



**Factors Influencing Occupational Injuries In Steely
Rolling Mill Industry PLC, Bishoftu, Ethiopia**

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**A THESIS IN PARTIAL FULFILLMENT OF THE
REQUIREMENT FOR THE DEGREE OF
MASTER OF ART IN HUMAN RESOURCE
MANAGEMENT**

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Declaration

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and that I have not previously in its entirety or in part submitted at any university for a degree.

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Abstract

Worldwide, there are around 340 million occupational accidents and 160 million victims of work-related illnesses annually. The estimated fatal occupational accidents in the Commonwealth of Independent States countries is over 11,000 cases, compared to the 5,850 reported cases. A study conducted recently among Workers in Large Scale Metal Manufacturing Industries in Ethiopia, indicated occupational injury rate was 489 per 1000 exposed workers per year. Thus, the purpose of this study is to know the prevalence and to assess the factors influencing employees work related injuries and assist Steely Rolling Mill Industry private limited company by forwarding appropriate recommendations. To address this objective, an institution based cross-

sectional study design was employed and a descriptive research design was adapted. One hundred-fifty three workers were selected by simple random sampling method as sample from production workers. For data collection management a pretested and structured questionnaire was used with interview technique, company data analysis record and check list were also used. To identify the significantly associated influencing factors of occupational injuries, data was entered and analyzed using SPSS version 23 statistical package, and Bivariate and multivariate logistic regression analyses were conducted. Thus the result reveals that the occupational injury 12 months prevalence rate was found 54.2% and the last four weeks was 28.8%. The most common injured body parts were hand, finger and eye; moreover, flying objects, collusion and slippery surface were the most common causes of occupational injury.

Hours work per week, sleeping disorder, chewing chat, level of education, marital status and work experience were found significantly associated with occupational injury.

Finally, occupational injuries were high in the Steely RMI factory workers. Most of the injuries occurred were preventable, because machines were not guarded to protect sharp and splitting object, oily and greasy work place not cleaned properly, employees were not obey to wear PPE. Therefore, it is recommended that the management shall strengthen its risk identification and mitigation strategy, shall create safety work practices and provide adequate safety training in order to control occupational injuries.

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Acronyms

CIS- Common wealth of Independent States

ILO -International Labor Organization

PPE-Personal Protective Equipment

MOLSA- Ministry of Labor and Social Affairs

Steely RMI- Steely Rolling Mill Industry

PLC-Private Limited Company

Chapter One

Introduction

1.1 Background of the study

In accordance with the Ethiopian labor proclamation no. 1156/2019, “occupational injury” means an employment accident or occupational disease. It is any injury during or in connection with the performance of worker while carrying out the employer's order in the work place or away from the work place or outside normal hours of work.

ILO (1998), an occupational injury is defined as any personal injury, disease or death resulting from an occupational accident; an occupational injury is therefore distinct from an occupational disease, which is a disease contracted as a result of an exposure over a period of time to risk factors arising from work activity. A case of occupational injury is the case of one worker incurring an occupational injury as a result of one occupational accident. An occupational injury could be fatal (as a result of occupational accidents and where death occurred within one year of the day of the accident) or non-fatal with lost work time.

According to ILO (2019) every day, people die as a result of occupational accidents or work related disease - more than 2.78 million deaths per year. Additionally there are some 374 million non-fatal work-related injuries each year, resulting in more than 4 days of absence from work. The human cost of this daily adversity is vast and the economic burden of poor occupational safety and health practice is estimated at 3.94% of global growth domestic product each year. According to results from the Census of Fatal Occupational Injuries conducted by the U.S. Bureau of Labor Statistics, a preliminary total of 4,383 fatal work injuries were recorded in the United States in 2012.

Most of the factors associated with occupational injury as per the study done in Ethiopia are educational status, marital status, job category, lack of experience, workplace supervision, job satisfaction, working hour per week, health and safety training, alcohol use, sleeping disorder, manual handling of heavy objects, need for visual concentration for the task, and maintenance of machine, job stress, non PPE use (Gebretsadik M., 2014).

1.2 Problem Statement

The ILO (2012) estimates that some 2.3 million women and men around the world succumb to work-related accidents or diseases every year; this corresponds to over 6000 deaths every single day. Worldwide, there are around 340 million occupational accidents and 160 million victims of work-related illnesses annually. The ILO updates these estimates at intervals, and the updates indicate an increase of accidents and ill health.

The estimated fatal occupational accidents in the Common wealth of Independent States (CIS) countries is over 11,000 cases, compared to the 5,850 reported cases (information lacking from 2 countries). The gross underreporting of occupational accidents and diseases, including fatal accidents, is giving a false picture of the scope of the problem. The rate of health damage has increasing trend, given the global growth in urbanization and industrialization in developing countries. While this is a benefit acknowledged to improve the livelihood of mankind, there are negative consequences in terms of the effect it may have on workers' health and on the immediate environment. This side effect felt if an effective and sustainable interaction between development and environment is not in put place.

Occupational Injuries may occur in the production process of rebar and billet in Steel RMI factory as a result of unsafe working condition, unsafe acts, personal failure and lack of awareness on the side of both employers and employees. Management has failed in realizing and applying properly guarded machine, ventilation, non defective tools etc could be considered as the causes of injury. Occupational injury may result in physical disability, material damage, loss of life and termination of work that will be a big financial loss.

Getting full data in Ethiopia on a rate of occupational injuries and its factors in large scale metal manufacturing industries MOLSA (2008). As per the research conducted recently among Workers in Large Scale Metal Manufacturing Industries in Ethiopia, showed occupational injury rate was 489 per 1000 exposed workers per year (Habtu 2014).

The Steely RMI Plc (2019) stated in their report that 12 month's injury report from July to June 2018 and 2019 regarding employee injury indicate 48% and 36% prevalence rate.

Thus, the purpose of this study is to research the factors influencing employees work related injuries and assist Steely RMI private limited company by forwarding appropriate recommendations.

1.3 Research Questions

1.3.1 Research Questions

1. What is the prevalence of occupational injuries in the Steely RMI Plc.
2. What socio-demographic characteristic of workers influence occupational injuries in Steely RMI Plc.
3. What work behavioral characteristics influence occupational injuries in Steely RMI Plc.
4. What work environment characteristics influence occupational injuries in Steely RMI Plc.

1.4 Research Objectives

1.4.1 General Objective

- To assess the level of occupational injuries and influencing factors among production workers in Steely RMI Plc in Bishoftu, Oromyia, 2020.

1.4.2 Specific objectives

1. To determine the prevalence rate of occupational injuries among production workers in Steely RMI Plc in Bishoftu.
2. To identify the possible influencing factors of occupational injuries among production workers Steely RMI Plc in Bishoftu.

1.5 Significance of the Study

Occupational injuries cause vast difficulty in the workplace globally. An occupational injury is one of the most prevalent among Steel Industries worldwide. Work-related injuries in developing countries are the most commonly reported occupational illness and reasons for long-term sick leave and disability payment. Hence apart from personal suffering, these conditions impose a major financial burden on both the employers and workers.

This study will add to existing knowledge about the influencing factors of occupational injuries, serve as a reference material for further research, and its findings are hoped to stop misery of the company's workers. Moreover, it helps in reducing expenses and loss of manpower as a result of occupational injury, the study helps in reducing costs due to insurance claims, treatment of employees, and hospitalization. The results of the study provides the company policy maker with evidence to improve strategies of integrating proper occupational safety and health policies.

Steely RMI PLC is a Rolling Mill and Melting industry was established in October 2004, located east of Addis Ababa in Oromyia National Regional State, at Bishoftu town. The

company has more than 600 employees. Occupational injuries occurrence in the factory is very high especially in the production section.

No study on occupational injury and influencing factors in Rolling Mill and Melting industry sector has been yet conducted in Ethiopia. The study shall investigate influencing factors of occupational injury among Steely RMI factory workers..

1.6 Scope of the Study

The study focused on the factors influencing occupational injuries on workers of Steely RMI, in Bishoftu. Respondents were staffs those working in production process in Steely RMI Plc. Criteria for eligibility of respondents includes population who has worked within the identified areas of study at least for one month. The study cover to identify the behavioral and work environment factors influencing occupational injuries. In more specific terms, the three production process area namely Rolling Mill -1, Rolling Mill-2 and Melting were targeted in this study. These sections of working area shall be selected since the most hazardous areas of the factory as the workers are exposed directly to the physical injury, chemical smoke, dust and number of other occupational injuries affects workers.

