Impact of Occupational Health and Safety on Workers' Productivity in Textile Industries in Addis Ababa

By

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This is to certify that the thesis prepared by Mengistu Gadisa, entitled: Impact of Occupational Safety and Health on Workers' Productivity in Textile Industries in Addis Ababa and submitted in partial fulfillments of the requirements for the degree of master of science (Mechanical and Industrial Engineering) complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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Declaration

I hereby declare that the work which is being presented in this thesis entitled "Impact of Occupational Safety and Health on Workers' Productivity in Textile Industries" is original work of my own and has not been presented for a degree of any other university and all the resources of references used for the thesis have been duly acknowledged.

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This is to certify that the above declaration made by the author is correct to the best of my knowledge.

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ACRONYMS

ILO: - International labor Organization

WHO: - World Health Organization

MOLSA: - Ministry of Labor and Social Affairs

COR: - Crude Odds Ratio

PPE: -Personal Protective Equipment

SPSS: - Statistical package for social sciences

PPE: - Personal Protective Equipment

TTD: - Temporary total disability

PPD: - Permanent partial disability

GDP: - Gross Domestic Product

PTD: - permanent total disability

OSH: - Occupational safety and health

FEV: -Forced Expiratory Volume

FVC: -forced volume capacity

CSA: - Central Statistical Authority

PLC: - private limited company

ETIDI: -Ethiopian Textile Industry Development Institute

BLSA Bureau of Labor and Social Affair

Abstract

The study was conducted to investigate the impact of occupational health and safety workers' productivity of textile industries in Addis Ababa city. Several industries have key workers with personal protective device but with no practically trained. Diseases and accidents result not only fatality of the workers but also in productivity reduction and financial impact on textile industries even though the top management of the industries may not fully understand the impact of occupational health and safety on workers' productivity. The data collection method was based on the questionnaire survey, interview, and observation in five selected textile industries in Addis Ababa. This study indicated that workers' productivity was reduced based on the data obtained from the five industries. The accidents were notified as body injuries on workers as mortal and disability. The common cause of occupational accidents in textile industries were transporting objects, design work place, manual material handling, overload, fatigue, stress, lower performance increased irritability, slippery, machine, and dust particle. Common type of injuries in textile industries were burn, abrasion cut, piercing ,puncture ,fracture, eyes injury and others. Commonly affected body parts were finger, hand, tooth, back bone, eyes injuries and toe. The common cause of occupational diseases in textile industries were heavy chemical, air dust particle, extreme temperature, working position sitting, and standing, repetitive motion and task are more causes diseases in employees. The commonly diseases in textile industries were allergic, hypersensitivity, headache, typhus, pneumonia, otitis, respiratory track, typhoid, dyspnea and others. Less attention for providing the necessary personal protective device and accommodations significantly contributes to safety and health problems in textile industries with the result on workers' productivity in textile industries. The results showed that because of work related diseases 162 male and 920 female workers were absent from their work at least for three days in those five case companies. This concern is a public health issue that goes beyond the injured employee to affect the entire society. When the employees' ability to earn is disrupted by an event such as Workplace disease the financial stability of the family is seriously threatened. Because of the above reason total of 1902 working days were lost annually. During the lost days, absent workers from work were paid for medical treatment and salary, accident and injury, compensation, lose or reduction of production capacity due to inexperienced workers, loss of customers resulted from being unsatisfied of the less production capacity. Training for new employees for safety and health related issues also call for additional unproductive expenditure from the companies. 58 people were injured due to various contributing condition at work place of the five textile companies covered in this study and among these 40 (68.9%) were female workers. Due to this injury problem 505 working days were lost in one year. this research, ways to improve impacts of occupational health and safety on worker productivity in textile industries.

Keywords: Occupational health and safety, performance, employees' accidents, diseases and productivity

CHAPATER ONE

1. INTRODUCTION

1.1. Background and problem justification

Nowadays, occupational health and safety is one of the most important aspects of human concern. It aims at adaptation of working environment to workers for the promotion and maintenance of the highest degree of physical, mental and social wellbeing of workers in all occupations. According to the International Labor Organization ILO (2014) every day, 6,300 people die as a result of occupational accidents or work-related diseases and more than 2.3 million deaths per year. However, 317 million accidents occur on the job annually due to poor health and safety policies at work (1)**.** These deaths and accidents resulted not only fatality of the workers but also in productivity reduction and economic crises of nation at large. It is estimated that around 4% of annual worldwide GDP, or $1,250 billion, is absorbed by the direct and indirect costs of work accidents and occupational diseases. Indirect cost (over time, training and lost productivity) are empirically believed to be about two to five times the direct cost associated with these unsafe and healthy work practices which could raise the global percentage of GDP lost. Most of the world's work-related deaths, injuries and illnesses are Preventable (2)**,** (3)**.**

In sub-Saharan Africa, the fatality rate per 100,000 workers is 21 and each year 54,000 workers die and 42 million work related accidents take place that cause at least three days' absence from work (4). However, the textile industry has been identified as one of the most hazardous industries in many parts of the country. In Ethiopia studies in Textile Industries showed that the prevalence of work related injury 265 per 1100 exposed workers and individual, job and organization related factors are associated (5) **.**

The manufacturing industries particularly, textiles sector poses many hazards that can cause injury to workers, from transport in the workplace, exposure to excessive noise and harmful substances, dangerous large work equipment and plant, risk of slips from a wet working environment, manual handling and working with unsafe machinery, risks of fire and explosions (6). Most of the accidents in workplaces happened due to combination of various complex hazard factors. The leading causes of work related hazards in Textile Industries include physical

hazards, biological hazards, mechanical hazards and chemical hazards. These hazards are mostly prevalent in Textile Industries of the study area.

1.2. STATEMENT OF THE PROBLEM

Studies done on occupational safety and health in different sectors of manufacturing industries have revealed that occupational accidents and diseases were prevalent in different industries. Some study conducted in Ethiopia found prevalence of many types of occupational injuries affecting different parts of the body and it is the cause for hospitalization and working days lost (7). Although, there are various reasons for the poor occupational health and safety practices in developing countries.

According to a report of Ethiopian Ministry of Labor and Social Affairs (**MOLSA, 2015**), from 279 establishments in year 20014/15 a total of 5135 work related accidents were reported and among which 5092(99.16%) were non-fatal. This resulted a cost of 2,195,960.74ETB for medical case and an absent of 12,612 work days by injured employees. According to MOLSA report of 2014/15 in manufacturing industries 2856(56.62%) victims were registered as work relate accidents and diseases, in which textile industries is one of the most hazards sectors. Textile industries suffer markedly higher rate of fatal and non-fatal injuries to workers (8) because these industries have made massive employment for both skilled and unskilled workers.

In summary, the following problems were identified.

- Less consideration were given to occupational health and safety for work place health and safety in textile industries.
- Textile industries only focus on productivity improvement without procedure that to help increase production and job motivation.
- Lack of training and awareness creation practice in textile industries
- Management commitment problem with regards to occupational health and safety practice.

In textile industries, few researchers conducted studies concerning the impact of occupational safety and health which specifically assessed and determined the problem in these industries. Therefore, this study intended to be carried out to fill the gap by identifying the prevalence of occupational accidents, diseases and the related causing factors among textile industries workers in Addis Ababa.

Furthermore, the studies were identified the most common occupational accidents, diseases and factors causes on workers' productivity of the textile industries in Addis Ababa.

Furthermore, the studies were identified the most common occupational accidents, diseases and factors causes on workers' productivity of the textile industries in Addis Ababa.

1.3. Research Questions

- What gaps do exist in previous studies?
- What are the works related accidents and diseases in textile industries?
- What are the major common causes of occupational accidents and occupational diseases, and their impacts on workers' productivity in textile industries?
- How to come up with occupational health and safety problem improvements?

1.4. Objectives of the Study

1.4.1. General objective

- The main objective of this study is to investigate the impact of occupational health and safety on workers' productivity in textile Industries in Addis Ababa.

1.4.2. Specific objectives

To address the general objective of the study, the following specific objectives are identified:-

- Identifying existing literature gaps
- Identifying the common occupational related accidents and diseases in Textile Industries in Addis Ababa
- Investigating the major cause of occupational accidents and diseases impact on workers' productivity in Textile industries in Addis Ababa
- To develop corrective actions to be taken in improving impacts of occupational health and safety on workers' productivity.

1.5 Scope of the study

This study focused on studying the impact of occupational health and safety on workers' productivity in selected Textile Industries in Addis Ababa. The study cover to identify the work related diseases and injuries, time lost, cost ,due to injuries and illness at work place causes assess in production area in textile industries in Addis Ababa city. In more specific terms, the

production area was targeted in the industries. The above section of working area was selected since it the most hazardous area of industries as the workers are exposed directly to the cotton dust and number of occupational hazards affect workers performance.

1.6. Limitations of the Study

As the nature of the study mainly depends on the quantity and quality of the collected data, the depth of this study is limited by some factors. Among these: mainly the researcher got no financial support to investigate more facts and information, and also limited availability infrastructure in accomplishing the study.

1.7. Significance of the Study

Impact of occupational health and safety are major problem that affect the workers performance, efficiency, and health that leads to the reduction of the organization productivity. Exposure assessment and prevention play a great role to increase the productivity and workers satisfaction of an organization. The significance of this study is to provide the basis for the formulation of an effective health and safety policy which addresses specific health and safety needs that ultimately enhance the performance of the work force of any country, most especially Textile Industries. The study could also serve as a reference material for either decision makers of health and safety policies or students in academic research.

1.8. Organization of the study

The study organized in seven chapters. The first chapter presents the back ground to study, problem statement, and objectives (both general and specific). It also included research questions, significance, scope, as well as the limitation of the study. The second chapter deals with literature review on the concepts and core issues of the study. Chapter three deals with over views of the study companies textile industries in Ethiopia. The fourth deals with research design and methodology of the study. The fifth chapter deals with data analysis and presentation. Chapter six focuses on actions and procedures for improving productivity of workers in textile industries. The seventh chapter presents the conclusion and recommendation**.**

Chapter two

2. Related Literature Review

The literature review focuses on the presentation and discussion of key concepts used in the study. This historical background information of occupational accidents and diseases issues, for textile industries, special attention is given for textile industries. there are several themes in the literature review, covering global trend of occupational accidents and fatal work-related diseases ,economic impact of occupational accidents and diseases ,prevalence of occupational accidents and diseases of developing countries and factors affecting accidents, diseases in textile industries .the review being with discussing the basic concepts impact of occupational accidents and disease on employees' performances..

2.1. The Concept of Occupational Safety and Health

Safety involves more than the typical dictionary definition of "free from accident". The World Health Organization, (1999) defines health as a "state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity". ***Occupational safety and health*** is the discipline with the preserving and protecting human resources and factory equipment in the work place. The duties of the national health services in occupational health, especially in developing countries, may include setting health standards and norms; providing day-to-day preventive health services at work places in collaboration with employers; monitoring exposures to environmental hazards at work, training personnel; providing health education for employers and workers; carrying out field investigations and research; and under taking evaluation and follow up activities, together with requisite statistical work (9).

According to the International Conference of Labor Statistics **(1998), occupational accident** could also be defined as an unexpected and unplanned occurrence, including acts of violence, arising out of or in connection with work which results in one or more workers incurring ``a personal injury, disease or death.

Occupational injury according to the **ILO, (2005**), is defined as "death, any personal injury or disease resulting from an occupational accident" whiles **Occupational disease** is defined as "a disease contracted as a result of an exposure to risk factors arising from work activity". **A fatal occupational injury** occurs when an accident at work leads to the death of the victim whether immediately or not, and this varies among countries. **A non-fatal occupational injury** refers to

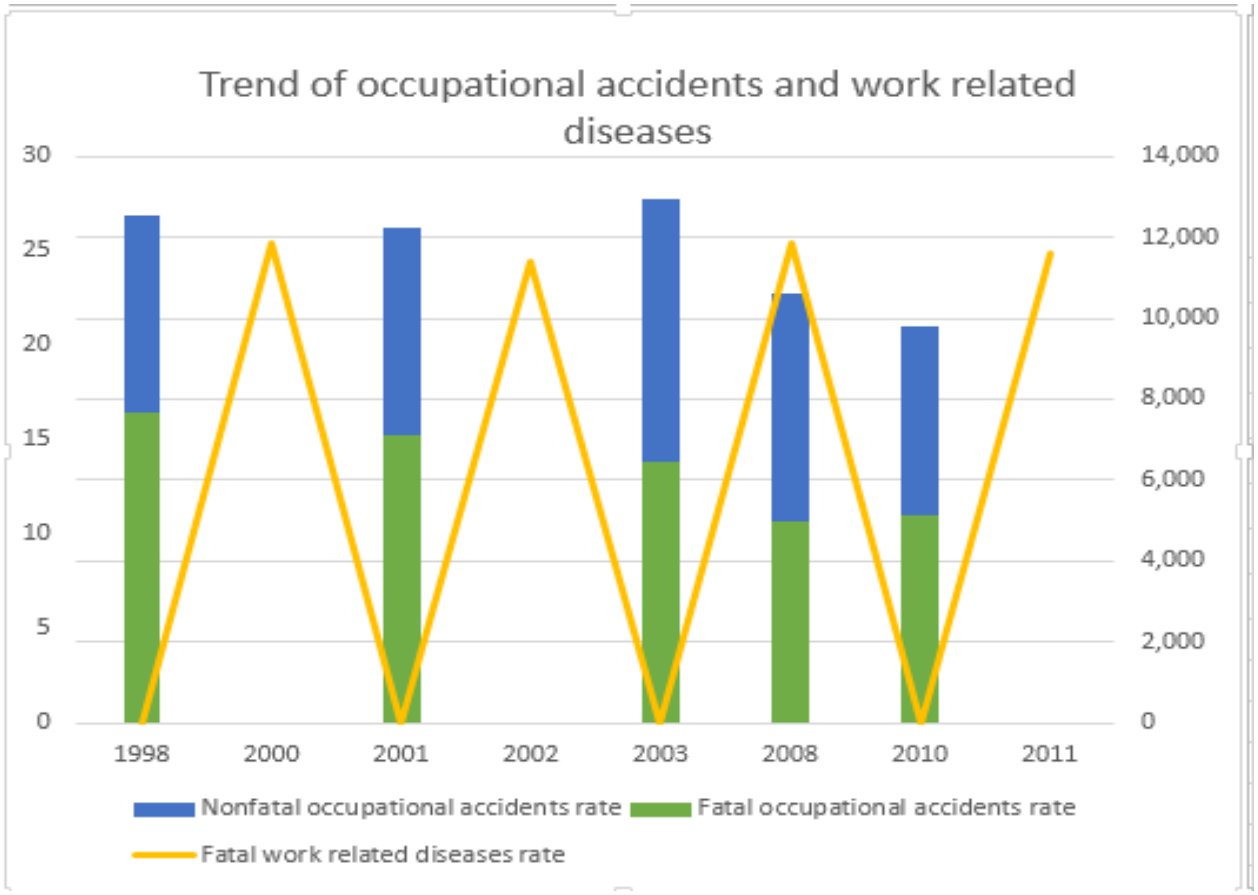
an accident that does not result in the death of the person, thus this refers to any injury that the victim sustains (9)**.**

The duties of the national health services in occupational health, especially in developing countries, may include setting health standards and norms; providing day-to-day preventive health services at work places in collaboration with employers; monitoring exposures to environmental hazards at work, arranging for the ambulatory treatment of workers; training personnel; providing health education for employers and workers; carrying Out field investigations and research; and under taking evaluation and follow up activities, together With requisite statistical work (10)

2.2. Global trend of occupational accidents and fatal work-related diseases

Information of occupational accidents is not standardized worldwide. Especially, developing countries do not have reliable information on their occupational accidents due to lack of proper recording and notification systems. Global estimates of occupational accidents are presented for 175 countries, in 1998 the average estimated number of fatal occupational accidents was 350 000 and there were 264 million non-fatal accidents (11)**.** Currently, work place safety is considered by World Health Organization (WHO) a priority setting for health promotion in the 21st century (WHO, 2010). In order to bring an accelerated sustainable economic and social development, a country needs to have health and safety certified workforce to improve productivity. Workplace safety and health impact is one of the main driving economic and social development pillar factor. Previously, it was given less consideration due to the fact that the focus was on the short term profit of business than safe workplace consideration. Thus, workplace safety and health was given less courtesy for a long period of time. ILO and WHO reports indicated that in manufacturing industries many employees suffer from workplace injuries and property damage resulted in economic crisis (**ILO,2010; WHO,2010**).According to the global estimates, occupational accidents and work-related diseases result in over 2.3 million fatalities' annually (below the table 2.1). In 2010, there were over 350,000 fatal occupational accidents and over 1.9 million fatal work-related diseases. Consequently, approximately 6,300 people die every day because of these causes; occupational accidents killed over 960 people and approximately 5,400 died from work-related diseases. There were also over 313 million non-fatal occupational accidents (with at least four days absence) in 2010 meaning that occupational accidents cause injury or ill health for approximately 860,000 people every day (12)**.**

Figure 2: 1 Trend of occupational accidents and work related disease *(12)*.



When we see fatal occupational accidents rate and non-occupational accidents rate are 1998,2001,2003,2010 (16.4, 15.2, 13.8 and, 11 fatal work related accidents & 12534, 12218, 12966 and 9786 non-fatal work related accidents rate) respectively .

The highest work related diseases rate in years 2000, 2002, 2011(12.43, 24.4 and 24.82) fatal work related diseases rate occurs respectively.

2.3. Work-related Mortality by Causes

The highest work-related problems: fatal work-related cancers (29%), circulatory diseases (33%) and fatal occupational injuries (15%) are the main work-related burden globally. The proportion of communicable diseases (10%) has decreased quite dramatically from previous estimate of 25%.While the burden from communicable diseases has reduced, circulatory diseases have increased. This is quite understandable, as life expectancy has increased with time and public hygiene was improved contributing to lower deaths from communicable diseases (12).

