

**ADDISABABA UNIVERSITY COLLEGE HEALTH SCIENCES SCHOOL  
OF PUBLIC HEALTH**



**MAGNITUDE OF WORK- RELATED INJURIES AND ASSOCIATED RISK FACTORS OF  
LARGE SCALE FLOUR FACTORY WORKERS IN ASELLA TOWN, OROMIA REGIONAL  
STATE, ETHIOPIA.**

**BY**

**MISAYE SHIFERAW (BSc)**

**ADVISORS**

**Professor AHIMEDALI (PhD)**

**Mr. WORKU TEFERA (MPH)**

**A THESIS REPORT SUBMITTED TO THE SCHOOL OF PUBLIC HEALTH ADDISABABA  
UNIVERSITY FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE  
DEGREE OF MASTER OF PUBLIC HEALTH.**

**May 2015**

**ADDIS ABABA, ETHIOPIA**

**ADDIS ABABA UNIVERSITY COLLEGE HEALTH SCIENCES SCHOOL OF PUBLIC HEALTH**

**MAGNITUDE OF WORK- RELATED INJURIES AND ASSOCIATED RISK FACTORS OF  
SCALE FLOUR FACTORY WORKERS IN ASELLA TOWN, OROMIA REGIONAL STATE,  
ETHIOPIA.**

**APPROVED BY THE EXAMINING BOARD**

**Signature**

**Dr. Wakgari Deressa (PhD) -----**

**ADVISORS**

**1. Professor AHIMED ALI (PhD) -----**

**2. Mr. WORKU TEFERA (MPH) -----**

**EXAMINER**

**1. External Examiner: Dr Hailu Yeneneh -----**

**2. Internal Examiner: Meaza Bezu -----**

## TABLE OF CONTENT

<u>Acknowledgment</u> .....	<b>Error! Bookmark not defined.</b>
<u>List of Tables</u> .....	iv
<u>List of Figures</u> .....	iii
<u>Accronyms</u> .....	<b>Error! Bookmark not defined.</b>
<u>Abstract</u> .....	<b>Error! Bookmark not defined.</b>
1. Introduction .....	1
1.1. Background .....	1
1.2. Statement of the problem .....	3
1.3. Significance .....	4
2. Literature Review .....	5
2.1 . Magnitude and burden of work place (occupational) injury.....	5
2.2 Body part affected sources and types of injury. ....	6
2.3 Factors affecting occupational injury .....	7
3. OBJECTIVES .....	9
3.1 General Objective: .....	9
3.2 Specific Objectives: .....	9
4. Material and Methods .....	10
4.1 Study design: .....	10
4.2 Study area: .....	10
4.3 Study period.....	10
4.4 Study Population .....	10
4.5 Source population .....	10
4.6 Study subjects .....	10

4.7	Inclusion Criteria .....	10
4.8	Exclusion criteria: .....	10
4.9	Sample size determination.....	11
4.10	Study variables.....	12
4.11	Operational definition .....	12
4.12	Data collection procedure. ....	13
4.11.1	Data processing and analysis.....	13
4.13	Ethical consideration: .....	14
4.14	Dissemination of results .....	14
5.	RESULTS .....	15
5.1	. Socio-demographic characteristics of respondents .....	15
5.2	Distribution of occupational injuries and Characteristics.....	16
5.3	Severity of work-related injury, .....	17
5.4	Description of work environment and Ergonomic Variables .....	18
5.5	Distribution of Behavioural variables .....	19
5.6	Work environment observation.....	21
5.7	Determinant factors of occupational injury .....	22
6.	DISCUSSION .....	24
7.	Recommendations .....	27
8.	STRENGTH AND LIMITATIONOF THE STUDY .....	28
	Reference.....	29
	ANNEXES.....	32

## **Acknowledgement**

First, I would like to prize the almighty God who gives me the Courage and power to complete this thesis within the time delineated.

I also extend my gratitude to my advisors Prof. Aimer Ali (PhD) and Mr. Worku Teferra (MPH) for their guidance and constrictive comments in all the stages of the study with full compassion, interest and encouragement. They made me feel more confident and be hard working than ever before.

My gratitude also goes to Dr Abera kume, and Mr.YifokirTeferra, Ms Meaza Gezuu for their constructive comment and reviewing my proposal.

I would also like to thank my best friend Mr. Alemu Gemechu for his unreserved contribution during the preparation of this thesis.

My appreciation goes to the University of Addis Ababa School of Public Health and Department of Preventive Medicine and Norwegian program for capacity development in higher education and research for development (NORAD) for funding my work.

Finally, I would extend my thanks to Asella Town Labor and Social Affair Office for their collaboration to undertake this thesis proposal.

## List of Tables

<b>Tables</b>	<b>Page</b>
Table1: Distribution of socio-demographic characteristics of respondents in Asella large scale flour factories April, 2015 (n=412) -----	15
Table 2: Parts of the body injured and types of injury among workers inAsella Large Scale Flour factories April, 2015(n=99) -----	17
Table 3: Severity of injury among injured workers in Asella large scale flour Factories April, 2015 (n=99) -----	17
Table 4: Working environment and ergonomic related factors among workers in Asella large scale flour Factories April, 2015 (n=412) -----	18
Table 5: Distribution of behavioural factors among respondents in Asella Flour Factories, April, 2015 (n=412) -----	20
Table 6: Occupational health and safety hazards identified in working sections, Asella Flour factories, April 2015-----	21
Table7: Working environment and ergonomic related determinant factors of respondents in Asella large flour factory April, 2015-----	22
Table 8: Behavioural factors related determinant factors of respondents in Asella large flour factory April, 2015-----	23

## List of Figures

Figures

Page

Figure 1: Conceptual framework -----8

Figure 2: Diagrammatic Presentation of Sampling Procedure -----11

Figure 3: Reported most common types of injures when injured occurred at work (n=99) --17

## **ACCRONYMS**

AAU	Addis Ababa University
AOR	Adjusted Odd Ratio
CI	Confidence Interval
COR	Crude Odds Ratio
DALY	Disability Adjusted Life Years
ETB	Ethiopian Birr
GNP	Gross National Product
GTP	Growth and Transformation Plan
ILO	International Labour Organization
ILS	International Labour Standard
OSHA	Occupational Safety and Health Agency
PI	Principal Investigator
PPE	Personal Protective Equipment
SPSS	Statistical Package for Social Sciences
WHO	World Health Organization

## ABSTRACT

**Background** -Occupational Injury (work related injury) is among major public health problems that accounts 1.5% of public health burden in terms of DALY and an economic loss of 5-10% GNP globally.Preventing or reducing work-related injury among flour factory workers are one of the key issues in improving workers health and safety in manufacturing industry. This issue is relevant particularly in developing countries including Ethiopia.

**Objective:** The aim of this study is to assess magnitude and associated factors of occupational injury among production workers in large scale flour factories in Asella during the last 12 months.

**Method:** : Institution based Cross-sectional study design was conducted from March,17-April 4 2015 among 412 study subjects were selected using simple random sampling method taking payroll as a sampling frame.

Data collection was done by using interviewer administered questionnaire, observation and record review by the Principal Investigator. The collected data were manually checked for completeness and entered in to EP Info for data cleaning and finally exported to SPSS for further analyses. Descriptive statistics and logistic regression analyses methods were employed to determine factors that may have significant association to the dependent variable. Variables that are identified as having p-value less than 0.25 on bivariate analyses were considered as a candidate to be evaluated on multivariable model, and then a variable with p-value less than 0.05 on final model were considered as having significant association.

**Result:** The overall occupational injury prevalence rate was 24%. , exposure to excessive heat at work was found to have positive association with accidental injury at AOR = 2.570, P value< 0.05, 95% CI (1.12-5.91), Accordingly, those employees who were carrying heavy weight compared to their counterparts are at high risk of accidental injury at AOR 1.432, p value 0.05 , (95% CI) (1.001-2.048),workers who have got regular health and safety supervision are more likely not to encounter injury at. AOR = 3.052, p value 0.002 , 95% CI (1.507-6.181), utilization of personal protective devices in which those who are using the device are at lower risk of encountering accidental injury at and AOR 0.39, p-value 0.001 ,(95% CI) (0.23-0.66). One more covariate identified as significant was status of chewing chat. Employees who are chewing chat are six times at higher risk of acquiring accidental injury compared to those who are not chewing chat at p-value < 0.05.

**Conclusion** - result show that work-related injury prevalence is high over the last one year. The factors significantly associated with incident of injury were utilization of personal protective device, handling of heavy object, excessive heat at work, Regular health and safety supervision &chewing chat

## **Introduction**

### **1.1. Background**

Occupational Injury is any unintentional physical damage or harm to the body tissue from occupational exposure. Abnormal condition or disorder that caused illness that result in death, loss of consciousness, work absences by the work environment sustained on the worker in connection with the performance of his/ her job, but does not include work related diseases that need exposure assessment or laboratory test's examination (1).

The International Labor Organization (ILO) 2011 report shows that 331.5 million occupational accidents and Due to this, 2.34 million deaths occurred from occupational accidents and diseases (2). In addition 268 million non-fatal workplace accidents occur in which the victims miss at least three days of work (3).

WHO recognized that disorders are work-related injury when the activities and work conditions significantly contribute to their development, Reports showed between 10% and 30% of the workforce in developed and between 50% and 70% in developing countries are exposed to poor working conditions (4).

In 2008 survey by the European agency for safety and health at work, showed work-related injuries are the most common health problem in European countries affecting millions of workers every year. Accordingly, about two million people die from unintentional injuries at work and work-related diseases (5). At present there is a rapid developmental change targeting at improving the quality of life, but the health and safety of workers is poor especially in developing countries due to the introduction of new technologies, new chemical substances and materials which led to new occupational injuries and diseases (6).

Work related injuries flour industry are caused by hazards including: fires and explosions, from grain dust accumulation, suffocation, falls from heights crushing injuries and amputations caused from grain handling mechanical equipment within wheat storage structures; such industries are where workers can be exposed to numerous serious and life threatening hazards (7).

Exposure to fumigants may cause permanent central nervous system damage, heart and vascular disease, and lung edema as well as cancer. These gases may result in passing out and falling into the grain, thus becoming engulfed and suffocating or otherwise injuring themselves (8). Study done in the USA shows that in Grain handling manufactory over the last 35 years, there have been over 500 grain dust explosions, which have killed more than 180 people and more than 675 injured (8).

A study carried out in Brazil showed that there was an incidence of 56 per 1000 full-time equivalent workers (10). Report from the Labor Inspection Directorate of Norway showed that the incidence of occupational injury was 34.7 per 1000 cases (10). A study reported that injury rate among Nigerian factory workers was 22 cases per 1000 workers per year (11).

In Ethiopia even though there is shortage of data nationwide, researches on the rate of occupational injuries and their determinants in flour factories, the study in small and medium scale industries of north Gondar Zone showed that the rate of occupational injury was 335 per 1000 workers exposed per year (12).

