



PREVALENCE AND CONTRIBUTING FACTORS OF WORK-RELATED
INJURIES AMONG SMALL AND MEDIUM SCALE INDUSTRIAL WORK-
ERS IN SEBETA TOWN, SOUTHWEST, ETHIOPI, 2019.

BY: FEKADU BEKELE (BSc)

A RESEARCH THESIS TO BE SUBMITTED TO DEPARTMENT OF
EPIDEMIOLOGY, FACULTY OF PUBLIC HEALTH, INSTITUTE
OF HEALTH, JIMMA UNIVERSITY; IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF
HUBLIC HEALTH IN GENERAL PUBLIC HEALTH (GMPH)

FEBRUARY, 2020
JIMMA, ETHIOPIA

PREVALENCE AND CONTRIBUTING FACTORS OF WORK-RELATED INJURIES AMONG SMALL AND MEDIUM SCALE INDUSTRIAL WORKERS IN SEBETA TOWN, SOUTHWEST, ETHIOPIA.

B: FEKADU BEKELE (BSc.)

ADVISORS:

LELISA SENA (PhD)

TEMIRAT SHAWANEW (BSc, MPHE.)

FEBRUARY, 2020

JIMMA, ETHIOPIA

Abstract

Background: Throughout the world, occupational exposure in small and medium scale industries continue to cause serious public health problems and are leading cause of disability and disease among workers. Since there has not been any study on the prevalence and contributing factors of occupational injury in small and medium scale industries

Objective: To assess the prevalence and contributing factors of work-related injury among small and medium scale industries workers in Sebeta Town.

Methods: An institutional based cross-sectional study design was conducted on 935 small and medium scale industrial workers from May to June,2019. Multi-stage sampling technique was used to selected the study participants. A pretested and structured questionnaire was used to obtain information on the occurrence of injuries and allied factors. Bivariate and multivariate analysis was carried out to ascertain the association between dependent and independent variables. Adjusted odds ratio with 95%CI and p-value less than 0.05 were used to declare the associated factors

Results: The overall annual prevalence rate of work-related injury was 36.1% workers per year, with 37.1% and 35.7% workers among small and medium scale industries, respectively. The prevalence and severity of annual rate was not associated with the scale type of industries. Younger age between 15-23 years (AOR: 3.3; 95% CI: 2.12, 4.99), working more than 48 hours per week (AOR: 3.70; 95% CI: 2.47, 5.54), sleeping disorder (AOR: 5.37; 95% CI: 3.47, 8.31), job dissatisfaction (AOR: 3.82; 95% CI: 2.33, 6.25), married (AOR: 3.26; 95%CI: 2.12, 4.99), not use of personal protective equipment (AOR:13.9; 95% CI: 7.94; 21.6) were found to be significantly associated factors to work related injuries. Adjusted odds ratio with 95%CI and p-value less than 0.05 were used to declare the associated factors.

Conclusion: The burdens of work-related injury in both small and medium scale industries workers are significantly high. Emphasis should be given to the provision of health and safety information, training and prevention should focus on young age workers, workers work more than 48 hours per week, and should assess workers satisfaction.

Acknowledgments

This thesis report would not have been possible without the support of many people.

I have to begin with thanking god from whom I have received strength, endless love and confidence to succeed in all my endeavors.

I would like to express my heartfelt gratitude to my advisors Dr. Lelisa Sena and Mr. Tamrat Shawanew for their valuable and precious comments throughout the preparation of the thesis. Also, I want to express my great thanks to Jimma University Department of Epidemiology for giving this chance.

I would also like to thank owners of all small and medium scale industries in Sebeta town and their workers who give necessary information during data collection voluntarily. I would like to thank Sebeta town health Office for giving the chance to attend the master's program and I would like to express my heartfelt gratitude to all my families and friends for their uncounted support. The last but not the least thanks go to all Sebeta towns' government Offices for his especial support through all process of the thesis preparation.

Acronyms and Abbreviations

AOR	Adjusted Odds Ratios
CLs	Confidence Interval
ILO	International Labor Organization
JU	Jimma University
MOLSA	Ministry of Labor and Social Affairs
MSI	Medium Scale Industries
OR	Odds Ratio
OSH	Occupational Safety and Health
PPE	Personal Protective Equipment
SPSS	Statistical Package for Social Sciences
SSI	Small Scale Industries
WHO	World Health Organization

Contents

Abstract	i
Acknowledgments	ii
Acronyms and Abbreviations	iii
List of tables.....	vi
List of Figures.....	vii
1. INTRODUCTION	1
1.1 Background.....	1
1.2. Statement of the Problems	3
1.3. Significance of the study.....	4
2. LITERATURE REVIEW.....	5
2.1 Magnitude of work-related injury	5
2.2 Common occupational injuries, causes and parts of the body affected.....	6
2.3 Factors related to work related injuries.....	8
3. OBJECTIVES	10
3.1. General objective:	10
3.2. Specific objective:	10
4. METHODS AND MATERIALS.....	11
4.1. Study Area and Study period.....	11
4.2. Study design:	11
4.3. Population	11
4.3.2. <i>Study population:</i>	11
4.4. Eligibility criteria	11
4.5. Sample size determination and Sampling technique	12
4.5.1 Sample size determination	12
4.5.2. Sampling technique	13
4.6. Study Variables	15

4.6.1. Dependent <i>Variable</i> :	15
4.6.2. <i>Dependent variables</i> :	15
4.7. Data collection tools and procedures.....	15
4.8. Operational definitions.....	16
4.9. Data Quality Control.....	17
4.10. Data processing and analysis.....	17
4.11. Ethical consideration.....	18
4.12. Dissemination of findings.....	18
5. RESULTS.....	19
5.1. Socio-demographic characteristics of the respondents.....	19
5.2 Distribution and characteristics of work-related injuries.....	21
5.2 Work environment and behavioral characteristics of respondents.....	25
5.3 Work environment observation.....	28
5.4. Bivariate analysis.....	30
5.4.1. <i>Socio-demographic factors</i>	30
5.4.2. <i>Work-place environmental factors</i>	31
5.4.3. <i>Behavioral factors</i>	32
5.5. Multivariate analysis.....	33
6. Discussion.....	35
7. Strength and Limitations of the study.....	39
7.1. Strength of the study.....	39
7.2 Limitation of the study.....	39
8. Conclusion and recommendations.....	40
Annex -1: References.....	41
Annex- 2: Information sheet and consent form.....	44
Annex -3: English version questionnaire.....	45
Annex -4: Afaan Oromo version questionnaire.....	51
Amharic version questionnaer.....	58

List of tables

Table 1: Socio-demographic characteristics of the respondents by types of industry, in Sebeta Town, May-July, 2019.	19
Table 2 :Distribution of work-related injuries in last 12 months by injured parts of the body, types among 338 injured respondents, Sebeta Town, May-July, 2019.	21
Table 3 Distribution of work-related injuries in last 12 months by causes of injury among 338 injured respondents, Sebeta Town, May-July, 2019.	22
Table 4 :Distribution of work-related injuries by reported day of week and time among small and medium industries in Sebeta Town, May-July, 2019.	23
Table 5 :Work environment and behavioral characteristics of respondents, Sebeta Town, May-July, 2019	25
Table 6 :Distribution of using PPEs types among used respondents of small and medium industries in Sebeta Town, May-July, 2019	26
Table 7 :Occupational health and safety hazards identified in selected industries, Sebeta Town, May-July, 2019	28
Table 8 Selected environmental socio-demographic as determinants of work-related injuries by types of industry, Sebeta Town, May-July, 2019.....	29

Table 9. Crude statistics of working environmental as determinants of work-related injuries in small and medium scale industries in in Sebeta Town, May-July, 2019-----30

Table 10. Bivariate analysis of behaviors as determinants of work-related injuries in small and medium scale industries in in Sebeta Town, May-July, 2019-----31

Table 11. Multivariate analysis of socio demographic, work environment and behavioral factors of work-related injuries among small and medium scale industries in in Sebeta Town, May-July, 2019-----33

List of Figures

Figure 1: A Conceptual Framework for study of assessment of prevalence of work-related injuries and contributing factors among small and medium scale industrial workers in Sebeta town, south west, Ethiopia, 2019 9

Figure 2: Schematic presentation of the sampling procedures for study of assessment of prevalence of work-related injuries and contributing factors among small and medium scale industrial workers in Sebeta town, southwest, Ethiopia,..... 14

1. INTRODUCTION

1.1 Background

An occupational injury is any wound or damage to the body resulting from an event in work environment. Any injury or illness is considered by the occupational safety and health administration to be work-related if an event or exposure in the work environment either caused or contributing to the resulting condition or significantly aggravated a pre-existing condition work related injuries range in severity from minor cuts and bruises to death and one of the major public health problems in the world(1–3).

Globally, poor occupational health and safety results in 271 million work related injuries, 2 million work-related deaths, and 160 million work-related diseases per year. The estimated economic loss caused by work-related injuries and disease is equivalent to 4 % of the world's gross national product (2–5). Worldwide out of 3 billion workers worldwide, nearly 85% are not having access to occupational health services (6). Only 5 to 10 percent of workforce in developing countries and 20 to 50 percent of workforce in developed countries have access to some kind of occupational health services(1–4)

In Sub-Saharan African countries about 54,000 fatal and approximately 42 million occupational accidents happen annually that results at least 3 days absence from work of every workers(1,7) .In developing countries including Ethiopia, the risk of having work-related injury is 10 to 20 times higher than that of developed countries. This is because in developing countries, majority of the workforce is employed in small and medium scale industries that do not meet the minimum standards and guidelines set by the World Health Organization and the International Labor Organization for occupational health, safety and social protection(1–4). There is no universal definition for small and medium scale industries, since the definition depends on who is defining it and where it is being defined. Small and medium scale industries can be defined in two ways, based on the enterprise and or the enterprise fixed assets.

In Ethiopia, Small and medium scale industries can be defined in two ways, number of employees and fixed asset they have. Small scale industry (SS1) means an industry in manufacturing sector work with machinery (excluding building construction) and engages from 6 to 30 workers including the owner, his family members and other employees and having a total capital excluding building from birr 100,001 to birr 1500,000 birr. Medium scale industry (MSI) means an industry in manufacturing sector work with machinery (excluding building construction) and engages from 31 to 100 workers including the owner, his family members and other employees and having a total capital excluding building from birr 1500,001 to birr 20,000,000 birr(8)

Small and medium scale industries employ about 80 % of the workforce and contribute over 90 % of all industries in developing countries. Workers in these industries are at great risk of work related injuries, chronic illness, stress, disability or death because of low educational and literacy rates, unfamiliarity with work process and exposures, and inadequate training(3, 4).The stated heavy burden calls for urgent strengthening of the field of occupational hazard prevention and control in Africa. Safer and healthier work conditions can make an important contribution to poverty alleviation and sustainable development. Efficient application of available knowledge to develop practical solutions to overcome the “knowledge application gap” is more important than generating new theoretical knowledge(4).

1.2. Statement of the Problems

Occupational injuries pose a major public health and developmental problems; which result in a serious health, social and economic consequences on workers and their employers(4,9,10). Occupational injuries alone account for more than 10 million disability-adjusted life years or healthy years of life lost whether to disability or premature death and 8% of unintentional injuries worldwide. Lack of comprehensive occupational health services policy, poor infrastructure and funding, insufficient number of qualified occupational health and safety practitioners and general lack of adequate information are among the main drawbacks to the provision of effective enforcement and inspection services in most African countries(11).

Even though the Ethiopian Labor proclamation No 377/06 in Article 92 clearly spells out the fundamental obligations of an employer with regard to putting in place of all the necessary measures in order to ensure, work places are safe, healthy and free of any danger to the well-being of workers. However, this is not practical in most of the industries in our country including study area for different reasons(9). In Ethiopia, the Epidemiology of work-related injuries are poorly documented. So far, only few studies have been done to identify work related injuries and related occupational health and safety problems among industrial workers in few towns of the country. According to the study on assessment of occupational injuries in Tendaho Sugar Factory in Afar region of Ethiopia, 6153 work days were lost among 634 injured respondents. On average 11.4 working days were lost per an injured worker per year(5).

The study conducted in Gonder woreda, North Gonder zone 55 (17.1%) injured workers were hospitalized in a year, which accounts 40% hospitalization for more than 24 hours. One hundred and three (53.9%) were absent from work for more than 4 days. As a result of 322 work-related injuries about 191 working days were lost and two deaths were reported because of work related injuries (3). In this country, there is rapid industrialization, which may result in increased number of industries and employment. Small and medium scale industries contributing over 90 percent of industries and employ more than 80 percent workers. Majority of workers in these industries are uneducated unskilled, untrained and

inexperienced with the tools and the hazards associated with the work process which can increase the risk of work related injuries(6).