2.4. Work-related diseases by region

Recent as 2011, there were still approximately 2 million fatal work-related diseases occurring in the world (table2:1).The largest groups of work-related diseases worldwide are cancers, circulatory diseases and communicable diseases. Table2:1 show work-related mortality according to region. It can be seen that in all regions except for the AFRO region, the proportion of diseases generally followed the proportions for the world (12)**.**

Table 2: 1Global estimated of fatal work diseases by region *(12).*

Causes	HIGH	AFRO	AMRO	EMRO	EURO	SEARO	WPRO
Communicable diseases	11 031	85740	6972	19964	4542	85743	16525
Malignant neoplasms	211890	30078	43931	24734	56527	94834	204215
Neuropsychiatric conditions	22565	3533	2945	2496	1009	6505	3933
Circulatory diseases	110 399	54188	46232	46563	139181	223872	207025
Respiratory diseases	24 964	7128	7649	9444	5364	68419	46688
Digestive diseases	3 113	4239	2354	1409	2860	8206	2476
Genitourinary diseases	3520	1642	1666	1081	733	6896	2237
TOTAL	387 482	186549	111749	105692	210216	494474	483100

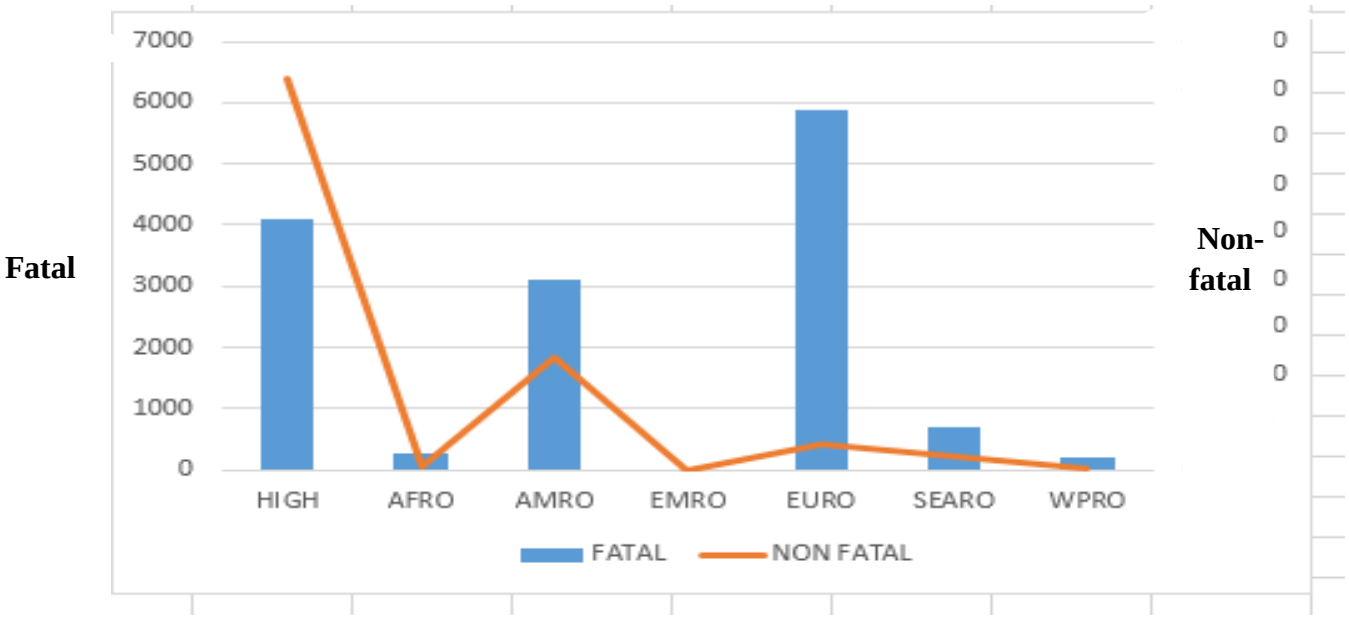
The most commonly indicated diseases in the survey by regions (Table2:1) are communicable disease more occurred in Low- and middle- income countries of the African Region**(AFRO)** and Low- and middle- income countries of the South East Asia Region**(SEARO)** regions with more than 85,000 illness. Neuropsychiatric conditions diseases are more in Low- and middle- income countries of the Americas **(AMRO)** and Low- and middle- income countries of the Eastern Mediterranean Region **(EMRO)** with more than 2000 of diseases occurrences. Genitourinary diseases are much common in AFRO and AMRO regions with more than 1600 diseases. Malignant neoplasms are much common in High income countries **(HIGH)** and Low- and middle- income countries of the Western Pacific Region (**WPRO)** regions with more than

46,000 diseases. Circulatory disease is also common in AMRO and EMRO countries. Respiratory diseases and digestive disease are also seen in different regions in 2011. The number of occupational diseases is increasing in many developing countries.

2.5. Occupational accidents by region

Globally, the estimates of occupational accidents are presented by region and the occupational accidents had occurred in the SEARO and WPRO regions. In both regions, the percentage of non-fatal occupational accidents comprised approximately 65% of all non-fatal occupational accidents in the world, with an equal load between these regions (33% each). Fatal occupational accidents had increased in the HIGH, AMRO and Low- and middle- income countries of the European Region **(EURO)** regions and had decreased in others. Non-fatal occupational accidents had increased in the AFRO, AMRO and SEARO regions and decreased in others (12)**.**

Figure 2: 2 the number of occupational accidents in 2010 by region *(12)*



2.6. Prevalence of occupational accidents of developing countries

In Sub-Saharan Africa countries slightly more than 54 000 fatal occupational accidents happen annually. According to Global estimates of occupational accidents 42 million work-related accidents took place that cause at least 3 days_ absence from work. Due to the fatality rate of the region is 21 per 100000 workers and the accident rate per 100000 workers is 16000 (13). Occupational accidents reported to ILO by the SSA countries accidents rate below the Table 2:2

Table 2: 2 occupational accidents by country in the SSA region (13)

Country	Economically Active Population	Total Employment	Fatality Rate	Non-Fatal Accidents, ≤ 3 Days Absence/Year		Accident Rate
				Lower limit (0.10%)	Upper limit (0.19%)	
Angola	6000000	475200	21.2	669600	1272240	16182
Benin	2085446		21.2	232374	441510	16157
Botswana	235000	225900	18.6	22966	43636	14171
Burkina Faso	5000000	163070	21.9	576263	1094900	16712
Burundi	4000000		21	466147	885680	16898
Central African Rep	1186972		22	137426	261110	16788
Republic of Congo	20000000		20.7	2182947	4147600	15826
Djibouti	282000		21.3	31544	59933	16219
Equatorial Guinea	102565		20.9	11288	21447	15958
Eritrea		57800		6531	12410	16385
Kenya	15000000		21.6	1704395	3238350	16476
Ethiopia	26000000		21.5	2945389	5596240	16426
Liberia	704321		21.1	78380	148922	16136

The most commonly indicated Fatality rate and non-fatality rate in the survey by regions (Table 2:2) Fatality rate more occurred in Burkina Faso and Central African Rep regions with more than 16,000 Accidents rate. Non- Fatal accidents are more in Republic of Congo, Kenya, and Ethiopia with more than 1704395 of lower limit occurrences. Non-fatal accidents are more in Republic of Congo, Kenya, and Ethiopia with more than 30,000,000 of upper limit occurrences.

Fatality rate is also common in Benin and Angola countries. Developing countries also have higher occupational injury fatality rates compared to developed countries. Many workers lack work security and are paid according to output; as a result, workers have to work longer hours to

reach production targets. When working in heat, which limits the ability to produce, stress and serious mental and physical health problems may become a negative outcome but also, inadequate accidents and diseases recognition, record- keeping and reporting mechanisms (13). For instance, a survey conducted on occupational safety and health by ILO suggests that, 250 million occupational injuries, 160 million work-related diseases and 2 million deaths occur each year resulting in a loss of roughly 4% of the world gross national product due to worker‘s compensation, loss of workdays, interruption of production, retraining, and medical expenses. According to the estimates of ILO (2005) the number of job-related accidents and illness, which annually claim more than 2 million lives, appears to be rising because of industrialization in some developing countries.

2.7. Prevalence of occupational diseases in textile industries

The study on work related diseases in Poland – an overview of current trends the number of occupational diseases recognized in the period 1998–2011 amounted to 70,265 cases, of which most numerous were chronic voice disorders (26.7%), hearing loss (17.7%), pneumoconiosis (15.1%), infectious and parasitic diseases (14.9%) followed by skin diseases (5.6%), asthma (3.1%), vibration syndrome (3.0%), chronic diseases of the peripheral nervous system (2.7%), chronic diseases of the locomotors system (2.6%), malignant neoplasm (2.2%), allergic rhinitis (2.1%), acute and chronic intoxications (2.0%) as well as chronic obstructive bronchitis (1.1%). Each other pathology represented less than 1% of the total number of occupational diseases (14) (15)**.**

The study on occupational health and safety in the textile sector, work related diseases musculoskeletal disorders (MSDs) are the most common work-related health problem in Europe, with almost one in four workers reporting backache and one in five complaining of muscular pains. Manual handling, the lifting, holding, putting down, pushing, pulling, carrying or movement of a load, is the largest cause of injury in the textiles sector. Manual handling can cause either cumulative disorder from the gradual deterioration of the musculoskeletal system, such as lower back pain, or acute trauma such as cuts or fractures due to accidents (16) (17) (18)**.**

A study conducted in Ethiopia found prevalence of byssinosis to be as high as 43.2% among blowers and 37.5% among carders, whereas a high percentage of bronchial asthma from 8.5% to 20.5% was reported across all sections (19). Studies conducted in other developing countries

found byssinosis prevalence of14.2% among cotton-processing workers in a thread-producing mill in Turkey; and 12.6% among spinning and weaving section workers in Taiwan (20)**and** (21)**.**

According to the study in some the results of work related diseases such as 5.21% upper respiratory disease, Lower respiratory disease 6.52%, hearing loss 9.56%, upper limb disorder4.78%, lower limb disorder 3.91%, eye strain, eye problems 19.56%, skin disease13.47%, headache 14.78 %, stern /depression. A study done in Ethiopia Federal government organizations occupational safety and health management system in some the results of work related diseases such as 5.21% upper respiratory disease, Lower respiratory disease 6.52%, hearing loss 9.56%, upper limb disorder4.78%, lower limb disorder 3.91%, eye strain, eye problems 19.56%, skin disease13.47%, headache 14.78 %, stern /depression 13.91% and others 7.82%. (22) (23)

The study on occupational Injuries among Textile Factory Workers in Arba Minch, Ethiopia, the results of work related diseases such as 37% back pain, 16% hearing loss, 13% chronic obstructive lung disease, 11% asthma, 10% injuries, 9% cancer, 2% leukemia ,noise-induced hearing loss, musculoskeletal diseases and respiratory diseases as the leading diseases (24) **.**

2.8. Factory cause of diseases in textile industries

A study on Pattern and predictors for respiratory illnesses and symptoms and lung function among textile workers in Pakistan indicated that prevalence of byssinosis was 10.5%, chronic cough 7.5%, chronic phlegm 12.9%, wheeze with shortness of breath 22.3%, shortness of breath (grade 2) 21%, chest tightness ever 33.3%; whereas, a low prevalence of asthma (4%) was identified in this population. 8% had obstructive, 8% restrictive and 2% mixed pattern of lung function abnormality. After controlling for potential confounders, work in the spinning section predicts frequent wheeze (AOR=2.0; 95% CI 1.1 to 3.5), wheeze with shortness of breath (AOR=1.8; 95% CI 1.0 to 3.4), and obstructive pattern on speedometer (AOR=2.5; 95% CI 1.0 to 6.2). Prolonged duration of work predicts breathlessness grade 1 (AOR=1.8; 95% CI 1.0 to 3.1) and grade 2 (AOR=2.7; 95% CI 1.3 to 5.4), as well as decrements in Forced Expiratory Volume in the first second (FEV1) and FEV1/Forced Vital Capacity ratio. Lack of education predicts frequent wheeze (AOR=2.0; 95% CI 1.2 to 3.3), and Sindhi ethnicity predicts chest tightness apart from during cold (AOR=2.7; 95% CI 1.1 to 6.6) (25)

2.9. Factors cause of accidents in textile industries

The study on Prevalence and Associated Factors of occupational Injuries among Textile Factory Workers in Arba Minch, Southern Ethiopia, The result of multivariate logistic regression analysis showed that the prevalence of occupational injury among textile industry workers was significantly associated with age, sex, job satisfaction, lack of Personal Protective Equipment (PPE) 84 (61.8%) was the commonest reason given followed by improper hand working instruments 19 (14%), absence of safety education 14 (10.3%), disorder of normal operation 11 (8.1%), and misuse of PPE 8 (5.9%) respectively. Significant amount 29 (21.3%) of the injuries occurred in Monday and Saturday 23 (16.9%), Tuesday 20 (14.7%), Friday 19 (14%), Sunday 15 (11%) and the rest 30 (22%) did not remember the exact day of injury. Regarding the time of injury, fifty one (37.5%) happened in the afternoon, while 35 (25.7%), 23 (17%), and 9 (6.6%) injuries occurred during morning, night, and evening respectively. Whereas, 18 (13.2%) injured respondents did not remember the actual time of injury.CI: (6.3, 11.7)]. However, no statistically significant association was found between workers in The odds of having injury in workers with extra hour duty was 4 times more after adjusting all factors [COR (95% C.I): 4.1 (1.7, 9.8)]. Having health and safety training, and regular workplace supervision were associated with 60% and 64% times decreased odds of injury, respectively [AOR (95% C.I): 0.4 (0.17,0.97), 0.36 +(0.17,0.75)]. Furthermore, manual handling of very heavy objects was significantly associated with injury [COR (95% C.I): 12.4 (5.4, 28)]. On the other hand, participants working in day shift had only marginally significant (P-value=0.05) higher odds of injury compared to those working at rotating and irregular shifts [COR (95% C.I): 26 (1.04, 658)]. Among the behavioral factors, PPE use and job stress showed association with injury significantly. Workers who use PPE had 2.5 times lower probability of injury than those who do not use [COR (95%C.I): 0.4(0.15, 0.9)]. Moreover, the odds of injury among job stressed was 2.4 more than among the non-stressed [COR (95% C.I): 2.4 (1.1, 5.4)] (26) (27)

The study done in Kombolcha textile factory, educational status and marital status of workers showed statistically significant association with occupational injury. Workers who had only 1–8 years of education were more likely to report work-related injury than those with more than nine years of education. Hours worked per week, manual handling of very heavy objects (>20 kg), need for visual concentration for the task, maintenance of machine and sleep disorder also showed significant association with work-related injury. Workers who were used to work >48

hours per week were more likely to be injured than those spend 48 hours or less. Workers who had sleep disorder in their workplace were almost 3-times more likely to report work-related injuries than their counterparts. But, age, sex, employment pattern, monthly income, working experience, safety supervision, health and safety training, drinking alcohol, chewing chat, job satisfaction and using PPE did not show significant associations with occupational injuries (28)**.**

2.10. Common causes and occupational accidents in manufacturing industries

A study done in Kombolcha textile factory, 168 workers (36.9%) had responded that they had incident at job that resulted occupational injury in the past 12 months which brings the overall prevalence rate of 36.9%. Out of the injured workers, 75 (44.6%) had experienced work-related injuries in the last two weeks period prior to data collection. Of these cases, 16(21.3%) reported that they had sustained work related injury more than once. The commonly affected parts of the body were hand 83(48.8%), toe 27(15.9%), back 25(14.7%), and eye 23(13.5%). Regarding types of injury, puncture 54(32.7%), abrasion/laceration 53(32.1%), fracture30 (18.2%), cut 28(17%) predominant types of injury. The commonest causes of injury were found to be machines 84(49.7%), lifting heavy objects 32 (18.9%), splinters 29(17.2%) and fall 22 (13%) orderly. 73(43.45%) were hospitalized where 67% of the hospitalization were for more than 24 hours.137 working days were lost as result of work related injuries in the last 12 months. There was no reported death as a result of work related injuries (28)**.**

The two years, 2014 to 2015, national injury report of MOLSA shows that in the Manufacturing industry machine, hand tool, fire and explosive, falling and slippery, Miss Handling, collisions with objects and work mistakes cause 75% of injuries. Among them 29% were caused by machine, 14 % were caused by hand tool, 13% were caused by falling and Slippery and 12 % were caused by hand tools. About 75 % of injuries involved upper extreme, lower extreme, eye and central body resulted in 39 % abrasion, 16% cuts, 13% piercing, 4% burns And 6% eye injury reported were the main types of injuries (29) (30)

2.11. Economic Impact of Occupational Accidents and Diseases

The study conducted in Lebanon on the cost of work-related injuries in insured workplaces indicates that the median cost per injury was $83. Extrapolated to all injuries within insured Workplaces, the overall cost was estimated 10 to 13 million when pain and suffering was Accounted for Fatal injuries and those that caused permanent disabilities accounted for 10.4% of

the overall costs and hospitalized injuries for 45%.Cost per injury was highest among older workers and for injuries that involved falls and vehicle incidents diseases (31).

According to world of health organization reported health status of the workforce in every country has an immediate and direct impact on national and world economies. Total economic losses due to occupational illnesses and injuries are enormous (32).

The International Labor Organization (ILO) has estimated that in 1997, the overall economic losses resulting from work-related diseases and injuries were approximately 4% of the world's Gross National Product. This estimate is based on a selected compensation system and is probably an underestimate due to the under-reporting of many work-related illnesses.

According to the international labor organization 2012 estimation 317 million peoples suffer from work-related injuries. It is estimated that around 4% of annual worldwide grows domestic productivity (GDP), or $1,250 billion, is absorbed by the direct and indirect costs of work accidents and occupational (33)

A study done in the manufacturing sector in Addis Ababa city work related injuries economic cost Medical payment was 3,856,879 Birr, which consists 29% of the total cost, temporary total disability(TTD) compensation payment was 1,950,384 Birr, which consists 14.8% of the total costs. Permanent partial disability (PPD) compensation payment was 6,314,777 Birr, which consists 47.8% of the total cost and permanent total disability (PTD) payment was 551,689 Birr, which consists 4.2% of the total cost. Death compensation payment was 522,875 Birr, which consists 4% of the total cost. Additionally, the average payment for medical, TTD, PPD, permanent total disability (PTD) and death compensation was 1,023.3 Birr, 962.7 Birr, 3,822.5 Birr, 6,567.8 Birr and 74,697 Birr respectively. The TTD cases accounted for 53.8 %(2,026) of all injury cases; their contribution to the total costs were 14.8%. On the other hand, PPD cases accounted for 43.8 %(1,652) of all injury cases but their contribution to the total costs was 47.9%: the PTD cases accounted for 2.2 %(84) of all injury cases but their contribution to the total costs was 4.2% and also fatal cases accounted for 7 (0.2%) of all injury cases but their contribution to the total costs was 4% (34)**.**

Primary result of personal problems brought to the workplace is reduced productivity. Absenteeism and tardiness also tend to increase. Increased cost of insurance programmers, including sickness and accident benefits, are a direct result of personal problems brought to workplace. Lower morale, more friction among employees, and more grievances also result from

troubled employees. Permanent loss of trained employees due to disability, retirement and death is also associated with trouble employees. Difficult to measure, but a very real cost associated with troubled employees, is the loss of business and a damaged public image (35)

2.12. Prevention Occupational Accidents and Diseases

Occupational disease is any illness associated with a particular occupation of the industry. Such diseases result from a variety of biological, chemical, physical, and psychological factors that are found in the workplace environment. Occupational medicine is concerned with the effect of all kinds of work on health and the effect of health on a worker's ability and efficiency. Occupational diseases are essentially preventable and can be described to faulty working conditions. The control of occupational health hazards decreases the incidence of work-related diseases and accidents. In turn it improves the health and morale of the work force, leading to decreased absenteeism and increased worker efficiency. In most cases the moral and economic benefits far outweigh the costs of eliminating occupational hazards implementing a system of hazard identification, risk control and preventing workplace injuries and diseases.