1.7 Limitation of the Study

This study focused only on one factory i.e. Steely RMI PLC due to limitation of time and available of budget as well as other logistic resources. The nature of the study by itself is descriptive as there was no reference to undertake comparative analysis. The output of the analysis and proposed recommendations may not be helpful to similar factories or industries as the data considered for this study focused only on a single factory.

1.8 Operational Definition of Terms

Occupational: Is work related

Worker/employee: Any person who performs work, either regularly or temporarily, for an employer.

Permanent employee: employee on unlimited term contract

Workplace: means the office, premises or work site, where the workers are habitually employed and shall include the office or place where the workers, who have no fixed or definite work site, regularly report for assignment in the course of their employment, in this study case Steely RMI PLC.

Work-related injury: Death or any personal injury resulting from an occupational accident.

Alcohol consumption: Consumption of any kind of alcohol at least two times per week

1.9 Organization of the Study

This study was organized in to five chapters. The first chapter is introduction part where the background of the study, statement of the problem, objectives of the study, and research questions described. It also lays out the significance of the study, the scope of the study; limitations of the study and the structure of the thesis. In chapter, two literature works pertinent to the subject was extensively and briefly described. Chapter three present detail description of the research methodology pursued in this study. It includes a description of the survey and its development; setting and selection of participants, measurement and instrument of variables, data collection procedure and the methods of analyses. In chapter four results and discussions on the findings of the study was extensively presented. Descriptive data analysis and proposed research described here. Finally summary, conclusion and recommendation based on the findings

presented. Following references and appendices addressed here. This Thesis also contains other formal documents such as, Abstract, Acknowledgements, Annexes Acronyms, etc.

Chapter Two

Review of Related Literature

Introduction

The literature review focuses on the presentation and discussion of key concepts used in the study. This historical background information of influencing factors of occupational injury issues, for Steely RMI Plc. The literature review contains several themes covering global and local trend of prevalence of occupational injury, socio-demographic determinants, common occupational injuries, causes, and parts of the body affected, working environment determinants of occupational injury and behavioral determinants of occupational injury.

2.1 The Concept of Occupational Injuries

Occupational injury defined as any personal injury, disease or death resulting from an occupational accident; an occupational injury is therefore distinct from an occupational disease, which is a disease contracted as a result of an exposure over a period of time to risk factors arising from work activity. A case of occupational injury is the case of one worker incurring an occupational injury as a result of one occupational accident. An occupational injury could be fatal (as a result of occupational accidents and where death occurred within one year of the day of the accident) or non-fatal with lost work time (ILO, 2012).

Occupational injury is a global public health burden and economic burden in addition to other public health challenges in both industrialized and less industrialized country (Nyguyen, 2009 & ILO, 2005).

As per physical exposures related to job tasks, workplace environment, use of tools and materials, machine operation, and machine-paced work affect workers in different occupations and employment sectors. The following physical workplace exposures are strongly associated with injury risk: Manual handling, forceful exertions, highly repetitive motions with short work cycles, awkward postures of the neck, trunk, and extremities, whole-body or segmental vibration, mechanical contact stress from work positions or handling of tools and equipment, high levels of ambient noise, extreme temperatures, work performed from heights and work performed around operating machinery (Chau, 2009 and Vandergrift, 2012).

As per the study conducted on Worker contact with machinery or equipment presents a major risk for severe injury, particularly in the manufacturing and mining sectors. Some recent risk mitigation efforts include the application of capacitance-sensing technology and the use of intelligent video technology to detect worker presence in hazardous locations near machinery (Powers, 2009).

2.2 Prevalence of occupational injury

According to the research applied in Vietnam, Japan and New Zealand showed the magnitude of occupational injuries were 583, 385, 132 workers per 1000 per year in Small and medium sized manufacturing industries. As per the research conducted in Small and medium sized manufacturing industries in Gondar showed the prevalence was 335 workers per 1000 exposed workers per year (Tadesse, 2007).

According to the national wide survey, woodwork and metal working were the industry sectors with exceptionally high injury rates which required sick leave of four day or more with an incidence of 877 and 748 per 100,000 full time workers, respectively (Akata, 2006).

Study conducted among Workers in Large Scale Metal Manufacturing Industries in Ethiopia, nearly 49% of study participants had responded that they had incident at job that resulted occupational injury in the past 12 months giving an overall prevalence rate of 489 per 1000 exposed workers per year (Habtu, 2014).

Another study done in Arba Minch Town among Small-Scale Industries Workers, the annual and two weeks prevalence of occupational injuries were 808 and 206 per 1000 exposed workers respectively. The annual and two weeks prevalence of occupational injuries were 808 and 206 per 1000 exposed workers respectively (Tanga, 2016).

2.3. Socio- demographic determinants of occupational injury

According to the study in small scale manufacturing enterprises workers in Germany, among the gainfully employed (18–70 years), 2.8% suffered at least from one medically treated occupational injury within the one year. The prevalence for men was 4.3%, which expected exceeding the prevalence for women. In men, the prevalence of occupational injuries decreases

with age. One from 15 men aged between 18 and 29 experience a medically treated occupational injury, this falls to one in 50 men aged between 60 and 70. Between 18 and 29 aged women also have a comparatively high chance of occupational injuries, but beyond the age of 30, the 12-month prevalence in women is less than 1% (Rommel, 2016).

The highest rate of accidents was recorded for workers with work experience of 1-5 years. Also, the lowest rate of accidents was found in workers with 16–20 years' and more than 25 years' experience (Ryu, 2017). However in study, the highest and lowest rates of accidents were seen for job experience of <1 year (34.8%) and >20 years (12.5%), respectively (Halvani, 2004).

In addition, another Case -Control study conducted in Textile Factory Workers in Amhara Regional State Ethiopia, show that there is significance association between ages with occupational injury in the workplace. However, the prevalence of occupational injury is no significance association with age (Zewdie, 2011).

As per the research conducted Kombolcha Textile Factory, North-East Ethiopia, on Determinants of Occupational Injury, the following results are found, educational status and marital status of workers showed statistically significant association with occupational injury when adjusted for all variables. 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 (Serkalem, 2014).

2.4. Behavioral determinants of occupational injury

The major influencing factors of occupational injury in both developed and developing countries are stress, tobacco, and drug and alcohol consumption in the workplace. As per the cross-sectional study conducted among municipal solid waste collector in Ethiopia, that utilization of PPE in the household was statistically associated with occupational injury (Bogale, 2014). As compared to workers who used PPE while being on duty, odds of injury among workers not used personal protective equipment was 2.62 higher and also work experience, monthly salary, job category, sleeping disturbance, and job related stress was significantly associated with occupational injury. Respondents who did not use PPE regularly were more likely to have a work-related injury. This finding is consistent with other studies (Tadesse, 2016; Kifle, 2013).

A cross-sectional study was done in Mit-Ghamr City, Dakahlia Governorate, Egypt among building construction workers extended work hours, short duration of work, job dissatisfaction, and lack of vocational training, working overtime and job stress were significantly associated with occupational injury (Abbas, 2013).

A case-control study done in India show that illiteracy, alcohol consumption, big family, and disease and risk-taking behavior was associated with injury (Tekele, 2002; Bijay, 2008).

2.5. Common occupational injuries, causes, and parts of the body affected

According to a research conducted among iron and steel industries workers in Addis Ababa on work related injuries and associated risk factors, most common causes of injury were splitting and flying objects, hit by falling objects and machinery. Workers were exposed to preventable workplace hazards such as to excessive noise, fumes and dusts and to old and unguarded machines, splitting materials and sparking of metals (Kifle, 2013).

According to the study conducted with questionnaires-based survey in Ethiopia, Gondar among construction worker show that the major occupational problem were skin disorder, eye problem and headache, musculoskeletal problem and harm by sharp instrument (Mesafint, 2013).

Results showed that hands (37.8%), head (27.8%), feet (23.1%), and back (11.3%) were the most affected parts in accidents (Rahmani, 2013, p.6).

As per the study Habtu (2014) showed that abrasion or laceration 214 (52.8%), eye injury 112 (27.7%), cut 87 (21.5%), puncture 76 (18.8%) and dislocation 60 (14.8%) were five commonest types of injury. Studies in East Asia showed consistent result (Nyguyen, 2009, Akinori, 2006, and Caslin, 2006).

