Benjamin O. Fundamental principles of occupational health and safety. Second edition. Vol. 39. International Labor Office, Geneva; 2002 [cited 2018 Sep 21]. Available from: http://choicereviews.org/review/10.5860/CHOICE.39-3997

2. World Health Organization. Occupational health. 2001 [cited 2018 Sep 21]. Available from: http://www.who.int/occupational_health/regions/en/oehemhealthcareworkers.

3. Lund F, Marriott A. Occupational health and safety and the poorest. Durban: School of Development Studies, University of KwaZulu-Natal; 2011.

4. Global Estimates of Occupational Accidents and Work-related Illness 2014.pdf. [cited 2018 Jul 28]. Available from: https://www.wsh institute.sg/files/wish/upload/CMS/file/Global Estimates of Occupational Accidents and Work-related Illness 2014.pdf

5. Tadesse S, Bezabih K, Destaw B, Assefa Y. Awareness of occupational hazards and associated factors among welders in Lideta Sub-City, Addis Ababa, Ethiopia. J Occup Med Toxicol [Internet]. 2016 Dec [cited 2018 Jul 26]; 11(1). Available from: http://occup-med.biomedcentral.com/articles/10.1186/s12995-016-0105-x

6. Oppong M, Owiredu A, Churchill RQ. Micro and small scale enterprises development in ghana. 2014;14.

7. Ageba G, Amha W. Micro and Small Enterprises (MSE) Development in Ethiopia: Strategy, Regulatory Changes and Remaining Constraints. Ethiop J Econ. 2001;(2):32.

8. Government of the Federal Democratic Republic of Ethiopia, Micro and Small Enterprise Development Policy & Strategy.

9. Jahangiri M, Rostamabadi A, Malekzadeh G, Sadi AF, Hamzavi G, Rasooli J, et al. Occupational Safety and Health Measures in Micro-scale Enterprises (MSEs) in Shiraz, Iran. J Occup Health. 2016 Mar 20;58(2):201–8.

10. construction-industry-policy-draft-english.pdf [Internet]. [cited 2018 Jul 28]. Available from: https://chilot.me/wp-content/uploads/2011/08/construction-industry-policy-draft-english.pdf

11. Dejen Yemane AB. Magnitude of Occupational Injuries and Associated Factors among Small- Scale Industry Workers in Mekelle City, Northern Ethiopia. Occup Med Health Aff [Internet]. 2015 [cited 2018 Oct 31]. Available from: http://www.esciencecentral.org/ journals magnitude-of-occupational-injuries-and-associated-factors-among-smallscale-industry-workers-in-mekelle-city-northern-ethiopia-2329-6879-1000197.php?aid=51898

12. Jessy Z. Occupational Hazards and Use of Personal Protective Equipment among Small Scale Welders in Lusaka, Zambia. 2015;

13. Kumie A, Amera T, Berhane K, Samet J, Hundal N. Occupational Health and Safety in Ethiopia: A review of Situational Analysis and Needs Assessment. 2017;18.

14. Zeleke T. Prevalence and Factors Associated with Work Related Injuries among Iron and Steel Industries workers Addis Ababa, Ethiopia. 2015;

15. Budhathoki SS, Singh SB, Sagtani RA, Niraula SR, Pokharel PK. Awareness of occupational hazards and use of safety measures among welders: a cross-sectional study from eastern Nepal. BMJ Open. 2014 Jun 2;4(6):e004646–e004646.

16. Abate B. assessing the prevalence of occupational injury and its association with utilization of personal protective equipment among workers in large scale metal manufacturing factories, Addis Ababa, ethiopia. :12.

17. Respiratory and physical ailments correlated with occupational exposure among welders in Pakistan. [cited 2018 Jul 22]. Available from: http://jpma.org.pk/full_article_text.php?

18. Joseph N. Occupation Hazards – Pattern, Awareness and Preventive Measures among Welders from an Unorganized Sector in India. J Clin Diagn Res [Internet]. 2017 [cited 2018 Jul 26]; Available from: http://jcdr.net/article_fulltext.asp?issn=0973-709x&year=2017&volume=11&issue=5&page=LC23&issn=0973-709x&id=9879

19. Isah E, Okojie O. Occupational Health Problems of Welders in Benin City, Nigeria. J Med Biomed Res [Internet]. 2009 Mar 18 [cited 2018 Jul 25];5(1). Available from: http://www.ajol.info/index.php/jmbr/article/view/10685

20. Zenebe G. Assessing the prevalence of work related musculoskeletal disorders and assocaiated factors among workers in selected garments in Addis Ababa, Ethiopia 2016. : 78.

21. Debela K. Addis Ababa city administration micro & small enterprises development bureau.

22. American Federation of State, County, and Municipal Employees, AFL-CIO, Laura R. Health and Safety Program for protecting workers from workplace hazards [Internet]. 2015 [cited 2018 Sep 16]. Available from: https://m.afscme.org/news/publications/workplace-health-and-safety/fact-sheets/pdf/Welding-Hazards-AFSCME-fact-sheet.pdf

23. Tadesse T. Assessment of prevalence of work related injuries among small and medium scale industrial workers in north Gondar zone, Amhara regional state. :87.

24. Internationals Arbeitsamt, editor. International labour standards: a global approach; 75th anniversary of the Committee of Experts on the Application of Conventions and Recommendations. 1. ed. Geneva; 2002. 690 p.

25. World Health Organization. WHO guidelines on protecting workers from potential risks of manufactured nanomaterials. 2017.