Some studies suggest that small-scale industries are more dangerous to work in than that of medium and large industries (2–4).However, information regarding the present status on the prevalence and factors affecting work-related injury is lacking for small and medium scale industries. Since there is no Epidemiological information regarding the present status on the prevalence and factors affecting work-related injury among small and medium scale industrial workers, it is crucial to know the prevalence, severity and determinants of work-related injuries among these workers. There are also studies that suggest small-scale industries are more dangerous to work in than that of medium and large industries. Hence, it is important to test this hypothesis. The main aim of this study is therefore, to assess the prevalence of work-related injury, severity, and determinate factors among small and medium scale industrial workers, in Sebeta town, Oromia regional state.

1.3. Significance of the study

The result of this study will give the clear picture of the actual occurrence of occupational injuries and associated factors in the study area. Furthermore, the finding of this study will provide a base line data for further studies on occupational health and safety measures. Finally, the study will be important for the town, and other concerned bodies to plan, implement, monitor and evaluate the occupational health and safety related activities.

2. LITERATURE REVIEW

2.1 Magnitude of work-related injury

Information on the magnitude of injury as a major public concern is invaluable in raising awareness, for making the problem more visible to policy makers and for lobbying governments, donors and other key factors to initiate program me for occupational injury prevention and trauma care(2).Studies that are available on industrial injuries indicated that work related injuries occur with great frequency and much greater severity in developing countries (3). According to study conducted small scale industrial workers in Uganda, injury rate of 700 per 1000 exposed workers was observed in one year period(16).

Study carried out in Malaysia, injury rate of 735 per 1000 exposed workers was observed in one year period(14). Study conducted among Saudi Star Agro industry workers in Gambella region and showed that injury rate was 367 per 1000 exposed worker per year(1).Another study conducted in a Nigeria , revealed that injury rate of 184 per 1000 exposed workers per year(17).Study conducted among building construction workers, Iran, showed that the injury rate of 310 per 1000 workers per year (18). In Ethiopia there is no systematized recording and reporting on occupational injuries that are organized at the national level. Moreover, there are only few studies conducted to determine the magnitude of occupational injuries among industrial workers. Study done among large scale metal industry workers in Addis Ababa, revealed that the injury rate of 489 per 1000 workers per year(12).

Study done among Tendaho factory workers in Afar regional stat revealed injury rate of 783 per 1000 workers per year(5).Another study conducted among construction workers in Addis Ababa city, revealed an overall annual prevalence rate of work-related injury was 847 per 1000 workers per year(9).Similar Study conducted among housing and construction industrial workers in Addis Ababa City, indicated that injury rate was 826 per 1000 workers per year(15). Study conducted among small and medium scale industrial workers in Gondar Woreda indicated that the annual prevalence rate of work-related injury was 335 per 1000 exposed workers. Out of the total work-related injuries, 355 and

324 per 1000 exposed workers occurred among small and medium scale industrial workers, respectively(3). Another similar study conducted among small and medium scale industrial workers in Bahir Dar town, revealed an overall work-related injury rate was 342 per 1000 workers per year .Out of the total work-related injuries,360 and 333 per 1000 exposed workers occurred among small and medium scale industrial workers, respectively(4).

Another study conducted among small scale industrial workers in Mekelle and Maizan Aman revealed that injury rate were 582 and 452 per 1000 exposed workers respectively per year(16,19).At present, the economic costs of occupational injuries are rapidly increasing and are responsible for more lost time from work, productivity, and working years of life than any other health conditions that continue to claim the lives, damage the physical and psychological well-being and consume the resources of workers and their families(20,21). In general, occupational injuries are costly to the individuals, families, their organizations and the nation as a whole in which many of the injured could be left with disabling sequel, and in some cases, permanent ones (1,12,21).

2.2 Common occupational injuries, causes and parts of the body affected

Different parts of human body are susceptible for work related injuries. The data on types of injury with the related injured parts of the body can help policy makers, managers, and industrial hygienists, public health experts, to provide and design appropriate personal protective equipment and safe ergonomic design(21).Study conducted among in Tendaho agricultural development in Afar regional state showed that laceration(36.9%),cuts(11.6%), and Eye injury and puncture(10.8%) were common occupational injuries(5).Assessment made on small and medium scale industries in Gondar indicated that abrasions(23.2%),cuts(19%),eye injury (18.8%), puncture(14.4%) and dislocation(6.5%) were common types of work-related injuries (3).

Study conducted among industrial workers in Indian, showed that laceration(40%) ,contusion(26%) ,cuts injury (16%) ,eye injury (12%) falling from a height, struck by/ against an object(10%), were common causes (22).Study done in construction workers at Addis Ababa, the most common agent stated as a cause of injury were Absence of protective device(40.3%) and lifting heavy objects(8.1%)(9).

The study conducted among small and medium scale industries workers in Gondar showed that machinery(23.9%), splinters(21.7%) and hand tools(16.6%) were common causes (3). Another study done on small and medium scale industries workers in Bahir Dar Town, north west Ethiopia(52%) and laceration(17%) were frequent causes of injury(4).

Occupational injuries most often affect; fingers, hands, eyes, feet, arms and legs of the body. Study made among workers in small and medium scale industries in Gondar wereda showed that hands (30%) fingers (23.6%) and accounted for more than a half of all injuries(3). Study conducted in China reported that limbs (57.2%), head and face (18.12%), trunk (17.39%) were the parts of the body commonly affected (14). A study done on small and medium scale industries workers in Bahir Dar Town, showed Hands (30%), fingers(23.6%), and eye injury(19.3%) were common parts of the body affected by occupational injuries(4). In general, fingers are common parts of the body affected by occupational injuries(3,4).

Generally, the study conducted in Ethiopia: in Saudi Star Agro industry workers in Gambella, Tendaho agricultural industry and in Gondar on small and medium scale industries showed that, abrasion/laceration, eye injury, cut and punctures as the most frequent types of injuries (1,3,5). Study conducted in Tendaho agricultural, and in small and medium scale industries in Gondar wereda revealed that the highest occupational injuries occur on Monday and the lowest on Thursday's and Friday's. Absenteeism is higher on Monday's than other days of the week in most industrialized countries, which results in workers to stand in for absent workers and undertake unfamiliar jobs on that day. The most common time of injury is from 8 am to 10am. It was suggested by the investigators that this could have been due to fatigue or the speeding up of production at these times in an effort to meet a target before break(3,5).

2.3 Factors related to work related injuries

Literatures from different countries identified various factors contributing to occupational injury; Studies done in developed and developing countries including Ethiopia reported that men had a higher risk of occupational injury than women in manufacturing industries (2,4,5,12,23,24). Most study findings at different places by different scholars reported that working at younger age increases the risk of sustaining more occupational injury among factory workers compared with older workers (2,4,5,16,24). This can be explained as due to the fact that inaccessibility to health and safety information, lack of training on health and safety, less work experience, low level of knowledge and skill towards the work among young workers(2,3).

Generally, Most study's findings at different places by different scholars identified another various factors contributing to occupational injury that including, marital status(21,23). lack of formal education compared to literate (21,23) ,work related injury was higher among those who were cigarette smokers,(12),sleeping problems (2,3,5,21),alcohol consumption(5,12,24), working for more than 48 hours/week (1,3,21,24),absence of health and safety training(1,2,5,16,23),Job category(2,3,12,23),Work experience less than 5years(3,5,12,16) not using personal protective equipment's(4–6), job dissatisfaction(3,5,24) were found to be significantly associated factors with occupational injury. However, the discrepancies in relation to the occurrences of occupational injuries among small and medium scale industry workers appear to necessitate further investigations. In Ethiopia, information regarding occupational injuries in small and medium scale industry is rare, and very limited attempts have been made to investigate the magnitude and associated factors(3,4).

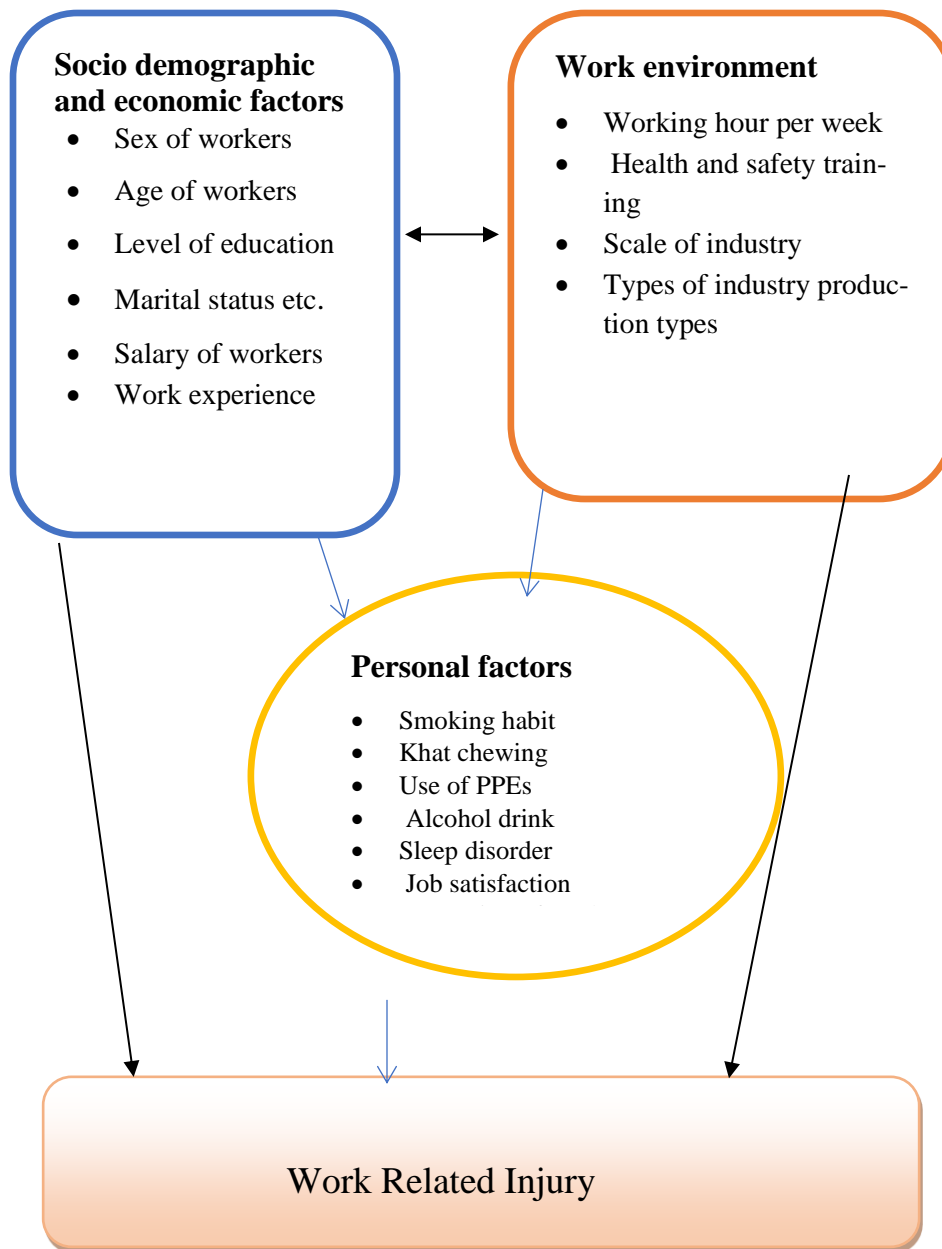


Figure 1: A Conceptual Framework for study of assessment of prevalence of work-related injuries and contributing factors among small and medium scale industrial workers in Sebeta town, south west, Ethiopia, 2019

(Source: Adopted from Reference(9,25).

3. OBJECTIVES

3.1. General objective:

To assesses the prevalence of work-related injury and contributing factors among small and medium scale industries workers in Sebeta town, south west Ethiopia, 2019.

3.2. Specific objective:

- To determine the prevalence of work-related injury among small and medium scale industry workers.
- To identify contributing factors with of work-related injury among small and medium scale industry workers.

4. METHODS AND MATERIALS

4.1. Study Area and Study period

The study was conducted in Sebeta Town, Southwest Ethiopia from May to June, 2019. Sebeta Town is one of the Oromia special zone surrounding Finfinnee or Addis Ababa, and located at 25 km to southwest of Addis Ababa. Sebeta is endowed with various ethnic groups living in harmony together. The total population of the town is estimated around 336'975 (50.9% female). Administratively the city has been divided in to four sub cities (Mogle, Hococa, Furi and Geda faji) encompassing 16 kebeles having a mayor as city administrator. The town has 335 small and 132 medium scale industries with total of 6,608 and 9,900 employees, respectively.