Other studies in Ethiopia, Gondar on small and medium scale industry, and Addis Ababa in textile factory workers and Afar showed consistent result except that eye injury was higher in this result (Osman, 2007, & Senbeto, 1991).

The five commonest parts of the body injured were hands 188 (46.4%), finger 135 (33.3%), toe 131 (32.3%), eye 112 (27.7%) and back 52 (12.8%). Moreover, machinery 169

(41.7%), splintering objects 155 (38.3%), hit by falling objects 58 (14.3%), hand tools 43 (10.6%), and hot substances 39 (9.6%) were among commonest sources of injury (Habtu 2014). This is true with other findings in Ethiopia Kazutaka (2008), Faris (1998) & Senbeto (1991) and other studies in East Asia (Nyguyen 2009, Akinori 2006, and Caslin 2006) in terms of their types although figures vary.

Machinery, hand tools, and hit by falling objects, are the frequent causes in most industrial setups (Nyguyen, 2009, Tadesse, 2007, Poosanathanasarn, 2005, Nyguyen, 2009 and Seth 2006).

2.6 Working environment determinants of occupational injury

Different country study showed that worked hour per day, work place supervision, and health and safety training were significant association with occupational injury. The highest rate of accidents occurred during shift work. The study results indicate that shift work considerably increased the risk of occupational injuries in the company (Ryu, 2017).

In an American paint company, workers had a greater injury rate (25%) during night shifts than morning shifts, and the injury risk was highest in the last 3 hours of the night shift (Levin 1985). Shift workers are at particular risk of sleep complaints (Drake 2004 and Ohayon 2002), and it can be a factor contributing to the relatively high rate of fatal and nonfatal work injuries in this group of workers (Akerstedt, 2003; Akerstedt, 2002).

Rate of injury differs by shift in different areas, for instance in the U.S. working in afternoon increased the risk of injury by 13% and in night shift by 30%, whereas in developing countries

employees in afternoon shift had 43% lower and in night shift 60% lower risk of injury compared to morning shift (Salminen, 2016).

By reviewing of 12 studies that the key influential factor of occupational injuries is long working hour, moreover employees working over 12 hours per day had 38% higher risk of occupational injury than those working 8 hours. Working 10 hours per day increased the risk of injury by 15% compared to working 8 hours per day. It is recommended that employees work 8 hours per day in the long run because of increased injury risk according to (Salminen, 2016, p.21).

Four studies showed that accidents increased linearly after the break, especially two hours after the break. The results supported the present system: employees have a break when they had worked two hours. The results of this review supported the present system of 8 hours work day. Night work, long work hours and long work periods without breaks increased considerable the risk of occupational injury (Salminen 2016, p.20).

In a metallurgic plant in the former German Democratic Republic, occupational injuries reached a maximum during night shifts. In an American paint company, workers had a 25% greater injury rate during night shifts than during morning shifts, and the injury risk was highest in the last three hour of the night shift. Occupational injuries occurred most often in the fourth working hour during the morning shifts and the fifth and sixth hour during night shift in Indian textile industries. In an Iranian mining industry in 2006-2007, shift workers injured more often than non-shift workers and shift workers reported more often fatigue-related injuries. In a synthetic fiber factory in Iran the occupational injury rate was one and half time higher during the first half of the shift than during the second half (Salminen, 2016, p.16).

.As per the study conducted in Korea steel company shift workers were 30% more often involved in occupational accidents than day workers. In 26 Korean companies, the accident rate in 2-shifting system was 1.7 times higher than 3-shifting system and 4 times higher than non-shift system. Based on the Korean Working Condition Survey of 2006, it was shown that shift workers had two times more often occupational injuries than non-shift workers (Salminen, 2016, p.17).

Lack of supervisor support independently increased the chance of physical injuries at work and the risk of physical injury was at least 3.5 times higher among those experiencing a lack of supervisor support than individuals without a supportive direct supervisor. Workers who experienced vulnerability were at less risk if they had a supervisor who was supportive (Yanar, 2014).

In Ethiopia north Gondar zone among small-and medium-scale factory workers revealed that risk of occupational injury decreased with job satisfaction and work place supervision (Tadesse, 2007).

Training is the influential factor for occupational injury as per the study done in our country on textile factory workers that workers who did not train on health and safety were 1.8 times more likely to report work-related injury than workers who trained (Zewdie , 2011).

2.7 Conceptual Framework (Conceptual Model)

Independent Variables

Dependent Variables

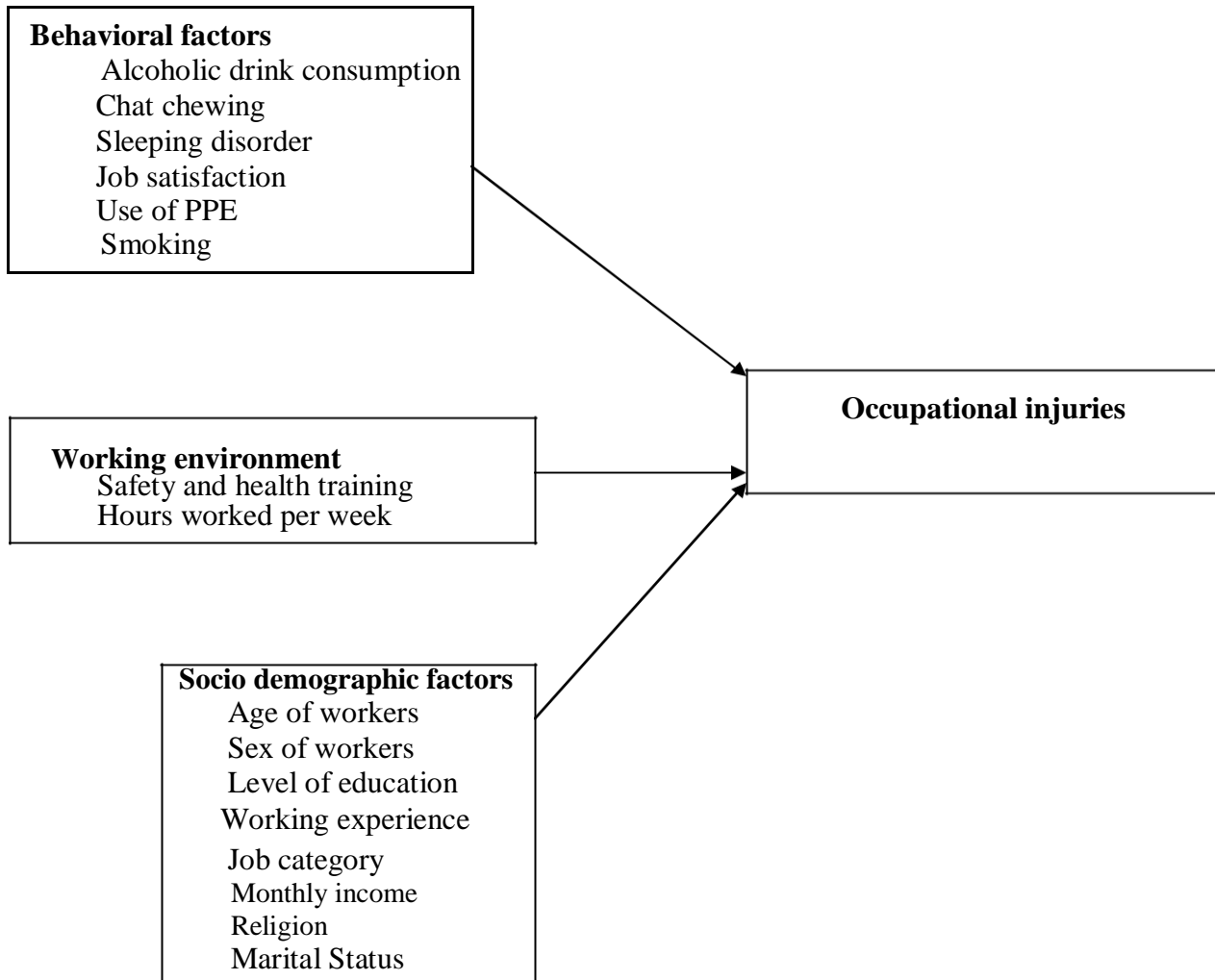


Figure 1 .Conceptual framework for assessment of occupational injury in Rolling Mill and Melting industry.