In the year 2009/2010 the number of industrial studies carried out at Tendaho Agricultural Farm in Afar Regional State and Addis Ababa large scale manufacturing industries, showed that the prevalence of occupational injuries were 783 and 489 per 1000 exposed workers per year respectively (13,14).

Today large-scale flour factory diversified with manufacturing ranging from small, traditional family-run, which are highly labor intensive, large capital intensive and highly mechanized industrial processes. Work-related injuries among large-scale flour factory was the main cause of injury in food industry are hand tools, from manual handling e.g. of sacks, workers who are directly involved in production unit process tasks (15).

Injuries at work happen due to manual handling, raw material storage, extraction, processing, preservation and packing. Super bulk sacks often containing several thousand pounds of dry powder material, bucket elevator with grain e.g. with confectionery and flour, air fluming for uploading grain for transport of raw material, flour and flour products (16).

This should also be true for developing countries like, Ethiopia where there is no strong functioning health and safety system. There is also a big regional variation in which fatality

rates in developing countries are four times higher than the developed world due to unsafe working environment (1, 3), less awareness (3) .untrained workers , limited occupational service provision (4) and psychosocial stress (5,6).

There is no any study conducted on the prevalence of work-related injury and associated factors among large-scale flour factory workers. Hence, this study was designed to assess the prevalence and associated factors for work-related injuries among large scale flour factories workers who are directly involved in production unit in the selected flour factories in Assela Tawon , Oromia Regional State.

The study will provide baseline information for policy makers to design strategy, to give priority for prevention and control of occupational injuries to have healthy workforce and sound economic development. The result of this research is expected to be important for practitioners and researchers on how to deal with, incorporate and identify problems related with ergonomic aspects to assess work related injuries.

## **1.2. Statement of the problem**

In Ethiopia, due to favorable conditions for investment, the number of large scale industries has been increasing. Work related injury is among major public health problems that accounts for 1.5% of public health burden of DALLY and an economic loss of 5-10% GNP globally( 1,2) .

The function of OSH service at work place is to provide preventive and advisory roles and being responsible for assisting employers, workers and their representatives in establishing and maintaining a safe and healthy working environment including the adaptation of work to suit workers capabilities (1). There is also a big regional variation in which fatality rates in developing countries are four times higher than the developed world due to unsafe working environment and lack of awareness (1,3) trained workers and limited occupational service provision (4) and psychosocial stress(5, 6).

At present, the rapid developmental change is improving the of life, but the health and safety of workers is devastating especially in developing countries due to the introduction of new technologies, new chemical substances and materials which led to new occupational injuries and diseases (7,8).

### **1.3. Significance**

Work-related injury is one of the most prevalent among manufacturing industries. Reports of developed countries shows work-related injuries are the most commonly reported occupational illness and reasons for long term sick leave and disability pensions. Apart from personal suffering, these conditions impose a major financial burden on the community, on employers and on individuals. There is less information about the magnitude and risk factor of work related injuries among adult employed population in developing countries when compared to industrialized countries.

This study provides baseline information for policy makers about work-related injury to incorporate in National Occupational Health and Safety Policy according to the context of our country, will provide valuable information for researchers for farther investigation , also for employer , employee and to design a strategy to prevent work-related injury in this segment of the population.

## **1. Literature Review**

### **1.1. Magnitude and burden of work place (occupational) injury and health**

Flour industry is a high hazard industry where workers can be exposed to numerous serious and life threatening hazards. These hazards include: fires and explosions from grain dust accumulation, suffocation from engulfment and entrapment in grain bins, falls from heights and crushing injuries and amputations from grain handling equipment (14).

A study done in UK shows a flourmill exploded at William Primrose and Sons Ltd., Glasgow, UK, on Nov. 10, 1911, killing 5 people. Their grinding process was very dusty and had no dust collection system (14). In the USA large scale flour factory explosion in starch/corn plant at Cedar Rapids, Iowa, in 1919 killed 43 people and one at similar plant in Pekin, Illinois, in 1924 resulted in 42 deaths (15).

Explosion at a large export grain silo plant in Corpus, Christi, TX., USA, in April 1981 resulted in 9 fatalities. Thirty injuries and more than 30 million dollars damage at work place (16). The suspected cause of the explosion was thought to be smoldering lumps of milo grain, which ignited a dust cloud in a bucket elevator (16). Study shows in Westwego, Louisiana, UK, in Dec. 1977, killed 36 people and 3 injured (17). A study shows causes of the incident were falls from height can occur from many walking/working surfaces throughout a grain handling facility (18).

In 2006, a WHO report shows 1.5 percent of the global health burden was from industrial countries in terms of DALY and economic loss (1). Report showed that there is 5-10% of GNP loss annually in industrial countries(1, 2). In developing countries including Ethiopia, the experience in the practice of occupational health is limited. Records of work-related injuries and diseases are missing (19).

In Africa some selected countries have started to report their national occupational accident cases to ILO year book of labor statistics; even though it is not regularly reported and not based on the Framework for Occupational Safety and Health Convention (No-187) and

recommendation (No-197) for national profiles on OSH. Based on the report, the annual number of cases reported by Ethiopia ranks sixth among African countries in 2009 (20).

The comparative study conducted shows that; the occurrence of occupational injury in the Republic of Korea was twice when compared to The United States of America (21). In addition, the study carried out in Brazil showed that there was an incidence of 56 per 1000 full-time equivalent workers (22). A Report from the Labor Inspection Directorate of Norway showed that, the incidence of occupational injury was 34.7 per 1000 cases(23).

The injury rate among Nigerian factories workers was 22 cases per 1000 workers per year (24). In Ethiopia even though there is a shortage of data on nationwide researches on the rate of occupational injuries and their determinants in flour factories , the study in small and medium scale industries of north Gondar zone showed that the rate of occupational injury was 335 per 1000 workers exposed per year (25).

Considering that the report was not comprehensive and regular, in the year 2009/2010, the number of industrial studies carried out at Tendaho Agricultural farm in Afar Regional State and Addis Ababa large scale manufacturing industries, the prevalence was 783 and 489 per 1000exposed workers per year respectively (26).

Some selected African countries have started to report their national occupational accident cases to ILO yearbook of labor statistics. Even though it is not regularly reported and not based on the framework for occupational safety and health convention(No-187) and recommendation (No-197) for national profiles on OSH. Based on the report, the annual number of cases reported by Ethiopia ranks sixth among African countries in 2009 (27).

## **1.2 Body part affected sources and types of injury.**

The result of study done in India showed that more percentage of injured body parts were hand/wrist, ankle/foot and head with falls as cause (28). Factors that led directly to fatal accidents include electrocution, falling from a height, being trapped in a machine and the collapse of structure(29). Injuries to the upper extremities accounted for the largest percentage among other body parts and foreign body to the eyes were the most common

According to the study done in the USA, the most frequently injured part of the body was hand (30) and a study done in Turkey showed that; the most frequent injuries were traumatic,

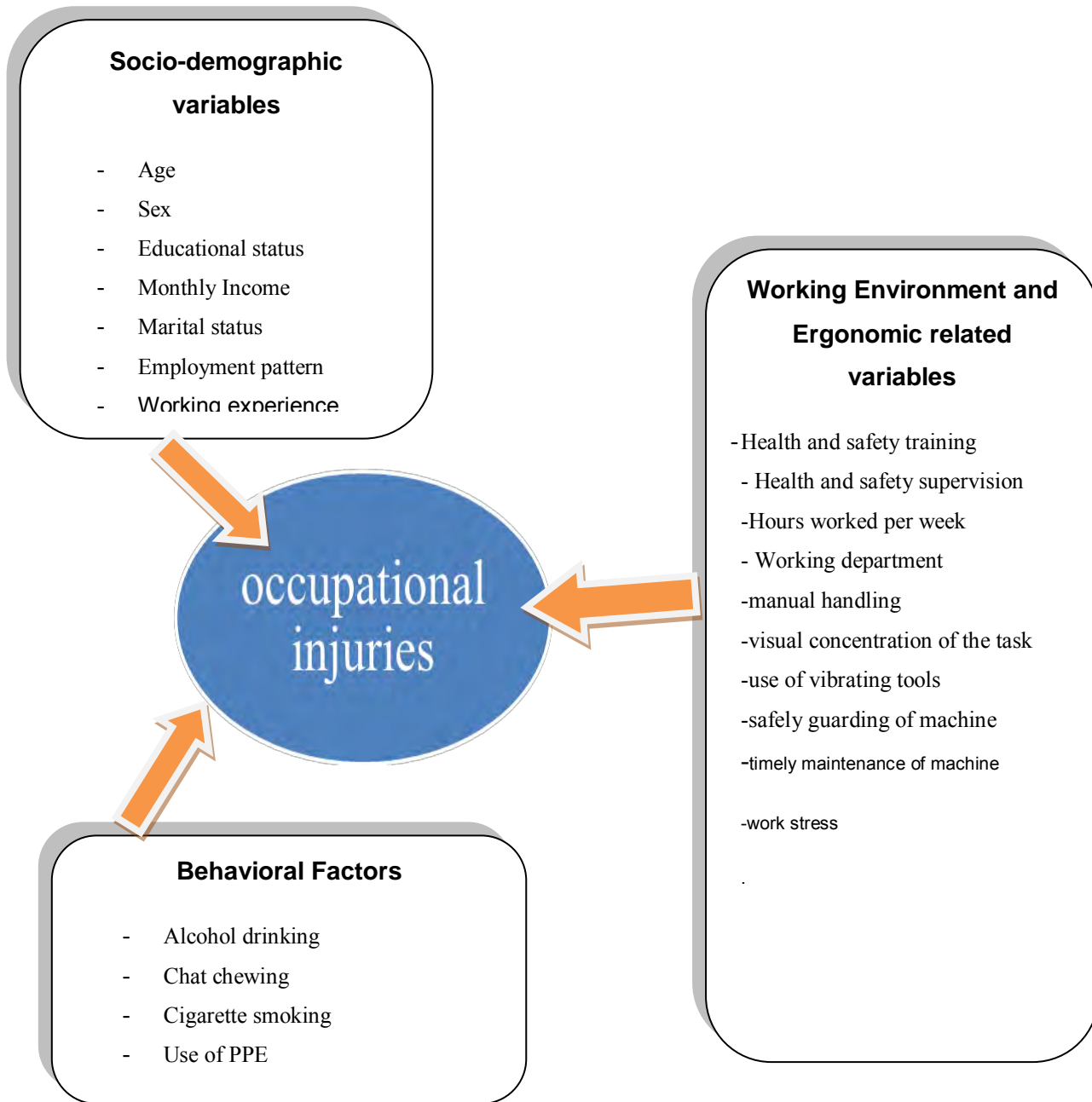
amputation of wrist and hand with machines as the common source of injury (31). Types of injury Studies in Nigerian factories showed that fatality rates from work-related injuries were associated with power driven machinery, explosion, falling and chemicals (21).