4.2. Study design:

Institutional based cross-sectional study design was used from May to June, 2019.

4.3. Population

4.3.1. Source population:

All workers who were work in small and medium scale industries in study area.

4.3.2. Study population:

All workers from both small and medium scale industries and who were directly engaged in the production process in the study.

4.4. Eligibility criteria

4.4.1. Inclusion criteria:

All workers with in the study period and who have been work at least for one year in selected industries were included.

4.4.2. Exclusion criteria:

All workers who were on annual leave and absent during data collection period were excluded.

4.5. Sample size determination and Sampling technique

4.5.1 Sample size determination

The sample size was calculated using sample size determination formula for a single population proportion formula with the following assumption, Level of confidence to be 95%, 4.7% margin of error($d=0.047$), and ($P=50\%$) assumed prevalence of work-related injuries since there was no previous studies data on the prevalence of work-related injuries among small and medium scale industries workers, Hence, prevalence of 50% was used in order to maximize the sample size.

$$n = \frac{(Z_{1-\alpha/2})^2 P(1-P)}{d^2}$$

$$n = (1.96)^2 \times 0.50 (1-0.50) / (0.047)^2 = 435$$

Where:

- n = the required sample size
- P (50%): assumed prevalence of work-related injuries since there was no previous studies.
- $Z_{1-\alpha/2}$: a standard Z score which is 1.96, corresponding to a 95% confidence level
- d =margin of error
- Finally, the total sample size calculated was 957. Considering 2 for sampling variation or design effect and 5% for non-response rate.

4.5.2. Sampling technique

Multistage sampling technique was used to select the sample among SSI & MSI workers. Initially, the total 467 of small and medium scale industries were stratified in to five strata based on the types of production. The five strata consisted of 62 metal works, 78 wood works, 257 food work, 52 plastic & rubber work, and 18 textile work. Using the list of all registered small and medium scale industries by trade office as a sampling frame from 140(30%) by assumption of addressing at least 30% of each stratum in each industry were selected using systematic random sampling (SRS) with a sampling interval of 3 for both small and medium scale industries. Based on probability of proportion to size (PPS) of the number of both SSI & MSI in each stratum, we got 19 metal works, 23 wood works, 77 food works, 16 plastic works, and 5 textile works.

Finally, 957 sample of SSI and MSI workers were taken using simple random sampling technique based on PPS of the number of workers employed in each small and medium industries(taking 6 respondents from SSI employing were <31 workers and 12 respondents from MSI employing 31-10 workers) getting 119 metal workers, 153 wood works, 517 food workers, 106 plastic and rubber workers, and 40 textile work workers recruited for the study (figure 2.)

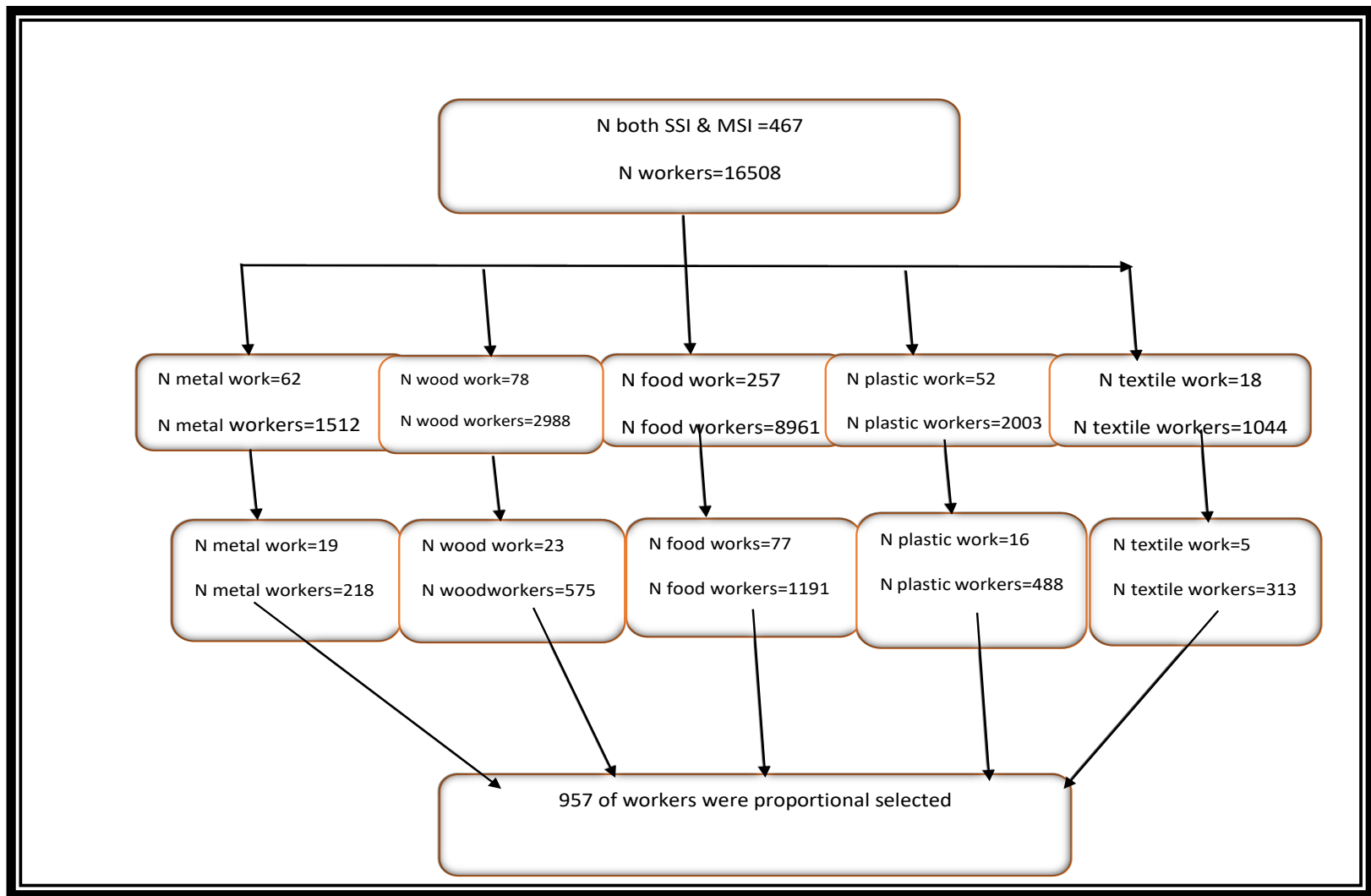


Figure 2: Schematic presentation of the sampling procedures for study of assessment of prevalence of work-related injuries and contributing factors among small and medium scale industrial workers in Sebeta town, southwest, Ethiopia,

4.6. Study Variables

4.6.1. Dependent Variable: Work-related injury in the past 12 months.

4.6.2. Dependent variables:

- **Socio demographic variables:** Sex, age, religion, educational level, marital status, monthly salary
- **Work environment variables:** Hours worked per week, workplace supervision, health and safety training, and scale of industry.
- **Behavioral factors:** Usage of PPE (personal protective equipment's), sleeping disturbance, Job satisfaction, Usage of substance.

4.7. Data collection tools and procedures

Data was collected from the study subjects by interviewing using structured questionnaire. The questionnaire was developed by adapting after reviewing different literatures to enhance instrument reliability then, the adapted questionnaire was prepared initially in English and translated to Afaan Oromo and Amharic and then back to English to check its consistency. It consists of 4 sections (socio demographic information, work related injury characteristics, Work environment information and workers behavior related). Ten data collectors were recruited from urban health extension workers who had exposures in data collection; speak Afaan Oromo & Amharic and familiar with the study areas prior to the study. Supervisors are two environmental health professionals who had exposures in data collection. Work place observation was conducted by principal investigator using structured questionnaires.

4.8. Operational definitions

- **Work related injury:** Any injury condition sustained by worker in connection with the performance of his/her work within the last one year, but not includes work-related diseases that need exposure assessment or laboratory tests and medical examination by considering OSHA recommendation to report the injury as significant (1,5,26).
- **Severity of injury:** Is any characterized by permanent disability, hospitalization more than 24 hours and absence from work over three days in the last one year (4,23).
- **Small manufacturing industry:** Any industry that uses power driven machine and employ from 6 to 30 workers (8).
- **Medium manufacturing industry:** Medium scale industry: any industry that uses power driven machine and employ from 31 to 100 workers(8).
- **Sleeping disorder:** The presence of sleeping problems when the worker is at work in the factory that occurred due to workers spending more than eight hours without shifting, working in evening, trying to work more than one task at a time, excessive heat at the work place, etc (27).
- **Health and safety training:** Trainings given on health and safety to factory workers by Occupational health and safety practioners (27).
- **Job satisfaction:** Was a self-reported felling of participants about their job as it was pleasurable for them (28).
- **Personal protective equipment (PPE):** Utilization of the worker-specialized clothing or equipment worn by employees for protection against health and safety hazards. PPE equipment is designed to protect many parts of the body, eg, eyes, head, face, hands, feet, and ears

4.9. Data Quality Control

Data quality was controlled through provision of training for data collectors and supervisors who are recruited based on a set of criteria such as knowledge of the local language Afaan Oromo and Amharic. They were trained for two days by the principal investigators on the purpose of the study and overall data collection procedures.

Before the actual data collection, the questionnaire was pretested on 5% of workers who were work in flour factors nearby Ajamba kebele and necessary corrections was made accordingly including on ambiguities of the questions, wording, logic sequence, and skipping order. The collected data was checked for completeness, consistency, accuracy and clarity by the supervisors and the principal investigator on a daily base. The collected data was checked on daily basis for completeness, consistency, accuracy and clarity by the supervisors and the principal investigator.

4.10. Data processing and analysis

After the completion of data collection, the raw data was edited, entered in to a computer using Epidata version 3.1 then exported to SPSS version 23. Data was cleaned in Epidata version 3.1 as well as SPSS version 23 by running frequencies and cross tabulations. Preliminary frequencies were run to identify missing variables. Continuous variables were coded and some coded variables were recoded. Linearity assumptions and homogeneity of variances were checked by scatter plot Descriptive and analytical statistics was conducted to describe the variables of the study. A Pearson chi-square was used to check adequacy of cells and re-categorization was done for inadequate cells. Independent variables which had p-value < 0.25 in binary logistic regression were considered for multiple logistic regressions. Model assumption was checked by using Hosmer and Lemeshow test statically significance value greater than 0.05 were considered as the model was adequately fits and describes the data. Multivariate logistic regression analysis was applied to assess significant predictors of work-related injuries. Adjusted odds ratio with 95%CI and p-value less than 0.05 were used to declare the associated factors. Tables and graphs were used to organize and present results.

4.11. Ethical consideration

This study was carried out after getting ethical clearance from Ethical review committee of Institute Health of Jimma University and Official letters was submitted to respective managers of each selected industries and permission to conduct this study was secured from all randomly selected industries before the start of the data collection. Informed consent was first obtained after clear explanation of the study from all the study participants. Confidentiality was maintained by omitting their names and personal identification. Study participants had the right to participate on the study or not and they can withdraw at any time of the study they wish were respected during the interview. If there was incident that results injury to the worker while visiting the industries, an immediate referral to their health center was arranged prior to data collection. However, there was no incident that resulted in injury. Study participants were informed on common causes and methods of preventing work related injuries by the interviewer after completing interview.

4.12. Dissemination of findings

The study report will be presented and submitted to Department of Epidemiology, College of Health Science, and Jimma University. Sebeta town administration, trade and industry office, the town health office, and all small and medium scale industries participated in the study will be communicated and have had copies of the research paper for future engagements and implementation. Finally, the research paper will be submitted to journal publishers for publication.

5. RESULTS

5.1. Socio-demographic characteristics of the respondents

From the total of 957 sampled workers, 935 were interviewed with response rate of 97.7%. Regarding to sex of respondents, 579 (61.5%) of workers were male. This report showed that 554(59.1%) of respondents were had less than 29 years of age with the mean age of the respondents was $28.76 \pm SD 5.21$ years. This study revealed that job category of respondents, 119(20 %) metal workers,153(16.3%) wood workers,517(53.3%) food processing workers,106(11.3%) plastic and rubber workers and 40(4.3) of were textile workers respectively.