26. Y-S Ahn. Comparison of unintentional fatal occupational injuries in the Republic of Korea and the United States [Internet]. Inj Prev: first published as 10.1136/ip.2003.004895 on 16 August 2004; 2004. Available from: http://injuryprevention.bmj.com

27. U.S. bureau of labor statistics. Number of fatal work injuries by employee status in the United States [Internet]. Fatal occupational injuries in 2016, BLS. 2016 [cited 2018 Sep 16]. Available from: https://www.bls.gov/iif/oshwc/cfoi/cfch0015.pdf

28. Jukka T. Report Global Estimates of Occupational Accidents and Work-related Illnesses 2017 rev1.pdf [Internet]. [cited 2018 Sep 16]. Available from: http://www.icohweb.org/site/images/news/pdf/Report%20Global%20Estimates%20of%20Occupational%20Accidents%20and%20Work-related%20Illnesses%202017%20rev1.pdf

29. Alwan A., Rachel Nugent, Olive Kobusingye, Kirk R. Smith. Injury Prevention and Environmental Health. In: Rachel Nugent, Olive Kobusingye, Kirk R. Smith, Charles N. Mock, editors. Injury Prevention and Environmental Health [Internet]. 3rd ed. The World Bank 1818 H Street NW, Washington, DC 20433; 2017 [cited 2018 Sep 20]. (9; vol. 7). Available from: https://www.ncbi.nlm.nih.gov/books/NBK525218/pdf/Bookshelf_NBK525218.pdf

30. Tanga AT. Prevalence of Occupational Injuries and Associated Factors among Small-Scale Industries Workers in Arba Minch Town, Southern Ethiopia, 2016. 2018;3(2):8.

31. Ratri P, Kumar RP. Study and analysis of occupational risk factors for ergonomic design of construction worksystems. Work. 2012;(Supplement 1):3788–3794.

32. Nakata A. Effects of long work hours and poor sleep characteristics on workplace injury among full-time male employees of small- and medium-scale businesses: Work hours, sleep and workplace injury. J Sleep Res. 2011 Dec;20(4):576–84.

33. Cezar-Vaz MR, Bonow CA, Rocha LP, Almeida MCV de, Severo L de O, Borges AM, et al. Risk Communication as a Tool for Training Apprentice Welders: A Study about Risk Perception and Occupational Accidents. Sci World J. 2012;2012:1–10.

34. Whittaker JD, Robinson T, Acharya A, Singh D, Smith M. Noise-induced hearing loss in small-scale metal industry in Nepal. J Laryngol Otol. 2014 Oct;128(10):871–80.

35. The Federal Democratic Republic, of Ethiopia Ministry of Health. Ethiopia-health-system-transformation-plan.pdf. Ministry of Health; 2015.

36. Alexander V, Sindhu KNC, Zechariah P, Resu AV, Nair SR, Kattula D, et al. Occupational safety measures and morbidity among welders in Vellore, Southern India. Int J Occup Environ Health. 2016 Oct;22(4):300–6.

37. Molla GA, Salgedo WB, Lemu YK. Prevalence and determinants of work related injuries among small and medium scale industry workers in Bahir Dar Town, North West Ethiopia. Ann Occup Environ Med [Internet]. 2015 Dec [cited 2018 Sep 2];27(1). Available from: http://aoemj.biomedcentral.com/articles/10.1186/s40557-015-0062-3

38. Seo J, Shin G-S, Kim MG, Min Y-S. Relationship between occupational injuries and the provision of safety and health information: data from the 4th Korean working conditions

survey. Ann Occup Environ Med [Internet]. 2018 Dec [cited 2018 Jul 21];30(1). Available from: https://aoemj.biomedcentral.com/articles/10.1186/s40557-018-0247-7

39. Steel L. Common Welding Injuries and How to Avoid Them [Internet]. LeJeune Steel Blog. 2015 [cited 2018 Sep 16]. Available from: https://www.lejeunesteel.com/blog/common-welding-injuries-and-how-to-avoid-them/

40. Ghimire A, Budhathoki SS, Niraula SR, Shrestha A, Pokharel PK. Work-related Injury among Welders Working in Metal Workshops of Dharan Municipality, Nepal. J Nepal Health Res Counc. 2018 Jul 5;16(2):156.

41. Ghani N, Tariq F, Hassan S. Respiratory and physical ailments correlated with occupational exposure among welders in Pakistan. J Pak Med Assoc. 2017;67(12):4.

42. Dawit S. Occupational safety and health profile for ethiopia. :95.

43. Lex W. Constitution of the Federal Democratic Republic of Ethiopia. 1994.

44. Mulu Gebreeyesus AA. A Research Workshop on Entrepreneurship and Small Business Development in Ethiopia Organized by The Ethiopian Development Research Institute (EDRI). 2017.

45. Yitagesu H. Assesment of Magnitud and Factors of Occupational Injury Among Workers in Large Scale Metal Manufacturing Industries in Addis Ababa. work [Internet]. 2010 [cited 2018 Aug 5];(suppliment 1). Available from: http://etd.aau.edu.et/bitstream/handle/123456789/10198/Yitagesu%20Habtu.pdf?sequence=1&isAllowed=y

46. Aklilu D. Assessment of the utilization of personal protective equipment among textile industry workers in Dukem town.

47. Bogale D, kumie A, Tefera W. Assessment of occupational injuries among Addis Ababa city municipal solid waste collectors: a cross-sectional study. BMC Public Health [Internet]. 2014 Dec [cited 2019 May 26];14(1). Available from: http://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-14-169

48. Nakata A, Ikeda T, Takahashi M, Haratani T, Hojou M, Swanson NG, et al. The Prevalence and Correlates of Occupational Injuries in Small-Scale Manufacturing Enterprises. J Occup Health. 2006;48(5):366–76.

49. Budhathoki SS, Singh SB, Niraula SR, Pokharel PK. Morbidity patterns among the welders of eastern Nepal: a cross-sectional study. Ann Occup Environ Med. 2016 Dec [cited 2018 Jul 25];28(1). Available from: http://aoemj.biomedcentral.com/articles/10.1186/s40557-016-0151-y

50. Park H, Ha E, Kim J, Jung H, Paek D. Occupational Health Services for Small-Scale Enterprises in Korea. Ind Health. 2002;40(1):1–6.

Annexes

Annex 1. Information sheet

Hello, my name is _____ I came from Addis Ababa University College of Health Science School of Public Health research team. I would like to ask few questions which take 20 minutes about incident at work that resulted in injuries to you in the previous 12 months. Your information that you are going to provide will help policy makers to design strategy/give priority for prevention and control of occupational injuries to have healthy workforce. **Title of the study**: Assessment of magnitude of occupational injuries and associated factors among micro-enterprise metal working workshop workers in Addis Ababa, Ethiopia.