Prevention of occupational disease and accidents; they should include

- Laws and regulations and, where appropriate, collective agreements incorporating the prevention of occupational disease and accidents
- Law compliance mechanisms, including effective OSH inspection systems;
- Cooperation between management and workers and their representatives in the implementation of OSH measures; provision of occupational health services;
- Adequate mechanisms for the collection and analysis of data on occupational diseases and accidents.
- OSH information and training; and
- Collaboration between ministries of labor, ministries of health and social Security schemes covering occupational injuries and diseases.

Summary

The primary aim of this study is to find the impact of occupational safety and health on workers' productivity of the textile industries. Safety and health issues in workplaces are affecting the total productivity of the textile industries through reducing profitability and incurring extra costs related to accidents and resulting diseases.

Unless the safety and health of the workforce at their workplace is promoted, higher attention is given and sustained, it is impossible for companies to think for achieving their goals of maximizing profitability and total productivity. According to some research studies carried out specifically in some Ethiopia, there are many problems those related with issues of workplace safety and health in various industrial sectors, which are needed to be solved. The findings of these studies revealed that there are significant workplace accidents and diseases with their resulting direct and indirect consequences such as total/or partial loss of life as well damage to materials and properties besides the costs resulted from these incidences.

As discussed in this study in support of literatures, industrial hazards and accidents are risk of many manufacturing industries suffering their productivity through loss of life, equipment or property damage. In this case the concepts health and safety linked to productivity improvement through the reducing accidents, disease, death, compensation costs. From the literature reviewed, it is revealed that few researchers conducted studies on impact of occupational health and safety on worker productivity in the sub-sectors of the manufacturing industry, construction industry, metal industry, food industry and cement industry.

The key objectives of the research is exploring problems, needs to detect the work hazards related to the working environment and the factors causing occupational health and safety in textile industry and, to identify the major causes of industrial accidents and the factors which are responsible to keep up occupational health and safety of the workers in textile industry .For this purpose ways of improving productivity of the employees in work place of the industries is forwarded based on the literature reviewed. By deal OHS as a dependent variable of the research, the study found different issues, which create hurdle to attain an effective OHS management system in textile industry.

Chapter Three

3. Overview of Textile Industries in Ethiopia.

Ethiopian traditional apparel (cottage industry) produced by handloom, has rich and prolonged History. This traditional cottage industry is inherited and continues till date, making it an important contributor in nation building and satisfying people's needs.

As a results of governments policies, textile manufacturing companies, ranging from medium to large scale, in Ethiopian textiles and apparel industry encompasses spinning, weaving, finishing of textiles, manufacture of cordage, rope, twine, netting, knitting mills, and manufacturing of wearing apparel and today stands more than 136. According to CSA survey of the Ethiopian manufacturing sector in 2012/13, there were 109 firms engaged in manufacturing of textile and apparel, most of them are owned by private, which is 104 and the rest five firms are under state ownership. The firms in the industry produce products such as cotton and woolen fabrics, nylon fabrics, acrylic and cotton yarn, blanket, bed sheet, shirts, carpets, gunny bags, wearing apparels, and sewing thread.

The Ethiopian government is activity promoting further modernization of the textile sectors with the objective of attracting local and foreign investors, at the same time foreign buyers.

Advantage the country offers for those engaged in textile industry.

- The industry is treated as number one priority sectors by the government's industrial development policy.
- Availability of around 1million hectare of the land and suitable for cotton cultivation
- Ethiopia is known as the water tower of African and provides one of the cheapest hydroelectric power supplies in the world.
- Duty and quota free market access to the EU and US as well as COMESA (the Common Market of Eastern and Southern Africa) markets and additional more than 16 bilateral trade agreements with different countries.
- Provision of infrastructure and comprehensive service in established industry zones.
- Easy access to land on a leaves fee ranging from 0 to 3 USD/m2 in regional states for a lease period of 60-80 years depending on the specific investment location.
- Tremendous incentives like duty free import, tax exemption, financial incentives and priority service delivery is given by the government to encourage the investment location.
- The most secure African country with administrative capital of the Africa union.

3.1. The textile industrial policy of Ethiopia

The government of Ethiopian has been to realize a developed and prosperous Ethiopia through its agricultural development led industrialization economic policy designed within the framework of free market economic philosophy with the following seven underling Principles.

- The private capitalist is engine of the industrial development strategy
- Following the direction of agricultural led industrialization
- Following export – led industrialization
- Focus on labor intensive industries
- Using coordinated foreign and direct investment
- Strong leadership role of the government
- Mobilizing the entire society for industrial development

3.2. Employment

According to CSA survey of the textile and apparel industry in 2012/13 employed a total of 19,233 workers; of which the private firms employed 15,885 workers, whereas the government firms employed 3,337. 20 Out of the above workers around 1,819 are direct employees (operators) and 161 are staff personnel.

3.3. Ethiopian textile industries impact economic variable

In terms of the domestic market, competition has become very tense due to the penetration of low priced imported textile and clothing in Ethiopian markets. In addition, the country's domestic trade environment is facing a number of challenges which include:

- Low productivity of the industries;
- Competition of imported / illegal imports of textile and apparel;
- Limited product mix and low quality of products;
- Expansion of used cloth trade throughout the country; and
- Low purchasing power of majority of the population and, as the result, limited local demand.

The technology used in most textile and garment units in Ethiopia is at a basic or medium level. However, in the newly established clothing factories, equipment and machineries are modern.

There are some spare parts and hand tool manufacturers who supply to the textile industry, and each factory has its own workshops that can produce some parts for its own use.

Chapter Four

4. Research Design and Methodology

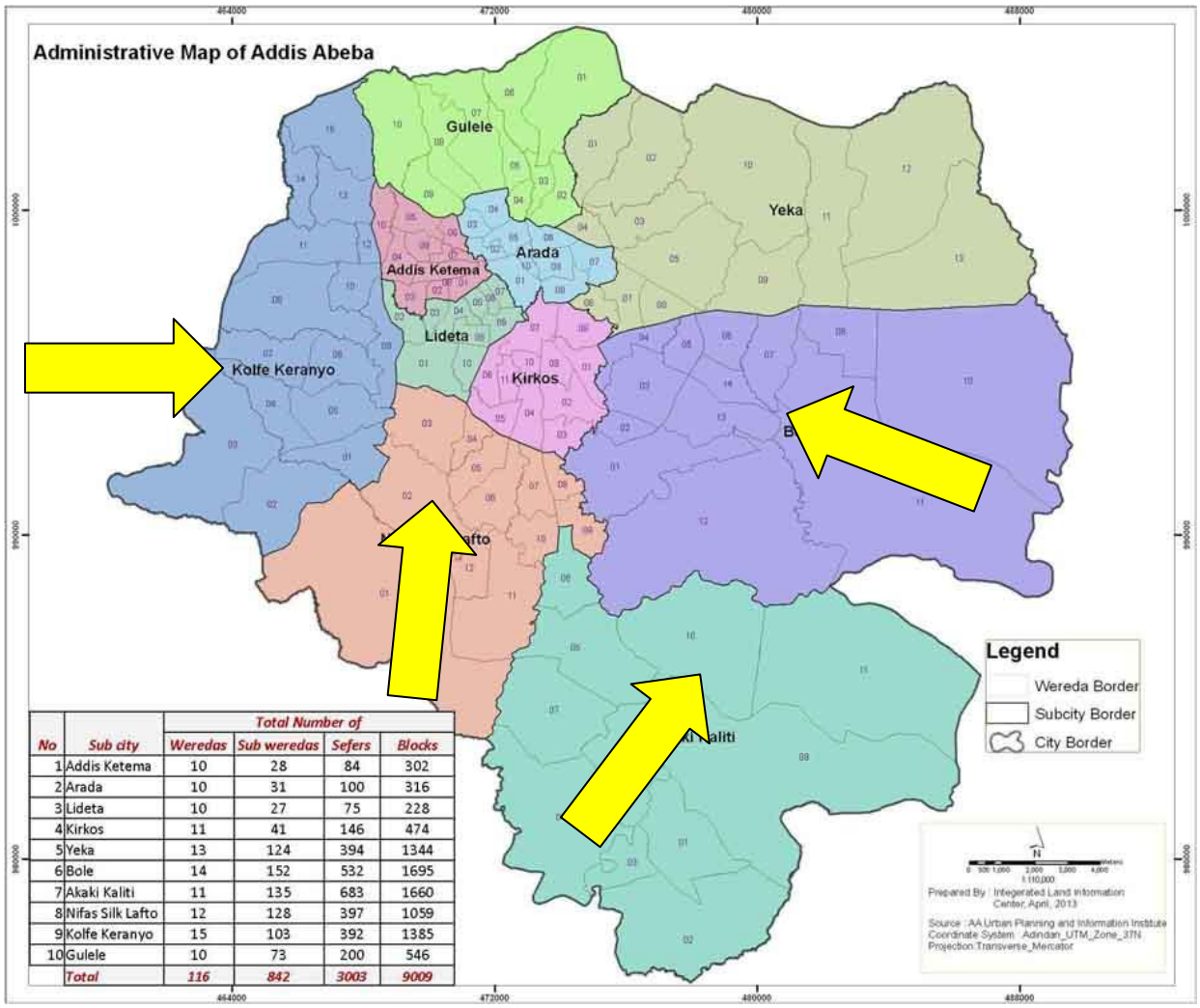
This chapter described the methods and procedures used to collect data and analyze data in order to determine the impact of occupational health and safety on worker productivity in Textile Industries in Addis Ababa. Sub-sections of the chapter include the design, population sample size and sampling procedures, instrumentation, data collection procedures for analysis and presentation.

4.1 Study area

This study was conducted in Textile Industries assess in Addis Ababa capital city of Ethiopia. Addis Ababa is located at the heart of the country with an area of 540 square kilometers. It is situated between 9 degrees latitude and 38 degrees east longitude in the plateau that stretches at the range of 2,200-2,800 meters of latitude above sea level (36). Total population of the Addis Ababa city was 3,194,999 with 1,522,379 (47.6%) are males and 1,672,620 (52.4%) are females (36). According to CSA report there are 10 Sub-Cities and 116 Woredas in Addis Ababa city. This study was carried out to assess the impact of occupational health and safety on productivity of workers of the selected Textile Industries. The location of study areas are presented as follows. From 10 sub cities of Addis Ababa city administration; Akaki/ Kalitiy sub city contain largest number of textile industries and among which two industries were selected for this survey, one from Nifas Silk–Lafto sub city, one from Bole sub city and one industry from Kolfe Keraniyo sub- city. According to report obtained from Ethiopian Textile Industry Development Institute (ETIDI) showed there are twenty one registered Textile industries in Addis Ababa city. Among the Textile industries of area five Textile Industries are selected randomly. These are given below

1. KK private limited company
2. Yirgalem Addis Textile Factory
3. Firke Factory plc.
4. G seven Trading and Industry plc.
5. Jay-Jay Textile plc.

The following map shows the study area of the research



No	Sub city	Total Number of Weredas	Sub weredas	Sefers	Blocks
1	Addis Ketema	10	28	84	302
2	Arada	10	31	100	316
3	Lideta	10	27	75	228
4	Kirkos	11	41	146	474
5	Yeka	13	124	394	1344
6	Bole	14	152	532	1695
7	Akaki Kaliti	11	135	683	1660
8	Nifas Silk Lafto	12	128	397	1059
9	Kolfe Keranyo	15	103	392	1385
10	Gulele	10	73	200	546
	Total	*116*	*842*	*3003*	*9009*

Figure 4: 1 map of study area [*Source:* http://en.wikipedia.org/wiki/Addis Ababa]

4.2. Study design

This study was conducted from December 1, 2016 to October 16, 2017 in textile industries found in Addis Ababa city. Descriptive survey was conducted so as to assess the impact of occupational health and safety on productivity of the workers in five selected textile industries in reference to Addis Ababa textile industry. Descriptive survey was a consistent data collection method in which both qualitative and quantitative methods are used. Recognizing every method has its restrictions but, the special approaches can be matching them for a better outcome. A descriptive data collection n is technique in which information is gathered through oral or written interviews, company document, observation, employees and could be structured, more formal or

a combination of the qualitative approach. Quantitative study furthermore included in this research the questionnaires approach. It focuses on eliciting information about the nature and status of specific phenomena at a given time. It is very useful for generalizing from a sample to a population so that inference can be made about the characteristics, attributes or behavior of the population. The reason why this method is implemented in this study is that is the most appropriate and helpful in determining the perception and attitude of respondents on the variables studied.

4.3. Sources of data

To carry out the research study, data were collected from both primary and secondary sources. Both sources are briefly discussed as follows.

Primary data: - The primary data of this study were collected through well prepared open and close ended questions. In additions the primary data were gathered from Ethiopian Textile Industry Development Institute (ETIDI), Ministry of Labor and Social Affairs (MOLSA) and Bureau of Labor and Social Affair (BOLSA) with various ways of collecting data such as face to face interview with respondents to gather information.

Secondary data: - both internal and external secondary data were employed while gathering additional relevant data required for assessing the impact of occupational safety and health on the productivity of workers of textile industries in Addis Ababa city. Internal secondary data has been gathered from the operational and safety manual of the five selected companies, as well as management documents related to occupational safety and health. Various articles, magazines, book, journal, newspaper and websites, are also recorded data as the source of external secondary data. Furthermore, annual reports concerning accidents, injuries, diseases and related matters from **MOLSA**, **BLSA** and **ETIDI**) were considered as important sources secondary data.

4.4 Study population

The samples selected from the textile industries in Addis Ababa city are considered as the study population and all the required samples were taken from these population.

4.5. Source of population data

All selected Textile Industries employees who were involved in Addis Ababa city Textile Industries were considered as a source population data and the required sample size was taken

from this population. All workers who are randomly selected from the production process of the Textile Industry. All employees who are directly engaged in the production process with in the study period and who have been working at least one year in the selected industries irrespective of gender were included in the study and the population of the study that consists of all the Textile workers between age of 18 to 55 years are the focused group and each worker as considered as a unit of analysis.

4.6. Sampling technique and sample size determination

4.6.1. Sampling technique

A stratified random sampling technique that is considered a fair representation of all workers in textile industries has been employed to select the representative samples of the study. the populations in Textile Industries are stratified into small, medium and large size based on Ethiopian Textile Industry Development Institute (ETIDI) arrangement method. From each stratum, proportional samples of Textile industries were randomly selected. To select representative numbers of Textile industrial sectors. First the size of the industries the population and sample sizes were determined based on the stratified random sampling techniques.

4.6.2. Sample size determination

For the first objective sample size (n) was calculated by using single population proportion formula considering.

Z α/2 a standard Z score 1.96 corresponding to 95% confidence level/ linked to 95% confidence interval (use 1.96)

Total population (N) =3486

Margin error (e) = 1-0.95=0.05

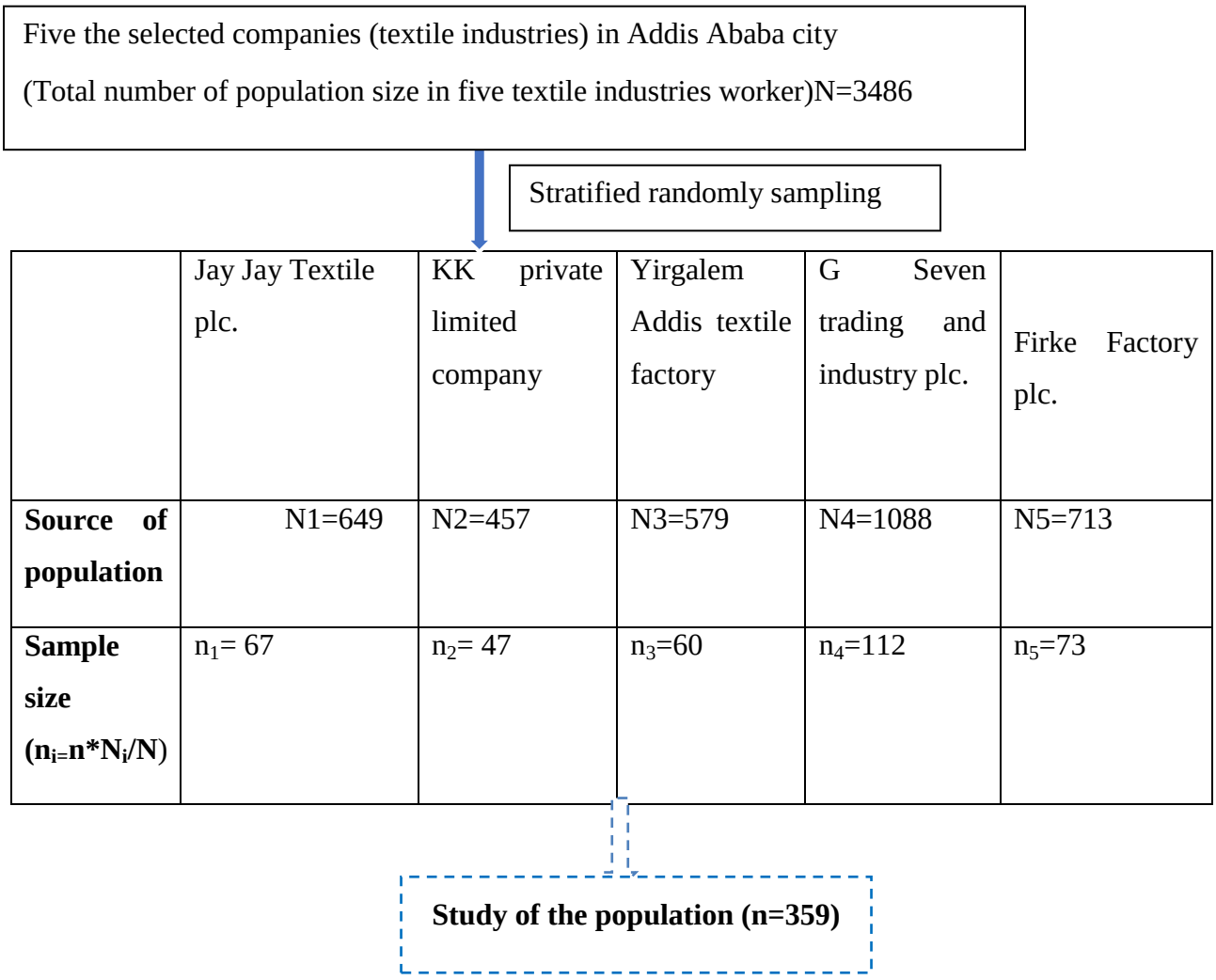
Sample size (n) = $\boldsymbol{N}/ (\mathbf{1}+\boldsymbol{Ne2})$ =3486/1+3486*0.0025=359

4.7. Sampling procedures

Stratified random sampling technique was applied to determine the desired sample size. Among the twenty one Textile Industries found in Addis Ababa city, five of them were purposely selected in expectable of time and financial constraint to account the whole Textile Industries in the city. The industries are stratified based on expected risk of work related accidents that cover textile industries. 359 samples were taken from the five elected industries via simple random sampling.