Regarding educational status of respondents, 189(20 %) primary, secondary 179 (18.7%) and 573(61.3%) were attend diploma or higher. The study revealed 229(24.4%) of industries workers were married. This study revealed that 576 (61.6%) of were had less than 5 years' work experience with mean work experience $4.8 + SD 1.8$ year. (Table 1).

Table 1: Socio-demographic characteristics of the respondents by types of industry, in Seb-eta Town, May-July, 2019

Variables	Category	Frequency(n)	Percentage (%)
Sex	Male	579	61.5
	Female	356	39.5
Age group	15-23years	554	59.1
	24-34 years	345	36.9
	35+	36	3.9
Educational status	primary school	189	20.0
	Secondary school	175	18.7
	Diploma & above	573	61.3
Marital status	Married	229	24.4
	Single	706	75.6
Work experience	<5 years	576	61.6
	>5 years	359	38.4
Salary	≤1000	201	21.5
	1001-2000	617	66.1
	2001-3000	74	7.8
	3000 and above	43	4.6

5.2 Distribution and characteristics of work-related injuries

The overall prevalence of work-related injury was 338(36.1%) and it was distributed in slight difference between three types of small-scale industries in the town. Out of the total work-related injuries, 116(37%) and 222(35.7%) workers per year were occurred among small and medium scale industrial workers, respectively.

Out of total injured respondents 268 (67.8%) and 70(20.7%) were injured one time and more than one times respectively in the last 12 months before this study conducted. Regarding two weeks incidence of injury were 47(5.0%). Of those injured 77(27.9%) were hospitalized, from which 25 (32.4%) were hospitalized for less than 24 hours and 52(67.5%) were hospitalized for more than 24 hours. The totals absent days from work were 608 days (table 2).

Regarding parts of the body injured, fingers 98 (29.0%), hand 80 (23.7%), and leg 39(11.5%) were predominantly affected parts of the body. With respect to types of injuries, abrasion 123 (36.4%), cuts 54 (16.0%), and puncture 41(12.1%) were commonly reported types of injury among respondents. Regarding to causes of injury, machine 91(26.9%), hand tools 59(17.5%), and splinting objects 41(12.1%), were top sources of work-related injuries (Table 3). Most reason given by respondent for the causes of injury were improper hand working instruments 35.7%, absence of machine safe guards 28%, absence of PPE 22.0%, and misuses of PPE 6.3%, respectively.

With regarding to the specific day of injury, about 78 (23.1%) of them reported to has been injured on Monday followed by incidents on 72(21.3 %) Tuesday, 43(12.7%) Wednesday, 44(13.0 %) Thursday, 46(13.0%) Friday, 20 (5.9%) Saturday, 24 (7.1%) Sunday and 11(3.3%) of the respondents did not remember actual days of injury. It was also indicated that 134 (39.6%) were injured in the morning working time whereas 124 (36.4%) were injured in the afternoon, and 60 (17.5%) were injured in evening/mid-night working time, but 21(6.2%) respondents did not remember the actual time of injuries (Table 4).

Table 2: distribution of work-related injuries in the last 12 months among respondents in small and medium scale industries in Sebata town, May to June, 2019(n=935)

Variables		Frequency	Percentage (%)
Work related injury in the last12 months		338	36.1
Injury in the last two weeks		47	5.0
Number of occurrence(n=388)	Once	268	79.3
	More than once	70	20.7
Hospitalization(n=338)	Yes	77	27.9
	No	261	77.1
Length of hospitalization (n=77)	Less than 24 hours	25	32.4
	More than 24 hours	52	67.5
Permanently disability condition		18	5.0

Table 3 Distribution of work-related injuries in last 12 months by injured parts of the body, types and causes of injury among 338 injured respondents, Sebata Town, May-July, 2019.

Characteristics	Categories	Frequency(n)	Percentage (%)
Body parts affected	Finger	101	26.8
	Hand	83	22.0
	Leg	42	11.1
	Eye	16	4.2
	Toe	15	4.0
	Back	19	5.0
	Lower leg	13	3.4
	Head	9	2.4
	Ear	9	2.4
	Tooth	9	2.4
	Upper arm	13	3.4
	Lower arm	16	4.2
	Others	32	8.5
	Total	377	100%
Types of injuries	Abrasion	128	36.4
	Cuts	59	16.0
	Puncture	46	12.1
	Back injury	34	8.6
	Fracture	43	11.2
	Eye injury	43	11.2
	Amputation	18	4.4
	Total	373	
Causes of injury	Machine	91	26.9
	Hand tool	59	17.5
	Splinting objects	41	12.1
	Hit by fallen objects from height	35	10.4
	Lifting heavy objects	30	8.9
	Acid and hot substance	29	8.6
	Fire and Explosion	26	7.7
	Electricity	14	4.1
	Others	13	3.8
	Total	338	100

Table 4: Distribution of work-related injuries by reported day of week and time among small and medium industries in Sebata Town, May-July, 2019

Variables	Frequency (N)	Percent- age%
Days of the week		
Monday	78	23.1
Tuesday	72	21.3
Wednesday	43	12.7
Thursday	44	13.0
Friday	46	13.6
Saturday	20	5.9
Sunday	24	7.1
I don't remember	11	3.3
Total	338	100.0
Time of injury		
In the morning	139	39.6
In the after noon	128	36.4
In the evening/ mid-night	65	17.5
I don't remember	26	6.2
Total	358	100.0

5.2 Work environment and behavioral characteristics of respondents by types of industry.

This study indicated that 481 (51.5%) of workers reported that they worked more than 48 hours per week. Majority 643 (68.8%) workers reported that they hadn't got occupational health and safety training. This study also indicated that 422 (45.2%) of respondents had sleeping problems. The study showed that 724 (77.4%) of workers were not chewing chat. This study revealed that 284 (30.3%) of workers reported that they were not satisfied with their current job (Table).

Regarding use of personal protective device 458(48.9%) of workers were not never used any types of PPEs at workplaces. the mostly PPE used by respondents were hand gloves (65.9%), Gowen (64.2%), Goggles (40%), respirator (25%), face shield (9.7%), ear plug (6.8%) and boots (5.7%) ((Table7). Reasons given by respondents for not using PPE at work were majorly lack of PPE (90.8%), reduce work performance (4%), inconvenience (create health hazard) (3%) and lack of awareness (2%).

Table 5 Work environment and behavioral characteristics of respondents, Sebeta Town, May-July, 2019

Variables	Categories	Number (n=935)	Percentages (%)
Scale of industry	SSI	313	33.5
	MSI	622	66.5
	Metal work	119	12.8
	wood work	153	16.3
Industry by their production types	Food process	517	53.3
	Plastic work	106	11.3
	Textile work	40	4.3
Hours worked per week	≤48	454	48.5
	48+	481	51.4
Health and safety training	Yes	292	31.2
	No	643	68.7
Sleeping disorder	Yes	513	54.8
	No	422	45.2
Job satisfaction	Yes	651	69.7
	No	284	30.3
Chew chat	Yes	213	22.7
	No	724	77.4
Use of PPE	Yes	477	51.0
	No	458	48.9

Notes=Small scale industries, MSI=Medium scale industries

Table 6: Distribution of using PPEs types among used respondents of small and medium industries in Sebeta Town, May-July, 2019

Type of PPE used	Responses	Frequency(N=477)	Percentage (%)
Glove	Yes	314	65.9
	No	163	34.1
Ear plug	Yes	32	6.8
	No	445	93.2
Respirator	Yes	119	25
	No	358	75.0
Helmet	Yes	0	0
	No	477	100
Gowon	Yes	306	64.2
	No	171	35.8
Goggles	Yes	191	40
	No	286	60
Face shield	Yes	46	9.7
	No	431	90.3
Boots	Yes	27	5.7
	No	450	94.3

5.3 Work environment observation

Workplace observation made on 140 industries were revealed that most of working environments both in small and medium scale industries were highly exposed to unsafe building, old and unguarded machineries, poor ventilation, excessive heat, noise dust, exposed electric wires, and other chemicals hazards, absence of warning signs, and health and safety instructions. There was no safety division and personal that helps in promoting health and safety condition at workplace. Warning signs and safety instruction or procedures did not exist in all visited industries.

Majority of visited industries had not first aid equipment. Regular visits and inspection on health and safety condition of work places were not made at all levels .In addition, programs on prevention, advocacy, awareness creation and capacity building were not undertaken .Based on the observation made most workers did not use personal protective devices at work places, most daily laborers use their own hand tools and wear their own cloths. No meeting was held in last six months with employees to discussed health and safety issues. Moreover, training needs in connection with new employment, equipment, or other changes were not considered accordingly (Table6). These are similar characteristics of work place in developing countries including Ethiopia as different studies revealed(4,5).

Table 7: Occupational health and safety hazards identified in selected industries, Sebeta Town, May-July, 2019

Types of industries	Hazards identified
1. Metal work industries	Excessive noise, unguarded machine, exposed electric wire, sharps, glare and lead
2. Wood work industries	Varnishes, glue, excessive noise, unguarded machine and exposed electric wires
3. Food processing industries	Excessive dust, Excessive noises, unguarded machine and exposed electric wires
4. Plastic and rubber industries	Excessive heat, Excessive noises, unguarded machine and exposed electric wires, highly indoor air pollution

5.4. Bivariate analysis

5.4.1. Socio-demographic factors.

Among assessed socio-demographic determinants of work-related injury analyzed by bivariate analysis, sex, age, marital status and work-experience were identified as major socio demographic factors associated with work related injury in crude analysis (Table 8). However, monthly salary and educational level, did not show statistical significance with work-related injuries.

Table 8. Bivariate analysis of socio-demographic as determinants of work-related injuries, Sebeta Town, May-July, 2019

Variables	Category	Work related injury		Crude OR (95%CI)	P-value
		Yes (%)	No (%)		
Sex	Male	239(41.2)	340(58.7)	1.82(1.37 -2.42) *	0.001
	Female	99(27.8)	257(72.2)	1.00 [®]	
Age group	15-23 years	229(41.2)	326(58.8)	0.53(0.44 -0.63)	0.001
	24-34 years	109(28.6)	271(71.3)	1.00 [®]	
	+35 years	4(11.0)	32(89.0)		
Educational status	primary school	74(39.6)	113(60.4)	1.32(0.80, 2.18)	.275
	Secondary school	66(37.7)	109(62.3)	0.77(0.46,1.30)	.0335
	Diploma & above	198(34.6)	375(65.4)	1.00 [®]	
Marital status	married	145(63.3)	84(36.7)	4.58(3.34 -6.29) *	0.001
	Single	193(27.3)	513(72.7)	1.00 [®]	
Work experience	<5 years	249(43.2)	327(56.8)	2.31(1.72 -3.09) *	0.001
	>5 years	82(24.8)	270(72.2)	1.00 [®]	
Salary	≤1000	74(36.8 %)	127(63.2 %)	0.53(0.14-2.02)	0.354
	1001-2000	233 (37.8 %)	384(62.2 %)	1.49 (0.41-5.47)	0.551
	2001-3000	20(27.0 %)	54(70.0 %)	1.03(0.21-4.97)	0.972
	3000 and above	11(25.6 %)	32(74.4 %)	1.00	

5.4.2. Work-place environmental factors

Among assessed workplace environmental factors of work-related injury, the finding of this study showed that, health and safety training and working hours per week were significantly associated with work-related injuries in crude analysis (Table9). However, Scale of industry, industry production types did not show statistical significance.

Table 9. Crude statistics of working environmental as determinants of work-related injuries in small and medium scale industries in in Sebeta Town, May-July, 2019

Variables	Categories	Work related injury		Crude OR (95%CI)	P-value
		Yes (%)	No (%)		
Hours worked per week	≤48	126(27.7)	328(72.3)	1.00 [®]	0.001
	48+	212(44)	269(56)	2.4(1.89-3.29) *	
Health and safety training	Yes	53(20)	239(80)	1.00 [®]	0.670
	No	285(44.3)	358(55.6)	3.59(2.56-5.02)*	
Scale of industry	SSI	116(37)	197(63)	0.58(0.33-1.10)	0.923
	MSI	222(35.7)	400(64.3)		
Industry production types	Metal work	40(33.6)	79(64.4)		0.335
	wood work	56(36.6)	97(63)	1.04(0.46, 2.38)	
	Food process	187(32)	330(63.8)		
	Plastic & rubber work	43(40.6)	63(59.4)	0.77(0.46,1.30)	
	Textile work	12(30)	28(70)		

Note: *=Significantly associated, ®=reference groups

5.4.3. Behavioral factors

Among selected Human factors, overall job satisfaction, sleeping disorder, chewing chat and use of personal protective devices showed significant association with work related injuries in crude analysis. However, worker used to drink Alcohol, and smoke cigarette did not show statistical significance (Table 10).