Back ground of the study: Each year, work-related injuries and diseases kill an estimated 2 million people worldwide. In Sub-Saharan Africa, the fatality rate per 100,000 workers is 21 and the accident rate16000. Few studies in different areas in Ethiopia show that the prevalence of work related injury reaches up to 73%. Therefore this study will provide additional information and attract the attention of policy makers, governments, and the trade unions in their efforts to improve occupational health and safety in iron and steel industries in Ethiopia.

Benefit of the study: There is no direct benefit for participants for being participated in responding to this questionnaire. But any issues regarding occupational injury care and treatment can be advised. The result will be disseminated to all stockholders for designing prevention and control measures.

Risk of the study: the study has no any health risk for participants and interview will also be private.

Rights of the participant: Participating and not participating is the full right of participant and participants can stop from participation in the study at any time. And participant can skip question which the worker does not want to respond. Participants can ask any questions which is not clear for understanding.

Confidentiality: Any information forwarded will be kept private and his name will not be specified.

Annex 2. Informed consent

Title of the study: **Assessment of magnitude of occupational injuries and associated factors among micro-enterprise metal working workshop workers in Addis Ababa, Ethiopia.**

I have been well aware of this research undertaking is a post graduate degree partial fulfillment of research thesis which is fully supported and coordinated by AAU School of Public Health and designate investigator is Negesse Mulugeta. I have been fully informed in the language I understand about the research project objective. And it is to assess magnitude of occupational injury and associated factors among welders. I have been informed that all the information I shall provide to the interviewer will be kept confidential. I understood that the research has no any health risk. I also knew that I have the right to withhold information, skip questions to answer or to withdraw from the study any time I want. I have granted that nobody will impose me to explain the reason of my withdrawal. It is also enlighten that there would have no effect at all in my benefit that I get from the microenterprise that I am engaged in. If I want more information about this study I can also contact through the following address.

Investigator: Mr. Negesse Mulugeta Tel: 0947584962 (Mobile)

Advisor: Dr. Abera Kumie, SPH, AAU; Mobile: 0911882912
Ms. Ansha Nega, SPH, Mobile: 0918151073

I have read this form, or it has been read to me in the language I understood the condition stated above, therefore, I am willing and confirm my participation by signing the consent.

Agreed to participate in the study: Yes ☐ No ☐ (for verbal consent)

Signature _____ (if written consent)

Name of witness signature_____ (Data collector or supervisor)

Signature _____ Date_____

Result of interview

1. Completed
2. Respondent not available
3. Refused
4. Partially Completed.

Remark: For any inconvenience and problem related to questionnaire please contact principal investigator.

Name of PI: Negesse Mulugeta

Address: Tell- 0947584962 e-mail: negesse.mulugeta@yahoo.com

Annex-3. English version questionnaire

Questionnaire ID----------

Name of firm by code _____Address by code_____

Part I socio demographic characteristics

No	**Questions**	**possible response**	**skipping**
101	sex	1. Male 2. Female	
102	Age	……	
103	Educational level	1) Illiterate 2) Read and write 3) Primary school (1-8) 4) Secondary school (9-12) 5) Technical and vocational 6) Degree or higher	
104	Marital status	1) Married 4) Widowed 2) Single 5) Separated 3) Divorced	
105	Employment condition	1) Permanent 2) Temporary	
106	salary	……	

Questionnaire ID----------

Part -II-work related injuries

No	Questions	Possible response	Skipping
201	Have you had an incident that resulted injury to you in the last 12 months?	1. Yes 2. No	
202	If yes for Q201, how many times?	----------	
203	Parts of the body affected	1) Eye 1) Yes 2) No 2) Tooth 1) Yes 2) No 3) Hand 1) Yes 2) No 4) Ear 1) Yes 2) No 5) Knee 1) Yes 2) No 6) Toe 1) Yes 2) No 7) Fingers 1) Yes 2) No 8) Head 1) Yes 2) No 9) Upper arm 1) Yes 2) No 10) Lower arm 1) Yes 2) No 11) Upper leg 1) Yes 2) No 12) Lower leg 1) Yes 2) No 13) Back 1) Yes 2) No 14) Chest 1) Yes 2) No Others (specify)…….	
204	Types of injury	1) Abrasion 1) Yes 2) No 2) Cut 1) Yes 2) No 3) Burn 1) Yes 2) No 4) Puncture 1) Yes 2) No 5) Fracture 1) Yes 2) No 6) Dislocation 1) Yes 2) No 7) Amputation 1) Yes 2) No 8) Electrocution1) Yes 2) No	

		9) Suffocation 1) Yes 2) No 10) Ear injury 1) Yes 2) No 11) Eye injury 1) Yes 2) No 12) Poisoning 1) Yes 2) No 13) Others specify ……..	
205	What was your personal condition at the time of injury?	1) I was new for the work process 1)Yes 2) No 2) Thinking about private affairs 1) Yes 2) No 3) Due to other medical problem 1) Yes 2) No 4) Accident is beyond control 1) Yes 2) No 5) It is the work behavior 1) Yes 2) No 6) It is due to not using PPD/E 1) Yes 2) No 7) I don't remember 1) Yes 2) No 8) Others (specify) ……	
206	What was the source of injury?	1. Machinery 1) Yes 2) No 2. Hit by falling objects 1) Yes 2) No 3. Electricity 1) Yes 2) No 4. Splintering objects 1) Yes 2) No 5. Collision with objects 1) Yes 2) No 6. Fire 1) Yes 2) No 7. Hand tools 1) Yes 2) No 8. Falls 1) Yes 2) No	

		9. Hot substances 1) Yes 2) No 10. Acid and acidic substance 1) Yes 2) No 11. Lifting heavy objects 1) Yes 2)No 12. Others specify…….	
207	What was the days of the week injury occurred?	1) Monday 1) Yes 2) No 2) Tuesday 1) Yes 2) No 3) Wednesday 1) Yes 2) No 4) Thursday 1) Yes 2) No 5) Friday 1) Yes 2) No 6) Saturday 1) Yes 2) No 7) Sunday 1) Yes 2) No 8) I don't remember 1) Yes 2) No	
208	How much is the time when injury occurred?	1) Morning 1) Yes 2) No 2) Afternoon 1) Yes 2) No 3) Evening 1) Yes 2) No 4) Midnight 1) Yes 2) No 5) I don't remember 1) Yes 2) No	
209	Have you hospitalized or being laid on bed at home due to injury?	1) Yes 2) No	
210	The number of days you are absent from work due to injury	…….	