Chapter Three

Research Methodology

3.1 Introduction

The purpose of this chapter is to clarify and justify the detail of research design and methodological procedures used to collect and analyze the data to address research questions. It presented the instruments and methods that were used in evaluating the implementation of factors influencing occupational injuries in Steely RMI PLC.

3.2 Research Approach and Method

3.2.1 Research Approach

This study was followed mixed method approach. Mixed research method was incorporated both qualitative and quantitative elements in each structure. It was involved the collection and analysis of qualitative and quantitative information in a single study. The obvious assumption behind the use of mixed method is that integrating qualitative and quantitative methods about a situation results better understanding than using only one of the pure methods. As Creswell (2009) explains, mixed method enables to understand a problem more comprehensively, and indeed mixed method is perhaps the most popular applications in the practice of research.

3.2.2 Research design

The research design is the conceptual structure for research study that creates the foundation of the entire research. Descriptive research technique was used. A cross sectional study was conducted to assess influencing factors of occupational injury among Steely RMI workers in

Bishoftu town. The issue was assessed through qualitative methods to collect quantifiable information to be used for statistical analysis of the population.

3.3 Population and Sampling

3.3.1 Population

Population define as the total number of all units of the issue or phenomenon to be investigated into which is “all possible observation of the same kind”. Population can be defined as the total group of people or entities from which research information is intended to be obtained (Kumekpor, 2002). The samples was selected from workers working in production process in Steely RMI factory in Bishoftu town are considered as the study population and all the required samples was taken from these population.

3.3.2 Sample Design

The Steely RMI factory production process workers was stratified into working sections and then the calculated sample sizes (153) allocate to the sections using probability proportional to their size. Sample was taken using simple random sampling method from the list of employees from each section of the factory.

3.3.3 Sample size and sampling techniques

The sample size is a smaller set of the largest population. They argue that the sample must be carefully selected to be representative of the population and the need for the researcher to insure that the sub divisions entailed in the analysis are accurately provide for (Cooper and Schindler, 2003).

The total population of the study is 250 which was stratified in to 3 competencies; Rolling Mill-1, Rolling Mill-2 and Melting. The sample was determined using Taro and Yemani's (1964) statistical formula mention below.

$$n=N/1+N(e)^2$$

Where:

n= sample size to be determined

N=proportion of interest

e= error margin (0.05)

1=constant value

$$n=250/1+250(0.05)^2$$

$$n=153$$

Table 1, Population and sample proportion

No	Population Description	Population	Simple proportion	(%)
				total
1	Rolling Mill-1	85	52	34%
2	Rolling Mill-2	85	52	34%
3	Melting	80	49	32%
	Total	250	153	100%

Table shows the population and sample proportion each competency. Accordingly, 52 respondents 52 from Rolling Mill-1, 52 from Rolling Mill-2 and 49 from Melting were chosen. Respondents were selected from each group using simple random sampling technique which gives equal chance to the members in the category.

3.4 Data Collection Procedure

The researcher use both primary and secondary data source. The questionnaires and check lists were developed after reviewing of relevant literatures to include all the possible associated factors that address the objectives of the study. The primary data was collected through standard and pre-tested questionnaire which was developed based on the related published studies with certain modification. The questionnaire was prepared in English version and translated to Amharic and back to English to confirm the correctness of the translation. The questionnaire composed of four parts: socio demographic, injury characteristics, work environment and behavioral variables. Face-to-face interview was employed by data collectors

to the production process workers to collect the data. Secondary data was also gathered from company document analysis. Training was given for two days for the data collectors on content of questionnaire, interviewing technique and about confidentiality of the participants, etc. Questions that are not easy for the participants to understand were rephrased to make them more easily understood.

3.5 Data processing and Analysis

The raw data was entered in to a computer using IBM SPSS version 23 and analyzed. Data cleaning was performed to check for frequencies, accuracy, consistencies and missed values and variables. Data was backed up by saving it in different folders in the computer, removable flash disk and email. Frequencies, proportion and summary statistics were used to describe the study population in relation to relevant variables. Bivariate and multivariate logistic regression analysis were done to evaluate the strength of association between influencing factor (variables) and occupational injury and crude Odds ratio with 95% confidence intervals and significance level at $P < 0.05$ were used to see the association. Bivariate analysis was done for checking associations between independent and dependent variable using odds ratio and variable that had significant association up to P-value ($P \leq 0.2$) were entered to multivariate analyses. After then results were displayed using tables and graphs.

3.6 Scale Reliability and Validity

Reliability and validity are both vital elements of every research. These items are crucial and deserve full recognition by all who are engaged in research of any kind. Reliability refers to the stability and consistency of the results derived from research.

Reliability refers to the extent to which the measurement procedure yields consistent findings. To insure the reliability of the instrument in this study, the reliability was tested using Cronbach's alpha (α). Cronbach's coefficient alpha (α) is used to calculate to estimate the internal consistency of reliability of a measurement scale. In this case α shall be fall within a range of 0.70 to 1.00 (Sun and others, 2007).

Vlachos (2009), answering a research questions in a specific sector adds to the validity of the research design because managerial skills, the population is homogeneous and helps to have a robust validity of data analysis to indicate the available link between occupational injury and work environment and occupational injury and behavioral factor as well as socio-demographic factors.

Validity is the most critical criterion and indicates the degree to which an instrument measures what it is supposed to measure (Kothari, 2004). Thus in this research content, questionnaire that its validity was checked and modified according to literatures within the specific topic and objective of the research by using advisor approval or expert and standard questionnaire in order to increase the content validity.

3.7 Ethical Considerations

Confidentiality means that individuals are free to give and withhold as much information as they wish to the person they choose (Levine, 1985). Most ethical issues fall in to one of four categories; protection from harm, informed consent, right to privacy and honesty with professional colleagues (Paul D. Leedy and Jeanne Ellis Ormrod, 2005.)

Data was collected after getting written consent from the Steely RMI Plc management. Participants' involvement in the study was on voluntary basis; each respondent was informed about the objective of the study and privacy during interview was ensured.

Thus informed consent was sought from workers before questionnaires were administered and before collections of data. Since research administration was done under the condition of confidentiality to encourage employee honesty and openness. More specifically, for ethical clearance the study confirmed containing, first a brief description was given what activities expected from participants, the guarantee that all response remains strictly confidential, the researcher reports the findings in complete and honest fashion. The explanations and interviews was conduct by local language, Amharic.

Chapter Four

Results and Discussion

4.1. Respondents Rate and Socio-demographic Data

The study was conducted in Steely RMI PLC, Bishoftu. The survey questionnaire was given to 153 production workers (respondents), of which 52 were given to Rolling Mill-1 production, the other 52 to employees at Rolling Mill-2 and 49 were distributed for Melting production employees. Among 153 questionnaires distributed all questionnaires were returned which make response rate of 100%.

4.2. Respondents Rate

Table2. Socio-demographic characteristic of respondents in Steely RMI factory, Bishoftu, Oromyia, Ethiopia 2020 (n=153).

Variables	Frequency	Percentage
Sex		
Female	147	96.1
Male	6	3.9
Age		
□28	63	41.2
29-32	52	34
≥ 33	38	24.8
Religion		
Orthodox	127	83
Protestant	17	11.1
Others*	9	5.9
Educational status		

Can't read and write	28	18.3
Primary school (1-8)	32	20.9
Secondary school(9-12)	32	20.9
Techn. & Vocational (9-12)	28	18.3
Diploma	23	15
1 st Degree	10	6.5
Marital status		
Married	101	66
Others**	52	34
Job category		
Operator	32	20.9
Mechanic	31	20.3
Attendant	11	7.2
Electrician	13	8.5
Cutter	16	10.5
Feeder	10	6.5
Others***	40	26.1
Service duration		
□6	85	55.6
≥7	68	44.4
Monthly salary in birr		
□2680	53	34.6
2681-4162	49	32
>4163	51	33.3

Note: - Others* Catholic, Muslim; Others** single, divorced; Others*** welder, remover (Mill

Cleaner), sorter. **Source: - own survey, 2020**

4.3. Results and Interpretation

4.3.1 Socio-Demographic Characteristics

This is an industry based cross-sectional study attempted to assess the prevalence and influencing factors of occupational injury among production workers in Steely RMI factory in Bisoftu, Oromya. Identifying and understanding influencing factors of occupational injury are important in the preparation of injury prevention strategy that can benefit both the workers, employer and the country.