Table 10. Bivariate analysis of behaviors as determinants of work-related injuries in small and medium scale industries in in Sebeta Town, May-July, 2019

Variables	Categories	Work related injury		Crude OR (95%CI)	P-value
		Yes (%)	No (%)		
Sleeping disorder	Yes	207(40.3)	306(59.7)	1.50(1.14 -1.97)*	0.011
	No	131(31)	291(69)	1.00 [®]	
Job satisfaction	Yes	83(29.3)	201(70.7)	1.00 [®]	0.012
	No	305(46.8)	346(53.1)	1.76(1.32 -2.34)*	
Chew chat	Yes	99(46.9)	112(53.1)	1.79(1.31- 2.43) *	0.0023
	No	239(33.1)	485(66.9)	1.00 [®]	
Use of PPE	Yes	100(22.8)	337(77.2)	1.00 [®]	
	No	238(52)	220(48)	3.59(2.56-5.02)*	

5.5. Multivariate analysis

From the Multiple logistic regression analysis among the mentioned socio demographic explanatory variables computed in the first steps of analysis, marital status and age of the worker were remained significant in the final step of analysis. Workers who married were showed significantly associated with work-related injury in the last (AOR: 9.15, 95% CI:5.7-14.6) level of analysis, respectively. This study also showed that the age of the worker was significantly associated with work-related injury. Workers who were between 15- 23 years age group were highly injured compared to those 24-34 years age group in the final (AOR:3.26,95%CI:2.12-4.99) level of analysis, respectively.

Although work experience and sex showed significant association with work related in bivariate analysis, their significance disappeared in first step of multivariate analysis. From work environment variable analyzed, safety training and hour worked per week were remained significantly associated with work-related injuries in the final model. Hence, workers who were work without health and safety training were highly injured compared to those who had training in the second (AOR: 6.02, 95% CI: 4.0-9.05) and final model (AOR: 1.85, 95 % CI: 1.20-2.84) model of analysis, respectively.

In this study working hours more than 48 hours also showed significant association with work related in the second AOR: 4.0, 95 % CI: 2.70-5.93) and final model (AOR: 3.70, 95 % CI: 2.47-5.54) model of analysis, respectively.

From the behavioral factors, job satisfaction, sleeping disorder and use of personal protective devices were showed significantly associated with work related injuries in the final step of multivariate analysis. Workers who were not satisfied with their current assigned job were 3.8 time (AOR: 3.82, 95% CI: 2.33-6.25) more likely injured than workers who were satisfied. Similarly, workers who had sleeping disorder and not use of personal protective devices were also significantly associated with work-related injuries (AOR: 5.37, 95% CI: 3.47-8.31), (AOR: 13.1, 95 % CI: 7.9-21.6), respectively (Table11)

Table 11. Multivariate analysis of socio demographic, work environment and behavioral factors of work-related injuries among small and medium scale industries in in Sebeta Town, May-July, 2019

Variables	Responses	COR (95% CI)	AOR (95% CI)	p-value
Age group in year	15-23years	0.53(0.44 -0.63) *	3.26(2.12-4.99)	0.003
	24-34years	1.00®	1.00®	
Marital status	Married	4.58(3.34 -6.29) *	9.1(5.70-14.6)*	0.001
	Un married	1.00®	1.00®	
Hours worked per week	<48 h	1.00®	1.00®	
	48 +h	2.4(1.89-3.29) *	3.7(2.47-5.54)*	0.001
Health & safety training	Yes	1.00®	1.00®	
	No	3.59(2.56-5.02)*	1.85(1.20-2.84)*	0.001
Job satisfaction	Yes	1.00®	1.00®	
	No	1.76(1.32 -2.34)*	3.82(2.33-6.25)*	0.004
Sleeping disorder	Yes	1.50(1.14 -1.97)*	5.3(3.47-8.31)*	0.002
	No	1.00®	1.00®	
Using PPE	Yes	1.00®	1.00®	
	No	3.59(2.56-5.02)*	13.1(7.9-21.6)*	0.001

®: Reference group, *Significance at p<0.05.

6. Discussion

This institution-based cross-sectional study was attempted to assess the prevalence and contributing factors of work-related injuries in the last 12 months among small and medium scale industrial workers in Sebeta Town southwest Ethiopia. This finding revealed that, the overall annual prevalence rates of work-related injury was 361 injuries per 1000 exposed workers per years and the annual prevalence rate of work-related injuries among the small and medium scale industrial workers were 370 and 357 per 1000 exposed worker, respectively. This is consistent with other studies conducted in Ethiopia on prevalence of work-related injuries among small and medium scale industries at Gondar woreda and Bahir dar Town, Northwest Ethiopia, respectively (3,4). study done on occupational injuries in Hawassa Etap soap and detergent factory Ethiopia, and a study done on work-related injury among Saudi Star Agro industry workers in Gambella Region, Ethiopia(1,3,4,6).

On the other way, this finding showed markedly greater than annual prevalence rate of work-related injury reported by other studies. Study done in Mughher cement factory reported rate of 104 injuries per exposed worker per year(10) Textile factory study done in Addis Ababa rate reported rate of 200 injuries per exposed workers in three months recall period(6) and other developing countries like study done in Nigeria(29). Such variation might be emanated from individual and complex interplay of different situation in the working environments like level of training ,use of personal protective devices, and strengths of occupational health services(4,29).

Regarding to severity which was measured by hospitalization or staying on bed and days away from works or absent from work due to injury. This study showed the most sever condition than other findings with 77(22.7%) hospitalization or stayed at bed with 52(67.5%) for 24 or more working hours and 608 working day or 1.8 days per injured workers. Out of these,15(12.5%) and 62(27.9%) of workers were from small and medium scale industrial, respectively .This also correlated with findings of (1,3,4,6).The main types of injuries reported were abrasion 128 (36.4%), cuts 59 (16.0%), puncture 46(12.1%), fracture 43(11.2%) and eye injury 43 (11.2%) in both small and medium scale industries. This is consistent with a studies done in Indian (22), and Ethiopia at North Gondar, Bahir Dar Town and Afar(4,5,25).

This finding also inconsistent with another study conducted in mugger cement factory ,Ethiopia (27). This could be due to the difference in the nature of the work, the type of machineries used in different industries are not similar. In this study most of injuries were caused by machine 91(26.9%), hand tools 59(17.5%), and splinting objects 41(12.1%), and hit by fallen objects from height 35(10.4%) as top sources of work-related injuries. This could be due to unguarded machine parts, defective tools and nonuse of personal protective equipment's by workers. This is in agreement with a studies made in Ethiopia (3,9,12,25,27). This is inconsistent with a study conducted in Afar, Ethiopia (9). This can be explained by the difference in materials they used for work.

In this study the most commonly affected body parts were fingers 101(26.8%), hand 83(22.0%), leg 39(11.5%), back injury 19(5.0%), and eye 16(4.2%) respectively. The possible explanation is due to more involvement in work which has direct exposure to machines and hand tool and non-use of personal protective equipment's (PPE) can be affect more by injuries. This is inconsistent with a studies conducted at Kombolcha textile factory ,mugger cement, and North Gondar(10,25,27). These findings are consistent with studies conducted in Ethiopia: study conducted in Afar on Tendaho Agricultural Development(5).

This study revealed that the largest number of wok related injuries was occurred on Monday, Tuesday and followed by Friday. The most common time of work-related injury was in the morning followed by afternoon. This study consistent with other studies conducted at Gondar and Afar in Ethiopia(3,5). This is inconsistent with a study conducted in mugger cement in Ethiopia (27). The reasons could be absentees that lead to the substitution of other workers in the place of absent workers and was probably due to speeding up production to meet the target before break.

In terms of types of injury, abrasions were usually most commonly types of injury occurred in both industries, overall accounting 123(36.4%). Number of occurrences by type of injury, part of body affected and causes of injury are not found to be statistically different in the both types of industries. Workplace observation made revealed that most of working environments were with unsafe building, old and unguarded machineries, poor ventilation, excessive heat, dust, without safety and warning signs, and absence of health and safety instructions. These are similar characteristics of work place in developing countries including Ethiopia as different studies revealed(4,5).

Studies done regarding sex specific injury rate showed that more injury rates in male than females (2,4,5,12,23,24). However, in this study sex has no significant association which could be mainly due to both males and females' workers were performing the same duty. Most studies revealed that young age workers were more likely sustained work related injury compared with older workers(2,4,5,16,24). This can be explained as due to the fact that inaccessibility to health and safety information, lack of training on health and safety, less work experience, low level of knowledge and skill towards the work among young workers This study also showed that young age between 15-23 years were more likely to be injured compared to those who were 24-34 years and above.

Most studies revealed that increasing educational levels have been associated with decreasing work-related injuries. However, in this study educational status is also not significantly associated with work related injuries when adjusted all variables of interest. This study is consistent with study conducted in mugger cement production factory and Arba Minchi (20,27). This implied that education may not a guarantee for not being injured but safe practice. This study revealed that married workers were more likely experienced work-related injury than unmarried workers. This result also consistent with the study done on industrial workers in Malaysia(21,23). This may due to the fact that, married workers usually have lack of sleep and exhausted at home dealing with house chores. Hence, this led to the lack of concentration in work and therefore, leading to injuries.

This study finding revealed that, workers without health and safety training were more likely to be injured compared to those who were got health and safety training in both crude odds ratio (OR:3.59 ,95% CI:2.56-5.02) and adjusted (OR:1.85,95% CI:1.20-2.84). The result also agree with other studies findings(1,2,5,16,23). Similarly, study participants who were used to work more than 48 hours per week were more likely to be injured compared to those who were engaged for 48 hours and less in both crude odds ratio (OR:2.4 ,95% CI:1.89-3.29) and adjusted (OR:3.7,95% CI:2.47-5.54).

This result is also consistent with other findings(1–3,24). However, In this study Regular workplace supervision, scale of industry, pattern of employment did not showed significance when it is adjusted for all variables .However, this study is not consistent with other findings(12). This study revealed that workers those who were not satisfied with their job were more likely to be injured compared to workers those who were

satisfied with their job in both crude odds ratio (OR:1.76 ,95% CI:1.32-2.34) and adjusted (OR:3.82,95% CI:2.33-6.25).

This finding was similarly observed (3,5,20,24). In this study a worker those who had sleeping disorder were 1.5 times more likely to be injured than those who had not sleeping disorder before adjusting (OR:1.50 ,95% CI:1.14-1.97) and 5.3 times more likely to be injured after adjusting for other behavioral and environmental factors. Most occupational health and safety studies conducted in developing and developed countries strongly agree with this report(2,3,5,21). This could explain that sleeping disorder affect the ability to maintain wakefulness, concentration, ability in assessing or watching the work environment and working condition and performance duties and health status.

In this study, most respondents 477 (51.0%) reported that they use at least one PPEs while working. This finding is less than other study carried out in North Gonder in Ethiopia which has 76% (3). Personal protective equipment (PPE) mostly used by respondents were hand gloves (65.9%), Gowen (64.2%), Goggles (40%), respirator (25%), face shield (9.7%), ear plug (6.8%) and boots (5.7%). This report clearly showed that majority of the respondents used hand gloves and overalls (work close). The figures above indicated that the workers had poor behavior to protect eye, face, and respiratory system, because small number of workers used the PPE which can protect these organs. It is obvious that majority of the workers were exposed to inhalable dust, light and splinting objects during work.

Reasons given by respondents for not using PPE at work were majorly lack of PPE(90.8%), reduce work performance(4%) , inconvenience(create health hazard) (3%) and lack of awareness(2%).This finding were also comparable with other study conducted in Addis Ababa iron and steel industry in which lack of provision of PPE by the organizations was the major reason for not using it(12). Even though most of the workers use at least one PPE during work, they indicated that Poor adherence to PPE use were common among the workers. This finding revealed that no use of personal protective equipment was significantly associated with work related injury when it is adjusted for all variables. This correlates with other studies(4–6). Some finding showed that drinking alcohol (5,12,24) smoking cigarette(12) and chewing chat(3), are significantly associated with work related injuries rate .

7. Strength and Limitations of the study

7.1. Strength of the study

- The study was the base line for this study area because there was no study conducted at SSI & medium scale level in the area.
- The data was primary which collected through face to face interview

7.2 Limitation of the study

- The nature of study design might affect the clear causal relationship of associated factories and occurrence of injuries
- Social desirability might affect the information
- The study could be subjected to recall bias because the study was the 12 months occurrence of injuries.