Questionnaire ID----------

Part –III- workplace related factors

No	Questions	Possible response	Skipping
301	How much is your weekly working hour?	……..	
302	Is your workplace is regularly supervised on safety and health?	1) Yes 2) No	
303	Have you had safety and health training in connection with your job?	1) Yes 2) No	
304	Have you had any work shift?	1) Yes 2) No	
305	If yes for Q304, How often?	……..	
306	Have you ever faced any work related instability like workplace violence, nervousness, managerial (colleagues) disagreement?	1) Yes 2) No	
307	Do you always get safe and adequate water for your hygiene?	1) Yes 2) No	
308	Do you have always safe solid and liquid waste disposal system that prevents you from accidents at work?	1) Yes 2) No	
309	In your job, how often do you take part with others in making decisions that affect you?	1. Always 2. Sometimes 3. Not at all	
310	How often do the demands of	1. Always	

	your family interfere with your work on the job?	2. Sometimes 3. Not at all	
311	How often do the demands of your job interfere with your family life?	1. Always 2. Sometimes 3. Not at all	
312	Do you trust management at the place where you work?	1) Yes 2) No	
313	Do you think you are treated with respect in your organization?	1) Yes 2) No	
314	The conditions on your job allow you to be about as productive as you could be?	1) Yes 2) No	
315	The place where you work is running in a smooth and effective manner?	1) Yes 2) No	
316	Safety and health conditions where you work are good?	1) Yes 2) No	
317	Is safety of workers is a high priority with management where you work?	1) Yes 2) No	
318	Your job requires that you keep learning new things?	1) Yes 2) No	
319	Is the chances for promotion is good in your position?	1) Yes 2) No	
320	Promotions are handled fairly?	1) Yes 2) No	
321	Your supervisor is concerned about the welfare of those under him or her?	1) Yes 2) No	

322	The way you performing your job is	1) Yes 2) No	
323	Do you use mobile devices near work sites to lift or move materials safely at last 12 months	1) Yes 2) No	
324	Are raw materials or products stored and color marked to prevent you from accidents?	1) Yes 2) No	
325	Are there always functional dangers or warning signs during your activities?	1) Yes 2) No	
326	Are machines always guarded or installed with safety devices during your activities?	1) Yes 2) No	
327	Are machines always maintained immediately when old or unsafe?	1) Yes 2) No	

Questionnaire ID----------

Part –IV- behavioral factories

No	Questions	Possible answers	Skipping
401	Duration in same workplace in hour/day/month/year	……..	
402	Have you had any medical problem before or after you work in this area?	1) Yes 2) No	
403	If yes for Q402, types of problem	…….	
404	Do you smoke?	1) Yes 2) No	
405	If yes for Q404, how often?	1) Everyday 2) 1-2 days 3) 3 days 4) 4-5 days	
406	Do you take excess alcohol?	1) Yes 2) No	
407	If yes to Q406, how often?	1) Everyday 2) 1-2 days 3) 3 days 4) 4-5 days	
408	Do you chew chat?	1) Yes 2) No	
409	If yes to Q408, how often?	1) Everyday 2) 1-2 days 3) 3 days 4) 4-5 days	
410	Do have any sleeping disorders?	1) Yes 2) No	

411	If yes to Q410, what is the reason?	1) Working more than 8 hour without shifting 2) Working in evening 3) Trying to do more than one task at a time 4) Others explain	
412	Are you satisfied with job or task required to do?	1) Yes 2) No	
413	Do you use any personal protective device during work	1) Yes 2) No	
414	If No to Q413, what is the reason? What are your reasons for not using personal protective equipment?	1. Organization providing no PPE 2. Lack of awareness 3. Not comfortable to use 4. Other specify	

Annex 4. Amharic version Questionnaire

ይህ መጠይቅ በአዲስ አበባ ከተማ በሚገኙ ጥቃቅን ብረታ ብረት ዎርክሾች በሚሰሩ ሠራተኞች መካከል ከሚሰሩት ሥራ ጋር በተያያዘ የደረሰባቸውን አካላዊ ጉዳት ለማጥናት የተዘጋጀ ነው።

የመጠይቁ መለያ ቁጥር ----------

የድርጅቱ ስም አድራሻ ----------

ጤና ይስጥልኝ ስሜ---------- ይላባል። እኔ የመጣሁት ከአዱስ አበባ ዩኒቨርስቲ ጤና ሳይንስ ኮላጅ ከህብረተሰብ ጤና ትምህርት ቤት ከጥናት ክፍል ነው። አሁን ልጠይቆት የምፈልገው አስከ 20 ደቂቃ የሚያቆይ መጠይቅ ሲሆን ከሥራዎት ጋር በተገናኘ ባለፉት 12 ወራት ውስጥ የደረሰበዎት አደጋ ካለና እና ተዛማጅ ጉዲዮችን ነው። የሚሰጡት መረጃ ፖሊሲ አውጭዎችን በሥራ ምክንያት የሚደርሱ አደጋዎችን መከላከል ቅዴሚያ እንዲሰጡ ያደርጋል።

የጥናቱ ርዕስ

በአዲስ አበባ ውስጥ በሚገኙ ጥቃቅን ብረታብረት ወርክሾፖች በሚሰሩ ሠራተኞች ላይ የደረሱ የሥራ ላይ አደጋዎች መጠን እና አጋሊጭ ጉዲዮችን ማጥናት፤