The result of this study reveals that the overall injury prevalence rate of the last twelve months of the samples was 54.2%. Additionally, the incidence rate of occupational injury during the last four weeks was 28.8% exposed workers, moreover 37 (24.2%) of workers were injured once and 4(2.6%) workers injured twice in the last four weeks (Table 3).

Table 3. Distribution of occupational injury in the last 12 months and 4 weeks among respondents in Steely RMI factory, Bishoftu, Oromya, Ethiopia 2020 (n=153).

Variable	Frequency	Percentage
Injury in the last 12 Months		
Yes	83	54.2
No	70	45.8
No. of occurrence(n=83)		
Once	49	32
More than once	34	22.2
Injury in the last four Weeks		
Yes	44	28.8

No	109	71.2
No. of occurrence(n=41)		
Once	37	24.2
More than once	4	2.6

Source: - own survey, 2020

The most commonly affected body parts were Hands 21 (13.7%), fingers 18 (11.8%), eye 16 (10.5%), Right leg 11 (7.2%) and Back 11 (7.2%) (Figure 2).

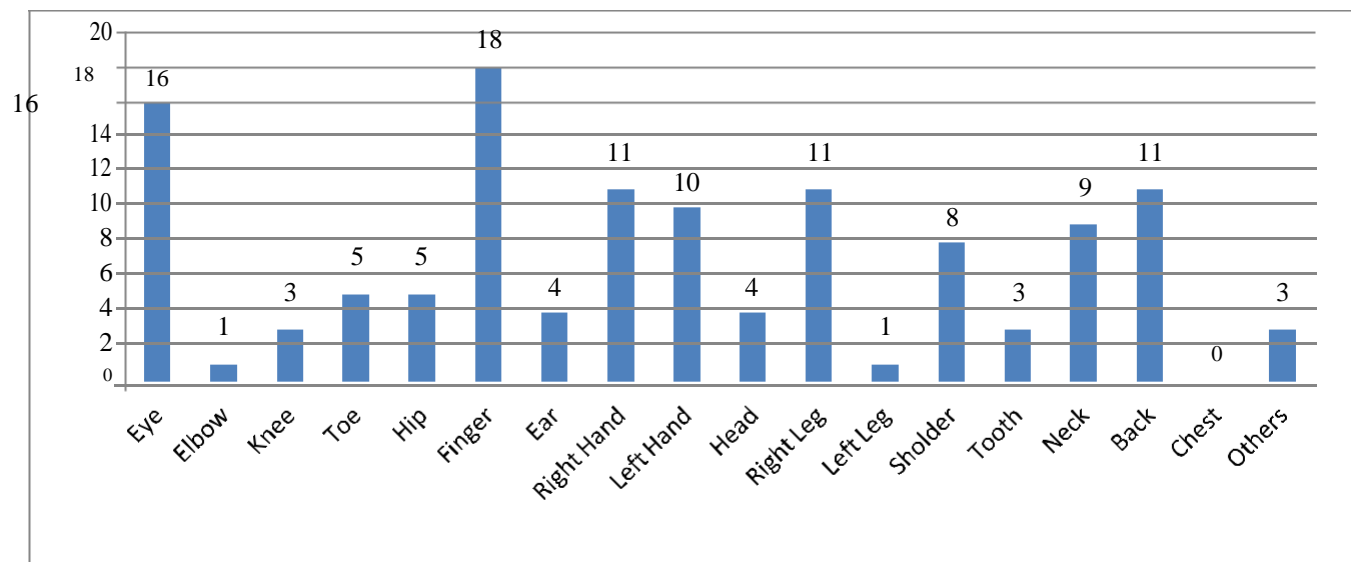


Figure 2. Distribution of work-related injuries by body parts in the last 12 months among respondents in Steely RMI factory, Bishoftu, Oromyia, Ethiopia 2020

Source: - own survey, June 2020

The types of occupational injuries those were found the most common during the study: Sprain 16 (10.5%), Burn 9 (5.9%), Eye injury 9 (5.9%) and Fracture 8 (5.2%) were found the most common types (Figure 3).

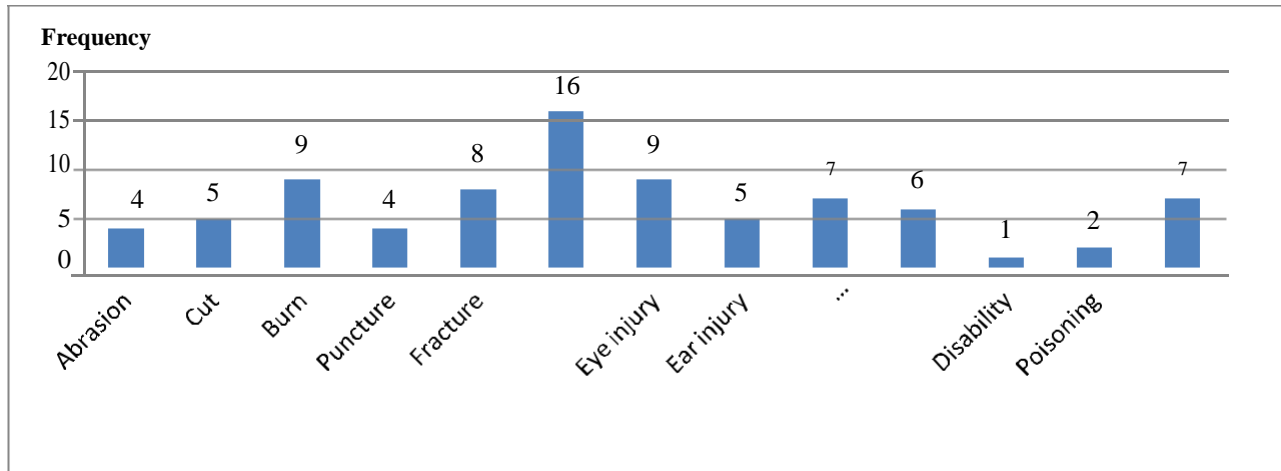


Figure 3. Distribution of work-related injuries types in the last 12 months among respondents in Steely RMI factory, Bishoftu, Oromyia, Ethiopia 2020 (n=153).
Source: - own survey, 2020

The most common causes of occupational injuries were mainly, flying objects 13 (8.5%), Collision 13(8.5%), and Fall/Slipped 7 (7.3%) and the most 43 (28.1%) common time of injury was in the afternoon followed by night 21(13.1%) (Table 4).

Table 4. Distribution of occupational injuries in the last 12 months by cause of injury and time of injury among 83 injured respondents in Steely RMI factory Bishoftu, Oromyia, Ethiopia 2020.

Variable	Frequency	Percentage
Cause of injury		
Machinery Repetitive motion	2	1.3
Hit by Falling objects	1	.7
Electric	6	3.9
Flying object	13	8.5
Hand tools / equipment	5	3.3
Fire	7	4.6
Hot Material	3	2.0
Falls /Slip	12	7.8
Collision with objects	13	8.5
Lifting heavy objects	4	2.6
Other, specify	15	9.8
Time of injury		
In the morning	19	12.4
In the Afternoon	43	28.1
In the Night	21	13.7

Source: - own survey, 2020

4.3.2 Characteristics of working environment

Out of the total of 153 workers, 78(51%) were working for more than 48 hours per week, about 81(52%) workers didn't get safety training in the last 12 months. (Table 5).

Table 5. Working environment characteristics with occupational injury among respondents in Steely RMI factory Bishoftu, Oromyia, Ethiopia 2020(n=153).

Variable	Frequency	Percent (%)
Hours worked/week:		
≤48	75	49
>48	78	51
Safety training:		
Yes	72	47
No	81	52

Source: - own survey, 2020

4.3.3 Behavioral characteristics

From all the respondents 67(43.8%), 27(17.6%) and 22(14.4%) of the respondents consumed alcohol, chewed chat, smoking Cigarette, respectively. Most of the respondents 57(37.3%) consumed alcohol and 22 (14.4%) chew chat occasionally, and 18(11.8) smoke cigarette every day. Nearly 31 (20.3%) of the respondents replied that they had sleep disorder and they expected 11(7.2%) working more than 8hours and 12(7.8%) excessive heat were reasons for working time sleeping. The greater part of the respondents equally, 123 (80.4%) had job satisfaction and use PPE at work, but 30 (19.6%) were not used PPE , 18(11.8%) and 13(8.5%)

respondents believed that their is lack of safety and health training and PPE are not comfortable to use respectively. (Table 6).