The most frequent parts of the body and their sources in a study conducted in Addis Ababa, were fingers, hands, lower legs and eyes with the source being machineries (19). Studies done in the northern parts of Ethiopia showed that the commonest parts of the body injured were hands, fingers and eyes with the most frequent causes being machinery and hand tools (17, 18,24).

### **1.3 Factors affecting occupational injury**

Most researchers showed that several factors are associated with the occurrence and types of injury including Socio-demographic, working environment, ergonomic related factors. Workers' behavioral conditions were among frequently reported risk factors for workers to acquire physical injury in work place of manufacturing industries (17, 18, 24, 27, 32).

Study conducted in Brazil revealed that the proportion of injury has no significant association with gender difference, but had positive association with educational status (20). A study in Canada showed that reported injury for men was higher than women(35).From a report of a study done in India, being male and younger in age (<30 years} were significant risk factors for occupational injury(32). A study done in Oman showed that age (<30 years) has significant association with occupational accident (34). Some studies in Ethiopia indicated that age(17, 22), sex (17), work experience (18, 24), alcohol consumption(18), cigarette smoking(19), sleeping disturbance(17,18, 24), hours worked per week(18, 19, 24), safety and health training and supervision are a risk factors (17, 18, 24).



**Fig1. Conceptual Frame Work of occupational Injuries and Associated Risk Factors adopted from (ILO).**

## 2. OBJECTIVES

### 2.1 **General Objective:**

To assess the magnitude and associated factors of work related injuries among production workers in Asella Town large-scale flour factories.

### 2.2 **Specific Objectives:**

.To determines the magnitude of work related injuries among production workers in Asella Town large scale flour factories .

.To identifies factors associated with work related injuries among production workers in Asella Town large-scale flour factories.

### 3. Material and Methods

#### 3.1 Study design:

An institutional based cross sectional quantitative study design was employed to conduct this study.

#### 3.2 Study area:

The study was conducted in Asella Town ,capital of Arsi Zone which is the second area in Oromia Region in manufacturing of wheat flour following Adama Town Administration. Five large scale flour factories located in Welkesa Keble, four kilometers from the center of Asella Town on the main road to Adam were included in the study.

#### 3.3 Study period

Data collection was conducted in Asella Town, among workers in five large scale flour factories from March 17-April to 4, 2015.

#### 3.4 Study Population

Workers who were directly engaged in the production process were considered as study population whereas administrative workers were excluded assuming that they are not exposed to factors of occupational injuries.

#### 3.5 Source population

Source population was all production process employees currently working in five large-scale flour factories found in Asella Town.

#### 3.6 Study subjects

Workers who are directly engaged in the production process wereselected from the list of employees taken from the Payroll, assigned unique number by lottery method then all data was collected from each unit.

#### 3.7 Inclusion Criteria

All workers who were involved in the production process of the factories at least for more than one year prior to the study and able to respond were included.

#### 3.8 Exclusion criteria:

Administration and other supportive staffs are excluded; production workers who were seriously ill or hospitalized and those unable to respond during data collection were excluded.

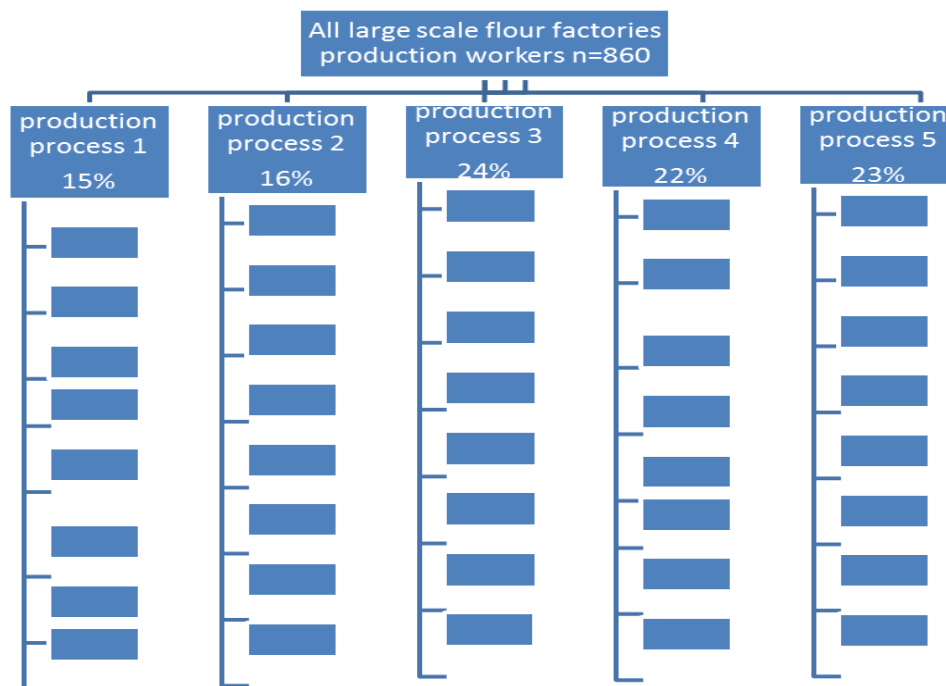
### 3.9 Sample size determination

The sample size were determined using a single population proportion formula since there was no study conducted in this area in related sectors among Ethiopians on large scale flour factories. To maximize, the sample size was calculated using assumption 50% proportion (p) for work related physical injuries in large scale flour factories due to lack of related studies in our set up  $n = \frac{(Z \alpha/2)^2 * p (1-p)}{d^2}$

$$d^2$$

Where sample size Proportion of work-related physical injury score = 50% Z  $\alpha/2$  standard normal distribution = 1.96 CI Confidence interval = 95% D margin of error (5%)  $n = \frac{(1.96)^2 (0.5) (0.5)}{0.05^2} = 384$ . Adding 10% non-response rate total sample size was equal to 422.

The sample sizes were allocated to each factory proportional to their size then selection of employees that are directly working in production process was done by simple random sampling using lottery method after assigning unique number for each sample unit.



$$N = n_1 + n_2 + n_3 + n_4 + n_5 = 422$$

**Figure 2: Diagrammatic presentation of sampling of Asella flour factory worker April 2015.**

### **3.10 Study variables**

#### **4.10.1. Dependent variable**

Occupational injuries

#### **4.10.2. Independent variables**

##### **1. Socio-demographic factors:**

- Age, sex, educational status, Monthly income, marital status,
- Employment status, work experience

##### **2. Work environment and ergonomic related factors**

- Work time shifting, Hours worked per week
- Health and safety training
- Health and safety supervision

Availability of working department handling manual, use of vibrating tools, Utilization of safety guarding of machine and timely maintenance.

##### **3. Workers personal behavioral factors**

Alcohol drinking, Chewing chat, Smoking Use of personal protective equipment's and sleeping disorder and job satisfaction

### **3.11 Operational definition**

**Work-related injury:** any unintentional personal injury, disease or death resulting at work for the past one year

**Excessive heat:** if found sweating when naked or with light clothing & investigator feels same during observation.

**Large-scale industry:** Industry that uses power driven machine & employ exceed 50employers.

**Drinking Alcohol:** - Current behavior of drinking any alcohol on workday (often, sometimes, occasionally)

**Smoking behaviour;** - Currently smoking regarding smoking on work day (often, sometime, and occasionally).

**Chat Chewing:** It is the habit of workers regarding chewing on workday (often sometimes and occasionally).

**Ergonomic injuries:** injuries that occur from situations that including sitting too long in incorrect position, lifting heavy object standing more than working time and lifting object in correctly.

**Sleeping –Disorder** -The presence of sleeping problems when the worker is at work in the factory.

**Job satisfaction:** Whether the worker was happy with the job that he/she had engaged currently or not.

**Safety guarding of machine:** the machine is safe if it safe guards workers from contacts with dangerously moving parts.

### 3.12 Data collection procedure.

#### 4.11.1 Data processing and analysis

Data were collected by face \_to\_ face interview using a structured and pre-tested questionnaire translated to Amharic and Afaan Oromo for the quantitative data. Record review of reports of injuries using observation checklist were employed by the principal investigator to support the self-reported information. Six BSc Environmental Health data collectors were selected assuming that they understand the concern very well. One supervisor in addition to the Principal Investigator was enrolled to check for completeness of the questionnaire during data collection.

The data collectors were trained for two days about the data collection tool, questioning techniques and ethical issues. They were given information about operational definitions and timing of questioning. The questionnaire was developed first in English and then translated to Amharic and Afaan oromo and back to English by language experts for reliability and validity. Pretest was done in a similar factory near the study area.

The data were manually checked for completeness and consistency and entered into EP Info version 3.5.4 to be cleaned, edited and transported to SPSS software statistical package were checked before further analyses. Logistic regression method was used to determine the

association of variables on bivariate analyses followed by multivariate model analyses. Those variables that had a significant level p-value less than 0.25 on bivariate analyses were considered as a candidate for multivariate analyses to increase the chance of inclusion of variables with higher epidemiological importance. Finally, independent variables with p-value of less than 0.05 on multivariate analyses were considered as having significant association with the dependent variable. The finding was demonstrated using tables, graphs and other descriptive method.

The quality of data was assured by using standard questionnaire, properly designed and pre-testing 5% of the questionnaire in one of the large scale flour factory in a nearby town other than the selected flour factories Training of data collectors and supervisors was conducted before the actual data collection filled questionnaires were reviewed and checked daily for completeness and relevance by supervisors and the principal Investigator the necessary feedback was offered to data collectors the next morning. For controlling errors during data analysis, 10% of the questionnaires were double entered into the software and also frequency checks were done.

### **3.13 Ethical consideration:**

Ethical clearance was obtained from the Institutional Review Board of Addis Ababa University. Supporting letter was obtained from Asella Town Labor and Social Affairs Department. Informed consent was obtained from each study subject. Each respondent was informed about the objective of the study that it will contribute necessary information for policy makers, employers, employees and other concerned bodies. Any involvement in the study was verbal or written obtained. Any workers who were not willing to participate in the study were not forced to participate. They were also informed that all data obtained from them would be kept confidential by using codes instead of any personal identifiers and is meant only for the purpose of the study.

### **3.14 Dissemination of results**

The result of this study will be communicated to Addis Ababa University School of public health, the flour factories, the labor and social affair of the town, the regional government as well as other interested non-governmental organizations. Publication in Scientific journal and online dissemination forums will be considered.

## 4. RESULTS

### 4.1. Socio-demographic characteristics of respondents

A total of 412 workers answered which yields 97% response rate (62.6%) of workers were males. 243(59%) were single, 242(58.7%) were Orthodox. of the study population 153 (37.1%) have educational level of primary school. the mean ( $\pm$ SD) age of the participants was (27.9  $\pm$ 5.49) years. Regarding employment pattern, 332 (80.6%) were permanently employed, 112(27.2) product receiver, work experience (41.5%) have two year work experience.