የጥናቱ መግቢያ

በአለማችን በያመቱ ከ2ሚሊዮን በላይ የሚሆኑ ሰዎች ከሥራ ጋር በተያያዘ በሚከሰት አደጋና በሽታ ይሞታሉ። ከሣራ በረሃ በታች በሚገኙ አገራት ከሥራ ጋር በተያያዘ በሚደርስ አደጋ የመሞት ዕድሉ ከ100,000 ሰዎች 21 ሲሆን በያመቱ 16,000 ያህል ያልታሰቡ አደጋዎች ይደርሳሉ። በኢትዮጵያ የተወሰኑ ጥናቶች እንደሚያሳዩት በሥራ ላይ የሚደርሱ አደጋዎች እስከ 73% እንደሚደርሱ ያሳያል። ስለዚህ ይህ ጥናት ወቅታዊ መረጃ በመስጠት የፖሊሲ አውጭዎች፣ የመንግስት እና የንግድ ድርጅቶች ትኩረት በመሳብ በጥቃቅን ብረታብረት ዎርክሾፖች በሥራ ላይ የሚደርሱ አደጋዎችን ለመከላከል ያስችላቸዋል።

ከጥናቱ የሚገኝ ጥቅም

አንድ ሠራተኛ ይህን መጠይቅ በመመለስ ስለተሳተፈ ብቻ ቀጥተኛ የሆነ ጥቅም አያገኝም። ነገር ግን ከድንገተኛ አደጋዎች ጋር ተያይዞ ማንኛዉም አይነት ድጋፍና ህክምና ቢያስፈልግ የማማከር ስራ ይሰራል። የዚህ ጥናት ውጤት ከሚመለከታቸው አካላት ሁሉ የሚሰራጭ በመሆኑ በቀጣይ በሥራ ላይ የሚደርስ አደጋ ለመከላከል ከፍተኛ ሚና የሚጫወት በመሆኑ በተዘዋዋሪ ተጠቃሚ ይሆናሉ።

በጥናቱ የመሳተፍ ስጋት

አንድ ሠራተኛ በዚህ መጠይቅ በመሳተፉ የሚደርስ ምንም አይነት የጤና ጉዳት የሌለ ሲሆን የሠራተኛዉ ማንነት ለተቋሙ አስተዳደርም/ባለቤት ይሁን ሌላ አካል አይገለጽም።

በጥናቱ የሚሳተፍ ሠራተኛ መብት

በዚህ ጥናት መሳተፍ/አለመሳተፍ የሠራተኛው ሙሉ መብት ነው። ከዚህ ባሻገር መመለስ የማይፈልገውን ጥያቄ መዝለልም ሆነ ጥናቱን ሙሉ በሙሉ ማቋረጥ ይችላል። በተጨማሪ ያልገባውና የተጠራጠረበት ጥያቄ ካለ የጥናቱን አስተባባሪው መጠየቅ ይችላል።

ምስጢራዊነት

በዚህ መጠየቅ የተሰጠው መረጃ ምስጥራዊነት የተጠበቀ ሲሆን የሠራተኛ ስም አይገለፅም።

ስምምነት

ከላይ የተገለፀውን መረጃ እኔ በምረዳው ቋንቋ ስለተገለጸ ሁሉንም በማንበብ ተረድቸዋለሁ። ስለሆነም በጥናቱ ለመሳተፍ ፈቃደኛ ነኝ።

የተሳታፊ ስም፡---------- ፊርማ----------

የሱፐርቫይዘሩ ስም፡ ---------- ፊርማ---------- መጠይቁ የተሞላበት ቀን----------

የመጠይቁ ውጤት

1. በሙሉ ተሟልቷል
2. ተሳታፊው አልተገኘም
3. ለመሳተፍ ፈቃደኛ አልሆነም
4. በግማሽ ተሟልቷል

ማሳሰቢያ፡- ያልገባዎት ወይም ጥያቄ የሆነብዎት ካለ የጥናቱ ዋና ተሳታፊ መጠየቅ ይችላሉ።

የጥናቱ ዋና ተሳታፊ፡ ነገሠ ሙሉጌታ

አድራሻ፡ ስልክ 0947584962 **ኢሜይል፡**

negesse.mulugeta@yahoo.com

የጥያቄ መለያ ቁጥር----------

ክፍል አንድ፡

ማህበራዊ እና ስነ-ሕዝባዊ ሁኔታዎችን በተመለከተ

ተ.ቁ	ጥያቄዎች	አማራጭ መልሶች	እለፍ
101	ዕታ	1. ወንዴ 2. ሴት	
102	ዕደሜ	……..	
103	የትምህርት ደረጃ	1) ማንበብ እና መፃፍ የማይችል 2) ማንበብ እና መፃፍ የሚችል 3) የመ/ደረጃ ትምህርት ያጠናቀቁ/1-8/ 4) ሁለተኛ ደረጃ ትምህርት ያጠናቀቁ 5) 10^{+1} አስከ ኮሌጅ ዲፕሎማ 6) የመጀመሪያ ዲግሪና ከዚያ በላይ	
104	የጋቢቻ ሁኔታ	1) ያገቡ 2) ያለገቡ 3) የፈቱ 4) በሞት የተሠዩ	
105	የቅጥር ሁኔታ	1) በጊዜያዊነት 2) በቋሚነት	
106	የወር ደመወዝ	……	

ክፍል ሁለት

ከሥራ ጋር በተያያዘ የደረሰ ጉዳትን በተመለከተ

ተ.ቁ	ጥያቄዎች	አማራጭ መልሶች	እለፍ
201	ባለፉት 12 ወራት ውስጥ ከሥራዎት ጋር በተያያዘ የደረሰብዎት ጉዳት አለ?	1) አዎ ⟶ 2) የለም	301
202	ለጥያቄ 201 መልስዎ አዎ ከሆነ ስንት ጊዜ ነው ጉዳት የደረሰብዎት?	----------	
203	የተጎዳብዎት የሰውነት ክፍል	1) ዓይን 1) አዎ 2) አይደለም 2) ጥርስ 1) አዎ 2) አይደለም 3) እጅ 1) አዎ 2) አይደለም 4) ጆሮ 1) አዎ 2) አይደለም 5) ጉልበት 1) አዎ 2) አይደለም 6) እግር 1) አዎ 2) አይደለም 7) የእጅ ጣቶች 1) አዎ 2) አይደለም 8) ራስ 1) አዎ 2) አይደለም 9) የላይኛው ክንዴ 1) አዎ 2) አይደለም 10)የታችኛው ክንዴ 1) አዎ 2) አይደለም 11)ታፋ 1) አዎ 2) አይደለም 12)ከጉልበት በታች 1) አዎ 2) አይደለም 13)ጀርባ 1) አዎ 2) አይደለም 14)ደረት 1) አዎ 2) አይደለም 15) ሌላ ካለ ይጠቀስ	