Table 6. Behavioral characteristics with occupational injury among respondents in Steely RMI factory, Bishoftu, Oromyia, Ethiopia 2020(n=153).

Variables	Frequency	Percentage
Alcohol		
Yes	67	43.8
No	86	56.2
How often		
Every day	4	2.6
1-3 Days in a week	5	3.3
Occasionally	57	37.3
Chat Chewing		
Yes	27	17.6
No	126	82.4
How often		
Every day	4	2.6
1-3 Days in a week	1	0.7
Occasionally	22	14.4
Smoking Cigarette		
Yes	22	14.4
No	131	85.6
How often		
Every day	18	11.8

1-3 Days in a week	3	2
Sleeping disorder		
Yes	31	20.3
No	122	79.7
Reason for sleeping at working hours		
Working Greater than 8hrs	11	7.2
Working in evening	8	5.2
Work more than one task at a time	4	2.6
Excessive heat	12	7.8
Job satisfaction		
Yes	123	80.4
No	30	19.6
Use of PPE		
Yes	123	80.4
No	30	19.6
Reasons for not using PPE		
Lack of PPE	5	3.3
Lack of safety and health education	13	8.5
Not comfortable to use	18	11.8
Decrease work performance	9	5.9
Poor Quality	4	2.6
Others	4	2.6

Source: - own survey, 2020

4.3.4. Work environment observation

Workers at production area were exposed to heat and flying objects due to lack of operation safety guard. The chemical lab room was not properly ventilated and workers at furnace area were exposed to smoke and most of the workers didn't wear chemical mask and gambale to protect fire, in addition, during observation in some working areas, workers were found working without PPE. The safety precautions posted were not enough and some of them faded and difficult to be read. Workers complained that some of the PPE has lacked quality; especially the safety shoe cannot prevent foot from hot rebar. No occupational hazards were identified in all working sections, moreover lack of safety training and safety supervision was observed.

4.4. Interpretation and Discussion

4.4.1. Occupational injury in relation to Socio-demographic factors

Socio-demographic variables were analyzed to check if there were associations with work-related injuries both in bivariate and in the multivariate logistic regression technique. Regarding the association of socio-demographic characteristics by bivariate method marital status, level of education, work experience, job category, monthly income (salary) and religion had showed statistical association with occupational injury. However sex and age hadn't shown significant association with occupational injury in the bivariate analysis (Table 7).

Regarding to marital status, others (single and divorce) workers were 3.75 more likely injured than married worker [AOR: 3.75, 95% CI: (1.08, 13.01)]. Worker who have less than seven year work experience were 7.96 times higher injured than those of worker who have greater than

seven year work experience [AOR:7.96, 95%CI:(7.96, 28.30)]. Workers who can read and write, attended primary school, and secondary school were 49.45, 32.61 and 2.88 times more likely to be injured than workers who have first degree [AOR: 49.45, 95%CI:(3.56, 685.70)], [AOR: 32.61, 95%CI:(2.59, 384.58)] and [AOR: 2.88, 95%CI:(0.32, 2875)] respectively. (Table 7).

Table 7. Association of socio-demographic characteristics with Occupational injury among respondents in Steely RMI factory Bishoftu, Oromyia, Ethiopia 2020(n=153).

Variable	Work-related injury		Crude OR (95%CI)	Adjusted OR (95% CI)
	Yes	No		
Sex				
Male	8(55.1)	66(44.9)	2.45(0.43-13.82)	
Female	2(33.3)	4(66.7)	1.00	
Age				
20-30	31(49.2)	32(50.8)	0.96(0.43-2.16)	
29-42	33(63.5)	19(36.5)	1.73(0.74-4.06) *	
≥33	19(50)	19(50)	1.00	
Educational level				
Can write and read	23(82.1)	5(17.9)	6.90(1.40-33.91) *	49.45(3.56-685.71) **
Primary education (1-8	21(65.6)	11(34.4)	2.86(0.66-12.33)	32.61(2.59-384.58) **
Secondary education(9-10	18(56.2)	14(43.8)	1.92(0.45-8.18)	2.88(0.32-25.75)
Technical and Vocational	11(39.3)	17(60.7)	0.97(0.22-4.24)	0.51(0.05-4.83)
Diploma	6(26.1)	17(73.9)	0.52(0.11-2.54)	0.45(0.058-3.50)
Degree	4(40)	6(60)	1.00	1.00
Marital status				
Married	50(49.5)	51(50.5)	1.00	1.00
Others	33.(63.4)	19(39.6)	1.77(0.89-3.51) *	3.75(1.08-13.01) **
Religion				
Orthodox	73(57.4)	54(42.5)	1.00	
Protestant	4(23.5)	13(76.4)	0.22(0.70-0.73) *	
Others	6(66.6)	3(33.4)	1.47(0.35-6.18)	
Work experience				
≤6	56(65.9)	29(34.1)	2.93(1.51-5.68) *	7.96(7.96-28.30) **
>7	27(39.7)	41(60.3)	1.00	1.00
Monthly salary				
≤2680	33(62.3)	20(37.7)	1.8(0.85-4.05) *	
2681-4162	26(53)	23(47)	1.27(0.58-2.79)	
≥4163	24(47)	27(53)	1.00	
Job Category				
operator	15(46.8)	17(53.1)	1.00	
Mechanic	15(48.3)	16(51.6)	1.06(0.39-2.85)	
Attendant	4(36.3)	7(63.6)	0.64(0.15-2.65)	
Electrician	8(61.5)	5(38.4)	1.81(0.48-6.75) *	
Cutter	11(68.7)	5(31.2)	2.49(0.70-8.83) *	
Feeder	10(190.9)	1(9.1)	11.33(1.29-99.23)	
Others	20(51.3)	19(48.7)	1.19(0.46-3.04)	

1.00 - reference category, * - p-value <0.2, ** - p-value <0.05,

Source: - own survey, June 2020

4.4.2. Occupational injuries in relation to environmental factors

With the bivairate analysis method hours work per week and safety training were the environmental variable that were checked with bivairate analysis, thus both variables were significantly associated with occupational injury. (Table 8).

Hours work per week and safety training were included in the multiple logistic regressions with the socio-demographic and behavioral variables, so hours work per week was a variable that remain significantly associated in the multiple logistic regressions with occupational injury (P<0.05, 95%CI).

The result implied that hours work per week was influencing factor to occupational injury; hours of work per week, workers who had worked 72 hours per week and 84 hours per week were 23.9 and 2.39 more likely injured than those who worked 48 hours per week [AOR: 23.9, 95% CI: (5.81, 98.23)] and [AOR: 2.39, 95% CI: (0.52, 10.87)] respectively. (Table 8).

Table 8. Association of environmental characteristics with occupational injury among respondents in Steely RMI factory Bishoftu, Oromyia, Ethiopia 2020(n=153).

Variable	Work-related injury		Crude OR	Adjusted OR
	Yes	No	(95%CI)	(95% CI)
Work hours /week				
48	26(34.6)	49(65.4)	1.00	1.00
72	45(77.6)	13(22.4)	6.52(2.99-14.21) *	23.9(5.81-98.23) **
84	12(60)	8(40)	2.82(1.02-7.78) *	2.39(0.52-10.87)
Safety training:				
Yes	30(41.7)	42(58.3)	1.00	
No	53(65.4)	28(34.6)	2.65(1.37-5.10) *	

1.00 - reference category, * - p-value <0.2, ** - p-value <0.05,

Source: - own survey, June 2020

4.4.3. Occupational injury in relation to behavioral factors

Bivariate analysis also done on behavioral variables, among behavioral variables that enter in the bivariate regression; sleeping disorder, chat chewing and smoking cigarette were shown significant association with occupational injury. (Table 9).

Behavioral variables were entered to multiple logistic regressions together with socio-demographic and environmental variables, and then among the behavioral variables that entered to the multiple logistic regression sleeping disorder and chat chewing were remain significantly associated with occupational injury.

The result had shown that sleeping disorder workers were 4.55 more likely injured than who had no sleeping disorder [AOR: 4.55, 95% CI: (1.05,19.67)].

Additionally workers who had chewed chat were 12.50 more likely injured than who hadn't chewed chat [AOR: 12.50, 95% CI: (2.22,70.34)]. (Table 9).