8. Conclusion and recommendations

The study concludes that there were high work-related injuries in both small and medium scale industries in Sebeta Town when compared to some studies in developing countries. The most frequently injured body parts were fingers and hands. The study has identified that Younger age between 15-28 years, working more than 48 hours per week, had sleeping disorder, job dissatisfaction, married, workers who didn't use PPEs were more likely to experiencing occupational injury than their counter parts.

Based on the study findings, we recommend promoting occupational safety and health through appropriate prevention programs and provision of comprehensive occupational health and safety services with the provisions of personal protective devices and follow up of their appropriate utilization, ensuring regular workplace inspections with feedbacks mechanism, and focused interventions for young, less experienced, workers who work for extended hours (>48 hours per week) and married works. Besides, reviewing the enforcement of regulations of safety standards and laws governing work practices, training on occupational health and safety to all categories of workers and integrating injury prevention by mainstreaming occupational health and Safety procedures in small and medium scale industries were highly advised.

Annex -1: References

1. Chercos DH, Berhanu D. Work related injury among Saudi Star Agro Industry workers in Gambella region, Ethiopia; a cross-sectional study. *J Occup Med Toxicol.* 2017;12(1):1–8.
2. Aderaw Z, Engdaw D, Tadesse T. Determinants of occupational injury: A case control study among textile factory workers in Amhara regional state, Ethiopia. *J Trop Med.* 2011;2011(377).
3. Takele T, Abera K. Prevalence and factors affecting work-related injury among workers engaged in Small and Medium-Scale Industries in Gondar wereda , north Gondar zone , Amhara Regional State , Ethiopia. *Ethiop J Heal Dev.* 2007;21(1):25–34.
4. Molla GA, Salgado 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.* 2015;27(1):1–6.
5. YIHA O. Assessment of occupational injuries in Tendaho Agricultural Development s.c, Afar Regional State. 2011;(march).
6. Negera DG. Prevalence and associated factors with work related injuries among workers in Etab soap and detergent factory Hawassa, Ethiopia. *MOJ Public Heal [Internet].* 2018;7(4):180–7. Available from: <https://medcraveonline.com/MOJPH/MOJPH-07-00225.php>
7. Kumie A, Amera T, Berhane K, Samet J, Hundal N, Michael FG. Occupational Health and Safety in Ethiopia : A review of Situational Analysis and Needs Assessment. 1981;
8. Small F, Manufacturing M, Development I. FEDERAL NEGARIT GAZETTE It ., " U. 2013;80.
9. Ababa A. Occupational hazards in construction industry : case studies from housing and construction workers at. 2016;4(9):84–96.
10. Gebretsadik M, Kumie A, Gebremichael G. Magnitude of occupational injury and associated factors among factory workers in Ethiopia : The case of Mughher Cement Factory. 2017;9(December):318–31.
11. Lucchini RG, London L. Global Occupational Health : Current Challenges and the Need for Urgent Action. *Ann Glob Heal [Internet].* 80(4):251–6.

12. Habtu Y, Kumie A, Tefera W. Magnitude and Factors of Occupational Injury among Workers in Large Scale Metal Manufacturing Industries in Ethiopia. OALib [Internet]. 2014;01(08):1–10.
13. Jilcha K, Kitaw D. A Literature review on global occupational safety and health practice & accidents severity. *int j qual res.* 2016;10(2):279–310.
14. Butt MS. Effects of physical environment factors on worker’s health in micro and small sized industries of Pakistan. 2012;38.
15. Mereta ST. Prevalence of occupational injuries and associated factors among construction workers in Addis Ababa , Ethiopia. 2017;(June).
16. Dejen Yemane AB. Magnitude of Occupational Injuries and Associated Factors among Small- Scale Industry Workers in Mekelle City, Northern Ethiopia. *Occup Med Heal Aff [Internet].* 2015;03(03).
17. Ca G, Ao O, Olumiji A. Prevalence , Pattern and Impact of Work-related Musculoskeletal Disorders on Functional Performance of Welders in a Nigeria Rural-Urban Center. 2012;1(2):87–94.
18. Jazari MD, Jahangiri M, Khaleghi H, Abbasi N. Original article : Prevalence of self-reported work-related illness and injuries among building construction workers ,. 2018;724–33.
19. Zone BM, Meleko A, Alemayehu B, Henok A. Original article Work Related Injuries and Associated Factors among Small Scale Industry Workers of Mizan-Aman Town ,. (7).
20. Industries S, Minch A, At T, Tessema F, Gk J. Public Health & Safety Prevalence of Occupational Injuries and Associated Factors among Small-. 2018;3(2).
21. Article O. Determinants of Occupational Injury in Kombolcha Textile Factory, North-East Ethiopia. 2014;5:84–93.
22. Sashidharan C, P MK, Gopalakrishnan S. Prevalence and determinants of external injuries among industrial workers in an urban area of Kancheepuram district , Tamil Nadu. 2017;4(12):4722–7.
23. Obi AN, Azuhairi A., Huda B. Factors associated with work related injuries among workers of an industry in malaysia. *Int J Public Heal Clin Sci.* 2017;4(2):97–108.
24. Cui Y, Tian SS, Qiao N, Wang C, Wang T, Huang JJ, et al. Associations of Individual-

- Related and Job-Related Risk Factors with Nonfatal Occupational Injury in the Coal Workers of Shanxi Province: 2015;10(7):1–13.
25. Tadesse T. Assessment of Prevalence of Work Related Injuries Among Small and Medium Scale Industrial Workers in North Gondar Zone , Amahara Regional State. 2005;1–87.
26. BLS. Survey of Occupational Injuries & Illnesses. 2017;21. Available from: <https://www.bls.gov/iif/osch0060.pdf>
27. Eguvbe A, Centre FM. Occupational Health Hazards in Small and Medium-scale Manufacturing Industries in Anambra State , South East , Nigeria. 2018;(January 2017).

Annex- 2: Information sheet and consent form

Dear sir/madam:

Good morning/ afternoon/ evening. Thank you for talking with me. My name is _____. I am here on the behalf of Fekadu Bekele who is student MPH in general specialist at Jimma University, Institute of Health Science, and Department of Epidemiology. I would like to ask you participate in a study on to assess Prevalence of work-related injuries among small and medium scale industrial workers in Sebeta town,2019 , This factory is selected as one of the research study unit and you are randomly selected as a study participant for this study among all like group members. Therefore, it is my privilege to get informed consent to ask you on few questions about an incident at job that resulted in injuries to you in the previous 12 months. This will help us to improve occupational safety, health and working environment services provided to you based on your answer to our questions.

The interview takes an average of an hours to complete. Whatever information you provide was kept strictly confidential and will not be shown to other persons. Your name will not be written on this form, and will never be used in connection with any of the information you tell to us. Participation in this survey is voluntary and you can choose not to answer any individual question or all of the questions. However, we hope that you will participate fully in this survey since your views are important. Are you willing to participate in the study?

1. I f yes may I begin the interview now? YES –Continue
2. If no, skip to the next participant by writing reasons for his/ her refusal

Annex -3: English version questionnaire

NO	Question	Possible Response	Skipping
Part I Socio-demographic characteristics			
101	Sex	1. Male 2. Female	
102	Age	----- years	
103	Religion	1.orthodox 3. Protestant 2.Muslim 99.other, specify	
104	Ethnicity	1.Oromo 2. Amhara 3.Gurage 4. Tigrie 99. other, specify	
105	Education	Grade completed_____	
106	Marital status	1.Married 2. Sigle 3.Divorced 4. widowed	
107	Pattern of employment	1.permanent 2. Temporary	
108	Total service year in this enterprise	-----month/year	
109	Monthly salary	-----birr	
Part II occupation injury characteristics			
201	Have you had an incident at job that resulted in an injury in the last 12 months?	1.yes 2. No	If no, skip To Q 301
203	If yes to Q 201 how many times?	1.One times 2. More than two times	

204	Parts of the body affected	1.Eyes	1. Yes	2. No	
		2.Upper arm	1. Yes	2. No	
		3. lower arm	1. Yes	2. No	
		4.Finger	1. Yes	2. No	
		5.head	1. Yes	2. No	
		6.Upper leg	1. Yes	2. No	
		7.lower leg	1. Yes	2. No	
		8.Tooth	1. Yes	2. No	
		9.Anterior trunk	1. Yes	2. No	
		10.Neck	1. Yes	2. No	
		11.Back	1. Yes	2. No	
		12.Knee	1. Yes	2. No	
		13.Toes	1. Yes	2. No	
		14.Face	1. Yes	2. No	
		15.multiple	1. Yes	2. No	
		99.other, specify	1. Yes	2. No	
205	Types of injury	1.laceration	1. Yes	2. No	
		2.Fracture	1.yes	2. No	
		3.Amputation	1.yes	2. No	
		4.Crushing	1.yes	2. No	
		5.Eye injury	1.yes	2. No	
		6. Heat strain	1.yes	2. No	
		7.Burn	1.yes	2. No	
		8.Ear injury	1.yes	2. No	
		9.Electrocutions	1.yes	2. No	
		10.Back pain	1.yes	2. No	
		11.poisoning	1.yes	2. No	
		12.Cuts	1.yes	2. No	

		13. Dislocation	1.yes	2. No	
		14. Puncture	1.yes	2. No	
		15. Suffocation	1.yes	2. No	
		16. Snake bite	1.yes	2. No	
		99. other, specify	-----	-----	
206	What were you doing at the time of injury?	-----			
207	Causes of injury	1. Struck by/against an object	1.yes	2. No	
			1.yes	2. No	
		2. Machinery	1.yes	2. No	
		3. Hit by falling objects	1.yes	2. No	
		4. Falling accident	1.yes	2. No	
		5. Hand tools	1.yes	2. No	
		6. Pesticides	1.yes	2. No	
		7. Fire	1.yes	2. No	
		8. Lifting heavy Objects	1.yes	2. No	
		9. Electricity	1.yes	2. No	
		10. Splinting objects	1.yes	2. No	
		11. Snake bite	1.yes	2. No	
		99. other, specify		---- ---	
208	What was the reason given? By the respondent for the Causes of injury?	1. Absence of protective Devices	1.yes	2. No	
		2. Misuse of protective Device	1.yes	2. No	
		3. Disorder of normal Operation	1.yes	2. No	
		4. Absence of safety Education	1.yes	2. No	
		5. Improper hand	1.yes	2. No	

		Working instruments 6.Absence/inadequate 1.yes 2. No Machine safe guards 99.other, specify 1.yes 2. No	
209	Day of injury	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 12.Do not remember -----	
210	Time of injury	1.In the morning 1.yes 2. No 2.In the afternoon 1.yes 2. No 3.In the evening 1.yes 2. No 4.In the mid-night 1.yes 2. No 22.Do not remember ----r	
211	Were hospitalized as a result of injury in the last 12 months?	1.yes 2. No	
212	If yes to Q211 for how long?	-----days	
213	Number of working days lost due to injury at work for the last one year	-----days	
Part III. Working Environment Information			

301	Hours worked per week	-----hr.	
302	Do work places supervised regularly?	1.yes 2. No	
303	Have you had any occupational safety? Training/education	1.yes 2. No	
304	How long since your last training/education?	-----days/month/years	
Part IV worker's Behavior Information			
401	Do you drink alcohol?	1.yes 2. No	If no, skip to Q403
402	If yes to Q401, how often?	1. Every day 2. 1-3 days/week 3.Occasionally	
403	Do you chew chat?	1.yes 2. No	If no, skip To Q405
404	If yes to Q403, how often?	1. Every day 2. 1-3 days/week 3.Occasionally	
405	Do you smoke cigarette?	1.yes 2. No	If no, skip toQ407
406	If yes to Q405, how often?	1.Every day 2.1-3days/week 3.Occasionally	
407	Do you have sleeping Disorders?	1.yes 2. No	If no, skip Toq409

408	What is the reason for? This sleeping	1.working more than 8hrs/day in the Enterprise 2.Engage in additional duties outside the enterprise 3.Every/Mid-night working time 4.work burden 99.others, specify	
409	Are you satisfied with your current assigned job?	1.yes 2. No	
410	What is the reason for? You not satisfied with your assigned current job	1.Low payment & absence of other benefit 2.Absence of training & career promotion 3.the safety issue of working environments 4.lack of supervisor/managerial support 5. lack of coworker support 99.Other, Specify	
411	Day you use personal protective	1. Yes 2. No	If no, skip To Q412
412	If yes to Q410, what types?	1.Gloves 1.yes 2. No 2.Respirators 1.yes 2. No 3.Goggles 1.yes 2. No 4.Boots 1.yes 2. No 5.Ear plug 1.yes 2. No 7.Helmet 1.yes 2. No 99.other, specify ----- -----	
413	What is your reason for not using personal protective?	1.Absence of protective devices 2.Not comfortable to use 3.Absence of safety & health education 4.It decrease work performance 5.Create health & safety hazards 99.Other, Specify	