204	የጉዳቱ ዓይነት	1) ጭረት /መላጥ/ 1) አዎ 2) አይደለም 2) መቆረጥ 1) አዎ 2) አይደለም 3) ቃጠሎ 1)አዎ 2) አይደለም 4) መወጋት 1) አዎ 2) አይደለም 5) ስብራት 1) አዎ 2) አይደለም 6) ወለምታ 1) አዎ 2) አይደለም 7) ተቆርጦ መውደቅ 1) አዎ 2) አይደለም 8) በኤላክትሪክ መያዝ 1)አዎ 2) አይደለም 9) መታፈን 1) አዎ 2) አይደለም 10)የጆሮ ጉዳት 1) አዎ 2) አይደለም 11)የዓይን ጉዳት 1) አዎ 2) አይደለም 12)መመረዝ 1) አዎ 2) አይደለም 13)ሌላ ካለ ይጠቀስ	
205	አደጋ የደረሰብዎት በምን ምክንያት ነው ብለው ያስባለ?	1) ለሥራው አዲስ በመሆኔ 2) ስለ ግሌ ሕይወት እያሰቡ ስለነበር 3) በሌላ የጤና ችግር ምክንያት 4) አደጋን መከላከል ስለማይቻል 5) የሥራው ባሕሪ ስለሆነ 6) የጉደት መከላከያ መሣሪያ ስላልተጠቀሙ 7) የጉዳቱን ምክንያት አላስታውስም 8) ሌላ ምክንያት ካለ ይጠቀስ	
206	የጉዳቱ መንስኤ ምን ነበረ?	1) ማሽን 1)አዎ 2) አይደለም 2) የወደቀ ዕቃ 1) አዎ 2) አይደለም 3) ኤላክትሪክ 1) አዎ 2) አይደለም 4) የሚፈናጠሩ ነገሮች 1)አዎ 2)	

		አይደለም 5) ከዕቃ ጋር በመጋጨት 1)አዎ 2) አይደለም 6) እሳት 1)አዎ 2) አይደለም 7) በእጅ መሣሪያዎች 1) አዎ 2) አይደለም 8) በመውደቅ 1) አዎ 2) አይደለም 9) በሞቃት ነገሮች 1) አዎ 2)አይደለም 10)በኬሚካል ነገሮች 1) አዎ 2) አይደለም 11)ከባድ ዕቃዎችን በማንሳት 1) አዎ 2)አይደለም 12 ሌላ ምክንያት ካለ ይጠቀስ	
207	አደጋዉ የተከሰተዉ በምን ቀን ነበር	1) ሰኞ 1)አዎ 2) አይደለም 2) ማክሰኞ 1) አዎ 2) አይደለም 3) ረቡዕ 1)አዎ 2) አይደለም 4) ሐሙስ 1)አዎ 2) አይደለም 5) አርብ 1)አዎ 2) አይደለም 6) ቅዳሜ 1)አዎ 2) አይደለም 7) እሁዴ 1)አዎ 2) አይደለም 8) ቀኑን አላስታዉስም 1) አዎ 2)አይደለም	
208	አደጋው የተከሰተበት ሰዓት	1) ጠዋት 1)አዎ 2) አይደለም 2) ከሰዓት 1)አዎ 2) አይደለም 3) በምሽት 1) አዎ 2) አይደለም 4) በለሊት 1) አዎ 2) አይደለም 5) አላስታውስም 1) አዎ 2) አይደለም	

209	በአደጋ ምክንያት በጤና ተቋማት ወይም በቤት ተኝተው ያውቃለ?	1) አዎ 2) የለም	
210	በአደጋ ምክንያት ከሥራ የቀሩበት ቀናት ብዛት	----------	

ክፍል ሦስት

የሥራ ቦታን በተመለከተ

301	በሳምንት ምን ያህል ሰዓት ይሰራለ?	1. ከ48 ሰዓት በላይ 2. ከ48 ሰዓት በታች	
302	በሥራ ቦታዎ ላይ የጤናና የደህንነት ቁጥጥርና ክትትል ሳይቋረጥ ይደረገል	1) አዎ 2) የለም	
303	ከሥራዎት ጋር በተገናኘ በጤንነት እና ደህንነት ዙሪያ ስልጠና ወስደውያውቃለ?	1) አዎ 2) የለም	
304	በሥራ መቀያየር/ፈረቃ አድርገው ያውቃለ?	1) አዎ 2) የለም	
305	በተራ ቁጥር 304 መልስዎ አዎ ከሆነ በየስንት ሰዓት?	1) በየአራት ሰዓት 2) በየስምንት ሰዓት 3) በየ24 ሰዓት 4) ሌላ ካለ ይጠቀስ-	
306	ከሥራ ጋር በተገናኘ ሁከት፣ በኃይል መደፈር፣ የዕምሮ መሳት፣ ከኃላፊ ወይም ከሌሎች ሠራተኞች ጋር ያለመስማማት ወይም ተጣልተው ያውቃሉ?	1) አዎ 2) የለም	
307	በዎርክሾፑ የግል ንጽህናዎትን ለመጠበቅ በቂ እና ንፁህ ውሃ ያገኛሉ?	1) አዎ 2) የለም	
308	በሥራ ላይ አደጋ እንዳይደርስብዎ የተመቻቸ	1) አዎ	