Table 9. Association of behavioral characteristics with occupational injuries among respondents in Steely RMI factory Bishoftu, Oromyia, Ethiopia 2020(n=153).

Variable	Work-related injury		Crude OR (95%CI)	Adjusted OR (95% CI)
	Yes	No		
Alcohol drinking consumption				
Yes	38(56.7)	29(43.3)	1.19(0.62-2.26)	
No	45(52.3)	41(47.7)	1.00	
Chat chewing				
Yes	24(88.9)	3(11.1)	9.08(2.60-31.71) *	12.50(2.22-70.34) **
No	59(46.8)	67(53.2)	1.00	1.00
Smoking Cigarette				
Yes	20(90.9)	2(9.1)	10.79(2.42-48.05) *	
No	63(48.1)	68(51.9)	1.00	
Sleeping Disorder				
Yes	23(74.2)	8(25.8)	2.97(1.23-7.15) *	4.55(1.05-19.67) **
No	60(49.2)	62(50.8)	1.00	1.00
Job satisfaction				
Yes	67(54.3)	56(45.5)	1.00	
No	16(53.3)	14(46.7)	0.95(0.42-2.12)	
Use of PPE:				
Yes	67(54.3)	56(45.5)	0.95(0.42-2.12)	
No	16(53.3)	14(46.7)		

1.00 - reference category, * - p-value <0.2, ** - p-value <0.05,

Source: - own survey, June 2020

Discussion:

The result of this study demonstrates that the overall injury prevalence rate of the last twelve months of the samples was 54.2%. This figure is nearly equivalent with the finding in Large scale Metal Manufacturing Industry (Habtu, 2014), it is very high compared with the finding in small and medium Size manufacturing Industry in Gondar (Tadesse, 2007). Thus reason for the higher prevalence may be due to the dangerous working environment, since the factory is large scale industry.

In contrast, it is much lower than the study in Arba Minch Town among Small-Scale Industries workers which is 80.8% (Tanga 2016). The reason for this may be that workers in Arba Minch Town among Small-Scale Industries did not use personal protective equipment. .

It was found that hands 21 (13.7%), fingers 18 (11.8%), and eye 16 (10.5%), were the most frequently injured body parts in this study. Study done in large scale metal manufacturing industries (Habtu 2014), and Arba Minch Town among Small-Scale Industries (Tanga 2016) hand, eye and finger were the mostly affected body parts These could explain that these active body parts were directly exposed to flying objects 13 (8.5%), and Collusion 13(8.5%), and Fall/Slipped 7 (7.3%). In contrast, the most causes of injury in large scale metal manufacturing industries (Habtu 2014), and Arba Minch Town among Small-Scale Industries (Tanga 2016) are hand tools, cut and eye injury.

Most accident were occurred in the in the afternoon in this study, this may be due to workers may be weakness due to hot working area, the weather condition humid/warm air and working more than 48 hours. This result was supported by a study done by in Arba Minch Town among Small-Scale Industries..

In this study most of injuries happened lower educational level background; workers who only can read and write were nearly 50 times more likely to be injured and also un married workers more likely to be injured 3.75 times than married workers; moreover, workers with work experience were nearly 8 times more likely to be injured than workers more than 7 years of work experience. This finding is consistent with findings in Kombolcha Textile Factory (Serkalem 2014) and study conducted in south Korea (RYU 2017), but it contradict with the survey conducted in Yazd city (Halvani 2004).

The result implies that hours work per week was significantly associated with occupational injury. Regarding hours of work per week, workers who had worked 72 hours per week and 84 hours per week were 23.9 and 2.39 more likely be injured than those who worked 48 hours per week. This finding is consistent with other studies (Abbas, 2013 and Salminen, 2016).

From behavioral factor this study highlighted the fact that chat chewing and having sleeping disorder were found to be statistically significantly associated. Chat chewers were 12.5 times more likely injured than non-chat chewers'. This finding is consistent with findings in small-industries workers in Arba Minch Town. This study also revealed that workers who complained disorder had about 4.55 times more likely to report occupational injury than workers who didn't report a problem of sleeping disorder. This finding is consistent with findings in Textile Factory .workers in Amhara regional state (Zewdie 2011) and small-industries workers in Arba Minch Town.

Chapter-5

Summary, Conclusion and Recommendations

5.1. Introduction

This chapter holds the summary, conclusions and recommendations. To make it clear that the aim is to summary from major findings and the conclusions are based on the research objectives of the study. Recommendations are made to the steely RMI management member, and suggestion for other researchers.

5.2. Summary

From socio-demographic variables, level of education, marital status and work experience are significantly associated with occupational injury; and also regarding environmental factors of occupational injury, the result implies that hours work per week was significantly associated with occupational injury, moreover concerning to behavioral variables, the result had shown that sleeping disorder and chewing chat were significantly associated with occupational injury.

5.3 Conclusion

The findings indicate that there are influencing factors for workers occupational injury in Steely RMI Plc. The result of this finding demonstrates that the overall occupational injury prevalence rate is 54.2% which is significantly high. The result indicates the most influencing factors of occupational injuries in Steely RMI Plc are level of education, marital status, work experience, chat chewing, sleeping disorder and hours of work worked per week.

The Company's workers are injured most on their hands, fingers, eye, right leg and back, the types of occupational injuries are Sprain, Burn, Eye injury and Fracture and most causes of injury are to flying objects, collusion, and fall/slipped (slippery surface). Moreover the Company's workers are mostly injured in the afternoon.

The finding shows that, there is significant relationship between level of education, marital status, work experience, chat chewing, sleeping disorder and hours of work worked per week.

5.4 Recommendation

The major attention of this paper was assessing the influencing factors of occupational injury and identifying the prevalence rate of occupational injury in Steely RMI PLC. Thus, the following recommendations have been drawn with the view to minimize the prevalence and effect of influencing factors of occupational.

- Counseling service shall be given for workers who are addicted with alcohol and chat; and for workers with sleeping disorder.
- Occupational injury influencing factors shall be identified in all working sections
- On job safety training shall be available in consistent manner and awareness safety training shall be given to workers from the beginning of their employment
- Discourage addicted workers habits like, chewing chat, drinking alcohol, etc with appropriate disciplinary measure.
- Preparing and implementing safety manual and safety procedure is important.
- Give opportunity for employees to improve their level of education.
- The company management shall give attention on lowering working hour per week.
- Encourage employees to get sufficient sleeping time during rest time and try to moderate work place temperature with appropriate ventilation.

5.5 Limitation and suggestion of further studies

5.5.1 Limitation

Due to lack of studies comparing results is difficult with similar methodology and similar topic.

5.5. 2. Future Research Area

The study is the first in the company's history, thus workers lack of awareness about research and may not be given sufficient information during questionnaires face to face interview. Therefore, the company not to be depending on this study but it shall conduct better an detail research. This study is limited to one company, thus cannot infers to similar company. Hence the government and other interested party shall be made further research in other similar manufacturing industries.

References

- Abbas, R., and Mohammed, M., (2013). Non-Fatal Occupational Injuries and Safety Climate: A Cross-Sectional Study of Construction Building Workers in Mit-Ghamr City, Dakahlia Governorate, Egypt. *Open Journal of Safety Science and Technology*.
- Akata, AN., Keda, TI., Akahashi, MT., Aratani, TH., Ojou, MH., et al. (2006). The prevalence and correlates of occupational injuries in small-scale manufacturing enterprises. *J Occup Heal* 48, pp. 366-76.
- Akerstedt, T., (2003). Shift work and disturbed sleep/wakefulness. *Occup Med.* 53, pp. 89–94.
- Akerstedt, T., Fredlund, P., Gillberg, M., Jansson, B., (2002). A prospective study of fatal occupational accidents-relationship to sleeping difficulties and occupational factors. *J Sleep Res.* 11, pp. 69–71.
- Akinori, N., Tomoko, I., Masaya, T., Takashi, H., Minoru, H., Naomi, G., et al. (2006). The Prevalence and Correlates of Occupational Injuries in Small Scale Manufacturing Enterprise. *Journal of Occupational Health*, 48, pp. 366-376. <http://dx.doi.org/10.1539/joh.48.366> [Accessed 10 Mar. 2020].
- Bijay, (2008) B. and Nearkaen, C. (2008). Relationship of job hazards, lack of knowledge, alcohol use, health status and risk taking behavior to work injury o f coal miners: A case-control study in India. *J Occup Health*..
- Bogale, D., Kumie, A., Tefera, W., (2014). Assessment of occupational injuries among Addis Ababa city municipal solid waste collectors: a cross-sectional study. *BMC public health*.