Annex -4: Afaan Oromo version questionnaire

Jimmaa universiitii Institute of Health Public health faculty, Department of Epidemiology Institutii Fayyaa, fakaaltii fayyaa Hawaasaa, Muummee Epidemiology Maqaa Warshaa _____ Sad.warshichaa(1. warshaa xiqqaa 2. warshaa G/Galeessaa) Respondent identification number _____ Ganda warshich keessatti argamu _____			
Kutaa 1: Odeeffannoo hawaasa diinagdeen walqabatee jiru			
Koodii	Gaaffannoo	Deebii gaffannoo	Gara gaaffannoo itti aanuutti darbi
101	Saala	1.Dhiira 2. Dhalaa	
102	Umuriin kee meeqa?	_____ waggaa	
103	Amantaa kee maali?	1. Ortodoksii. 2. Pirooteestaanti 3. Musiliima. 4. Kan biro.	
104	Sabni kee maalii	1. Oromoo 2. Amharaa 3. Tigiree 4. Kan biroo, specify	
105	Sadarkaa barnootaa kee maal?	_____	
106	Haala fuudhaa fi Heerumaa:	1. Kan hin heerumte/hinfuune 2. Kan fuudhe/heerumte 3. Kan hiikte ykn hiike	
107	Haala Qaccarrii maali?	Dhaabbii 2. Kontiraataa	

108	Warshaa kana keessa waggaa meeqa tajaajilte	_____ji'a/wagga	
109	Miindaa ji'aa	_____ Birrii	
kuta 2ffaa: gaaffannoo amaloota miidhaa qaamaa hojjetoota warshaa sabababa hojii isaaniin irra gahe ibsu.			
201	Miidhaan qaamaa sababa iddoo hojii keettiin walqabatuun ji'oota 12 darban kana keessatti sirra gahe jiraa?	1.Eeyyee 2.Lakki	Yoo deebiin kee lakkii ta'e gara gaaffii 301 tti arbi
202	Yoo deebiin kee gaaffii 201 eeyyee ta'e, yeroo meeqa miidhaan sirra gahe?	1. Yeroo tokko 2. Yeroo tokkoo ol	
203	Miidhaan qaamaa sababa iddoo hojii keettiin walqabatuun torbee laman darban kana keessatti sirra gahe jiraa?	1.Eeyyee 2.Lakki	
203	Yoo deebiin kee gaaffii 203 eeyyee ta'e, yeroo meeqa miidhaan sirra gahe?	1. Yeroo tokko 2. Yeroo tokkoo ol	
204	Gosa qaama kee isa kamtu miidhaan irra gahee?	1. Ija _____ 2.harka gara olii _____ 3.harka gara gadi _____ 4.quba harkaa _____ 5.mataa _____ 6.luka jilbaa olii _____	

		<p>7.luka jilbaa gadi _____</p> <p>8.Ilkaana _____</p> <p>9.Handhuura irra _____</p> <p>10.morma _____</p> <p>11.qama gara duba _____</p> <p>12.jilba _____</p> <p>13.Quba miilaa _____</p> <p>14.Fuula irra _____</p> <p>15.bakka baayyee _____</p> <p>16.iddoo bira _____</p>	
205	Gosa miidhaa qaamaa sirra gahe maaliidha	<p>1. Qunca'uugoga 1. Eeyyee 2. Lakki</p> <p>2. Cabinsa 1. Eeyyee 2. Lakki</p> <p>3. Qaama hir'isu 1. Eeyyee 2. Lakki</p> <p>4. Meeshaa waliin waitti bu'u</p> <p> 1.Eeyyee 2. Lakki</p> <p>5. Miidhaa ijaa 1. Eeyyee 2. Lakki</p> <p>6. Heat strain 1. Eeyyee 2. Lakki</p> <p>Gubachuu qaamaa 1. Eeyyee 2. Lakki</p> <p>8.Miidhaa Gurra 1. Eeyyee 2. Lakki</p> <p>9.Elektriin qabamu 1. Eeyyee 2. Lakki</p> <p>10.Qama garaduuba 1. Eeyyee 2. Lakki</p> <p>11.Summiin falamuu 1. Eeyyee 2. Lakki</p> <p>12.Qaama kutu 1. Eeyyee 2. Lakki</p> <p>13.Meelachu 1. Eeyyee 2. Lakki</p> <p>14. Waranamuu 1. Eeyyee 2. Lakki</p> <p>15. Affanamuu 1. Eeyyee 2. Lakki</p> <p>16.kan biroo, haa ibsamu _____</p>	

207	Miidhaan sab-aba ykn maalliin sirra gahe?	<p>1. meeshaa waliin walitti bu'uun 1. Eeyyee 2. Lakki</p> <p>2. maashiniin 1. Eeyyee 2. Lakki</p> <p>3. meeshaan kuufuun 1. Eeyyee 2. Lakki</p> <p>4. kufuun 1. Eeyyee 2. Lakki</p> <p>5. meeshaa harkaa 1. Eeyyee 2. Lakki</p> <p>6. Pestiisaayidiin 1. Eeyyee 2. Lakki</p> <p>7. Abiddaan 1. Eeyyee 2. Lakki</p> <p>8. waan ulfaata</p> <p>yeroo alkasu 1. Eeyyee 2. Lakki</p> <p>9. Elektirikiin 1. Eeyyee 2. Lakki</p> <p>11. kan biroo _ ____</p>	
208	Maaltu akkdhiibbaan kun sirra gahu godhe?	<p>1. PPE dhabamu 1. Eeyyee 2. Lakki</p> <p>2. PPE sirnaan fayyadame dhabu 1. Eeyyee 2. Lakki</p> <p>3. Haali hojii qinda'a ta'u dhibu 1. Eeyyee 2. Lakki</p> <p>4. Barumsa fayyaa Dhibuu 1. Eeyyee 2. Lakki</p> <p>5. Improper hand machine safe guards 1. Eeyyee 2. Lakki</p> <p>7. Other, specify</p>	
209	Gaafa guyyaa kami miidhaan sirra gahee?	<p>. Wiixata 1. Eeyyee 2. Lakki</p> <p>2. Kibxata 1. Eeyyee 2. Lakki</p> <p>3. Roobii 1. Eeyyee 2. Lakki</p> <p>4. Kamisa 1. Eeyyee 2. Lakki</p> <p>5. Jimaata 1. Eeyyee 2. Lakki</p> <p>6. Qidaamee 1. Eeyyee 2. Lakki</p> <p>7. Sambata 1. Eeyyee 2. Lakki</p>	

210	Sa'aatii mi-idhaan simuudate yeroo akka-miitii?	1.Waaree duraa 1. Eeyyee 2. Lakki 2.Waaree booda 1. Eeyyee 2. Lakki 3.Galgala sa'a jaha duraa 1. Eeyyee 2. Lakki 4. Halkan sa'a jaha booda 1. Eeyyee 2. Lakki 5.Yeroo isaa hin haadadhu	
211	Sababa mi-idhaa sirra gaheen hospitaala galtee ciistee yaalamteetaa?	1.Eeyyee 2. Lakki	
212	Yoo deebiin gaffannoo lakk.208 eeyyee ta'e yeroo hama-miif hospital ciistee turtee?	1. Sa'aatii 24 fi isaa gadiif. 2. Sa'aatii 24 oliif. .	
213	Saba miidhaa sir gaheetiin guyyaa meeqaaf hojii irraa hafte?	Guyyaa _____ Guyyaa/ji'a	
Kutaa 3ffaa: Odeeffannoo waliigala hojetaa fi naannoo mana hojii warshaa keessaa jiru ykn fakatu			
301	Torbanitti sa'aa meeqa hojetaa	_____ sa'aa	
302	Haalli hojii keessaniin irratti To'annoo fi hordoffiin yeroo Yeroon ni gaggeeffama?	1.Eeyyee 2. Lakki	
303	Leenjii ykn barumsi nageenya iddoo hojii keetiin walqabatuun g yeroo jalqabaa qacaramtu ykn iddoo hojii kee duraa jijjirame ykn Meeshaan haaraan dhufe siif kennamee jiraa?	1. Eeyyee 2. Lakki	
kutaa 4ffaa: Odeeffannoo amalaan walqabatan			

401	Dhugaatii Alkoolii ni dhugdaa?	1. Eeyyee 2. Lakki	Yoo deebiin kee lakkii ta'e gara gaaffii 403 darbi
402	Yoo deebiin gaaffii lakk. 401 kee eeyyee ta'e guyyaa meeqa tti dhugdaa?	1.Guyyaa hunda 2.Torbanitti guyyaa 1-3 3.Darbee darbe	
403	Caatii ykn Jimaa ni qamaataa?	Eeyyee Lakki	Yoo deebiin kee lakkii ta'e gara gaaffii 405 darbi
404	Yoo deebiin gaaffii lakk. 403 kee eeyyee ta'e guyyaa meeqa tti qaamaata?	1.Guyyaa hunda 2.Torbanitti guyyaa 1-3 3.Darbee darbe	
405	Dhugaatii Alkoolii ni dhugdaa?	1. Eeyyee 2. Lakki	Yoo deebiin kee lakkii ta'e gara gaaffii 403 darbi
406	Rakkoo jeequmsa sa'aa hirribaa ni qabdaa?	1. Eeyyee 2. Lakki	Yoo deebiin kee lakkii ta'e gara gaaffii 408 darbi
407	Yoo deebiin gaaffii lakk. 406 kee eeyyee ta'e maaliif Rakkoo kun simuudate?	Guyyaa tti waan sa'aa 8ti ol dalagduufi Hojii warshaan ala hojii dabalataa waan baay'atuuf Halkan sa'aa irribaati waan warshaa keessa dalagduufi Waan iddoon hojii koo humnaa ol ho'uuf Kan biro	
408	Hojii kee amma hojichaa jirtu kanatti gamadeettaa	1. Eeyyee 2. Lakki	
409	Meeshaalee miidhaa ykn balaa nama irraa ittisanni fayyadamtaa?	1. Eeyyee 2. Lakki	

410	Yoo deebiin gaaffii 409 kee Eeyyee ta'e, Gosa kam fayyadamta?	<p>1. Gilaavii harkaatii 1. Eeyyee 2. Lakki</p> <p>2. waanfunyaa fi afaanitti ka'atamu 1. Eeyyee 2. Lakki</p> <p>3. Manatsarii ijaa 1. Eeyyee 2. Lakki</p> <p>4. Waan fuulatti ka'atamu 1. Eeyyee 2. Lakki</p> <p>5. Caammaa bottii 1. Eeyyee 2. Lakki</p> <p>6. Waan gurratti ka'atamu 1. Eeyyee 2. Lakki</p> <p>7. Waan mataati ka'atamu 1. Eeyyee 2. Lakki</p> <p>8.. Other, specify</p>	
411	Sababa maaliif Meeshaalee balaa namarraa ittisan hin fayyadamne?	<p>1. Sababa hin jirreef.</p> <p>2. Sababa barumsii ofeeggannoo iddoo hojii fi tooftaa ittisa bala ittisuu irratti hin arganneef</p> <p>3. Sababa hin mijanneef</p> <p>4. Yoo fayyadame raawwii hojii koo gadi buusuuf</p> <p>5. Kan biro yoo ta'e haa ibsamu_____</p>	

Amharic version questionnaire

ክፍል አንድ፡ ጥያቄዎችና ማጣሪያዎች

ተ. ቁ	ጥያቄዎችና ማጣሪያዎች	አማራጭ መልሶች	ይሻገሩ
ቁ101	ጾታ	1. ወንድ 2. ሴት	
ቁ102	እድሜ በአመት	_____	
ቁ103	ሀይማኖት	1. ኦርቶዶክስ 2. ሙስሊም 3. ፕሮቴስታንት 4. ሙስሊም 5. ሌላ ካለ ይጠቀስ	
104	ብሄር	1. አሮሞ 2. አማራ 3. ጉራጌ 4. ትግሬ ሌላ/ይጠቀስ.....	
ቁ104	የትምህርት ደረጃ	_____	
ቁ105	የጋብቻ ሁኔታ	1. ያገባች 2. ያላገባች 3. የፈታች 4. የሞተበት/ባት 5. ተለያይተው የሚኖሩ አግብቶ/ታ	
ቁ106	የቅጥር ሁኔታ	1. ቋሚ 2. ጊዜያዊ	
ቁ107	የሙያው አይነት	_____	
ቁ108	በሥራ ቦታዎ ስንት አመት አገለገሉ?	_____	
ቁ109	የወር ደመወዝ	_____	