The calculated sample size (n=359) is allocated to each stratum using probability proportion to population size. The participants of the study are selected using random sampling technique from the sampling frame.

Figure 4: 2 schematic presentation of sampling procedures



4.8. Data collection instrument reviewing

Organized questionnaire was developed by reviewing several international journals. First the questionnaire was prepared in English and it was translated into Amharic. The data collected in Amharic was translated into English. Then, the questionnaire focuses on socio demographic, behavioral and work environmental factors that can determine occupational accidents and diseases within the Textile workplace. The questionnaires were distributed for production department, human resource department and occupational safety and health department. Primary

data was collected through structured qualitative in-depth interview. The interview was conducted with people who are considered to be particularly knowledgeable about the topic of interest in the Companies. Hence, production head, production and technique head, operators, human resource managerial personals of the case companies were the key respondents.

4.9. Data Collection Procedure

All the necessary and useful information concerning the existing situation of Textile industries were collected to attain the objective of the study. First both quantitative and qualitative data were collected via closed and open ended questions. Then in depth interview was employed. The Amharic variety questionnaire were employed to gather the data concerning the socio demographic status, behavioral status, socio-economic status, numbers of accidents/injuries, cause of accidents/injuries, cause of diseases and affected part of body, health safety policy and practice near occupational health and safety among textile industries workers and period of injuries in the past one year. Later the interviews were employed to collect the same information in depth.

4.10. Study Variables

4.10.1. Independent variable

Socio demographic factors including age, sex, employment pattern, educational level and work experience.

Behavioral factors including alcohol taking status, chat chewing status, smoking status job satisfaction and the status of using personal protective equipment.

Work environment factors including workplace supervision, health and safety training, work shift, work place violence, and liquid waste disposal.

4.10.2. Dependent variable

The study considers variable such as dependent variable (Occupational accidents, occupational diseases, cuts, burns, abrasion and all factors causing accidents and diseases.

Occupational diseases including respirators diseases and musculoskeletal disorders

4.11. Operational definitions

Occupational disease: - a disease that is directly cause by the condition of somebody's work

Personnel protective equipment: - use of worker specialized clothing or equipment worn by employees for protective against health and safety hazards at the time of interviews.

Occupational hazards: - a source of risk associated with the work that somebody's does.

Occupational: - relating to work or cause by somebody work.

Injuries: - to cause physical damage to person or body part.

Productivity: - an expression of how efficiently and effectively goods and services

Work related injuries: - any physical injury condition sustained on worker in connection with performance of his/her work in textile industries.

Hazards: - a physical situation with a potential for human injury, damage to property, damage to the environment or some combination of these.

Physical hazards: - this related to harm cause to the body from noise, vibration, light and radiation.

Biological hazards: - this related mainly to illness resulting from bacteria, fungus and viruses.

Psychosocial hazards: - this related mainly to stress, violence and bullying

Ergonomic hazards: - this related harm cause to the body repetitive movements and improper setup of work station.

Health: - the general condition of the body or mind, especially in term of the presence or absence of illnesses and injuries.

Safety: - it is relative freedom from danger, risk or threat of harm or loss to personnel or property.

Performance: - the act of carrying out or accomplishing something such as a task or action.

Accident: - an event that happens completely by chance with no planning or deliberates intent

Employee: - member of the working class, especial an industry employee.

4.12. DATA ANALYSIS PROCEDURES

The analysis of the collected data is done at the end of the data collection. The response were classified and summarized on the basis of the information provided by the respondents. The analysis was done using both qualitative and quantitative tools with the quantitative tools, the

current version (20) of statistical package for social science (SPSS) data analysis program, Microsoft excel, absolute figures, table, percentages, and statistical tools such as graphs, charts, and diagrams were used.

4.13. Data quality assurance

Both quantitative and qualitative data are collected via questionnaire and depth interview. The data concerning impact of occupational health and safety on workers' productivity were collected by using a check list inspection to observable work related accidents and diseases. The questionnaire was primarily prepared in English and then translated into Amharic for the data collection. After the questionnaire was designed, it was evaluated through pretest in order to ensure the quality of validity and reliability of the questionnaire collected data through this way. The researcher has taken training concerning relevant aspects of the data collection instruments, questioning technique and how to fill the questionnaire. The advisor and co advisor have checked and reviewed either the questionnaire was correctly completed. Finally the collected data was translated into English analysis using SPSS software package.

4.14. Dissemination of results

An aspect report of this study which involves on main findings are disseminated to textile industries, Ethiopian textile industry development institute, ministry of labor and social affairs and bureau of labor and social affair. In addition to this, effort will be utilized to publish the study on international journals.

Chapter Five

5. Data Analysis and Presentation

5.1. Introduction

This chapter focuses on the data analysis and presentation based on the data collected from the field survey. The information was collected through interview, observation and questionnaire. This study has included 307 employees' respondents within five textile industries. The objective of this study is to investigate the impact of occupational health and safety on workers' productivity in textile industries in Addis Ababa city based on the data obtained and to give appropriate recommendations.

5.2. Background and Demography of respondents.

The background of respondents, age, gender, experience, education level job position, and number of employees in the companies are indicated in table 5.1.The demography of the employees indicated that 98(31.9%) are male and 209(68.1%) are female in textile industries from which respondents obtained 60(19.5%) from KK private limited company, 903(33.6%) from G-Seven trading private limited company, 49(16%) from Yirgalem Addis textile factory, 43(14%) from Jay-Jay textile private limited company and 52 (16.9%) from Firker factory private limited company respectively. Regarding employment patterns the permanent share 280(91.2%) while temporary share 27 (8.8%). With regards to position the highest indicated were operators 249(81.1%) followed by human resource management 19(6.2%), Forman 15(4.9), supervision 15(4.9), production and technique head 5 (1.6%) and production head 4 (1.3%).The socio demographic characteristics of respondents are briefly indicated in the table below.

Table 5: 1 Demographic characteristic of the respondents in textile industries in Addis Ababa city

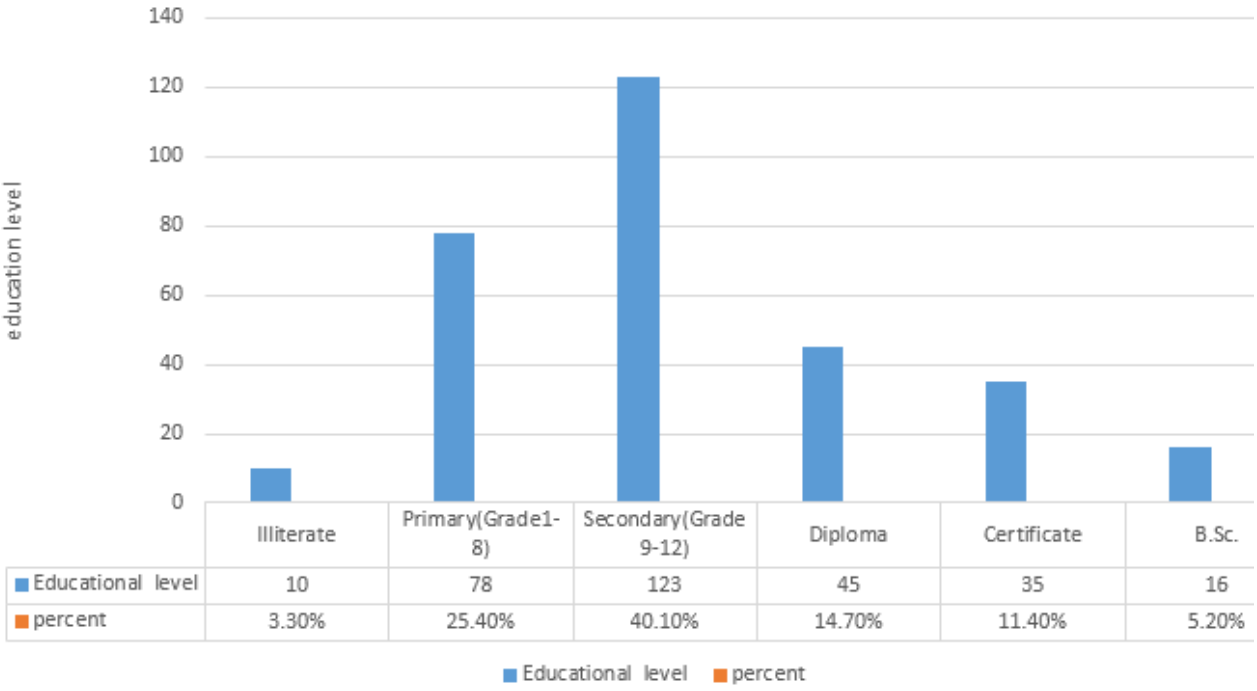
Respondents gender	Frequency	Percentage
Male	98	31.9%
Female	209	68.1%
Respondents age		
Below 20 yrs.	5	1.6%
20-29yrs	109	35.5%
30-39yrs	90	29.3%
40-49yrs	52	16.9%
50-55yrs	51	16.6%
Employment pattern		
Permanent	280	91.2%
Contract/ temporary	27	8.8%
Respondents position		
HRM	19	6.2%
Production head	4	1.3%
Production and technique head	5	1.6%
Forman	15	4.9%
Supervision	15	4.9%
Operators	249	81.1%

5.2.1. Educational status of respondents

The employees were asked to indicate their educational status in order to find out the educational qualifications of the respondents who participated in the study.

It provided in the graph below and shown that the educational level of most of the workers is secondary school (grade 9-12) which is 123(40.1%) followed by elementary level, 78(25.4%), diploma 45(14.7), and 35(11.4%), of the respondents were certificate level, whereas, as it can be seen in the graph below in figure 5.1 that shows the educational level of the workers, BSc 16(5.2%) and few are uneducated or illiterate 10(3.3%). The data shows that majority of the employees have attained secondary school whose opinions and view are guided and well informed. The below results indicate that Employees of textile industries found in Addis Ababa city are with educational level of secondary level followed by elementary level.

Figure 5: 1 Educational level respondents

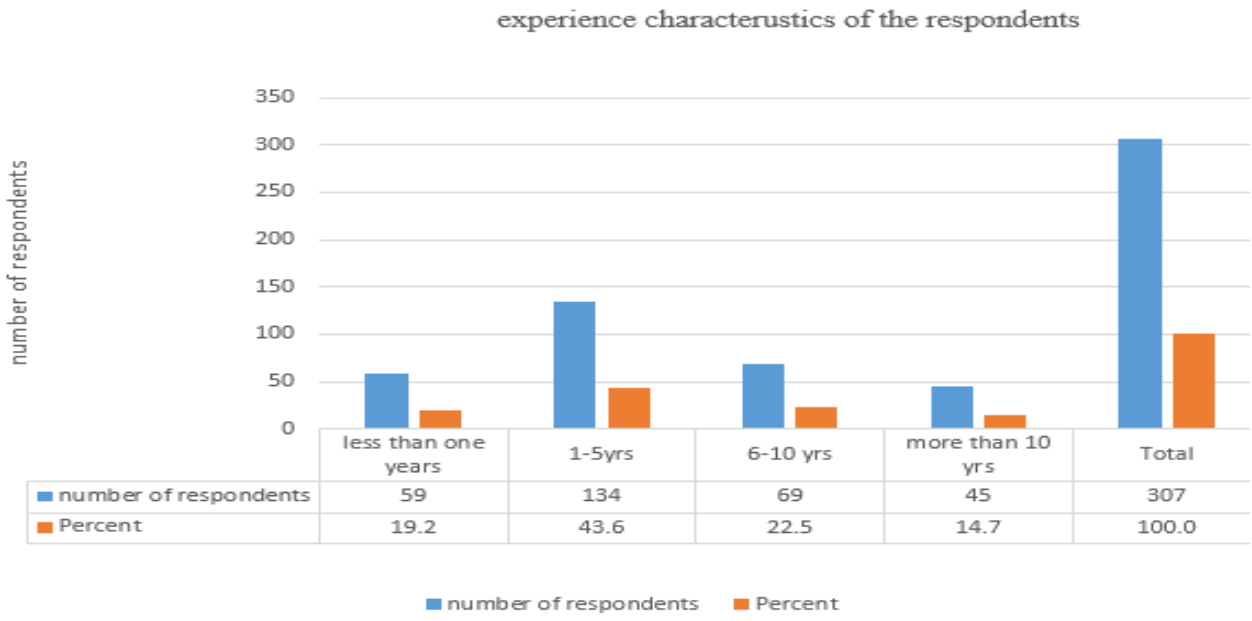


5.2.2 .Working Experience of Respondents

With regards to work experience indicated in figure 5.2, majority (134) representing (43.6%) have worked between 1-5 years of experience in the companies, 69(22.5%) of the workers have served for 6-10 years, 59(19.2%) of the respondents have less than one years' experience and 45 (14.7%) of the workers have more than 10 years' experience. The available data show that majority 43.6% of the employees have been working for more than one year and therefore have acquired the necessary competencies and reliability in their work.

The experience characteristics of the respondents are summarized below figure 5.2

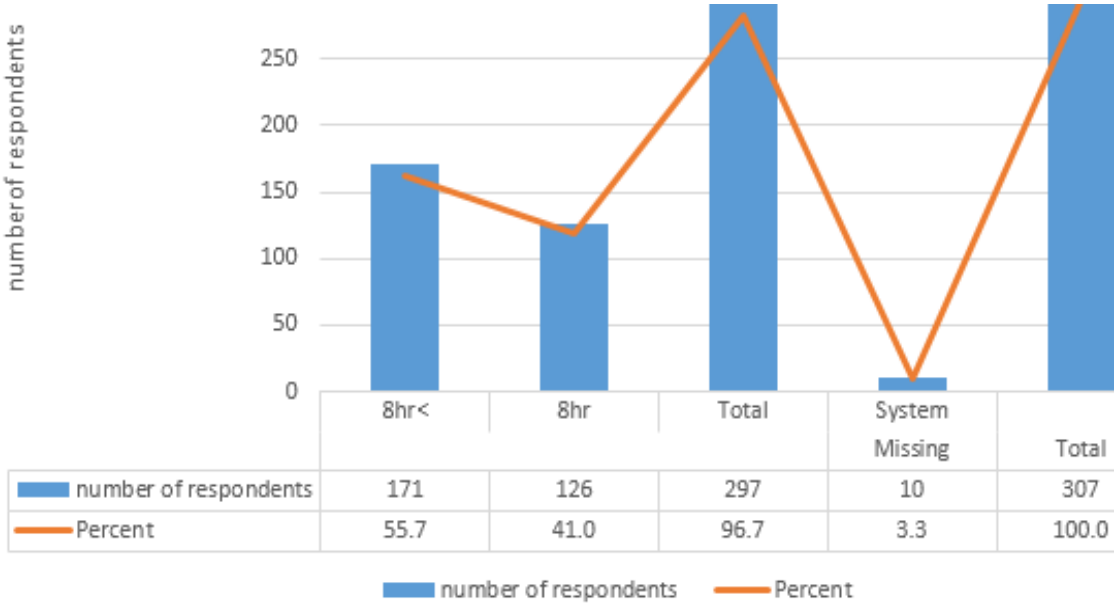
Figure 5: 2 Experience characteristic of respondents



5.3. Working Place Characteristics of the Respondents

Most of the respondents 250(79.8%) do not have knowledge of occupational health and safety in the organization. The questions "did you take any safety and health training related with job?" Regarding with occupational health and safety training, 37(12.1%) of the respondents replied that they had taken safety and health training related to their job. While the majority, 255(83.1%) of the respondents revealed that they didn't take any safety and health training related to their work. But the other from this data, 15(4.9%) of the sample workers didn't give responses. In additional, as it is indicated in figure 5.3 below, 171(55.7%) of the respondents replied that they spent for more than 8 hours per day at their work. This is mainly due to overtime working time in order to increase their income. Whereas in the other hand, 126(41%) of the sample workers worked for only 48 hours or six days per week. Working hours per day's respondents' was response summarized in the figure 5.3

Figure 5: 3 working environments characteristic



Referring to figure 5.3 we can understand that most of the respondent work for more than 8 hours per day. Therefore, the employees are exposed for accidents or injury.

5.3.1. Impact of workplace environmental factors on employees.

The employees of the selected textile industries in Addis Ababa city requested to rate the impact of work place factors on workers among those mentioned in table 5.2 below. In the table the representative manifestation stands for cannot mention, uncomfortable, comfortable and very comfortable.