**Table 1: Distribution of socio-demographic characteristics of respondents in Asella large flour factory April, 2015 (n=412).**

variable	No	%
Sex		
Female	155	37.6
Male	258	62.4
Age (years)		
18-29	273	66.3
30-40	132	32.0
>40	7	1.7
Religions		
Orthodox	242	58.7
Muslim	96	23.3
Protestant	72	17.5
Catholic	1	0.2
Other	1	0.2
Marital status		
Marred	155	37.6
Single	243	59.0
Divorced	5	1.2
Widowed	7	1.7
Separated	2	0.5
Educational status		
Illiterate	17	4.1
Elementary school(1-8)	153	37.1

High school(9-12)	126	30.6
Higher Education	116	28.2
Employment status		
Permanent	332	81
Temporary	78	19
1years	76	18.4
2years	171	41.5
3years	126	30.6
4years	34	8.3
5years	4	1
6years	1	0.2
Monthly income		
Time≤750	199	48.3
750-900	55	13.3
≥900	158	38.3

#### 4.2 Distribution of occupational injuries and Characteristics

Among the study participants 99(24%) responded that they had injury at job that resulted in occupational injury in the past 12 months Out of injured workers 41(9.9%) had experienced work-related injuries in the last two weeks prior to data collection.

Among the injured, 35(8.7%) were injured once, 64(15.5%) twice. Injured respondents were also asked about body part affected, types and sources of injury.

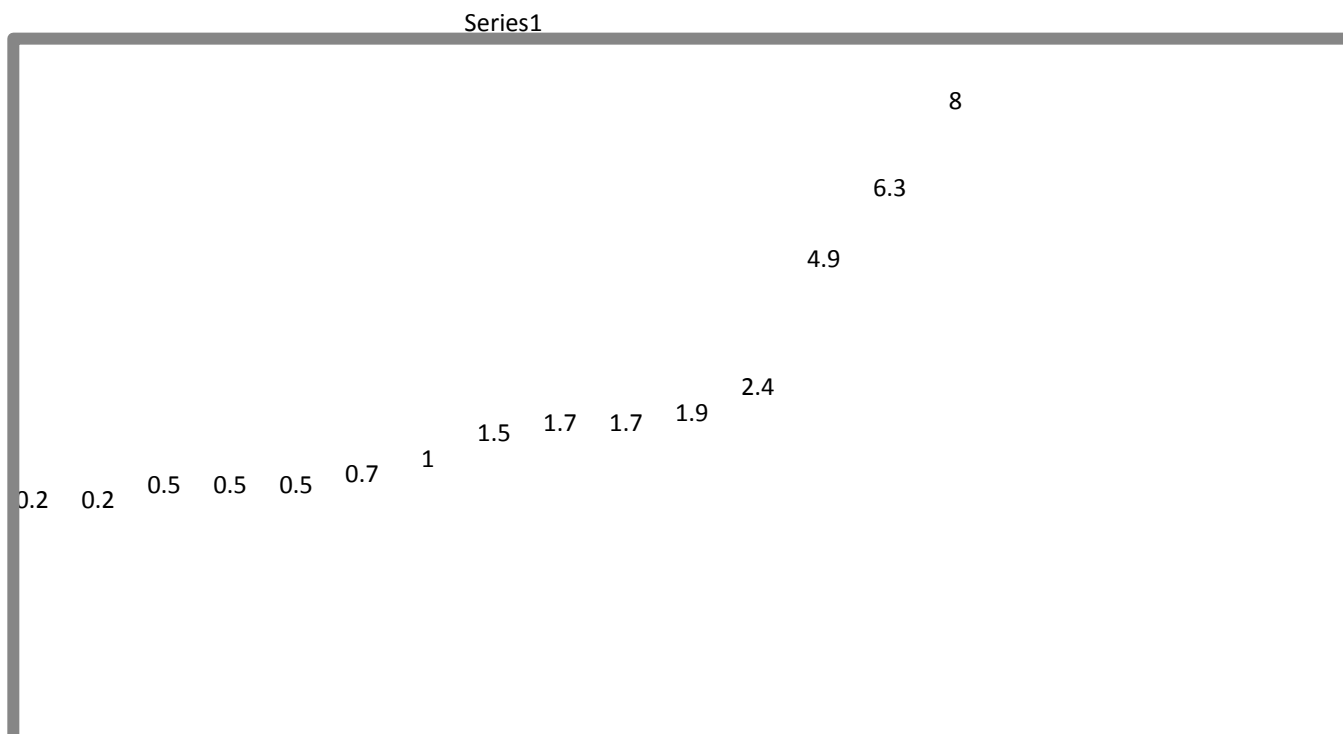
The commonly affected parts of the body included back 33 (8%), hand 26(6.3), finger 20(4.9%), ear 8(1.9), lower legs 7(1.7%). Regarding types of injury back injury 42(10.2%), laceration 32 (7.8%), reparatory organ (mouth& nose) 25(6.1%), eye injury 10(2.4%), and ear injury 9 (2.2%) were the predominant types of injury.

**The reason of injury** were lifting heavy objects 37(9%), machines 26(6.3%), hot substance 22(5.3%) and fall 20 (4.9%) splitting object 14(3.4%), hit by falling object 13(3.2%) .

**Table 2: types of injury among workers in Asella Large scale flour factory April, 2015(n=99)**

Types of injury	NO	%
<b>Puncture</b>	11	11.1
Abrasion/Laceration	23	23.2
Fracture	2	2
Cut	2	2
Back injury	42	42.4
Dislocation	17	8.5
Eye injury	10	10.1
Reparatory body (mouth nose)injury	25	25.2

**NB:** Percentage exceeds 100 because of multiple responses



**Fig3:** Parts of the body injured and types of injury among workers in Asella Large scale flour factory April, 2015 (n=99):

#### 4.3 Severity of work-related injury,

Out of 99 (24%) injured workers 36 (8.7% were hospitalized in a health institution. Among the hospitalized 26 (72.2%) were hospitalized less than 24 hours, 10 (27.8%) for over 24 hours, Thirty two (88.9%) were hospitalized from 2-3 days. A total of 58 working days were lost by the injured workers in the last 1 year.

Table.6 Severity of work- related injury among production process factory workers at large-scale flour factories in Asella town, April 2015.

Variable	No	%
Number of injury	99	24
Number of Hospitalized injured	36	8.7
Nmber of injured hospitalized>24hr	26	72.2
NO hospitalized<24hr	1	27.8
2-3days	32	88.9
No of working days lost	58	22

**NB:** Percentage exceeds 100 because of multiple responses. Workday264working days

#### 4.4 Description of work environment and Ergonomic Variables

Among study participants, 39 reported that they were at work for <48 hours per week, 282(68.4%) were working for less than or equal to 48-hr per week 130 (31.6%) were working above 48-hr per week. About 130(31.6%) of workers were day time shift, 87(21.1%) rotating shift with night, 271(65.8%) of respondents had been regularly supervised at work about safety. Regarding safety and health training 329 (80%) workers didn't get any safety training.

Participants were also asked about manual handling activities like (pulling, pushing, carrying and lifting tasks), which may contribute for work place accidents 329(80%) of them respond that their jobs involve these activities. Respondent said their job need visual concentration one hundred thirty five (33.5), their job had use vibrating tool 219(53.5%), time on vibration from 1-3 hr. 244(60%).It was found that 67(16.3%) and 133(32.2%) of the participants work with safely guarded and timely maintained machines, respectively.

Table.7 Working environment and ergonomic related factors among workers in Asella large flour Factories, April, 2015(n=412)

Variable	No	%
Hours worked per week	N=412	
≤48 hours	39	9.5
>48 hours	373	90.5
Safety supervision	271	65
Safety training	95	23.1
Working Department	N=412	

operator	47	11.4
laminating	8	1.9
loading	76	18.4
product receiver	112	27.2
product supplier	63	15.3
quality control& store	58+9	16.3
<b>Total worker Handling object</b>	329	80.0
Light(not greater than 5kg)	27	3.2
Medium(6-10kg)	2	.5
Heavy(11-50kg)	11	2.7
Very heavy(>50kg)	383	93.0
<b>Time spend on manual handling</b>	N=329	
<2 hours	2	0.6
2-4hours	11	3.3
>4 hours	316	96
<b>Visual Concentration(n=412)</b>	140	34
<b>Use of Vibrating Tools(412)</b>	219	53.1
<b>Time spend on vibrating tools</b>	N=412	
≤ 1 hour	165	40
2-4 hours	35	8.5
>4 hours	209	50.7
<b>Safely Guarded Machines</b>	345	83.7
<b>Maintenance of machine</b>	133	32.3

**NB:** Percentage exceeds 100 because of multiple responses.

#### 4.5 Distribution of Behavioural variables

The result showed that 16(3.9%) smoke cigarette, 56(13.6%) drink alcohol, and 9(2.2%) of participants used to chew chat respectively. About 226(54.9.4%) of the respondents had sleep disorder at their workplace.

Reasons for sleeping disorder were excessive heat, 154(37.4%), 87(21.6%) working in evening, 46(11.2) working more than one task at a time. 374(91%) of the participant perceive their work highly stressful working more than 8 hrs. per day without rest

Two hundred eighty-nine (70%) of the respondents were not satisfied with their current job. Majority 331(80.3%) of the respondents used personal protective equipment at their workplace at the time of data collection. while 79 (19.3%) were not used any type of

personal protective equipment, Out of total participant reasons for not using standards personal equipment were, lack of provision 379(92.9%) not comfortable to use 41 (8.6%), and perception of decreasing work performance reduction 19 (4.6%).Among users, shoes 318(77.8%), over all 292(71.4%) glove 161(39.1%), hair cover 149(36.6%)Respirators.

Table 8: Distribution of behavioural factors among respondents in Asella flour Factories, April, 2015 (n=412)

<b>Variable</b>	<b>No</b>	<b>%</b>
Cigarette smoking	16	3.9
Drinking Alcohols	56	13.6
Chewing chat	9	2.2
Sleeping dis order	226	55
Job satisfaction	127	31.1
Works tress <8hrs without rest	9	2.2

<b>PPE Utilization(n=412)</b>		
variable	No	%
PPE utilization	331	80.3
<b>Type of PPE used among user (n=331)</b>		
Respirators	137	41.4
Ear plug	5	1.5
Glove	161	48.6
Goggle	6	1.8
Over all's	292	88.2
Head dress	149	45.0
Face shield	5	1.5
<b>Reasons for not using standards PPE(n=412vs331)</b>		%
Lack of provision	378	93
Not comfortable	35	8.6
Decrease performance	19	4.7
Create health hazards	1	0.2
Not knowing how-to use	1	0.2
other	1	0.2

Percentage exceeds 100 because of multiple responses

#### 4.6 Work environment observation

In this study each of the five flour factories have eight working unit all eight of unit were inspected to identify potential occupational health and safety hazards and health and safety service provisions based on the operational definition given on the observational checklist.