ክፍል ሁለት፡ የሥራ ቦታ ጉዳትን በተመለከተ

ቁ2 01	ባለፉት አስራ ሁለት ወራት ውስጥ ከሥራ ጋር በተያያዘ የደረሰብዎት ጉዳት አለ?	1. አዎን 2. የለም	
ቁ2 02	ለ201 መልስዎ አዎን ከሆነ ስንት ጊዜ?	1. አንድ ጊዜ ብቻ 2. ከአንድ ጊዜ በላይ	
ቁ2 03	ባለፉት ሁለት ሳምንታት ውስጥ ከሥራ ጋር በተያያዘ የደረሰብዎት ጉዳት አለ?	1. አዎን 2. የለም	301 ይሻ ገሩ

ቁ2 04	ለ203 መልስዎአዎንከሆነስንትረዜ?	1. አንድጊዜብቻ 2. ከአንድጊዜበላይ	
ቁ2 05	በጉዳቱየተጎዳውየሰውነትክፍል		
	አይን	1. አዎን2. የለም	
	ጥርስ	1. አዎን2. የለም	
	እጅ	1. አዎን2. የለም	
	ጆሮ	1. አዎን2. የለም	
	ጉልበት	1. አዎን2. የለም	
	የእግርጣት	1. አዎን2. የለም	
	እጅጣት	1. አዎን2. የለም	
	ራስ	1. አዎን2. የለም	
	የላይኛውክንድ	1. አዎን2. የለም	
	የታችኛውክንድ	1. አዎን2. የለም	
	ጭን	1. አዎን2. የለም	
	ከጉልበትበታችያለው	1. አዎን2. የለም	
	እግር	1. አዎን2. የለም	
	ጆረባ	1. አዎን2. የለም	
ደረት	1. አዎን2. የለም		
በተለያዩየሰውነትክፍሎች	1. አዎን2. የለም		
ሌላካለይጠቀስ -----	_____		
ቁ2 06	የጉዳቱአይነት		
	ጭረት	1. አዎን 2. የለም	
	መቆረጥ	1. አዎን 2. የለም	
	ቃጠሎ	1. አዎን 2. የለም	
	መወጋት	1. አዎን 2. የለም	

	ስብራት	1. አዎን 2. የለም	
	ወለምታ	1. አዎን 2. የለም	
	አይንላይዩደረሰጉዳት	1. አዎን 2. የለም	
	ጆሮላይዩደረሰጉዳት	1. አዎን 2. የለም	
	መታፈን	1. አዎን 2. የለም	
	በኤሌክትሪክመያዝ	1. አዎን 2. የለም	
	የአካልመገደል	1. አዎን 2. የለም	
	መመረዝ	1. አዎን 2. የለም	
	ሌላካላይጠቀስ -----	_____	
ቁ2 07	አደጋዩደረሰበዎትበምንምክንያትነውብለውያስባለ?	1) ለሥራውአዳስበመሆኑ 2) ስለግሌሕይወትእያሰቡስ ለነበረ 3) በላላየጤናችግርምክንያት 4) አደጋንመከላከሌስለማይቻል 5) የሥራውባሕሪስለሆነ 6) የጉዳትመከላከያመሣሪያ ስላልተጠቀሙ 7) የጉዳትንምክንያትአላስታ ውስም 8) ሌላምክንያትካላይጠቀስ	
	የጉዳትምክንያት		

ቁ2 08	ማሸኖች	1. አዎን2. የለም	
	በሚወድቁእቃዎች	1. አዎን2. የለም	
	በመመታት	1. አዎን2. የለም	
	ኤሌክትሪክ	1. አዎን2. የለም	
	በተፈናጣሪነገሮች	1. አዎን2. የለም	
	የእጅመሣሪዎች	1. አዎን2. የለም	
	እሳት	1. አዎን2. የለም	
	ትኩስነገሮች	1. አዎን2. የለም	
	መውደቅ	1. አዎን2. የለም	
	ግጭት	1. አዎን2. የለም	
	ከባድእቃዎችንበማንሳት	1. አዎን2. የለም	
	ሌላካለይጠቀስ	1. አዎን2. የለም	
ቁ2 09	በደረሰብዎትጉዳትምክንያትበጤናተቋምተኝተውያውቃሉ?	1. አዎን2. የለም	
ቁ2 10	ለ209 መልስዎአዎንከሆነለስንትሰዓት	1. 24 ሰዓትናከዚያበታች 2. ከ24 ሰዓትበላይ	
ቁ2 12	ከሥራጋርበተያያዘጉዳቶችምክንያትባለፉትአስራሁለትወራትከሥራዎቻችንምቀርብንትቀርብንትነው?	_____	

ክፍልሦስት፡የስራቦታንበተመለከተ

ቁ301	በሰዎችምንያህልሰዓትይሰራሉ?	_____	
ቁ302	በሥራ ቦታዎ ላይ የጤና እና የደህንነት ቁጥጥርና ክትትል ሳይቋረጥ እየተደረገ ነው?	1. አዎን2. የለም	
ቁ303	ከሥራዎትጋርበተገናኘንበጤንነትእናደህንነትተረጋግጠናወስደውያውቃሉ?	1. አዎን2. የለም	
ቁ304	በተራቁጥር 304 መልስዎአዎንከሆነበየስንትሰዓት?	1) በየአራትሰዓት 2) በየስምንትሰዓት 3) በየሃያአራትሰዓት	

		4) ሌላካለይጠቀስ	
--	--	-------------	--

ክፍል አራት የሠራተኛ የሕይወት ዘይቤን በተመለከተ

ቁ40 1	የሚጠጡ ከሆነ በየስንት ጊዜ?	1) አዎ 2) የለም	403ይኛ ፍ
ቁ40 2	ለጥያቄ ቁጥር 401 መልስ ያስቀመጡ ከሆነ በሰዓት ለምን ያህል ጊዜ?	1. በየቀኑ 2. ከ1-3 ቀን በሰዓት 3. አልፎ አልፎ	
ቁ40 3	የሠራተኛ ለደረሰች በሠራተኛ ላይ ጥራት የሚጠይቅ የውቃት?	1) አዎ 2) የለም	
ቁ40 4	ለጥያቄ ቁጥር 403 መልስ ያስቀመጡ ከሆነ በሰዓት ለምን ያህል ጊዜ?		
ቁ40 5	ስጋ ራዕይ ሌላ?	1. አዎ 2. የለም	407ይኛ ፍ
ቁ40 6	ለጥያቄ ቁጥር 405 መልስ ያስቀመጡ ከሆነ በሰዓት ለምን ያህል ጊዜ?		
ቁ40 7	የእንቅልፍ ችግር አለብዎት?	1. አዎ 2. የለም	409ይኛ ፍ
ቁ40 8	ለጥያቄ ቁጥር 407 መልስ ያስቀመጡ ከሆነ ምክንያቱም ገንዘብ ለውጥ ያስባሉ?	1. በቀን ከስምንት ሰዓት በላይ የሚሰጥ ማስራት 2. በማታመስ ማስራት 3. በአንድ ጊዜ ከአንድ በላይ የሆነ ሥራ ማከናወን 4. ሌላ ካለባቸው	
ቁ40 9	በሚሰሩት ስራ ደስተኛ ነዎት?	1. አዎ 2. የለም	
ቁ41 0	በሚሰሩት ስራ ደስተኛ ነዎት		
	1. በከፍተኛ ጥቅም ጥቅም	1. አዎ 2. የለም	
	2. በሥልጠና እና ዕድገት	1. አዎ 2. የለም	

	3. በሥራቦታደህንነት	1. አዎን2. የለም	
	4. ለሰራተኞችሃላፍነትከመስጠትአንፀር	1. አዎን2. የለም	
	5. ከሥራሃላፍዎችጋርበሚኖረዉግንኙነት	1. አዎን2. የለም	
	6. ከሌሎችሠራተኞችጋርበሚኖረዉግንኙነት	1. አዎን2. የለም	
	7. በሥራበሚኖረዉቆይታ	1. አዎን2. የለም	
ቁ 411	በስራቦታዎቹጉዳትመከላከያመሣሪያዎችንተ ጠቅመዉ ያውቃሉ?	1. አዎን 2. የለም	411 ይሻገሩ
ቁ 412	የሚጠቀሙከሆነምንአይነት?	1. አዎን2. የለም	
	ዳንት	1. አዎን2. የለም	
	የጀሮመከላከያ	1. አዎን2. የለም	
	የአፍንጫናአፍመከላከያ	1. አዎን2. የለም	
	የጭንቅላትመከላከያ	1. አዎን2. የለም	
	የሥራልብስ	1. አዎን2. የለም	
	የብዩዳመነጽር /የሴፍቲመነጽር	1. አዎን2. የለም	
	የፊትመከላከያ	1. አዎን2. የለም	
	ቦቲጫማ/የሴፍቲጫማ	1. አዎን2. የለም	
	ሌላካለይጠቀስ	_____	
ቁ41 3	የማይጠቀሙከሆነምክንያትዎ ምንድንነዉ?	1. የመከላከያመሣሪያዎች ባለመኖራቸዉ 2. የደህንነትናጤንነት ትምህርትስለማይሰጥ 3. ለአጠቃቀምምቸስላልሆነ 4. የስራአፈፃፀምንስለሚቀንስ 5. የደህንነትናየጤናጠንቅ	

		ሊያስከትልስላሚቸል ፊ. ሌላካለይጥቀሱ	
--	--	----------------------------	--

Annex 5: Work environment observation checklist

Checklist for observation of working Environment in small scale and medium scale industries in Sebeta town, South West, Ethiopia, 2019

Checklist identification number: _____

Identification

Name of industry _____ type of industry 1.SSI 2.MSI

Major hazardous raw material in use _____

Final product _____

Address: Kebele _____

Total number of employees directly involved in production processes _____

Hazards in working environment

1. Is there excessive heat in the workplace? 1. Yes 2. No: A yes requires that a worker is found sweating when naked or with light clothing; if investigator feels as sudden heat wave when entering into the industry.

2. Is there excessive dust in the workplace? 1. Yes 2. No. A yes requires if the investigator experiences sudden sneezing upon entering the industry or if the worker's eye brows, hair, nostrils and cloths is observed by investigators to be covered with dust particle.

3. Is there excessive noise in the workplace? 1. Yes 2. No. A yes requires that it difficult to communicate with nearby worker without shouting.

4. Is there warning signs or safety rules? 1. Yes 2. No. A yes requires no lack of such arrangement at inspection around.

5. Do the employees use the necessary personal protective equipment? 1. Yes 2. No. Ayes require no lack in use of safety devices seen at inspection around.

6. Does all production equipment have the appropriate protective arrangements?

1. Yes 2. No: A yes requires no lack of such arrangement (poorly installed electric wire or unguarded machine or equipment) at inspection around.

7. What is the most dangerous incident in the industry during the last 12 months, and any preventive measures been implemented? 1. Yes 2. No. Attainment of yes requires specification of the incident and preventive measures.

8. Does the industry have copy of the most important safety and health regulations? 1. Yes 2.No. A yes requires a copy of the regulation.

9. Does the industry have of health and safety personnel? 1. Yes 2.No. Attainment of yes requires either implementation as result of initiative from health and safety personnel or written program me for action worked out with them.

10. Does the industry follow written health and safety plan for action in the workplace? 1. Yes 2.No. A yes requires completion of at least one of the measures in the plan.

11. Does the industry have meetings to discuss safety and health factors with the employees in the last six months? 1. Yes 2.No. A of yes requires minutes with written conclusions.

12. Are training needs considered in connection with new employment, equipment or other changes? 1. Yes 2.No. A yes requires an example of training given as a consequence of a change.

13. Does the industry have first aid equipment? 1. Yes 2.No. A yes requires that first aid equipment be available in the production area and that content be as prescribed that is the end of our observation. Thank you very much for taking time to answer these questions. We appreciate your help.

Name of inspector _____

Signature _____ Date _____

EPIDEMIOLOGY DEPARTMENT

DECLARATION

The undersigned agrees to accept responsibility for the scientific ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of the Faculty of Public Health in effect at the time of grant is forwarded as the result of this application.

Name of the student: _____

Date. _____ Signature _____

Place: Jimma University

Date of Submission _____

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

Name of the examiner: _____

Date. _____ Signature _____

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

Name of the first advisor: _____

Date. _____ Signature _____