	የደረቅና ፍሳሽ ቆሻሻ ማስወገጃ ዘዴ አለ?	2) የለም	
309	ከሥራ ጋር በተገናኘ እርሰዎን በሚመለከት በሚደረግ ውሳኔ ተሳትፈው ያውቃሉ?	1) ሁልጊዜ 2) አልፎ አልፎ 3) ተሳትፈው አያውቁም	
310	የሚሰሩት ሥራ ከቤተሰብዎ ጋር ያለውን ግኑኝነት ለምን ያህሉ ጊዜ አለመስማማት ወይም አሉታዊ ተፅዕኖ አሳድሮ አውቃል?	1) ሁልጊዜ 2) አልፎ አልፎ 3) አሳድሮ አያውቅም	
311	ከቤተሰብዎ ጋር ያለው ግኑኝነት በሥራዎት ላይ ለምን ያህል ጊዜ ውጥረት ወይም ጭንቀት አሳድረው ያውቃል?	1) ሁልጊዜ 2) አልፎ አልፎ 3) አሳድሮ አያውቅም	
312	በዎርክሾፑ አስተዳደር ሙሉ እምነት አለዎት?	1) አለ 2) የለም	
313	በዎርክሾፑ እርሰዎን በአክብሮት ያስተናግዳል?	1) አለ 2) የለም	
314	የሚሰሩት ሥራ ያለዎትን አቅምና እውቀት ሙሉ በሙሉ ተጠቅመው እንዲሰሩ ያደርጋል	1) አለ 2) የለም	
315	የሚሰሩት ሥራ ያለምንም ችግር በተሳለጠ ሁኔታ እየሄደ ነው?	1) አለ 2) የለም	
316	በዎርክሾፑ ያለው የደህንነትና ጤንነት ሁኔታ ጥሩ ነው?	1) አለ 2) አይደለም	
317	የሚሰሩበት ዎርክሾፕ ሠራተኛ ደህንነት እና ጤንነት ቅድሚያ ይሰጣል?	1) አለ 2) የለም	
318	ዎርክሾፑ በቀጣይ አዳዲስ ዕውቀት እያገኙበት እንዲሄዱ ያደርጋል?	1) አለ 2) የለም	
319	በሥራ ቦታዎ ዕድገት የማግኘት ዕድል ጥሩ ነው?	1) አለ 2) የለም	
320	ዕድገት የሚሰጥ ከሆነ አሰጣጡ ፍትሀዊ ነዉ?	1) አለ 2) የለም	

321	ሱፐርቫይዘርዎ ስለ ደንነትዎ ይጨነቃል	1. አዎ 2. የለም	
322	ሥራዎትን የሚያከናውኑ	1) በእጅ 2) በማሽን 3) በሁለቱም	
323	ከባድ የሆኑ ቁሳቁሶችን በእጅ ማንሳት፣ ማውረድና ከቦታ ቦታ ማንቀሳቀስ ሥራ አለ?	1) አለ 2) የለም	
324	ለሥራ ግብዓት የሆኑ ምርቶች አደጋ በማያስከትሉ ሁኔታ ምልክት ተደርጎባቸው ይቀመጣሉ?	1) አለ 2) የለም	
325	ሁልጊዜ የአደጋ ሁኔታን የሚገልፀ ምሌክቶች አለ?	1) አለ 2) የለም	
326	ማሽኖች አደጋ እንዳያደርሱ ጥንቃቄ ይደረጋል?	1) አለ 2) የለም	
327	ማሽኖች ጥገና ሲያስፈልጋቸው በወቅቱ ይጠገናለ?	1) አለ 2) የለም	

ክፍል አራት

የሠራተኛ የሕይወት ዘይቤን በተመለከተ

401	በዚህ ሥራ የቆዩበት ጊዜ ምን ያህል ነው በቀን/በወር/በዓመት	.....	
402	ስጋራ ያጨሳሉ?	1) አዎ 2) የለም	404
403	ለጥያቄ ቁጥር 402 መልስዎ አዎ ከሆነ በሳምንት ለምን ያህል ጊዜ?	1) ሁልጊዜ 2) 1-2 ቀናት 3) 3 ቀናት 4) 4-6 ቀናት	
404	አልኮል ይጠጣለ?	1) አዎ 2) የለም	406
405	ለጥያቄ ቁጥር 404 መልሰዎ አዎ ከሆነ በሳምንት ለምን ያህል ቀናት?	1) ሁልጊዜ 2) 1-2 ቀናት 3) 3 ቀናት 4) 4-6 ቀናት	

406	ጫት ይቅማሉ?	1)አዎ 2) የለም →	408
407	ለጥያቄ ቁጥር 406 መልስዎ አዎ ከሆነ በሳምንት ለምን ያህል ቀን?	1) ሁሌ ጊዜ 2) 1-2 ቀናት 3) 3 ቀናት 4) 4-6 ቀናት	
408	በሥራ ቦታዎ ሆነው እንቅልፍ የሚያስቸግርበት ሁኔታ አለ?	1)አዎ → 2) የለም	410
409	ለጥያቄ ቁጥር 408 መልስዎ አዎ ከሆነ ምክንያቱ ምንድን ነው ብለው ያስባሉ?	1) በቀን ከ8 ሰዓት በላይ ያለፈረቃ መስራት 2) በማታ መስራት 3) በአንde ጊዜ ከአንድ በላይ የሆነ ሥራ ማከናወን 4) ሌላ ካለ ቢጠቀስ	
410	በሚሰሩት ሥራ እረክተዋል?	1)አዎ 2) የለም	
411	በሥራ ላይ የሚደርሱ አደጋዎችን ለመከላከል እንዲያስችልዎት የአደጋ መከላከያ መሣሪያዎችና ቁሳቁሶችን ይጠቀማለ?	1)አዎ 2) የለም	
412	ለጥያቄ ቁጥር 411 መልስዎ የለም ከሆነ ምክንያቱ ምን ነው?	1) ሥርክሾፑ የአደጋ መከላከያ መሣሪያዎችና ቁሳቁሶችን ስለማይሰጥ 2) ግንዛቤ ስለሌለኝ 3) ለሥራ ስለማይመቸኝ 4) ሌላ ካለ ይጠቀስ----	

Annex- 5. Observational checklist for the work environment

Name of the workshop (Code) _____

Hazards in the workshop

501. Is there excessive heat in the workshop? (Yes requires that a worker is found sweating when naked or with light clothing or if data collector or investigator feels sudden eat wave when entering to the industry.)