Table 5: 2 work place environmental factors and employees comfort level

Workplace environmental factors	Cannot mention		Uncomfortable		Comfortable		very comfortable	
	N	%	N	%	N	%	N	%
Room temperature& air quality	15	4.9%	227	73.9%	28	9.1%	37	12.1%
Lighting in work place	38	12.4%	58	18.9%	202	65.8%	9	2.9%
Noise at work place	96	31.3%	106	34.5%	79	25.7%	26	8.5%
Organization provided PPE	29	9.5%	211	68.7%	58	18.9%	9	2.9%
Work place layout	21	6.8%	219	71.3%	67	21%	0	0%

Regarding the room temperature and air quality, 227(73.9%) of the respondents revealed that they were uncomfortable, while 28(9.1%) of the sample workers said that they were comfortable and 37(12.1%) of the respondents were very comfortable. However, the rest 15(4.9%) of the

respondents couldn't mention It. Thus, from the data obtained above it is possible to conclude that the room temperature and air quality were uncomfortable. Concerning the lighting in the work place, 202(65.8%) and 9 2.9%) of the sample workers responded it was comfortable and very comfortable respectively. Whereas, 58(18.9%) of the respondents replied it was uncomfortable and remaining 38(13.4%) of the sample representatives were not able to mention about It.

About noise at work place, 106(34.5%) of the representatives said it was uncomfortable while 79(25.7%) and 26(8.5%) of the respondents said it was comfortable and very comfortable respectively, but the remaining respondents said nothing about noise at work place.

Regarding the working place layout, 67(21.8%) of the respondents said it was comfortable while 219(71.3%) of the sample workers indicated that it was uncomfortable, and the rest 21(6.8%) could not mention about it. As the data confirmed the layout of the working place in the textile industries was uncomfortable. The employees of the sample textile industries in Addis Ababa city were asked whether or not they used personal protective equipment at their work place and '' they are satisfied with their assigned job".

5.4. Behavioral characteristics of the respondents

The employees of textile industries in Addis Ababa city were requested to give their response to the question" do you used personal protective at your work place? "And other question is raised **''Are you satisfied with your assigned job?**'' among the 307 respondents, some responded to ''yes'' and ''no'' response types. The reaming part cannot mention it. The respondents' response summary in table 5.3

Table 5: 3 behavior factors causes related accidents and diseases

Behavior cause for accidents and disease	Yes		No		Undecided	
	N	n%	N	n%	N	n%
Used personal protective equipment	71	21.8%	207	67%	29	8.9%
satisfied with assigned job	135	41.4%	163	50%	28	8.6%

As indicated in table 5.3 above, 71(21.8%) of the respondents reported that they properly use personal protective equipment while they performance their tasks, whereas, 226 (69.3%) of the sample workers did not use them, and 29 (8.9%) of the respondents could not decide. Regarding satisfaction with their assigned job, 135 (41.4) of the respondents revealed that they were

satisfied with their assigned job while 163(50%) of the sample representatives responded they were not satisfied, whereas, the remaining respondents were not able to decide. Most of the respondents are not satisfied by assigned job.

5.5. Personal protective equipment and facilities

The questions that deal about personal protective equipment and facilities have been raised for the sample workers of textile industries. The data obtained from these questions help to see how the personal protective equipment and facilitates are available. Thus, the responses of the workers have been arranged in table 5.4

Table 5: 4 personal protective equipment and facility respondents

PPE and facilities	Yes		No		Missed	
	N	%	N	%	N	%
Safety shoes	90	29.3%	205	66.8%	12	3.9%
Dust musk	87	28.3%	196	63.8%	24	7.8%
Gloves	56	18.2%	210	68.4%	41	13.4%
Ear plugs	117	38.1%	82	26.7%	108	35.2%
Clothes	110	35.8%	169	55%	28	9.1%

As it can be seen in table 5.4, 90(29.3%) of the respondents agreed that safety shoes were given for them, whereas, 205(66.8%) of the sample workers responded that they didn't have safety shoes while 12(3.9%) of respondents did not decide. Regarding to dust musk and gloves, 196(63.8%) and 210(68.4%) of the sample workers revealed that those personal protective equipment were not provided for them. About the provision of ear plug and clothes, 117(38.1%) and 110(35.8%) of the respondents workers disagreed. As clearly indicated from the above analyzed data, personal protective equipment and facilities were not provided (available) for most of the workers of the sample textile industries.

5.6. Work Related Diseases and Recognized Symptoms of Diseases in textile industries

The workers of the sample textile industries were asked a question that deals about their experience of disease symptoms in the working place. The said; "which of the following

symptoms of disease do you experience mostly?" the employees response were summarized in table 5.5

Table 5: 5 types of diseases recognized by symptom in the textile industries

Disease symptoms	Yes		No		Undecided	
	N	%	N	%	N	%
Dizziness	221	72%	65	21.2%	21	6.8%
Psychological stress	163	53.1%	113	36.8%	31	10.1%
Headache	250	81.4%	44	14.3%	13	4.2%
Insomnia/sleeplessness	296	96.4%	9	2.9%	2	0.7%
Typhoid	200	65.1%	86	28%	21	6.8%
Dysentery	167	54.4%	116	37.8%	24	7.8%
Strain	167	54.4%	125	40.7%	15	4.9%
Skin diseases	156	50.8%	140	45.6%	11	3.6%
Respiratory diseases	259	84.4%	33	10.7%	15	4.9%
Musculoskeletal disorder	214	69.7%	69	22.5%	24	7.8%

As presented in table 5.5 the respondents experienced with dizziness were 221(72%), with psychological stress 163(53.1%), with headache were 250 (81.4%),with insomnia/sleepleness were 296 (96.4%), with typhoid were 200(65.1%), with dysentery were 167(54.4%), with strain were 167(54.4%), with skin disease were 156(50.8%), with respiratory disease were and 259(84.4%), with musculoskeletal disorder were 214(69.7%). From these data, it can be understood that much of the disease symptoms occurred in the sample textile industries with more than 60% of the response rate except psychological stress, dysentery, and strain and skin disease with less than 55% response rate. Therefore, it is possible to conclude that the employees of the sample textile industries were exposed for these diseases. This happened because of poor practice of using personal protective equipment, weak management decision, improper work place arrangement and lack of training on occupational safety and health in the sample textile industries. In addition a question about work related disease at work place was rose to workers of textile industries. "Did you face any work related disease at your work place?" has been raised for employees of the sample textile industries. Thus, 271(88.3%) of the respondents replied 'yes' while 17 (5.5%) of the sample workers said 'no', but 19(6.2%) of the respondents were not decided.

5.7. Frequency of work related disease occurrence on workers of the textile industries

The question rose through the workers in textile industries the issue of disease occurs "frequency of work related disease occurrence at your work place" the reply given by the employees in the textile industries are always, sometimes, rarely and not at all. The following table is used for to draw information from the workers concerning work related disease occurrence.

Table 5: 6 occurrence of work related diseases on the workers

Type of diseases	Always		Sometimes		Rarely		Not at all		Missed	
	N	%	N	%	N	%	N	%	N	%
Dizziness	38	12.4%	219	71.3%	42	13.7%	4	1.3%	16	5%
Psychological stress	23	7.5%	81	26.4%	34	11.1%	55	17.9%	114	37.1%
Shoulder pain and feeling	124	40.4%	101	32.9%	70	22.8%	5	1.6%	44	14.3%
Headache	62	20.2	111	36.2%	97	31.6	27	8.8%	46	15%
Allergic	25	8.1%	111	36.2	128	41.7%	2	0.7	6	2%
Insomnia/sleeplessness	39	12.7%	177	57.5%	72	23.5%	12	3.9%	13	4.2%
Typhoid	15	4.9%	138	45%	108	35.2	21	6.8%	25	8.1%
Backache	18	5.9%	139	45.3%	127	41.4%	20	6.5%	70	22.8%
Dysentery	41	13.4%	55	17.9%	68	22.2%	73	23.8%	60	19.5%
Cold	36	11.7%	69	22.5%	130	42.4%	12	3.9%	70	22.8%
Strain	94	30.6%	101	32.9%	31	10.1%	11	3.6%	164	53.4%
Skin diseases	55	17.9%	144	46.9%	79	25.7%	12	3.9%	61	19.9%
Respiratory diseases	52	16.9%	62	20.2%	85	27.7%	47	15.3%	29	9.5%

Table 5.6 further shows that all the, shoulder and pain feeling occur, always 124(40.4%) of sample workers. The diseases that occur sometimes are dizziness on 219(71.3%) of respondents, headache on111 (36.2%) of the workers, allergic on 111(36.2%) of the samples, insomnia/sleeplessness on 177(57.5%) of the sample employees, typhoid on 138(45%) of the respondents, backache on 139(45.3%) of the sample workers, strain on 101(32.9%) of the sample

employees and skin diseases on 144(48.9%) of the respondents. Whereas, occurrence allergic128 (41.7%), typhoid, 108(35.2%) backache, 127(41.4%) and cold, 130(42.4%) of the respondents, said rarely.

5.8. Common factors causing illness at work place

The workers of the sample textile industries in Addis Ababa city were requested to give their response to the question" are the followings common causes of illness at the working place?" Hence, their responses are tabulated in the next table

Table 5: 7 workers responses to questions of common causes of illness

Cause illness	Yes		No		Missed	
	N	%	N	%	N	%
Fume (gas, mist)	230	74.9%	53	17.35%	24	7.8%
Mental stress due to work	189	61.6%	62	20.2%	56	18.2%
Biological agents of infection diseases	227	73.9%	59	19.3%	21	6.8%
Working position standing	234	76.2%	56	18.3%	17	5.5%
Working position sitting	233	75.9%	65	21.2%	9	2.9%
Heavy chemical	225	73.3%	47	14.6%	37	12.1%
Repetitive task	246	80.1%	53	17.3%	8	2.6%
Repetitive motion	251	81.8%	35	11.4%	21	6.8%
Extreme noise	201	65.5%	85	27.7%	21	6.8%
Extreme temperature	232	75.6%	63	20.5%	12	3.9%
Extreme vibration	74	24.1%	217	70.7%	16	5.2%

As pointed out in table 5.7above, the workers responses rate that the illness occurred due to fume(gas mist) was 230(74.9%), because of mental stress was 189(61.6%), due to biological agents of infection disease was 227(73.9%), that of working position standing was 234(76.2%), due to working position sitting was 233(75.9%),because of repetitive task was 246(80.1%),due to repetitive motion was 251(81.8%), because of extreme noise was 201(65.5%), because of heavy chemical was 225(73.3%) and due to extreme temperature 232(75.6%). These data indicate that the most common causes of disease in the sample textile industries were heavy chemical, air dust particles, extreme temperature, working position sitting and standing, repetitive motion and task.

5.9. Factors that cause accidents at the working place

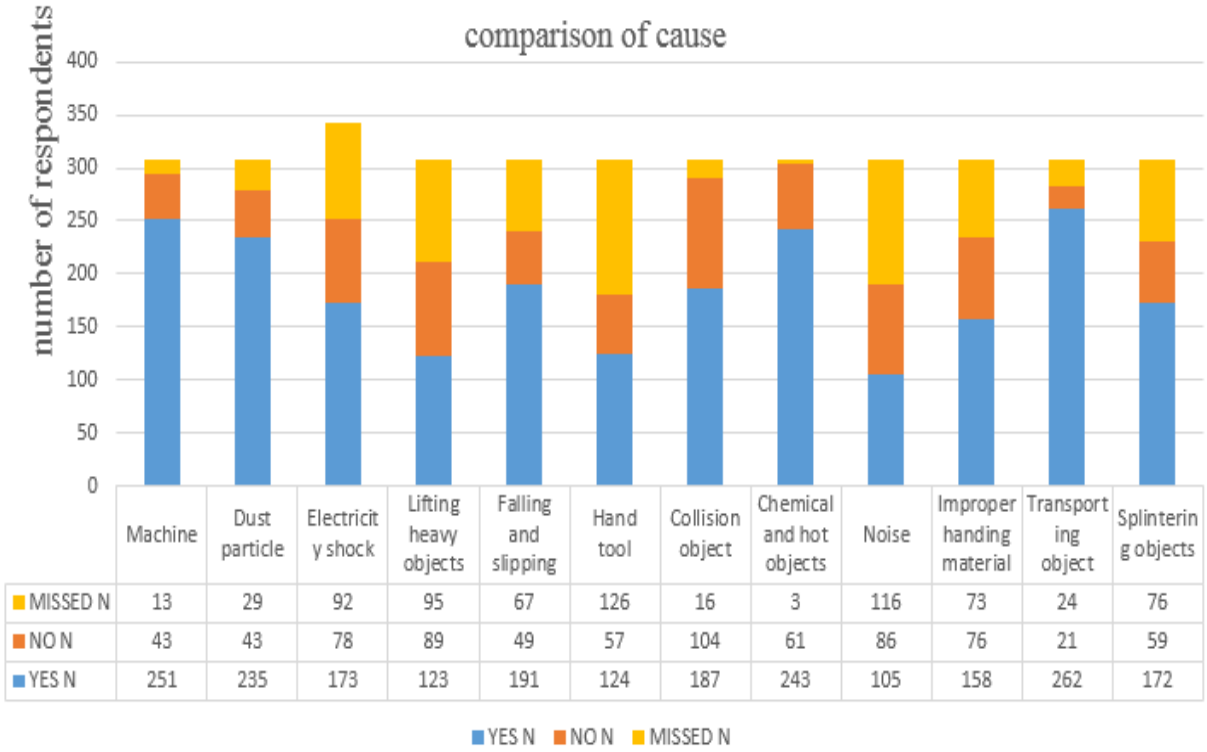
A question "did you face occupational accident due to the following factors for the last 12 month?" their responses has been tabulated in table 5.8 as follows.

Table 5: 8 the causes of occupational accidents that faced on workers

Causes of accidents	Yes		No		Missed	
	N	%	N	%	N	%
Machine	251	81.8%	43	14%	13	4.2%
Electricity shock	173	56.4%	78	25.4%	92	30%
Lifting heavy objects	123	40.1%	89	29%	95	30.9%
Falling and slipping	191	62.2%	49	16%	67	21.8%
Hand tool	124	40.4%	57	18.6%	126	41%
Colliding object	187	60.9%	104	33.9%	16	5.2%
Chemical and hot objects	243	79.2%	61	19.9%	3	1%
Improper material handing	158	51.5%	76	24.8%	73	23.8%
Transporting object	262	85.3%	21	6.9%	24	7.8%
Splintering objects	172	56%	59	19.2%	76	24.8%

As indicated in the above table, the employees response indicate that the number of workers experienced work related-accidents due to machine is 251(81.8%), that of electric shock is 173(56.4%), because of lifting heavy objects 123(40.1), due to falling and slipping 191(62.2%),due to hand tool 124(40.4%), because of collision objective was 187(60.9%), that of chemical and hot objects was 243(79.2%), due to noise was 105(33.6%) , because of transporting object was 262(85.3%) and due to splintering object 172(56%).

Figure 5: 4 Comparisons of factors accidents in work place response



Responses comparison for causes most affected the employees of textile industries in Addis Ababa city were presented on Figure 5.4. As employees' response the most common factors cause of accidents in textile industries such as transporting objects, machine, and dust particle causes are more than accident in employees.

5.10. Accidents in working place of textile Industries

Another question raised to textile industries be situated Have you been accidents at your workplace for given impacts below the table 5.9 the impacts such as burn, cut punctured, fracture, sprain and dislocation. Most of textile industries employees have given their view as ''yes ''or'' no'' responses to the givens accidents. The furthers detail percentage and frequency values are shown below in the table 5.9

Table 5: 9 types of accidents in work place in textile industries response

Types of accidents	Yes		No		Missed	
	N	%	N	%	N	%
Burn	107	34.9%	139	45.3%	61	19.9%
Cut	226	73.6%	34	11.1%	47	15.3%
Punctured	165	53.8%	93	30.3%	49	16%

Fracture	182	59.3%	68	22.1%	57	18.6%
Piercing	215	70%	85	27.7%	7	2.3%
Sprain	175	56.6%	84	27.4%	48	15.6%
Abrasion	237	77.2%	65	21.2%	5	1.6%

Regarding type of accidents were due to abrasion 237(77.2%), cut 226(73.65), piercing 215 (70%), sprain175 (56.6%) and burn 107(34.9%) were common types of occupational related accidents. These accidents occurred at large as it is obtained from the response rates. As a result, it is the place where to focus for further workplace improvement is on these issues.

5.11. Part of the body injured by Occupational accidents in textile industries

The employees of textile industries around Addis Abba city were question to give their response to the question which part of your body affected by occupational accidents the injuries given below the table 5.10**?''** among the 307 respondents, some responded to" yes "or "no**"** responses forms. The remaining percentages considered as missed values of the responses. Occupational accidents on body affected summarized below the table 5.10

Table 5: 10 occupational related injuries part of body response

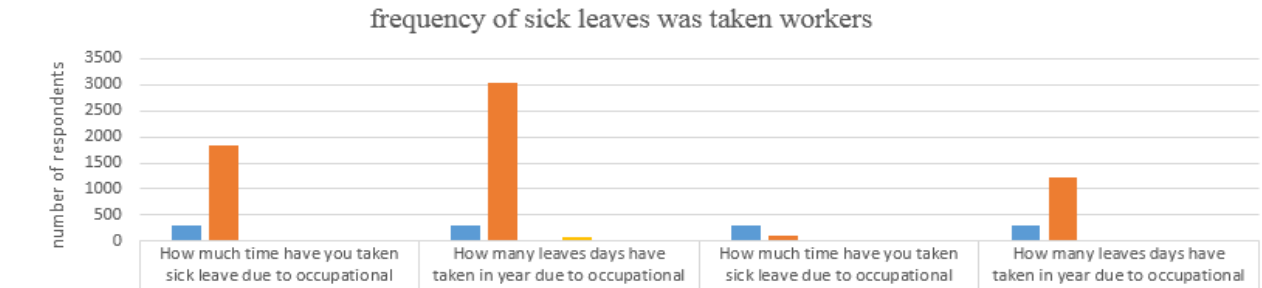
Body injuries	Yes		No		Missed	
	N	%	N	%	N	%
Fingers	223	72.6%	35	11.4%	49	16%
Hand	218	71%	72	23.5%	17	5.5%
Tooth	203	66.1%	51	16.6%	53	17.3%
Back bone	198	64.5%	67	21.8%	42	13.7%
Leg	174	56.7%	56	18.2%	77	25.1%
Toe	131	42.6%	95	31%	81	26.4%

Regarding with parts of body injured 223(72.6%) finger, 218 (71%) hand, 203(66.1%) tooth, 198 (64.5%) back bone, 174(56.7%), and 131 (42.6%) toe were the part of the body commonly affected. Among workers in textile industries in Addis Ababa city, finger and hand were most common part of the body affected.