The survey revealed that workers in Asella large scale flour factories were highly exposed to high excessive heat, noise, dust and chemicals. There is one health center and one higher level private clinic that factories contract for workers if injury occurs at work ; The companies cover all cost. There is no first aid equipment's observed in any of the working sections .that might be severe if injury occurs at work before reaching to the contracted health center and clinic. The company had no safety and health regulations but had health and safety committee having six members from different governmental organizations.

Administration (municipality), health office, Labour and social affair, police Kebele and each factory. There was no professional safety officer in factories. This committee was giving some occupational health services like safety information education communication, quarterly but information was not address to all.

Table10:-Occupational health and safety hazards identified in working sections, Asella flour factories, April 2015.

Observed Work department	Hazards Identified
Product Receiver & supplier section & laminating	Excessive heat, excessive dust, excessive noise flour explosion when electric shock power disconnect
Quality control section	Excessive heat, excessive dust, noise, long visual concentration, vibrating machine, uncomfortable sitting condition.
Operator & Sanitization	Long sitting , high visual concentration, glare Excessive noise excessive noise chemicals Naphtha, oil, and excessive dust
Lodging and store	Excessive heat lifting & loading very heavy object.

#### 4.7 Determinant factors of occupational injury

The analysis was done based on the conceptual frame work illustrated in Fig2, to assess the relative effect of socio-demographic, environmental and ergonomic related and behavioural factors on the outcome variable(occupational injury).

To avoid unstable estimates due to many variables in the subsequent model, only variables with a p-value less than 0.25 at the bivariate analysis were kept in the subsequent analysis.

First, the effect of selected socio-demographic factors on the magnitude of occupational injury was assessed. In the second step of analysis, environmental and ergonomic related factors were included, and their effect was seen in the presence of socio-demographic factors. Finally, behavioural factors were added to see their effect in the presence of socio-demographic and environmental and ergonomic related factors.

##### 4.7.1. Socio demographic factors

Among selected socio-demographic variables workers whose education was belong to primary and below were less likely to be injured than secondary and above but there was not statically significant.

##### 4.7.2. Working environment and ergonomic related factors

Among work environment and ergonomic related variables, hours Regular health and safety supervision, AOR 3.052, p-value 0.002, 95%CI(1.507-6.181), manual handling (more than 50kg), and excessive heat at work machine showed significant association with work related injury, [AOR 2.57, p-value 0.026,95%CI(1.117-5.91)]. Workers who used to work more than 48 hours per week were 2.71 times more likely to be injured than those spend 48 hours and less [AOR: 1.432, p-value0.049, 95% CI (1.001-2.048)]. Similarly respondents who were handled more than 50 kg per day more than 2 times more likely to be injured compared to those who were not engaged in manual handling work.

**Table: 7 Working environment and ergonomic related determinant factors of respondents in Asella large flour factory April, 2015**

Variables	Occupational Injury		AOR (95% CI)
	Yes	No	
Regular health	71	28	3.052,P-value 0.002 95%CI(1.507-

manual handling	86	13	1.432p-value0.049(1.001-2.048)
Excessive heat at	48	51	2.57 p-value0.026(1.117-5.91)

Only Variables p-value < 0.25, \* Significant at p<0.05, \*\* Significant at p<0.01, \*\*Significant at p<0.001.

#### 4.7.3. Behavioural factors

Among behavioural factors entered in the final model, those who are using personal protective equipment are lower risk of encounter accidental injury at and [AOR 0.39, p-value 0.001,95%CI(0.23-0.66) and chewing chat. Employees who were chewing are six times higher risk acquiring work related injuries compared to those who are not chewing chat at, [AOR 0.015 ,P-value 0.01 , 95%CI (0.29-1.893)].

Table 8: Behavioural factors related determinant factors of respondents in Asella large flour factory April, 2015

	Occupational Injury		AOR (95% CI)
	Yes		
Cigarette smoking	6	93	1.44(0.645-3.84))
Drinking alcohol	17	82	0.710(0.518-2.62)
Chewing chat	4	95	0.015(1.421-27.72)
Sleeping disorder	38	61	,0.740(0.290-1.893)
Job satisfaction	25	102	1.00
PPE utilization	68	31	ARO,0.129 ,p-value

Variables whose p-value < 0.25. \* Significant at p<0.05, \*\* Significant at p<0.01, \*\*Significant at p<0.001.

#### Summary of Logistic regression analysis of respondents in Asella large flour factory April, 2015

The variables with p-value < 0.25 on bivariate logistic regression were entered to multi nominal logistic model to identify significant factors after controlling for confounding factors. The multi nominal al logistic regression analysis shows that six variables are found to be significant. Accordingly, exposure to excessive heat at work was found to have positive association with accidental injury at P value < 0.05. AOR (95% CI) = 2.570 (1.117-5.91).

Factory workers who have got regular health and safety supervision are more likely not to encounter injury at. AOR = 3.052, p-value 0.002, 95% CI (1.507-6.181). Another variable that was identified as significant was weight handling status, Those employees who were carrying heavy weight compared to their counterparts are at high risk of accidental injury at AOR 1.432 ,p-value < 0.05 with (95% CI) (1.001-2.048).

In this study among factors identified with significant association with incident of injury was utilization of personal protective devices in which those who are using the device are at lower risk of encountering accidental injury at AOR) 0.39 , p-value 0.001 and (95% CI (0.23-0.66). One more covariate identified as significant was status of chewing chat. Employees who are chewing chat are six times at higher risk of acquiring accidental injury compared to those who are not chewing chat at p-value < 0.05.

## 5. DISCUSSION

### 5.1 Magnitude and severity of occupational injury

Injury prevalence of the last twelve months was 24% or 244 worker per 1000. This was higher than those in studies in Brazil, Norway and Nigeria (20,22) which showed the magnitude of occupational injuries of 56, 35, 132 workers per 1000 per year respectively (20, 21, 22) . Also our finding was higher than in Akaki 20% (14), manufacturing industry in Iran 23.5% (8), in company in India 14.1 (26,27) This difference may be due to: presence of excessive heat, heavy weights object handling and dust environment. Majority of study participants 289 (70.1%) were not satisfied in their job which may be due to difference in technology, behavior of workers and working environment safety condition.

also showed lower rate of injury compared to study Tendaho, Afar Agricultural farm, Afar (78.1%) , Addis Ababa manufacturing industry 48.9% & Gondar 33.3% 330 (15 16,22 ), The reason may be the respondent 379 (92.9%) were use personal protective equipment at their work place at the data collection time. This could be due to better promoted and preventive occupational health and safety measures at work places such as presence of work place supervision. More than 48 hours (long working hours) working time per week in Tendaho and with the prevalence of 48.9% (18)

### 5.2 Major occupational injury types, parts of the body affected and sources of injury

Five common parts of the body injured in this study were back, 33(8%) hands 26(6.3%), finger 20(4.9%), Ear8 (1.9%and, lower leg (1.7%). This finding is consistent with other findings in Ethiopia .and with finding an in USA, Iran, Oman, India, Addis Ababa, Tendaho, Afar,(17, 18 ,22,23,26, 38); except back pain in this study, May be due to human failures like dangerous working method, including conscious risk-taking, lack of compliance with safety rules and improper use of PPE.

A total of 58 working days were lost by the injured workers in the last1year. Exposure excessive heat at work was found to have positive association with accidental injury.

This is consistent with a study done in Britain (26).This may be due to the fact that workers who work in excessive heat area have slow information process, reaction times to environments; observation will be reduced, accuracy of short-term memory and concentration decreased. This may lead to human error and increases risk of injury.

Factory who have got regular health and safety supervision are less likely to encounter injury at AOR = 3.052, p-value 0.00,95% CI (1.507-6.181). From behavioural factors using personal protective device and chewing chat was associated with work related injury in this study. This is similar with study finding in Tendaho, Afar(17), and Egypt (26), but not for chewing chat (16), job dissatisfaction [16, 22), smoking (17) and drinking Alcohol (17). This might be due to workers not wanting to express these personal behaviours at the time of data collection.

### **5.3 Determinants of occupational injury**

Researchers mentioned several factors that related to the occurrence, severity, and types of injury such as socio-demographic, working environment, and ergonomic factors.

In this study socio demographic factors may in significantly associated with magnitude of occupational injury .This is consistent with the studies done in Ethiopia (14,15,16) and 17).but workers whose education were primary and below were likely to be injured than secondary and above, which is consistent study in India and Netherlands (4, 27).This may be due to that workers in the higher education, may work in relatively less hazardous area, and might not work in night shift because they are highly technical.

Regarding the work environment factors, regular health and safety supervision was significantly associated with occupational injury in this study which is in agreement with other studies done in Ethiopia (16, 17 and 22). With regard to ergonomic related factors excessive heat, manual handling and personal protective equipment were significantly associated with magnitude of occupational injury in this study.

Those who are using the device are at lower risk of encountering accidental injury and AOR 0.39, at p-value 0.001, 95% CI (0.23-0.66). Employees who are chewing chat are six times at higher risk of acquiring accidental injury compared to those who are not chewing chat at p-value < 0.05.

Literatures in other countries (3, 26 and 27) stated that ergonomic related factors are predictors for occupational injuries. However, as to the author's knowledge so far there is no study showing these relations in Ethiopia for comparison.

The results show that work-related injury prevalence is high, Out of 99(24%) injured workers 36(8.7%) were hospitalized in health institution, (88.9%) were hospitalized from two to three days. This injury type showed that back pain 42 (10.2%), abrasion/laceration 32 (7.8%), suffocation 25 (6.1%), eye injury 10 (2.4%) and ear injuries 9 (2.2%).

the most common types of Injury which is consistent with the result of a study done on small and medium scale industries in Gondar (17). except the back pain (ergonomic injury) in this result. weight compared to their counterparts are at high risk of accidental injury with AOR 1.432, p-value < 0.05 (95% CI (1.001-2.048). This could be mainly because 329 were engaged in a work that need manual handling activities like pulling, pushing, carrying and lifting activities that contribute to increase the risk of back pain this were consistent with study in Korea and USA(18). Those employees who were carrying heavy.

With regard to sources of injury, this study showed lifting heavy objects 37(9%), machine 26(6.3%), hot substance 22(5.3%) and fall 20(4.9%), splitting object 14 (3.4%) and hit by falling object 13 (3.2%) were the common sources of injury. This result is in agreement with other studies (18, 23) except lifting heavy objects in this study. This could be mainly due to the workers 329 were engaged in a work that need manual handling activities like pulling, pushing, carrying and lifting.

Related factors and worker's behaviour as the commonest possible risk factors for workers to be injured in work place (17, 18, 20, 22 and 27).