a. Yes b. No

502. Is there excessive noise in the workshop? (Yes requires when that is difficult to communicate with nearby workers without shouting)

a. Yes b. No

503. Is there **warning signs** or safety rules in the workshop? (Yes requires no lack of such signs or posts while inspection around)

a. Yes b. No

504. Do the employees use the **necessary personal protective devices**? (No requires lack of such equipment and used by each workers while inspection around)

a. Yes b. No

505. Do all production **equipment and materials have appropriate protective arrangement**? (Yes requires no lack of such arrangement while inspection around)

a. Yes b. No

506. Does the workshop follow **written health and safety plan of action** in the workplaces? (Yes requires the completion of at least one of the measures in the plan)

a. Yes b. No

507. Does the workshop have **first aid equipment**? (Yes requires the presence of first aid equipment during data collection)

a. Yes b. No

Annex 7. Curriculum vitae of advisors and principal investigator

Telephone:

+251947584962 or +251942565937 :

Email

negesse.mulugeta@gmail.com/or negessemulugetaamare05@gmail.com

Negesse Mulugeta

Back Ground

Name: Negesse Mulugeta Nationality: Ethiopian

Sex: Male

Birth Date: April 27,1980 E.C

Marital status: married

Experience Summary

I have been working for 9 years and 2 months with a good understanding of the following duties and responsibilities:

- **family health care,**
- **diseases prevention and control,**
- **hygiene and sanitation,**
- **Accident and injury prevention and control and first aid**
- **woreda health office head**
- **food drinking, health related institutions hygiene and environmental health competency assurance and control**
- **hygiene and promotion officer**

I especially have been working in hygiene and sanitation activities, overall waste management practices, family planning, communicable and non-communicable diseases prevention and control, as well as youth reproductive health. Have a good knowledge of Ethiopia's health policy especially legislations associated with adolescent and youth health

care, family health, waste management plus environmental policy coupled with extensive experience on basic safety measures, first aid kits, assessments, data collection & analysis, planning, reporting and partnership coordination.

1st May, 2008 E.C- to date health office Yeka Sub city, Addis Ababa, Ethiopia

Roles and responsibilities:

- Coordinate hygiene and promotion activities
- Facilitating stakeholder's participation on training, urban health extension program implementation.
- Mobilizing resources.
- Giving capacity building training for urban health extension professionals and worda program supervisors working in the 13 woredas of yeka sub city.
- Monitoring the activities of urban health extension program works at the sub city.
- Appraise and produce development project proposals and searching for fund.
- Conducting supportive supervision on implementation of the urban health extension program including adolescent and youth health care.
- Monitoring and evaluating on weekly, Quarterly and annually on the overall activities and implementation of urban health extension packages.
- Facilitate community mobilization, organization and empowerment process.
- Providing technical support for Health extension professionals and supervisors.
- Facilitating and organizing the functioning of community health committees.
- Interact with the stakeholders and work with NGOs, Private health sector and the community.
- Preparing and disseminating report on regular base to the concerned governmental offices.

September 1st 2007 E.C - to 30th April, 2008 E.C.

Food, Drinking, Health and Health related facilities and Industries Environmental Health Quality Assurance and Control Core Process Owner

Roles and responsibilities:

- Preparing plans and reports on regular base.
- Participate in setting supplementary quality standards.

- Coordinate and guide sanitation and hygiene activities (Overall hygiene and sanitation management) in the sub city.
- Inspection of food and drinking establishment to ensure compliance to food safety regulatory requirements and safety of food.
- Giving Quality assurance and control of food and drinking establishment based on the criteria.
- Creating awareness about pest control measures and action taken in food and drinking establishment as well as institutions.
- Supervising availability of first aid kits in food and drinking establishment and institutions.
- Supervising food handlers about their personal hygiene.

July 1st 2004 E.C – to 30th August, 2006 E.C

Yeka sub city woreda 02 health office head

Roles and responsibilities:

- Coordinating overall health activities at woreda level.
- Planning, staffing, budgeting, guiding, coordinating and monitoring health activities.
- Organizing community participation in diseases prevention and control activities.
- Monitoring and evaluating performance.

2nd October 2002 E.C – to 30th June 2004 E.C AAHB, Yeka Sub city, woreda 02 health office

Urban Health Extension Program Supervisor

Roles and Responsibilities:

- Monitoring the field activities of health extension program works as well as checklist that enables good monitoring
- Conducting supportive supervision for health extension professionals on implementation of the urban health extension program (UHEP)
- Monitoring and Evaluating on weekly, Quarterly and annually on the overall activities of urban health extension program.
- Conducting supportive supervision for health extension professionals on implementation of the urban health extension program (UHEP).
- Monitoring and Evaluating on weekly, Quarterly and annually on the overall activities of urban

health extension program.

- Facilitate community mobilization, organization and empowerment process.
- Providing technical support for Health Extension professionals on the implementation of UHEP.
- Facilitating and organizing in the functioning of health committee
- Appraise and produce development project proposals and searching for fund.
- Interact with the stakeholders and work closely with NGOs, Private health sector and the community.
- Providing technical support in the implementation of risk assessment and reaching MARPs on HIV/AIDS.
- Preparing and disseminating report on regular bias to the concerned governmental offices.

Education, trainings and skills

- BSC Degree in Environmental health Science; from October 2007–July 2009, Jimma University.
- Certified on Training on adolescent and youth health care.
- Certified on Training on adolescent and youth health care by Ethiopian federal ministry of health.
- Certified on Training on building Community Support & capacity Enhancement dialogue for healthy community, by AAHB & FMOH in 2013 G.C.
- Certified on basic Computer application skill (MS Word, MS Excel, MS Access, Ms Power point, and internet application) in 2016 G.C.
- Certified on Supportive supervision, UHEP packages, Monitoring and evaluation, planning and reporting training in May 2010 G.C.
- Certified on Training on government strategies and policies on health care delivery system.
- Building Community Support & capacity Enhancement dialogue training for healthy community,
- Certified on Training on communicable and none communicable diseases prevention and control.
- Certified on **driving license,**
- Amharic is native language

Language

- English : Proficient in speaking, writing and reading

Annex 8. Declaration

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

Name of principal investigator: NEGESSE MULUGETA AMARE

Signature _____ Date._____

Place: Addis Ababa university college of health science school of public health department of general masters of public health

Approval of the primary Advisor

This thesis has been submitted for approval to primary advisor

Advisor: Dr. ABERA KUMIE (MSc, PHD)

Signature _____ Date._____