5.12. Employees taken sick leave and lost day due to occupational disease and accidents

A question raised to textile industries related to occupational accidents and diseases have taken sick leave the employees. How much times have you taken sick leaved due to occupational accidents and disease in a year? And also how many leave days has taken in year to due occupational accidents and disease? Regarding the leaves the employees have taken a year due to accidents and diseases. Respondents who response to the occurrence in a year showed that due to accidents 1.06 average and due to diseases 5.97 average in years. Regarding day lost due to occupational accidents 26.96 average and diseases 9.934 in year. Total lost due occupational accident and diseases absents 303 and 1213 day respectively. The lost days are summarized figure 5.5

Figure 5: 5 workers taken sick leaves and working day lost response



	How much time have you taken sick leave due to occupational disease in a year?	How many leaves days have taken in year due to occupational disease?	How much time have you taken sick leave due to occupational accident in a year?	How many leaves days have taken in year due to occupational accident?
N	307	307	307	307
sum	1834	3030	108	1213
Minimum	0	0	0	0
maximum	28	80	6	0
Mean	5.97	9.934	1.061	26.955
Std. Deviation	5.426	12.189	1.337	25.175

5.13. Observation

One of the way through which the researcher gathered the relevant data for investigating the condition of the work place environments of textile industries is physical observation. Through observation the following data about availability and usage PPE; availability of emergency exits; and quality of the working areas are collected from the case companies. Based on the findings, most of the machines are no guarded so that the workers are exposed to injuries and diseases in work place. Regarding to the floor, it is dirty and contains dust particles; work place layout and material handling systems are poor that will be one of factor that may facilities occurrence of accidents and disease. Some of the workers don't use gloves while working with chemicals and

others are exposed repetitive motions, commonly; in material handling, lifting and unloading activities.

5.14. Demographic factors and work related disease

Socio-demographic factors: multivariate analysis of socio demographic characteristic with occupational diseases revealed gender, age educational, and experience and employees pattern significantly associated. As results of analysis presented in the table below, among the selected sample of 307 employees 296 (96.4%) of them have mention to answer the question of "whether they faced any work related diseases at their work place" and only 255 (83.06%) of those reported that they have faced occupational diseases at their work place.

Table 5: 11 demographic factors and work related disease

Demographic factors		Did you face work related diseases at your work place		COR:95%CI
		Yes	No	
Gender	Male	76(82.6)	16(17.4)	1.0
	Females	179(87.8)	25(12.1)	**1.123 (1.077- 1.168)**
Age	Below 20 yrs.	4(80)	1(20)	1.00
	20-29 yrs.	91(87.5)	13(12.5)	1.225(1.060- 2.191)
	30-39 yrs.	66(75)	22(25)	1.00
	40-49 yrs.	47(92.2)	4(7.8)	**1.240**(1.0021- 2.155)].
	50-55 yrs.	47(97.9)	1(2)	1.210(0.9789- 2.0627)
Experienc e	Less than 1 yr.	50(47.6)	55(52.4)	1.00
	1-5 yrs.	109(83.9)	21(16.2)	1.00
	6-10 yrs.	57(85.1)	10(14.9)	1.149(1.062-2.237)
	More than 10 yrs.	39(88.6)	5(11.4)	1.114(1.016-2.212)
Employee s pattern	Permanents	232(85.9)	38(14.1)	1.147 (1.099-2.382)
	Temporary	23(88.5)	3(11.5)	1.125(1.984-2.247)
Education al level	Illiterate	9(90)	1(10)	1.324(.967-2.182)
	Primary(grade 1-8)	65(83.3)	13(16.7)	1.124(.768-2.095)
	Secondary(grade 9-12)	81(79.4)	21(7.6)	1.121(.669-2.084)
	Certificate	28(73.7)	10(3.1)	1.009(0.017-1.109)
	Diploma	31(70.5)	13(29.6)	1.00
	B.Sc.	5(31.25)	11(68.8)	1.00

The rate of workers' exposure to work related diseases in textile Industries is analyzed on the basis of their gender, age, educational level, work experience, and employment pattern. According to the findings from multivariate analysis the female workers are 1.123 times more

likely to exposed to occupational disease than males [COR: 1.123,95% CI(1.077- 1.168)]. Regarding their age range, workers in ranges of workers with age range of 40-49 years are 1.240 times more likely exposed to work related disease than those with age range of 20-29years.[COR:1.240 CI(1.0021- 2.155)]. But workers of age (20-29years) have 1.225times more chances of exposure to occupational disease than those with age range of (below 20 and 30-39 years)and that of (50-55years) have 1.210 times more chance of exposure to work related disease in comparison to other age range of (below 20 and 30-39 years). Regarding experience of the workers in organizations for 6 and more years have got work related disease 1.149 times more likely than those remained for 5 years and less time. Regarding employment pattern and educational level of the worker are also other demographic factors which have direct and indirect contribution for occupational disease at work place. According to the results of computation shown in table 5.11, the workers employed permanently are 1.147 times more likely exposed to occupational disease than workers employed temporarily[COR:1.147,95%CI(1.099-2.1825)]. According to the findings of this study the workers with Illiterate are highly rated by being exposed for work related disease. The workers with educational level of Illiterate are 1.324 times more likely reported than other educational levels [COR: 1.324, 95% CI (.9675-2.182)].

5.15. Work place environmental factors of workers and work related disease

Regarding environmental factors which have significant impact on workers' safety and health condition, the working time and training on occupational safety and health issues are the major ones given more focus in this study. The results indicated that among the workers spending more than 8 hours per day on work 125(80.7%) of them have faced work related disease at their work place where as among those work for 8 and less hours per day 89(67.9%)of them encountered diseases caused due to the conditions at their work place.

Table 5: 12 the impact of working of workers on exposure to work related disease response

Environmental factors		Did you face work related diseases at your work place		COR:95%CI
		Yes	No	
Working hours	8hr<	125(80.7)	30(19.4)	1.194(1.134-1.260)
	8hr	89(67.9)	42(32.1)	1.00
Training	Yes	18(52.9)	16(47.1)	1.471(1.322-1.623)

	No	198(80.2)	49(19.8)	1.198(1.146-1.249)

Regarding training 281 of worker selected for the study only 34 (12.1%) have taken training concerned about occupational safety and health related to their job. Among 34(workers who have taken training concerning issues related to occupational safety and health at workplace, 18 (52.9%) have faced work related diseases while among those who did not take any training concerning occupational safety and health 247(87.9%) haven't got the same problem at their work place. Thus, the result shows that provision training related to occupational safety and health very important measurement for reducing workers' to work related diseases in textile industries.

5.16. Behavioral factors and work related disease

As we can understand from the table below that the exposure to work related diseases in textile

Table 5: 13 behavioral factors and work related disease response

Behavior factors		Did you face work related diseases at your work place		COR: 95%CI
		Yes	No	
PPE	Yes	131 (92.9)	10(7.1)	1.0
	No	136 (95.8)	6 (4.2)	1.678(0.627-4.494)
Job satisfaction	Yes	125(94)	8 (6)	1.00
	No	138 (95.7)	6(4.2)	1.019(0.381-2.722)

Workers those did not wear personal protective device were about 1.678 more likely to be caught disease than those wear were personal protective device [COR: 1.678, 95%CI (0.627-4.4940)]

PPE is used for reducing the opportunity of workers to be victimized with work related disease. It could be also understand that workers those are not satisfied with the assigned job 1.019 times more likely face work related diseases at their work place than satisfied workers[COR:1.019, 95%CI(0.381-2.722)]

5.17. Demographic factors and work related accidents

Socio- demographic factors: multivariate analysis of socio demographic characteristic with occupational accidents revealed gender, age educational, and experience and employees pattern significantly associated were summarized below the table.

Table 5: 14 demographic factors and work related accidents

Demographic factors		Did you face work related accidents at your work place		COR
		Yes	No	
Gender	Male	92(95.8)	4(4.2)	1.443(0.603-3.454)
	Females	179(93.2)	13(6.8)	1.00
Age	Below 20 yrs.	4(40)	3(60)	.227(.016-3.169
	20-29 yrs.	95(96)	4(4.0)	2.065(0.494- 8.629)
	30-39 yrs.	80(67.1)	29(33)	1.466(.412-5.216)
	40-49 yrs.	46(86.3)	7(13.7)	.520(.412-5.216)
	50-55 yrs.	4(75)	12(25)	1.00
Experience	Below than one yrs.	53(96.4)	2(3.6)	1.293(0.175-9.570)
	1-5 yrs.	116(94.3)	7(5.7)	1.00
	6-10 yrs.	61(89.7)	7(10.3)	1.00
	More than 10 yrs.	41(95.3)	2(4.6)	1.00
Employees pattern	Permanents	184(68.2)	86(31.9)	1.00
	Temporary	18(69.2)	8(30.8)	1.139(0.4.58-2.829)
Educational level	Illiterate	4(50.0)	4(50.0)	1.671(.0105-2.720)
	Primary(grade 1-8)	71(91.1)	7(8.9)	2.885(.488-7.048)
	Secondary(grade 9-12)	101(90.2)	11(9.8)	2.787(.396-6.045)
	Certificate	10(31.3)	22(68.8)	1.00
	Diploma	20(45.5)	24(54.5)	1.00
	B.Sc.	3(18.8)	13(81.3)	1.00

Regarding work related accident at work places of textile industries in Addis Ababa male workers are facing the incident 1.443 time more likely than female workers[COR:1.443, 95%CI(0.603-3.454)]. Concerning the age group of the workers, most of them are in range of 20-29 years and this the workers in this age group are highly exposed to work related accident at their work place While concerning the work experience of the workers of textile industry under this study in relation to their chance of exposure to work related accident, the workers with work more experience are highly facing the problem, particularly for this study workers of work experience below than one years are highly encountering the situation. Workers with experience of below than one year's exposed to occupational accidents 1.293 times more likely than those with work experience of more than one years.[COR: 1.293 ,95%,CI: (0.175-9.570)]. The

employment pattern is one of factors which have impact on the occurrence of accidents at work place. From the result of analysis it is obtained that temporary employed exposed to occupational accidents 1.139 times more likely than permanent[COR:1.139, 95%CI(0.4.58-2.829)].

According to the findings, the educational level of the workers and the occurrence frequency of work related accidents have no such significant relationship rather depends on the number of employees in each category of workers' educational level.

5.18. The impact of working condition of workers on exposure to work related accidents

As shown in the following table, working hours per day and status of training culture on issues related to occupational safety and health are also other parameters whose influence on occurrence of accidents at work place of textile industries is analyzed. The results showed that people working more than 8 hours per day have got more opportunity of getting work related accidents than those working for 8 hours per day i.e., workers those spend more than 8 hours per day face work related accidents 1.966 times more likely than those spent 8 and less hours at their work per day [COR: 1.966, 95%CI (1.144-3.380)

Table 5: 15 Working Environments Factors and Work Related Accidents

Environmental factors		Did you face work related accidents at your work place		COR 95%CI
		Yes	No	
Working hours	8hr<	125 (80.6)	30(19.4)	1.966(1.144-3.380)
	8hr	89 (67.9)	42(32.1)	1.00
Training	Yes	19(55.9)	15(44.1)	1.00
	No	225(91.1)	22(8.9)	1.08(1.0-1.16)

The result also indicated that workers which took training related to issues of occupational safety and health have less chance of getting work related accidents at work place than workers those did not take the related training. That means availability and provision of training related to occupational safety and health issues is very necessary in order to reduce the frequency of accidents happening at work place.

5.19. Behavioral factors and work related accidents

The exposure of workers to work related diseases in textile industries in Addis Ababa with respect to the availability and usage of PPE as well as job satisfaction is shown in table below.

Table 5: 16 behavioral factors and work related accidents

Behavior factors		Did you face work related at your accidents work place		COR: 95%CI
		Yes	No	
PPE	Yes	78 (53.4)	68(46.6)	1.00
	No	132 (91.0)	13 (8.9)	2.68(0.486-7.045)
Job satisfaction	Yes	89(69)	40(31)	1.00
	No	119 (74.8)	40(25.2)	1.063(0.619- 1.823)

Availability and the culture of workers' using of personal protective equipment (PPE) and the workers' satisfaction by the job assigned is also other important behavioral factors in work place which have significant impact on safety and health status of the workers. Workers those did not wear personal protective device were about 2.680 time more likely to be injured than those wear personal protective device [COR: 2.680, 95%CI (0.486-7.045)]

It can be also understand that workers those are not satisfied with the assigned job 1.063 times more likely face work related in juried at their work place than those satisfied workers[COR:1.019, 95%CI(0.619-1.823)]

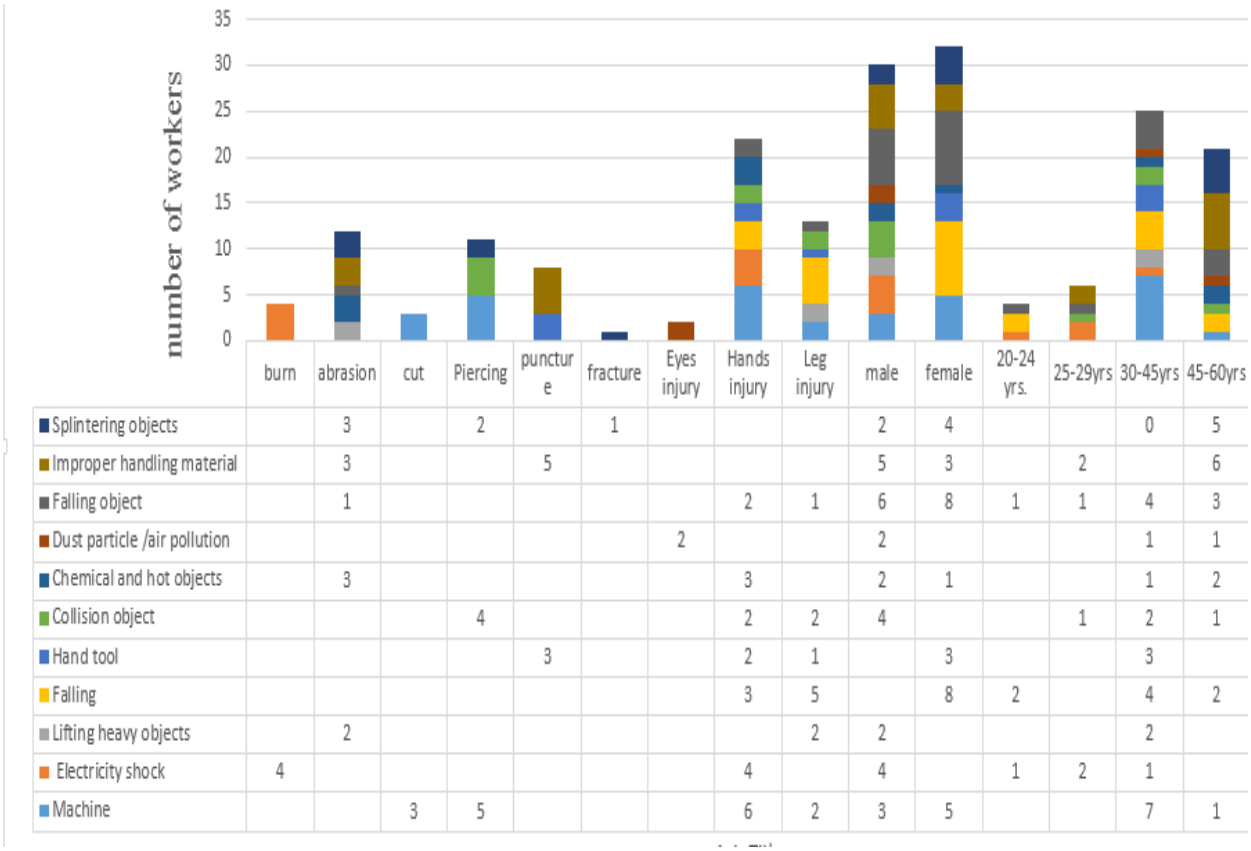
5.20. Data analysis based on companies records

The data collected from the records of from five textile industries out of 21 textile industries in Addis Ababa city. Finding from the companies recordings for one year's regarding accidents and diseases in organization. Depending on this data records the prevalence of lost working days and incurred cost were taken from five textile industries.

5.20.1. Causes of occupation accidents and injuries in textile industries

The cause of the accidents at work place of textile industries in Addis Ababa city in relation to the types of injuries happened, body parts affected by accident, as well as the gender and age of the victimized workers is presented in detail figure 5.6

Figure 5: 6 types of causes and types of body part injuries



	burn	abrasion	cut	Piercing	puncture	fracture	Eyes injury	Hands injury	Leg injury	male	female	20-24 yrs.	25-29yrs	30-45yrs	45-60yrs
Splintering objects		3		2		1				2	4			0	5
Improper handling material		3			5					5	3		2		6
Falling object		1						2	1	6	8	1	1	4	3
Dust particle /air pollution							2			2				1	1
Chemical and hot objects		3						3		2	1			1	2
Collision object				4				2	2	4			1	2	1
Hand tool					3			2	1		3			3	
Falling								3	5		8	2		4	2
Lifting heavy objects		2							2	2				2	
Electricity shock	4							4		4		1	2	1	
Machine			3	5				6	2	3	5			7	1

As we can see from the table above accidents caused by machines are result through piercing hands and legs of the workers. Females are extremely victim of accidents caused by industrial machine and workers with age range of 40 years and above are victimized. Electric shock is one of the causes for accidents at workplace and burning injury is the most commonly related to such shock. For male workers are mostly closer to tasks in contact with electricity, males with age 40 years and above were injured. According to the responses from the workers those participated in the study never indicate which parts of body are exposed to such incident and injure.

Lifting heavy objects, falling\ object, improper handling material and splintering objects are the main causes for abrasion injury and leg and hands are injured commonly with these causative conditions. Jobs involving lifting heavy objects are mostly performed by male workers so that they are victim of injuries and accidents resulting from such activities and workers of age above 40 years are facing the problem. Splintering objects cause piercing and fracture injures, while improper handling causes puncture. Improper handling material and falling objects are common to every work section so that workers of both sex and workers of all age ranges have experienced accidents caused by falling objects.

5.20.2. Working days lost due to occupational accidents and diseases

Types of work related accidents, diseases and the working days lost due to occupational accidents of employees accidents has taken to clinic were obtained in one years from the companies documents group in textile industries found in Addis Ababa city is presented in detail in the following table.