#### **5.4 Conclusion**

The result shows that work-related injury prevalence is high in in the last 1 year. Compare to study in in Brazil, Norway from ddeveloped country and also our finding was higher than study in Nigeria (22%) (22), Akaki 20% (14), manufacturing industry in Iran 23.5% (8), in company in India 14.1(26, 27)

#### **The factors significantly associated with incident of injury**

- ✓ Utilization of personal protective device
- ✓ Handling of heavy object, Excessive heat at work, Regular health and safety supervision & chewing chat.

#### **6. Recommendations**

The following recommendations are forwarded from findings of the study.

For Government

Government should give special attention for the prevention and control strategy of work related injuries in industries through proper occupational health and safety policy implementation.

For employer/organization;

It is recommended to have occupational health and safety policy at work place and integrate it as an overall part of their management concern.

Employ occupational health and safety professional and better to train workers about proper manual handling techniques at their work place.

Intervention should be carried out to help workers who are, chewing chat, use specific personal protective equipment should be provided and its utilization be monitored regularly.

For workers,

To cooperate and follow the company's working rule.

Finally, the recommendation will go to researchers to conduct further study on occupational injury, health & safety.

## 7. STRENGTH AND LIMITATION OF THE STUDY

### 7.1. Strength of the study

The use of multiple approaches to collect the data such as with structured questionnaires, observational check lists for working environment and record review from injury reports will give strength for findings.

### 7.2. Limitation of the study

Since the study, used interview on injuries over the last one year and this could lead to recall bias.

Work-related injuries due to long-term exposure to occupational hazards were not studied.

## Reference

1. International labor Organization. Global health risks: mortality and burden of disease attributable to selected major risks. Geneva: WHO; 2009.
- 2 world Health Organization. Safety and health at work,Istanbul,Turkey. 2011.
- 3.African Newsletter on occupational health and safety. 2005;15(1):14-16.
4. J. Rantanen J. Basic Occupational health services. *African newsletter on occupational health and safety*2005; 15(2): (2):29.
5. E K. Raising awareness of stress at work in developing countries. Asia Pac newsletter on occupational Health and safety. 2009; 15(1):20-236.
6. Organization. II. Women and psychosocial hazards they face at workplace. African Newsletter on occupational health and safety. 2005;18 (3):52-53.
- 7Occupational Health and Safety in Africa WHO/ILO. 2004;14(2):28-29.
8. Mohammed G. Ergonomics in small-scale grainmills in Nigeria. *African newsletter on Occupational health and safety* 2005; 15(1):7-10.
9. FDRE. Growth andTransformation Plan. 2010/11-2014/15, Adiss Ababa, Ethiopia.
- 10.Concha-Barrientos M, Nelson DI, Driscoll T, Steenland NK, Punnett L, Fingerhut MA, et al. Selected occupational risk factors. 1652.
- 11.affairs MOLAS. Occupational health and safety training package,. 1997.
- 12.Organization. ILO ccupational Health Convention No.161. 1985,Geneva, Switzerland
13. Senbeto E. The incidence of injuries and their determinants in Akaki textile factory, Addis Ababa.Masters Thesis, Addis Ababa University 1991.
- 14.Addis Ababa. Masters Thesis, Addis Ababa University 1998. F. Injuries in urban factories of Ketena one,. 1998, Addis Ababa University.
15. Tadesse T, Kumie A. Prevalence and factors affecting work-related injury among workers engaged in Small and medium-Scale Industries in Gondar Wereda, north Gondar zone, AmharaState, Ethiopia. *Ethiop J Health Dev*2007;21(1)
16. Yiha O Kumie2A. Assessment of occupational injuries in Tendaho Agricultural development S.C. Afar regional state. *Ethiop J Health Dev*. 2010;24(3).
- 17.Yiha H. Assessment of magnitude and factors of occupational injury among workers in large scale metal manufacturing industries in Addis Ababa. A AU. 2010.
- 18 Y, Bena J, Bailer A. Comparison of unintentional fatal occupational injuries in the Republic of Korea and the United States. *Injury Prevention* 2004;10(4):199-205.
- 19.SV S, D L, Ann. Informal Jobs and Non-fatal Occupational Injuries. *occup Hyg* 2004;48(2):147-157.

20. Inspection: DoI. annual inspection report ,Oslo, Norway. 1999.
21. O A E. A study of fatal injuries in Nigerian factories. Occupational medicine. 2001;51 (8):485-489.
22. Tadesse T, Kumie A. Prevalence and factor 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 Health Dev*2007; 21(1)
23. health. Fioo, Organization I. System for collection and analysis of occupational accident data. African newsletter on occupational health and safety 2009, 19 (1):4-5.
24. Analysis KHJs. A practical tool for ensuring safety of the workplace African Newsletter on occupational health and safety. 2008; 18 (2):36-37.
25. KbsS, Ergonomics related factors evaluation in medium manufacturing industries in Nepal. *Asia Pac J Public Health*. 2006; 13 (3):56-57.
26. Sorock SG, AD L, Am. HB. A Case-Crossover Study of Occupational Traumatic Hand Injury. *J Ind Med*. 2001;39: 171-179.
27. DavasAksan A, Durusoy R., Bal E, Kayalar M, S.Am. A. Risk Factors for Occupational Hand Injuries: Relationship between Agency and Finger. *J Ind Med*. 2012; ; 55:465-473.
28. A J. Occupational Injury and its Deteriorating Factors. *Global Journal of human Social science*. 2012; XII (X).
29. T N, M L. Occupational injuries and prevention activities in Vietnam. *Asia Pac J Public Health*. 2009; 15 (1):7-10.
30. Alazab R. Work-related diseases & occupational injuries among workers in the construction industry in Egypt. African newsletter on occupational Health& Safety 2004;14(2):37-42. Al-Rubaei FR, A A-M. Work Related Injuries in an Oil field in Oman.
31. Smith PM MC. examining the associations between physical work demands and work injury rates between men and women in Ontario. *Occup Environ Med* 2004; 61:750-756.
32. <http://www.flipkart.com/job-killing-me-john-kachuba-book-0440234867> .Accessed at 11 may 2010.
33. Colin D, Christina B, Kim M, et al. Global Burden of Disease in 2002: data sources, methods and results. World Health Organization December 2003. Paper No. 54.
34. Bijay M, Ashis B, Narkasen C .Relationships of occupational Health, lack of Knowledge, Alcohol Use, Health Status and Risk Taking Behavior to Work Injury of Coal Miners. *J Occup Health* 2008; 50:236-244.
35. Hassan A. The Economic Burden of work-related injuries, and descriptive profile of the current situation in the Kingdom of Saudi Arabia. Available from :[http://ipac.kacst.edu.sa/eDoc/2009/174515\\_1.pdf](http://ipac.kacst.edu.sa/eDoc/2009/174515_1.pdf). Accessed at 7 may 2010.
36. Eijkemans G. WHO and ILO Joint Effort on Occupational Health and Safety in Africa. *Afr Newslett on Occup Health and Safety* 2004;14:28- 29. Jaiswa A.A

37. Case Control Study among Carpet Thread Factory Workers in Uttar Pradesh, India: Occupational Injury and its Deteriorating Factors. *Global Journal of human Social science* 2012; XII(X):
38. Nguyen T, Luong M. Occupational injuries and prevention activities in Vietnam. *Asia Pac J Public Health* 2009; 15(1):7-10.
39. Smith PM, Mustard CA. examining the associations between physical work demands and work injury rates between men and women in Ontario. *Occup Environ Med* 2004; 61:750–756
40. O’Neil DH work place ergonomics in industrially developing countries: Does it application differ from that in industrially advanced countries? *Applied ergonomics* 2003; 31:631-640.

## ANNEXES

### Annex I. English version Information sheet

#### 1. Information sheet

Hello, I am \_\_\_\_\_. I am working with Misaye shiferaw, who is doing a research for partial fulfilment of the requirement of Master of public health in Occupational safety and health management at Adiss Ababa of University. I would like to ask few questions which take 30 minutes about prevalence of injury at work that happened to you in the previous 12 months. Your genuine 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. You are selected scientifically to be participant of this study if you give me consent after you have understood the following information sheet:

**Title of the study:** Assessment of magnitude and Risk factors affecting occupational injuries among workers in Asella large scale flour factories.

**Back ground of the study:** Occupational injuries constitute the majority of global public health burden which millions of workers die each year from work related injuries and diseases which cause for economic loss. Morbidity, disability and death in most developing countries including Ethiopia.

**Objective of the study:** To assess the magnitude and factors affecting occupational injuries among workers in Asella large flour factories.

**Benefit of the study:**-The participants will not get any direct benefit for being participated.

-The result will be used as a baseline for further studies that can be done in these areas.

-The result will be disseminated to Asella town Labour and social affairs to ministry of Labour and social affairs for designing prevention and control measures.

- If injuries occurred during data collection, the data collector/investigator will report to clinic of the industry or first aid will be given.

**Risk of the study:** the study has no any risk for the participant and interview also will be private to make safe participants from management related problems.

**Rights of the participant:** -participating and not participating is the full right and participants can stop from participation in the study at any time. And also the 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.

#### 1. Informed consent

I have read this form or it has been read to me in the language I comprehend and understood all conditions stated above. Therefore, I am willing to participate in this study.

Name of participant \_\_\_\_\_

Signature \_\_\_\_\_

Name of PI: misaye shiferaw Address: Tel. **091995912**

(E-mail) [misaye.shife@gmail.com](mailto:misaye.shife@gmail.com)

Signature \_\_\_\_\_

Interviewer: Code-----Name-----signature-----



የመቃወምና የማቋረጥ መብት፡-

በዚህ ጥናት ላይ የመሳተፍ ምሁራን የሥራ ስራ ለመግባት ያለባቸውን ጥያቄዎች ለማሟላት ለሚያስፈልጉት ጥያቄዎች ላይ ለመሳተፍ ለሚችሉት ሰዎች ለማቋረጥ ይቻላል፡፡

ለተጨማሪ መረጃ

1. ምሳዬ ሰፈራዊ

ስልክ: +251-911-99-59-12

E-mail: [misaye.shife@gmail.com](mailto:misaye.shife@gmail.com)

2. ፕ/ር አህመድ አሊ

ስልክ. +251-911-68-43-99 አቶ ወርቁ ተፈራ ስልክ: +251-913-62-05-14

2. የተሳታፊዎች የፈቃደኝነት ቅፅ

duration of project

ኢ-ሜይል [misaye.shife@gmail.com](mailto:misaye.shife@gmail.com)

ፊርማ -----

የጠያቂ መለያ ቁጥር ----- ስም ----- ፊርማ -----

መጠይቁ የተሞላበት ቀን ----- የተጀመረበት ሰአት ----- የተጠናቀቀበት ሰአት -----

ውጤት፡- 1. ተሟልቷል 2. ተጠያቂው አልተገኘም 3. ተቃውሞ 4. በከፊል ተሞልቷል  
ተሳታፊው/ዋ ፈቃደኛ ካልሆነ/ች ወደሚቀጥለው ይሸጋገሩ፡፡

የተቆጣጣሪው ስም ----- ፊርማ ----- ቀን -----

**AnnexIII**

Questionnaire identification number-----

: Part I socio-demographic characteristics of respondents Assessment of magnitude and Factors affecting work related physical injuries among workers in Asella Town large scale flour factories.