Table 5: 17 occupational related disease and injuries, working time lost per year

Types of disease	Male	Female	18-29 yrs.	30-39 yrs.	40-55 yrs.	Working day lost/ year
Allergic	9	32	23	10	5	155
Hypersensitivity	8	52	13	10	29	164
Headache	31	308	32	186	97	101
Typhus	21	173	59	87	33	328
Pneumonia	8	21	3	2	7	295
Otitis	11	29	12	7	10	118
Respiratory track	19	98	39	27	20	152
Typhoid	43	156	102	24	55	254
Dyspnoea	12	51	9	14	23	335
Total	162	920				1902
Type of injuries						
Burn	6	2	1	4	3	38
Abrasion	3	7	2	8		80
Cut	1	3	3	1		63
Piercing	2	11				112
Puncture	3	8	5	2	4	86
Fracture	1	3	1		3	102
Eyes Injury	2	6		3	5	24
Total	18	40				505

The types of occupational disease from which workers of textile industries are facing frequently put much negative impact on the organization. As shown in the above table that due to these diseases 162 male and 920 female workers were absent from their work at least for three days in those five case companies. This concern is a public health issue that goes beyond the injured employee to affect the entire society. When the employees' ability to earn is disrupted by an event such as Workplace injury or death, the financial stability of the family is seriously threatened. In turn total of 1902 working days were lost annually.

During these days the workers who are absent from work were paid for salary, medical treatment, accident and injury compensation, cost of searching for hiring new workers, lose or reduction of production capacity due to un experienced workers, loss of customers resulted from being unsatisfied of the less production capacity. Training for new employees and for safety and health related issues also call for another unproductive expenditure from the organizations.

As we can understand from the above table that total of 58 people were injured due to various causative condition in the work place of the five textile companies covered in this study and among these 40 (68.9%) were female workers. The injuries are resulted from burn, abrasion, cut, piercing, puncture, fracture, and eyes injury and due to this injury problem 505 working days were lost in one year.

5.20.3. Medical cost due to work related diseases and accidents

As it is presented in the figure below, in this study the most common types of health problems which affected the workers and incurred significant medical costs on textile industries under consideration are allergic, hypertension, headache, dyspoe, pneumonia, otitis, respiratory track, typhoid, typhus ,burn, abrasion , cut, piercing , puncture, fracture and eye injury. Regarding the gender of workers affected by these diseases and accidents, female workers are mostly facing the problem because much of the workers are female. The data about total number of employees taken to clinic in one years due to occupational acidents and diseases are obtained from the companies' documents. Concerning the medical cost incured due to these accidents and diseases to textile industries in one year is found to be with minimum of 251(10) birr, maximum of 972(2000) birr, sum of 448322 (210190) birr and average of 665.79 (1014.1) birr, respectively. Employees have been paid for the number of lost working hours while they were absent due to accidents and disease in the same year with minimum of 32.26 (32.5) birr, maximum of 1290 (1750) birr, sum of 837590 (376327) birr and average of 649.3 (901.5) birr for monthly salary.

Table 5: 18 occupational accidents and diseases, medical cost

Types of cost related to occupational accidents	N(Employees)	Min	Max	Mean	Sum
Medical expense due to accidents	40	251	972	665.79	448322
Salary paid for employees absent in juried	40	32.26	1290	649.3	837590

Medical expense due to illness	1082	10	2000	1014.1	210190
Salary paid for employees absent in sickness	1078	32.5	1750	901.5	376327

The medical expense resulted from work related accidents and illnes in relation to the salary paid while workers are not at their work and the number of workers sufared during the year of the study are presennted in the above table and the negative impact of thes health problem can be summarized as follows. The resulting levels of absenteeism in textile industries have serious repercussions on the economy, firstly affecting the productivity of the individual at the level of the firm and finally the entire economy. Once the individuals and families lose their ability to earn and to provide support, they become dependent on government services and public assistance for health care, housing and food. Direct costs such as replacement of lost wages and medical bills are insured and are well documented. However, indirect and opportunity costs such as lost hours of production, years of work, ability to earn and the hardship placed on the injured employee and his/her family are great and are not measured in this study.

Chapter Six

6. Methods of Improving Impacts of Occupational Safety and Health on Workers' Productivity in Textile Industries

6.1. Introduction

Approaches for improving organizational productivity are also vital to reduce the negative impact of health and safety on workers' productivity in the workplace. Giving maximum concentration on safety and health issues in the workplace will help achieve this goal in textile industries of Addis Ababa. Since the quality of work environment has a strong influence on the performance and profitability of firms., developing system for improving safety and health in these industries provides the following direct and indirect benefits for the individuals as well as for the employer:. Direct benefits:

- Higher employment opportunities
- Reduced insurance premiums
- Reduced litigation costs
- Reduced sick pay costs
- Improved production/productivity rates
- Reduced production and materials damage
- Lower accident costs/production delays

Indirect benefits:

- Reduced absenteeism
- Reduce staff turnover
- Improve corporate image
- Improved chances of winning contracts
- Improved job satisfaction/morale.

However, many of the employees are have less than one year experience and are exposed psychological, physical, biological, chemical, and ergonomics hazards in addition to the lack of adequate training and awareness on safety and health related issues. This situation exposes the workers to occupational accidents, injuries and diseases.

Accordingly, this chapter discusses improvement principles and set approaches for developing effective safety and health management program based on the results identified from the analysis in the preceding chapters. This section focuses on approaches of solving the problems in the textile industries so as to raise their organizational and employees' productivities through identification, prevention and elimination of risk and hazardous condition and the causes of work related accident, injuries, and diseases.

6.2. Main problems and causes Identified

In this study, a lot of safety and health problems are identified in textile industries. Among these, improper use of personnel protective equipment (PPE), poor treatment from management, work over load, training, and layout work place and displeased job assign cause of loss of attention and mind exhaustion are the major ones. Health and Safety problems are resulted from work-related accidents, potentially arising aggression, physical damage on workers and injuries. As a result of these factors causing incidents in the workplace, mortal and non-fatal accidents are suffering the employees and reduced the companies' productivity.

The causes of accidents in industries have been attributed to two major sources; these are personal factors and environmental factors. In terms of the personal factors there are certain physiological and psychological agents and conditions rendering the individual more likely to be involved in emotional and cognitive development program for addressing the mental resilience of the employee and a work culture for encouraging social relationships among employees. These ensure the improvement on the well-being of workers in an Organizational performance.

Environmental factors such as lack of quality temperature room extreme noise at work place guarding on machinery, air dust ,working position standing, working position sitting, repetitive task repetitive motion particles and heavy chemical were identified. These are few systems which focus on the improvement of conditions affecting the performance, productivity, labor welfare and the management system; which focuses on managing systems and designing prescribed processes in which the textile industries should seek to achieve their goals. For this reason the components of an organization's health and safety are used as determinant of an organization's health and safety programs and principles.

6.3. The impact of Occupational health and safety on worker Productivity of textile Industries

Productivity of workers in workplace of textile industries is affected by several factors mainly by occupational safety and health problems. The findings from this study also proved that the companies are working only for the income generating and increasing profitability on the market for long time. The organizations have no focused for the workplace environment and only focused profit maximization or productivity. A healthy and satisfied employee can do these achievements than a bureaucratic management system.

The textile industries in Addis Ababa city have documented total of 1,513 lost working days in one year due to work related diseases and injuries. If the cost incurred in these lost work days are converted to money, it will have a remarkable effect on productivity and annual costs of the industries. But industries do not recognize how much these affect their productivity because they do not calculate it in terms of cost beyond counting number of absenteeism from the jobs. Related to total numbers of employees visited health centers 2,407 were taken to clinic in one year from five selected textile industries.

The numerical analysis of this study revealed that accidents don't only reduce organizational productivity; it also contributes to the cost of production. This cost can be classified into direct and indirect costs. The direct costs are made up of medical fees, compensation/insurance cost, death benefits, wage lost, whereas the indirect costs include, loss of time, damage to machineries and equipment, replacement of injured employees, sick leave. The later costs are hardly recognized by employers 'in spite of their high percentage of the total cost due to accidents. The status of textile industries in Addis Ababa city is investigated regarding the costs incurred on their companies. Among the five textile industries very few of them have records with respect to costs related safety and health incidents in workplace from which the researcher tried to review the total expenditures of successive years.

Medical expenses of occupational accidents or diseases impoverished the textile industries with sum of 448,322 birr as calculated and reviewed from the records of five industries in one year.

Due to accidents and disease in five textile industries employees were paid for the hours they were absent from work, total of 837,590birr in one year. This study attempt to set improvement approaches in order to addressed the problems in the following subsections.

6.4. Employee Productivity Improvement Approaches for in textile Industries

On the basis of the problems identified and discussed above and their impacts on productivity has been discussed and seen in brief, as it is not the primary objective of this study. The following are considered as the most important areas where the approaches or principles forwarded will be implemented improvement approaches to the Textile industries involved in this research study.

6.4.1. Building an Effective Health and Safety Management System

A system of managing health and safety in workplaces of textile industries involves the introduction of processes and activities to decrease the incidence of injury and illness in the industries. The successful implementation of this system requires management commitment to the system, effective allocation of resources, and a high level of employee participation.

The components of an effective health and safety management system are briefly discussed below:

a. Management leadership and organizational commitment

For this system to be effective, management at all level must show leadership and commitment to the program and should put the organization's expectation around health and safety by developing a written health and safety policy. For a health and safety management system to be effective, management at all levels, should demonstrate their support of the health and safety program. This may be demonstrated through management, participation in health and safety leadership training meetings, facility inspections incident investigations etc.

b. Roles and Responsibilities

Clearly defined and well communicated health and safety roles and responsibilities for all levels of the organizations create an expectation of a standard level of performance and accountability among employees, contractors, and visitors. All levels must be aware of their individual roles and responsibilities under both state law and company standards.

c. Employee Participation

Employees who forms part of the health and safety committee, should be involved in writing the policy as it is important for workers to be involved in the development of the system in order to create ownership as well as help a better fit with the culture of the organization.

d. Hazard Identification and Assessment Process

Employers are required to assess a work site for existence of potential hazards before work begins. The data obtained could be used as the basis for inspection checklists to determine what worker–training needs to be done, to build the content of employee orientations.

e. Determine Control methods

The most effective controlling methods to eliminate or reduce the identified hazards can be determined based on legal requirements, manufacturers' specifications, company rules, industry best practices, and worker inputs.

f. Hazard Control

The implementation of control measures to eliminate or reduce the risk of harm to workers is what we call the control system. Thus, employers should take all reasonable steps to eliminate or control identified hazards in order to make the workplace safer.

g. Enforcement of controls

To enforce control methods, develop a constructive enforcement policy, and communicate the consequences to employees and the steps that will be taken if noncompliance occurs.

6.4.2. Workplace station Improvement of the industries

The layout of the workplace station is one of the factors which have a significant impact on work environment and contributes to occurrence of work related accidents and injuries. During physical observation, it is investigated that most of the companies' workplace layout is recognized as one factor increased workplace complexity i.e., dispersed raw materials, inputs, exposed electric cables nearby work areas, piece of metals fallen every were, narrow aisles, finished and semi processed products stored in one room, and many other complicated were noticed. These were capable to create occupational accidents which gradually lead to work related disease on the victim employees.

Part of designing the layout and configuration of a workplace contributes to safe working environment as:

- designing the layout of a building so that noisy machinery is isolated from workstations

- designing workplace space and layout to facilitate use of mechanical aids to prevent musculoskeletal disorders in the textile industry
- designing storage of raw material and finished product whilst taking into consideration the functionality (e.g. location, material to be stored, layout, height, and doors)
- Accommodation of equipment: accommodating the equipment is needed for allowing space for additional traffic and general activity.
- Consider the layout of plant's workstations in relation to the building or structure and other factors such as environment of the plant, ease of access to operator controls, and the impact of plant location in close proximity to other plant is vital. Textile industries should redesign their workplace environment so that they can promote productivity through keeping the workplace safer and healthier for all persons and properties.

6.4.3. Safety and health Committee

A committee with representation of the employees' safety and health representatives should be established and function at organization level. Occupational safety and health, including compliance with the OSH requirements pursuant to national laws and regulations, and practice, is the responsibility and duty of the employer. The employer shall show strong leadership and commitment to OSH activities in the organization, and make appropriate arrangements for the establishment of an OSHMS. The system shall contain the main elements which are: policy development, organizing, planning and implementation, evaluation and action for improvement.

- Policy: it includes activities related to the development of the OSH policy statement, structures and practices that insure active and meaningful worker participation in OSH arrangement.
- Organizing: the establishment of OSH responsibilities and accountabilities structures, a training system, competency definitions, documentation practices and a communication system are to be addressed.
- Planning & Implementing: this addresses the activities associated with the fulfillment of the principles expressed in the OSH policy statement. The initial assessment of the OSH arrangement that then support the actual system planning, development and implementation functions are the activities included.

- Evaluation addresses those functions associated with measuring the performance of management system. This includes the development of performance monitoring and measurement protocols, investigation practices for accidents, auditing methods and management review arrangement.
- Action for Improvement: issues associated with preventive/corrective actions and continual improvement is to be addressed here. Based on the results of performance monitoring and measurement, investigations, audits, and management review, appropriate prevention/corrective and continual improvement actions can be taken. The inspectorate focuses on reducing safety and health risks at workplaces and ensures safety and health standards are maintained by: .

- Monitoring workplaces.
- Investigating accidents.
- Sharing lessons learnt from accidents with industry.

In a country existences of workplace safety and health institute will help the workplace safety and health improvement and give high focus to safety.

Chapter seven

7. Conclusion and Recommendation

7.1. Conclusion

Based on the findings from the data analysis the following understandings and results were concluded in relation with the impact of occupational health and safety on workers' productivity in textile industries in Addis Ababa city**.**

As he objective of this study was to investigate the impact of occupational health and safety on workers' productivity in textile industries in Addis Ababa city**.**

Five textile industries were taken as sample case companies with a total of 307 worker participated as respondents in this study. These companies are: KK private limited company with 104 (33.9%), G-Seven trading private limited company with 58(18.9%), Yirgalem Addis textile factory, 45(14.7%) from Jay-Jay textile private limited company and 69(22.5%) from Firker factory private limited company respectively. The data collected from the questionnaire survey, interview, field observation, document review and analysis are used for the assessment of the existing safety and health conditions of the selected textile industries.

As indicated above in the survey findings, there are multi faced problem in textile industries in Addis Ababa city in relation to the issues of occupational safety and health and their impact on workers' productivity. The aforementioned can be identified that impact of occupational safety and health at workplace are concern in textile industries in Addis Ababa sector.

Most of the companies covered in this study have no adequate employee safety and health protection facilities, Personal Protective Equipment, as well as adopted program and policies concerning workers' safety and health at work place. Most of the textile companies in Addis Ababa city which are included in this paper don't give regular safety and healthy training. Due to this most of the employees in these textile companies have no adequate understanding and knowledge safety and in textile industries.

The response of respondents taken from those five textile industries about work related diseases is used to rate such as dizziness, psychological stress, headache, insomnia/ lack of felling for sleep, typhoid, dysentery, strain, skin disease, respiratory disease and musculoskeletal disorder. The prevalence of other factors causing illness at work place such as heavy chemical, air dust

particle, extreme temperature, working position (sitting, and standing, repetitive motion and repetitive handling are more causes diseases in employees.

The common factors cause accidents in textile industries as employees' response such as transporting objects, machine, and dust particle causes are more than accident in employees.

The common parts of body injured finger, hand; tooth, back bone, and toe were in textile industries.

The employees leave days have taken in year to due occupational accident and diseases absents 303 and 1213 day respectively and the total 1516 working day lost per years.

7.2. Recommendation

The following recommendations are forwarded for both concerned as well as beneficiary organizations and personals based on the findings of the study:

- Each textile industry's management or administration should provide necessary personal protective equipment and facilities and enforcement its usage
- Occupational safety and health committee is needed to be established in all textile industries.
- Management should carry out adequate job analysis, to help in identifying job related hazards, which should be communicated to workers during training, orientation, seminar or workshop.
- Employer should motivate their workers by giving recognition for the workers those showed better performance and hardworking in the process of order to enhance their productivity.
- The work place should be cleaned regularly to avoid dust, chemical sewages, and unnecessary pollutant to keeping the workers' health.
- The management should also work on reducing the work stress level by frequently communicating with employees.
- Any accidental and illness event should be recorded properly and timely and kept by company.
- Management should develop effective health and safety policy and ensure its effective implementation within the organization

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Appendix A

Addis Ababa University

Addis Ababa Institute of Technology

School Of Mechanical and Industrial Engineering

Topic: Impact of Occupational Health and Safety on Worker Productivity in Textile Industries in Addis Ababa city.

Questionnaire to be filled by employees.

This questionnaire is to investigate the impact of occupational health and safety on workers' productivity in textile industries in Addis Ababa city.

The purpose of the study is purely academic and not for other purpose used. Please be assured that your responses will be treated with utmost confidentiality.

Name of industry by code_____ Address by code_____

Part one

Personal information

ENCIRCLE ON THE LETTER FOR YOUR ANSWER

1. Gender: A. Male B. Female

2. Age: A. below 20yrs B.20-29 yrs. C. 30-39 yrs. D. 40-49 yrs. E. 50 -55yrs. F. 56-60yrs and above

3. Educational level

A. Illiterate B. Can write and read

C.Primary (Grade 1-8)

D. Secondary (Grade 9-12)

E. Diploma

F. Certificate G. B.Sc.

H. M.Sc. I. PhD

4. Employment pattern

A. Permanent B. contract/ temporary C. (others) specify_____

5. How long have you been served in this organization?

A. less than 1year; B. 1-5 years; C. 6-10 years; D. more than 10years

6. Your position (work division) _____

Part two

Work related occupational safety and health

1. Do you have knowledge of Occupational Safety and Health in organization? 1. Yes 2.No

If the answer "No", why? _____

2. Did you take any safety and health training related with your job? 1. Yes 2. No

If the answer is yes how many training per year? _____

Part three

Work place environment characteristics

Please indicated your work place agreement on factors described below (tick)

No	Factors on work place	Can't mentioned	uncomfortable	comfortable	very comfortable
1	Room temperature and air quality				
2	Lighting				
3	Noise				
4	personal protective equipment				
5	Layout				

3. How many hours do you work per day? _____

Part three

Workers behavior information

1. Do you use personal protective equipment at your work place? 1. Yes 2. No
2. Are you satisfied with your assigned job? 1. Yes 2. No
3. Do you have sleeping disorders? 1. Yes 2. No
4. Do you drink alcohol at your work place 1. Yes 2. No
5. Do you smoke cigarette at your work place? 1. Yes 2. No

Please say Yes or No in the appropriate box

6. Which of the following personal protective equipment and services have you been using at your work**?**

a. Helmet ☐
b. Safety shoes ☐
c. Coverall ☐
d. Gloves ☐
e. Face shield ☐
f. Google ☐
g. Dust mask ☐
h. Ear plug ☐
i. cloth ☐

Part four

Work related diseases and causes.

1. **Have you been illness on your work place caused by?**

N	Causes/ types of hazards	Yes	No
1	Air dust particle		
2	Mental stress due to work		
3	Lack of adequate toilet facilities		
4	Biological agents of infection diseases		
5	Working position standing		
6	Working position sitting		
7	Un safe equipment or machine		
8	Repetitive task		
9	Repetitive motion		
10	Poor lighting		
11	Extreme noise		
12	heavy chemical		
13	Extreme temperature		
14	Extreme vibration		

2**. Did you face any work related diseases at your work place? 1. Yes 2 No**

If yes, which the following symptoms of disease do you experience mostly?

N	**Items**	**Yes**	**No**	
1	Psychological stress ጭቀት			
2	Dizziness በድብርት			
3	Chronic voice disorders			

4	Vomiting			
5	hepatitis ጉበት ብግነት			
6	Bronchial asthma የሳባ አስም Influenza/cold ጉንፋ			
7	Nausea የማቅለሸለሸ			
8	Typhoid ታፎይድ			
9	Insomnia/sleeplessness የእንቅልፍ ማጣት			
10	Carpal tunnel syndrome			
11	skin diseases የቆዳ በሽታ			
12	respiratory diseases የመተንፈስ ችግር			
13	Muscular Disorders የአጥንት ጡንቻ መዛባት			
14	Dysentery የተቅማጥ በሽታ			
	Strain ወጠሪ			
16	Pneumonia የሳምባ ምች በሽታ			
17	Lung disease የሳም በሽታ			
18	Headache የራስ ምታት			

3. The frequency of work related diseases occurrence at you work place

N	**Items**	**Always**	**Sometimes**	**Rarely**	**Not at all**
1	Headache የራስ ምታት				
2	Dizziness መዞር				
3	Vomiting /Nausea				
4	Lung disease የሳም በሽታ				
5	Pain neck & shoulders የዐንትና ትከሻ ህመም				
6	Insomnia/sleeplessness የእንቅልፍ ማጣት				
7	Pain in the joints የመገጣጠሚያ ህመም				
8	Bronchial asthma የሳንባ አስም				
9	Heat stress				
10	Musculoskeletal diseases				
11	heart beat problem				
12	skin diseases				

	የቆዳ በሽታ				
13	respiratory diseases				
14	Eye problem				
15	Allergic አላረክ				
	Backache የጀባ ህመም				
16	Other(specify)				

1. Which of the following factors causes accidents in your organization in the last 12 months?

N	Items	Yes	No
1	Machine ማሽን		
2	Electricity shock የኤሌክትራክ ንዝረት		
3	Lifting heavy objects ክባዴ ዕቃዎችን ማንሳት		
4	Falling and slipping መደቅ/መንሸራትት		
5	Hand tool የእጅ መሣሪያዎች		
6	Collision object ክቁስ አካል ጋር በመጋጨት		
7	Chemical and hot objects የኬመሚካል እና ሙቀት		
8	Dust particle /air pollution አየር ብክላ		
9	Poor lighting ደካማ ብርሀን		
10	Falling object ክላይ በወደቁ ቁስ አካላት		
11	Improper handling material ነገሮችን ተገቢ በሆነ ሁኔታ ባለመያዝ		
13	Splintering objects በዕቃዎች መሰነጣጠቅ		
a14	Noise ጫጫታ ሁካታ		
15	Poor ergonomic design አናሳ የሰራ ሁኔታ ጥናት ድዛይ		
16	Repetitive task/motion የተደጋመ ስራ/እንቅስቃሴ		

17	Others(specify) ሌላ ካለ (ይጠቀስ)		

5. Have you been accidents at your workplace? 1. Yes 2. No

If yes, which the following accidents happens

N	Item	Yes	No	Remark
1	Abrasion (መላጥና ቅጥቅጥ)			
2	Burn (መቃጠል)			
3	Cut (መቆረጥ)			
4	Punctured (መወጋት)			
5	Eyes injury (የዓይን ጉዳት)			
6	Fracture (መስበር)			
7	Ear injury(የጆሮ ጉዳት)			
8	Dislocation (የሥር መዞር)			
9	Suffocation(መታፈን)			
10	Sprain (ውልቃት)			
11	Wound (ቁስል)			
12	Drowning(መስመጥ)			
13	Others(specify) ሌላ			

Please say yes or No in the appropriate box

6. Which part of your body affected by occupational accidents?

1. Eye
2. Tooth
3. Hand
4. Ear
5. Knee
6. Toe
. Fingers
8. Head
9. Arm
10. Leg
11. Back bone
13. Chest
14. other, specify

7. How much time have you taken sick leave due to occupational disease in a year?

8. How many leaves days have taken in year due to occupational disease? _____

9. How many times did you take sick leave due to occupational accident in a year? _____

10. How many leaves days have taken in year due to occupational accident? _____

THANK YOU FOR YOUR PARTICIPATION.

Interview Questionnaires

1. How occupational diseases and accidents affect your company?

2. What are common works related diseases and accidents in your company?

3. Why accidents and diseases occur in your company?

4. How much productivity is lost in your company due to accidents and diseases?

5. How many employees are lost in your company due to accidents and diseases?

6. What is personal protective equipment used in your company?

7. Does your company have written occupational health and safety policy?

8. How do you the effectiveness of the occupational health and safety policies contribution in your company?

9. How to prevent occupational diseases and accidents in your company?

Appendix B

አድስ አበባ ዩኒቨሪስቲ ቴክኖሎጅ ኢንሲቲቱዩት

መካኒካል እና ኢንዱስትሪያል ምህንድስና ትምህርት ክፍል

የጥናቱ ርዕስ፡- በአዲስ አበባ የሚገኙ የጨርቃጨርቅ ፋብሪካዎች የስራ ቦታ ደህንነትና ጤንነት በሰራተኛ ምርታማነት ላይ ያለው ተፅዕኖ

መግለጫ -ሀ ፡ በሰራተኛ የሚሞላ መጠይቅ

ይህ መጠይቅ በአድስ አበባ ከተማ የሚገኙ የጨርቃጨርቅ ፋብሪካዎች የስራ ቦታ ደህንነትና ጤንነት በሰራተኛ ምርታማነት ላይ ያለው ተፅዕኖ ለማጥናት የተዘጋጀ ሲሆን የተፈለገበትም ዋና ዓላማ ለትምህርታዊ አገልግሎት ብቻ ነዉ፡፡ በመሆኑም መጠይቁን የሚሞሉ አካላት የሚሠጡት ምላሽ በተቻለ መጠን በልበ ሙሉነት ቢሆን ዉጤቱ የተሻለ ይሆናል፡፡

የድርጅቱ (ኩባንያው) ስም ----------አድራሻ----------

ክፍል 1

ግላዊ መግለጫ

የሚከተሉትን መጠይቆች መልስ ይሆናል ያሉትን ያክበቡ

1.ፃታ: ሀ. ወንድ ለ. ሴት

2. ዕድሜ : ሀ. ከ20 ዓመት በታች ለ.ከ20-29 ዓመት. ሐ. 30-39 ዓመት. መ. 40-49 ዓመት.

ሰ. 50 -55ዓመት. ረ. 56-60ዓመት እና በላይ

3. የትምህርት ደረጃ

ሀ. ያልተማሩ ለ. ማንበብ እና መጻፍ የሚችሉ ሠ.ማስተር ሸ.ዶክትሬት

ሐ. አንደኛ ደረጃ (1-8 ክፍል)

መ. ሁለተኛ ደረጃ (ከ 9-12 ክፍል

ሰ. ሰርቲፊኬት ረ. ድፕሎማ ሸ. ባችለር ድግሪ

4. የሰራተኞች የቅጥር ሁኔታ

ሀ. ቋሚ ለ. ኮንትራት/ጊዜያዊ ሐ.ሌላ ካለ ይገለጽ ----------

5 በድርጅቱ ምን ያል ጊዜ አገልግለዋልል ?

ሀ.ከአንድ ዓመት በታች ለ. 1-5 ዓመት. ሐ. 6-10 ዓመት መ. ከ 10ዓመት በላይ

6. የሚሰሩበት የስራ መደብ(ዘርፍ) ----------

ክፍል ሁለት

ስራ ነክ የሆኑ የስራ ቦታ ደህንነትና ጤንነት ሁኔታዎች

1. በድርጅትዎ ውስጥ የስራ ቦታ ደህንነት እና ጤንነት ግንዛቤ አለዎት? 1. አለኝ 2.የለኝም

መልስዎ የለኝም ከሆነ ለምን ? _____

2. ከስራዎ ጋር በተገኘ የስራ ቦታ ደህንነትና ጤና አጠባበቅ ጋር ተዛማጅ የሆኑ ስልጠናዎችን ወስደዋል?

1. ወስጃለሁ 2.አልወሰድኩም

መልስዎ ወስጃለሁ ከሆነ በአመት ምን ያህል ጊዜ? _____

ክፍል ሶስት

የስራ ቦታ አከባቢ ባህሪ

በስራ ቦታዎ ላይ በሚቀጥለው ሰንጠረዥ የተገለፁት የስራ ቦታዉ ሁኔታዎች የምቾት ደረጃ ይግለፁ

ተ.ቁ	የስራ ቦታ ሁኔታ	አልተጠቀሰም	ምቹ አይደለም	ምቹ	በጣም ምቹ
ነ	በቀላሉ መግባባትና መረዳዳት መቻል				
2	የስራ ቦታዎች ሙቀትና አየር ጥራት				
3	የብርሃን መጠን				
4	አላስፈላጊ ድምፅ(ጫጫታ)				
5	የማሽኖች ጥንቃቄ መጠበቂያ				
6	የራስ መከላከያ መሳሪያዎች				
8	ማበረታቻዎች				
9	የፋብሪካዉ የስራ ቦታ አደረጃጀት				

3. በቀን ለምያህል ጊዜ ይሰራሉ? (በሰዓት)----------

እባክዎ በስዬ ቦታዎ ከሚከተሉት መሳሪያዎች በሚጠቀሙዋቸዉ ላይ የ(X)ምልክት በማድረግ ይመልሱ

4. በስራ ክፍልዎ ላይ ከሚከተሉት ውስጥ የሚጠቀማቸው የአደረገ መከላኪያዎች የትኞቹ ናቸው?

ሀ. የብየዳ መከላከያ ☐

ለ. ሴፍቲ ጫማ ☐

ሐ. ሙሉ መሸፈኛ ☐

መ. ጓንት ☐

ሰ. ፊት መሸፈኛ ☐

ረ. መነፅር ☐

ሸ. የአቧራ መሸፈኛ ☐

ቀ. የጆሮ ማፈኛ ☐

በ. ልብ ☐

ክፍል ሶስት

ከስራ ጋር ተያያዥነት ያላቸው በሽታዎች እና መንስዔዎቻቸዉ

2. በሚከተሉት ሁኔታዎች ምክንያት በስራ ቦታዎ ላይ ታመው ያውቃሉ?

ተ.ቁ	ምክንያቶች/የስደጋ ስጋነቶች	አዎ	አይደለም
1	ብናኝ እና አቧራ		
2	በስራ ምክንያት መጨናነቅ		
3	የተሟለ ሽንትቤት አለመኖር		
4	ባዮሎጂካ በሆነ በሽታዎች		
5	ረጅም ጊዜ ቁጭ ብሎ በመስራት		
6	ምቹ ባልሆነ መሳሪያ ወይም ማሽን መስራት		
7	ድግግሞሽ ያለበት ስራ በመስራት		
8	ተደጋጋሚ እንቅስቃሴ ማድረግ		
9	ዝቅተኛ (ደብዛዛ) ብርሃን		
10	ከፍተኛ ድምፅ እና ጫጫታ		
11	በከባድ ኬሚካሎች		

12	ከፍተኛ ሙቀት		
13	ከፍተኛ የመርገብገብ (ቫይብሬሽን)		

2. በስራ ቦታዎ ላይ ያለብዎትን ችግር አቃለዋል ? ነ. አቃልያለሁ 2 . አላቃለልኩም

መልስዎ አዎ ከሆነ ከሚከተሉት ምልክቶች በብዛት ተጠቂ የሆኑት በየትኛው ነው ?

ተ.ቁ	የችግሮች ዝርዝር	ተጠቂ ነበርኩ	ተጠቂ አልነበርኩም	
1	ጭንቀት			
2	ድብርት			
3	ከፍተኛ የድምፅ መጎርነን			
4	ትውከት			
5	የጉበት ብግነት			
6	የሳባ አስም ጉንፋንእና ኢንፉሌንዛ			
7	የማቅለሽለሽ			
8	ታፎይድ			
9	የእንቅልፍ ማጣት			
10	የቆዳ በሽታ			
11	የመተንፈሻ አካላትችግር			
12	የአጥንትጡንቻመዛባት			
13	የተቅማጥ በሽታ			
14	መወጠር			
15	የሳምባ ምች በሽታ			
16	የሳምባ በሽታ			
17	የራስ ምታት			

3. በስራ ምክንያት የሚፈጠሩ በሽታዎች የክስተት ድግግሞሽ

ተ.ቁ	የችግሮች ዝርዝር	ሁለጊዜ	አንዳንድ ጊዜ	ከስንት አንድ	ፈፅሞ የለም
1	የራስ ምታት				
2	መዘር				
3	ማቅለሽለሽና ማስታወክ				
4	የሳምባ በሽታ				

5	የዐንትና ትከሻ ህመም				
6	የእንቅልፍ ማጣት				
7	የመገጣጠሚያ ህመም				
8	የሳንባ አስም				
9	በሙቀት መታፈን				
10	የጡንቻ እና አጥንት በሽታዎች				
11	የልብ ምት ችግር				
12	የቆዳበሽታ				
13	የመተንፈሻ አካላት ችግር				
14	የአይን ችግር				
15	አለርጅክ				
16	የጀባ ህመም				
17	ሌላ ካለ ይገለፅ				

ነ. ባለፉት 12 ወራት ውስጥ የሚሰሩበት ድርጅት የስራ ቦታ አደጋ ተጋላጭነትን ተከላክሏል?

ተ.ቁ	የችግሮች ዝርዝር	ተከላክሏል	አልተከላከለም
1	በማሽን መያዝ		
2	የኤሌክትሪክ ሾክ		
3	ትልቅ ክብደት መሸከም		
4	መውደቅና መንሸራተት		
5	የእጅ መሳሪያዎች		
6	ከግዑዝ አካላት ጋር መጋጨት		
7	ኬሚካል ንኪኪ እና የጋሉ እቃወዎች		
8	ብናኝና አቧራ		
9	ደብዛዛ ብርሃን		
10	ዕቃዎች መውደቅ		
11	በአግባብ ያልተያዙ መሳሪያዎች		
13	ሹል ዕቃዎች		
14	አላስፈላጊ ጩኸት		
15	ምቹ የሆነ የስራ ቦታ አቀማመጥ		
16	ድግሞሽያለው ስራና እንቅስቃሴ		
17	ሌላ ካለ ይገለፅ		

5. በስራ ቦታዎ ላይ አደጋ ደርሶበዎት ያውቃል?

ተ.ቁ	የችግሮች ዝርዝር	ደርሶብኛል	አልደረሰብኝም	መግለጫ
1	(መላጥና ቅጥቅጥ)			
2	(መቃጠል)			
3	(መቆሪጥ)			

4	(መወጋት)			
5	(የዓይን ጉዳት)			
6	(መስበር)			
7	(የጆሮ ጉዳት)			
8	(የሥር መዞር)			
9	(መታፈን)			
10	(ውልቃት)			
11	(ቁስለት)			
12	(መስጠም)			
13	የጀርባ ህመም			
13	የአንገትና የትከሻ ህመም			
14	ሌላ (ካለ ይገለፅ)			

6. የትኛው የሰውነትዎ ክፍል በአደጋ ምክንያት ተጠቂ ሆኗል

1. አይን

2. ጥርስ

3. እጅ

4. ጆሮ

5. ጉልበት

6. የእግር ጣት

7. የእጅ ጣት

8. ራስ

9.ክንድ

10. እግር

11. አከርካሪ

13. ደረት

14. ሌላ ካለ

7. በአንድ አመት ውስጥ ምን ያህል ጊዜ በህመም ምክንያት የስራ ፈቃድ ወስደዋል? _____

8. በአንድ ዓመት ውስጥ ምን ያህል ቀናትን በህመም ምክንያት ከስራዎ ቀርተዋል? _____

9. በአንድ ዓመት ውስጥ ምን ያህል ጊዜ በአደጋ ምክንያት የስራፈቃድ ወስደዋል? _____

10. በአንድ ዓመት ውስጥ ምን ያህል ቀናትን በአደጋ ምክንያት ከስራዎ ቀርተዋል? _____

ላደረጉልኝ ትብብር አመሰግናለሁ.

Interview Questionnaires [የቃለመጠይቅ ጥያቄዎች]

1. ስራ ነክ አደጋዎች እና በሽታዎች ድርጅትዎ ላይ እንዴት ተፅእኖ ሳድራሉ?
2. በድርጅትዎ ዉስጥ በተደጋጋሚ የሚከሰቱና የተለመዱ አደጋዎች እና በሽታዎች ምንድን ናቸዉ?
3. በድርጅትዎ ዉስጥ አደጋዎች እና በሽታዎች ለምን ይከሰታሉ?
4. በነዚህ ዉስጥ አደጋዎች እና በሽታዎች የተነሳ ድርጅትዎ ምን ያህል የምርታማነት ኪሳራ ይደርስበታል?
5. በስራ ነክ አደጋዎች እና በሽታዎች ምክንያት ድርጅትዎ ምን ያህል ሰራተኞችን በአመት ያጣል?
6. በድርጅትዎ ዉስጥ ሰራተኞች አብዛኛዉን ጊዜ ምን አይነት የራስ መከላከያ መሳሪያዎችን ይጠቀማሉ?
7. ድርጅትዎ የተጻፈ የስራ ደህንነት እና ጤንነት ፖሊሲ አለዉ ወይ?
8. በድርጅትዎ የስራ ደህንነት እና ጤንነት ፖሊሲ ስኬታማነት እንዴት ይለካል?
9. በድርጅትዎ ዉስጥ ስራ ነክ አደጋዎች እና በሽታዎች ለመከላከል ምን አይነት ቅድሜ እርምጃዎች የወሰዳሉ?