Questionnaire identification number-----

**Part I socio-demographic characteristics of respondents**

No	Question	Possible response	Code	Remark
101	Sex	1. Male 2. Female		
102	Age	-----in years		
103	Religion	1. Orthodox 2. Muslim 3 Protestant 4. Catholic 5. Others		
104	Marital status	1. Married 2. Single 3. Divorced 4. Widowed 5. Separated		

105	Educational status	1.Illiterate 2.read and write 3.Primary school(1-8) 4.Secondary school(9-12) 5.Technical and vocational 6. Degree or higher		
106	Employment pattern	1. Temporary 2. Permanent		
107	monthly income including over time	-----ETB/month		
108	Working Department	-----		
109	Work experience	----- in years		

**Questionnaire Identification number**-----

**Part II work related injury characteristics**

No	Question	Possible response	Code	Remark
201	Have you had an incident at work that resulted injury to you in the last 12 months	1. Yes 2. No		If no, skip to Q 301
202	Have you had an incident at work that resulted injury to you in the last 2 weeks?	1. Yes 2. No		
203	If yes for Q201 or 202, how many times?	1.-----in 12 months 2.----- in 2 weeks		
204	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.Chest1.Yes2.No 15.other ,specify		
205	Types of injury	1.Abrasion/laceration 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.Electrocution 1.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.back pain 1.Yes 2.No 14.Others, specify_____		

206	What were your reason(s) at the time of injury?	<p>1. I was new for the work process 1.Yes 2.No</p> <p>2. Thinking about private affairs 1.Yes 2.No</p> <p>3. Due to other medical problem 1.Yes 2.No</p> <p>4. I think accident is beyond control 1.Yes 2.No</p> <p>5. It is the working behaviour 1.Yes 2.No</p> <p>6. It is due to not using PPD/E 1.Yes 2.No</p> <p>7. I don't remember 1.Yes 2.No</p> <p>8. Others (specify)</p>		
207	sources of injury	<p>1.Machinery 1.Yes 2.No</p> <p>2.Hit by falling objects 1.Yes 2.No</p> <p>3.Electricity 1.Yes 2.No</p> <p>4.Splintering objects 1.Yes 2.No</p> <p>5.Collision with objects 1.Yes 2.No</p> <p>6.Fire 1.Yes 2.No</p> <p>7.Hand tools 1.Yes 2.No</p> <p>8.Falls 1.Yes 2.No</p> <p>9. Hot substances 1.Yes 2.No</p> <p>10.Acid and acidic substance 1.Yes 2.No</p> <p>11.Lifting heavy objects 1.Yes 2.No</p>		

		12.Others ,specify		
208	Were you hospitalized due to injury	1.yes 2.No		
209	If yes for Q208, how long it takes (hours)	-----		

**Questionnaire ID:** \_\_\_\_\_

**Part -III-Working environment and ergonomic related variables**

No	Question	Possible response	Code	Remark
301	Hours worked per week	-----		
302	Regular health and safety supervision	1.Yes 2.No		
303	Have you had safety training in connection with new employment, equipment, or Work process?	1.Yes 2.No		
304	Does your work involve manual handling activity (pulling, pushing, carrying, and lifting)?	1.yes 2.No		
305	If yes for Q304 On average how much weight did you handled per day?	1.light (not greater than 5kg) 2. medium (6-25kg) 3. heavy (25-50)kg 4.very heavy (greater than 50kg)		

306	On average how much time did you spend at this work per day	Not more than 2 hours. 4.hours 4 hours and above		
307	Did your work need visual concentration?	1.Yes 2.No		
308	Do you use vibrating tools at your work place?	1. Yes 2. No		
309	If your answer for Q308 is yes for how long per day	1.Not greater than 1 hour 2. 2-4 hours 3. greater than 4 hours		
310	Are machines you are working with always guarded or installed with safety devices?	1. Yes 2. No		
311	Are machines you are working wital ways maintained immediatly when old or unsafe?	1. Yes 2. No		

**Questionnaire ID** \_\_\_\_\_

**Part-IV- Workers behaviour and characteristics**

No	Question	Possible response	Code	Remark
401	Do you smoke?	1.Yes 2.No		If no skip to Q403
402	If yes for Q401, how often?	1.Every day 2.1-3 days/ week 3.Ocassionally		
403	Do you drink alcohol?	1.Yes 2.No		If no skip to Q405
404	If yes to Q403, how often?	1.Every day 2. 1-3days/wk3.Ocassionally		

405	Do you chew chat?	1.Yes 2.No		If no skip to Q407
406	If yes to Q405, how Often	1.Every day 2.1-3 days/wk. 3.Ocassionally		
407	Do you have any sleeping disorders	1.Yes 2.No		
408	If yes to Q407, what is the reason	1.Working greater than 8 hours with out Shifting 1.Yes 2.No 2.Working in evening 1.Yes 2.No 3. Trying to work more than one task ata time 1.Yes 2.No 4.Excessive heat 1.Yes 2.No 5.Others,Specify_____		

**Questionnaire ID \_\_\_\_\_**

No	Question	Possible response	Code	Remark
409	Are you satisfied with your job or task required to do at present?	1.Yes 2.No		
410	Do you use any personal protective device while you are working?	1.Yes 2.No		
411	If yes to Q410 what type?	1.Glove 1.Yes 2.No 2.Ear plug 1.Yes 2.No		

		3.Respirators 1.Yes 2.No 4.Helmet 1.Yes 2.No 5.Overalls 1.Yes 2.No 6.Goggles 1.Yes 2.No 7.Face shield 1.Yes 2.No 8.Boots /shoes1.Yes 2.No 9.Others, specify _____		
412	What were your reasons for not using personal protective equipment?	1.Lack of provision 1.Yes 2.No 2.I don't know how to use it 1.Yes 2.No 3.Not comfortable to use 1.Yes 2.No 4.Decrease work performance 1.Yes 2.No 5.Create safety and health hazards 1.Yes 2.No 6.Others,specify _____ _____		

That is the end of our questionnaire. Thank you very much for taking time to answer these questions. We appreciate your he

**የጥያቄ መለያ ቁጥር-----ክፍል አንድ: ማህበራዊና ስነ ህዝባዊ ገፅታዎችን በተመለከተ**

ተ.ቁ.	ጥያቄ	አማራጭ መልሶች	ኮድ	መሸጋገሪያ
101	ጾታ • ••	1. ወንድ      2. ሴት		
102	እድሜ	... ዓመት		

103	ሀይማኖት	1. አርቶዶክስ 2. ሙስሊም 3. ፕሮቴስታንት 4. ካቶሊክ 5. ሌላ		
104	የጋብቻ ሁኔታ	1. ያገባ/ች 2. ያላገባ/ች 3. የፈታ/ች 4. የትዳር አጋር በሞት የተለየ/ች 5. ተነጣጥለው የሚኖሩ		
105	የትምህርት ደረጃ	1. ማንበብና መጻፍ የማይችል/ትችል 2. ማንበብና መጻፍ 3. የመጀመሪያ ደረጃ ትምህርት(1-8) 4. የሁለተኛ ደረጃ ትምህርት(9-12) 5. ሙያና ቴክኒክ 6. የመጀመሪያ ድግሪና ከዚያ በላይ		
106	የቅጥር ሁኔታ	1. በጊዜያዊነት 2. በቋሚነት		
107	የወር ገቢ	-----ብር		
108	የስራ ክፍል	-----		
109	የስራ ልምድ	-----ዓመት		

የጥያቄ መለያ ቁጥር-----

ክፍል ሁለት፡ የስራ ላይ ጉዳትን በተመለከተ

ተ.ቁ.	ጥያቄ	አማራጭ መልሶች	ኮድ	መሸጋገሪያ
201	ባለፉት አስራ ሁለት ወራት ውስጥ ከስራዎ ጋር በተያያዘ የደረሰበዎት አደጋ አለ?	1. አዎ 2. የለም		መልሰዎ የለም ከሆነ ወደ ጥያቄ ቁጥር 301 ይሸጋገሩ
202	ባለፉት ሁለት ሳምንታት ውስጥ ከስራዎ ጋር በተያያዘ የደረሰበዎት አደጋ አለ?	1. አዎ 2. የለም		

203	ለጥያቄ ቁጥር 201 እና 202 መልሰዎ አዎ ከሆነ ለስንት ጊዜ?	1..ባለፉት 12 ወራት ውስጥ---- ጊዜ 2.ባለፈት ሁለት ሳምንታት----ጊዜ		
204	ጉዳት የደረሰበት የሰውነትዎ ክፍል	1. አይን1.አዎ 2.የለም 2. ጥርስ 1.አዎ 2.የለም 3. እጅ 1.አዎ 2.የለም 4. ጆሮ 1.አዎ 2.የለም 5. ጉልበት 1.አዎ 2.የለም 6. ዕግር 1.አዎ 2.የለም 7. የእግር ጣት 1.አዎ 2.የለም 8. ራስ 1.አዎ 2.የለም 9. የላይኛው ክንድ 1.አዎ 2.የለም 10. የታችኛው ክንድ 1.አዎ 2.የለም 11. ከጉልበት በላይ ያለው እግር 1.አዎ 2.የለም 12. ከጉልበት በታች ያለው እግር 1.አዎ 2.የለም 13. ጀርባ 1.አዎ 2.የለም 14. ደረት 1.አዎ 2.የለም 15.ሌላ ካለ ይገለፅ-----		
205	የጉዳቱ አይነት	1.ጭረት/መላጥ 1. አዎ 2. የለም 2.መቆረጥ 1. አዎ 2. የለም 3.ቃጠሎ 1. አዎ 2. የለም 4.መውጋት 1. አዎ 2. የለም 5.ስብራት 1. አዎ 2. የለም 6.ወለምታ 1. አዎ 2. የለም 7.ተቆርጦ መውደቅ 1. አዎ 2. የለም 8.በኤሌክትሪክ መያዝ 1. አዎ 2. የለም		

		<p>9.መታፈን 1. አዎ 2. የለም</p> <p>10. የጆሮ ጉዳት 1. አዎ 2. የለም</p> <p>11. የአይን ጉዳት 1. አዎ 2. የለም</p> <p>12.መመረዝ 1. አዎ 2. የለም</p> <p>13.የወገብ ህመም 1. አዎ 2. የለም</p> <p>14.ሌላ ካለ ይገለጹ _____</p>		
206	አደጋው ለምን የደረሰበዎ ይመስለዎታል?	<p>1. ለስራው ሂደት አዲስ ነበርኩ 1. አዎ 2. የለም</p> <p>2. ስለ ግል ህይወቴ እያሰብኩ ነበር 1. አዎ 2. የለም</p> <p>3. ሌላ የጤና ችግር ስለነበረብኝ 1. አዎ 2. የለም</p> <p>4. አደጋን መከላከል ስለማይቻል ነው ጉዳቱ የደረሰብኝ 1. አዎ 2. የለም</p> <p>5. የስራው ባህሪ ስለሆነ ነው 1. አዎ 2. የለም</p> <p>6. የአደጋ መከላከያ ባለማድረግ ነው 1. አዎ 2. የለም</p> <p>7. አላስታውስም 1. አዎ 2. የለም</p> <p>8. ሌላ ካለ ይጠቀሱ-----</p>		
207	የጉዳቱ መንስኤ ምን ነበር	<p>1. ማሸን 1. አዎ 2. የለም</p> <p>2. የሚወድቁ ነገሮች 1. አዎ 2. የለም</p> <p>3. ኤሌክትሪክ 1. አዎ 2. የለም</p> <p>4. የሚፈናጠሩ ነገሮች 1. አዎ 2. የለም</p> <p>5. ከእቃ ጋር መጋጨት 1. አዎ 2. የለም</p> <p>6. እሳት 1. አዎ 2. የለም</p> <p>7. የዕጅ መሳሪያዎች 1. አዎ 2. የለም</p> <p>8. መውደቅ 1. አዎ 2. የለም</p> <p>9. ሞቃት ነገሮች 1. አዎ 2. የለም</p> <p>10. አሲድና አሲዳማ ነገሮች 1. አዎ 2. የለም</p> <p>11. ከባድ ዕቃ ማንሳት 1. አዎ 2. የለም</p> <p>12. ሌላ ካለ ይጠቀሱ -----</p>		

208	በአደጋውምክንያት በጤና ተቋም ወይም በቤት ውስጥ አልጋ ይዘው ነበር	1. አዎ 2. የለም		
209	ለጥያቄ ቁ.208 መልሰዎ አዎ ከሆነ ለምን ያህል ጊዜ( በሰዓት)	-----ሰዓት		
210	በአደጋው ምክንያት ከስራ የቀሩበት ቀናት			

**ክፍል ሶስት፡ የስራ ቦታንና ኤርጎኖሚካል ጥናቶችን በተመለከተ**

ተ.ቁ.	ጥያቄ	አማራጭ መልሶች	ኮድ	መሸጋገሪያ
301	በሳምንት በአማካይ ምን ያህል ሰዓት ይሰራሉ?	ሰዓት		
302	በመደበኛ የስራ ቦታ የሙያ ደህንነትና ጤንነት ቁጥጥር ተደረጎ ያውቃል	1.አዎ 2. የለም		
303	የሙያ ደህንነትና ጤንነት ስልጠና ወስደው ያውቃሉ?	1.አዎ 2. የለም		
304	በስራ ቦታዎ ከፍተኛ ዕቃ የማንሳት፣ የማጓጓዣ፣ መግፋትና የመሸከም መሳሰሉትን ስራ ያከናውናሉ?	1.አዎ 2. የለም		
305	ለጥያቄ ቁ.304 መልሰዎ አዎ ከሆነ በቀን በአማካይ ምን ያህል ክብደት ያነሳሉ?	1. ቀላል (ከ5ኪ.ግ የማይበልጥ) 2. መካከለኛ (ከ6-10ኪ.ግ) 3. ከባድ (ከ11-20ኪ.ግ) 4. በጣም ከባድ (ከ 20ኪ.ግ የሚበልጥ)		
306	በአማካይ በዚህ ስራ ላይ ለምን ያህል ጊዜ ይቆያሉ?	1. ሰዓት ያነሰ 2.	h2 h2-4	

		<p>ሰአታት</p> <p>3. ሰአታት በላይ</p> <p>h 4</p>		
307	ስራዎ የማየት ትኩረትን የሚሻ ነውን?	<p>1. አዎ(ጥቃቅን ነገሮችን በትኩረት አመለከታለሁ ≤50ሴ.ሜ)</p> <p>2. አልመለከትም(ጥቃቅን ነገሮችን በትኩረት አልመለከትም&gt;50ሴ.ሜ)</p>		
308	በስራ ቦታዎ እርግ-በግቢት ያለባቸውን መሳሪያዎች ይጠቀማሉ?	1.አዎ 2. የለም		
309	ለጥያቄ ቁ.308 መልሰዎ አዎ ከሆነ ለምን ያህል ጊዜ?	<p>1. ከ1 ሰአት አይበልጥም</p> <p>2. ከ2-4 ሰአት</p> <p>3. ከ4 ሰአት በላይ</p>		
310	ስራ በሚሰሩበት ጊዜ የሚሰሩበት ማሽን ክላል አለው?	1.አዎ 2. የለም		
311	ማሽኑ ሲበላሽ በወቅቱ ጥገና ይደረግለታል?	1.አዎ 2. የለም		

የመለያ ቁጥር-----

ክፍል አራት: የሰራተኞችን ባህሪ በተመለከተ

ተ.ቁ.	ጥያቄ	አማራጭ መልሶች	ኮድ	መሸጋገሪያ
401	ያጨሳሉ?	1.አዎ 2. የለም		መልሰዎ የለም ከሆነ ወደ ጥያቄ ቁ.403 ይሸጋገሩ
402	ለጥያቄ ቁ.401 መልሰዎ አዎ ከሆነ በስንት ጊዜ	<p>1. በየቀኑ 2 ከ.1-3 ቀን በሳምንት</p> <p>3. አልፎ አልፎ</p>		
403	ያጨሳሉ?	1.አዎ 2. የለም		መልሰዎ የለም ከሆነ ወደ ጥያቄ ቁ.405ይሽጋገሩ

404	ለጥያቄ ቁ.403 መልሰዎ አዎ ከሆነ በስንት ጊዜ	1.በየቀኑ 2 ከ.1-3 ቀን በሳምንት 3. አልፎ አልፎ		
405	ጫት ይቅማሉ?	1.አዎ 2. የለም		መልሰዎ የለም ከሆነ ወደ ጥያቄ ቁ.407ይሽ ጋገሩ
406	ለጥያቄ ቁ.405 መልሰዎ አዎ ከሆነ በስንት ጊዜ	1. በየቀኑ 2 ከ.1-3 ቀን በሳምንት 3. አልፎ አልፎ		
407	ስራ ላይ እያሉ የእንቅልፍ ችግር አለበዎት	1.አዎ 2. የለም		መልሰዎ የለም ከሆነ ወደ ጥያቄ ቁ.409ይሽ ጋገሩ
408	ለጥያቄ ቁ.407 መልሰዎ አዎ ከሆነ ምክንያቱ ምንድን ነው?	1.ያለ ዕረፍት/ቅያሬ ከ8 ሰአት በላይ መስራት 1. አዎ 2. የለም 2.በምሽት መስራት 1. አዎ 2.የ ለም 3. በእንድ ጊዜ ከእንድ በላይ ስራ መስራት 4.ከፍተኛ የሙቀት ጫና 1. አዎ 2.የ ለም 5.ሌላ ካለ ይጠቀስ -----		
409	በአሁኑ ጊዜ በስራዎ ደስተኛ ነዎት	1.አዎ 2. የለም		
410	በስራ ቦታዎ የአደጋ መከላከያዎችን ይጠቀማሉ	1.አዎ 2. የለም		
411	ለጥያቄ ቁ.410 መልሰዎ አዎ ከሆነ ምን አይነት	1.ጓንት 1. አዎ 2. የለም 2.የጀሮ መከላከያ 1. አዎ 2. የለም 3.የአፍና የአፍንጫ መከላከያ 1. አዎ 2. የለም 4.የጭንቅላት መከላከያ 1. አዎ 2. የለም 5. ሁሉንም የሰውነት ክፍል 1. አዎ 2. የለም 6.የአይን መከላከያ መነፅር 1. አዎ 2.		

		የለም 7.የፊት መሸፈኛ 1. አዎ 2. የለም 8.ቦታ/ቆዳ ጫማ 1. አዎ 2. የለም 9.ሌላ ካለ ይገለፅ -----		
412	ለጥያቄ ቁ.410 መልሰዎ የለም ከሆነ ምክንያትዎ ምንድን ነው	1.የመከላከያ መሳሪያዎች አቅርቦት ባለመኖሩ 1.አዎ 2.የለም 2.ስለ አጠቃቀሙ ስልጠና ስለማይሰጥ 1.አዎ 2.የለም 3.ለአጠቃቀም ስለማይመች 1.አዎ 2.የለም 4.የስራ ቅልጥፍናን ስለሚቀንስ 1.አዎ 2.የለም 5.ሌላ የሙያ ደህንነትና ጤንነት ጠንቅ ስለሚፈጥር 1.አዎ 2.የለም 6.ሌላ ካለ ይገለፅ -----		

ይህ የመጠይቃችን መጨረሻ ነው። እነዚህ ጥያቄዎች ጊዜ ወስደው በመመለስ ላደረጉልን ትብብር ክልብ እናመሰግናለን

**Annex V. Observational checklist for the work environment**

Name of industries (Code) \_\_\_\_\_

Name of the working Department \_\_\_\_\_

Hazards in the working industries

1. Is there excessive heat in the workplace? 1. Yes 2. No, Yes requires that a worker is found sweating when naked or with light clothing or if data collector or investigator feels sudden heat wave when entering to the industry.

2. Is there excessive noise in the workplace? 1. Yes 2. No, yes requires when that is difficult to communicate with nearby workers without shouting.

3. Is there excessive dust in the work place? 1. Yes 2. No , Yes requires if the investigator experiences sudden sneezing upon entering or if worker’s eye brows, hair, nostrils and close is observed to be covered with dust particles.

4. Is there posted warning signs or safety rules in the working department? 1. Yes 2. No, yes requires no lack of such signs or posts while inspection around.

5. Do the employees use the necessary personal protective devices? 1. Yes 2. No

Yes requires no lack of such specific PPE for specific work place and used by each workers while inspection around.

6. Do all production equipment's have appropriate process flow?  
 1. Yes 2. No, yes requires no lack of such arrangement while inspection around.
7. What is the most dangerous incident in the working department during inspection? \_\_\_\_\_
8. Was there any preventive measures implemented? 1. Yes 2. No, Yes requires  
 Specification of preventive measures.
9. Does the industry have copy of the most important safety and health regulation?  
 1. Yes 2. No, Yes requires showing a copy of the regulation?
10. Does the industry have safety and health personnel? 1. Yes 2. No , Yes requires either  
 implementation as result of initiatives from health and safety inspector or written action  
 worked out with them, presence of the person? 11. Does the industry follow Health and safety  
 system implementation? 1. Yes 2. No, Yes requires the completion of at least one of the  
 implementations (reporting system and format, responsibility, safety committee, personnel  
 meeting reporting).
12. Does the working department have first aid equipment? 1. Yes 2. No, Yes  
 requires the presence of first aid equipment during data collection.