- Caslin, C., (2006). An Investigation into the Measurement of Workplace Injury Severity. Wellington. [online] Available at: <http://ojs.victoria.ac.nz/LEW/article/view/1609>
- Chau, N., Bhattacharjee A, Kunar B M, Group L. (2009). Relationship between Job, Lifestyle, Age, and Occupational Injuries.” Occupational Medicine 59 (2), pp. 114–19.
- Cooper, DR, Schindler PS, Sun J (2003). Business Research Methods.
- Creswell, J., (2009). Research Design: Qualitative, Quantitative and Mixed Method Approaches (3rd ed.). California: Sage Publications Inc.
- Drake C.L., Roehrs T., Richardson G., Walsh J.K., Roth T. (2004). Shift work sleep disorder: prevalence and consequences beyond that of symptomatic day workers. Sleep. 27, pp. 1453– 1462.
- European Journal of Scientific Research ISSN 1450-216X [online] Vol.31 No.4 (2009), pp.546-552 © EuroJournals Publishing, Inc. 2009 <http://www.eurojournals.com/ejsr.htm> [Accessed 15 Mar. 2020].
- Faris, K. (1998). Survey of Occupational Safety and Sanitary Conditions in Small Scale Enterprise in Jimma South Western Ethiopia. Ethiopian Journal of Health Development, 12, pp. 183-190.
- Gebretsadik M., Kumie A., Gebremichael G. (2014). Assessment of occupational injury and associated factors among Muger cement factory workers, Muger, Ethiopia, J.JPHE 9 (12), p. 318-331

- Gizaw Z., Gebrehiwot M., Teka Z., Molla M. (2014). Assessment of occupational injury and associated factors among municipal solid waste management workers in Gondar town and Bahir Dar City, northwest Ethiopia, 2012. *J. Med. Med. Sci.* 5(9), pp. 181-192
- Habtu, Y., Kumie, A. and Tefera, W. (2014). Magnitude and Factors of Occupational Injury among Workers in Large Scale Metal Manufacturing Industries in Ethiopia. *Open Access Library Journal*, 1: e1087. Available at : <http://dx.doi.org/10.4236/oalib.1101087> [Accessed 10 Mar. 2020].
- Halvani G.H., and Aminipour M.R. (2004). Survey of work events in factories of social securing organization in Yazd City. *Toloe Behdasht J.* 2, pp. 9–17
- ILO (1998). Resolution of the 16th international conference of labour Statisticians.
- ILO (2005). Prevention of occupational diseases: world day for safety and health at work. Decent Work-Safe Work. Geneva
- Kazutaka, K. (2008). Roles of Ergonomic Check Points for Safer and Heathier Work. *African Newsletter on Occupational Health and Safety*, 18, pp. 24-25.
- Kifle M, Engdaw D, Alemu K, Rai Sharmab H and Amsalu S, et al. (2013) Work related injuries and associated risk factors among iron and steel industries workers in Addis Ababa, Ethiopia. *Safety Science* 63, pp. 211–216.
- Kumekpor, K. B., (2002) *Research Methods & Techniques of Social Research*, Ghana, SonLife Printing Press and Services.
- Kumie A, Amare T, Berhane K, et. al., (2016) Occupational Health and Safety in Ethiopia: A review of situational analysis and needs Assessment. *Ethiopian J Health Dev.* 30, pp. 17-27

- Levin 1985 L., Oler J., Whiteside J.R. (1985) Injury incidence rates in a paint company on rotating production shifts. *Accid Anal Prev.* 17, pp. 67–73.
- Levine (1976). Preliminary Papers prepared for the commission, The Belmont Report, DHEW Publication, Washington DC,
- Mesafint A. Getahun, K. Hardeep, R. Walelegn, W. (2013) Occupational Injuries Among Building Construction Workers in Gondar City, Ethiopia. *Occup Med Health Aff.*
- MOLSA (2008). Work related Injuries Report from Federal, Amhara and SNNRGs. Department of Occupational Health and Safety at Work, Addis Ababa.
- Nyguyen, T. and Luongo, M. (2009). Occupational Injuries and Prevention Activities in Vietnam. *Asia-Pacific Journal of Public Health*, 15, pp. 7-10.
- Ohayon. M, Lemoine P., Arnaud-Briant V., (2002) Dreyfus M. Prevalence and consequences of sleep disorders in a shift worker population. *Psychosom Res.* 53, pp. 577–583.
- Osman, Y. and Kumie, A. (2007). Assessment of Occupational Injuries in Tendaho Agricultural Development S.C, Afar Regional State. AAU, Addis Ababa. [12] Kiwekete, H.M. Job Safety Analysis
- Paul, D. Leedy and Jeanne Ellis, O. (2005). *Practical research: planning and design*, Pearson Prentice Hall, Danilo B. Largo, Lecture Slide: code of conducts in research for solg, aug. 14, 2012
- Poosanthanasarn (2005), N., Lohachit, C., Fungladda, W., Sriboorapa, S. and Pulkate, C. (2005) An Ergonomics Intervention Program to Prevent Workers' Injuries in a Metal Auto Parts Factory. *Southeast Asian Journal of Tropical Medicine and Public Health*, 36, 512-522.
- Powers Jr J R, Anmons D E, Brand I. (2009). Machine Safety. *Professional Safety* 54 (11), pp. 28–31.

- Rommel A, Varnaccia G, Lahmann N, Kottner J, Kroll LE (2016). Occupational Injuries in Germany: Population-Wide National Survey Data Emphasize the Importance of Work-Related Factors. *PLoS ONE* 11(2): e0148798. doi:10.1371/journal.pone.0148798
- Ryu J, Jung-Choi K, Choi KH, Kwon HJ, Kang C, Kim H. (2017). Associations of Shift Work and Its Duration with Work-Related Injury among Electronics Factory Workers in South Korea. *Int J Environ Res Public Health*. 2017;14(11):1429.
- Salminen S. (2016). Long Working Hours and Shift Work as Risk Factors for Occupational Injury Finnish Institute of Occupational Health, Helsinki, Finland. *The Ergonomics Open Journal*, 9, pp. 15-26
- Senbeto, E. (1991) The Incidence of Injuries and Their Determinants in Akaki Textiles Factory. AAU, Addis Ababa.
- Serkalem Y., Haimanot M., Ansha A. (2014) Determinants of occupational injury in Kombolcha textile factory, North East Ethiopia. *Int J Occup Environ Med* 5, pp. 84-93.
- Seth, A. and Salminen, S. (2006) Making Sense of Industrial Accidents: Role of Job Satisfaction. *Journal of Social Sciences*, 2, 127-134.
- Steely RMI, (2019). Fourth Quarter, 2019 Annual Report
- Sun, W. Chou, C. Stacy, A.W., Ma, H., Unger, J. and Gallaher, P., (2007). SAS and SPSS macros to calculate standardized Cronbach's Alpha using the upper Bound of the pie coefficient for dichotomous items. Peer reviewed journal, vol39, no.1, pp.71-81.
- Tadesse T, and Kumie A. (2007). Prevalence and factors affecting work-related injury among workers engaged in Small and Medium-Scale Industries in Gondar wereda, north Gondar zone, Amhara Regional State, Ethiopia. *Ethiop J Health Dev.*; 21(1), pp. 25–34.

- Tadesse S, and Dagnachew I. (2016). Occupational injuries among building construction workers in Addis Ababa, Ethiopia. *Journal of Occupational Medicine and Toxicology*. pp11-16.
- Tanga AT, Tessema F, Jilo GK. (2016). Prevalence of Occupational Injuries and Associated Factors among Small-Scale Industries Workers in Arba Minch Town, Southern Ethiopia. *Int J Pub Health Safe*, pp. 3-152.
- Tekele, T. and Kebede, F. (2002). Lecture Note For Environmental Health Students Occupational Health, Safety, and Hygiene. University of Gondar: In collaboration with the Ethiopia Public Health Training Initiative, The Carter Center, the Ethiopia Ministry of Health, and the Ethiopia Ministry of Education.
- Vlachos, I. P., (2009). The effect of Human Resource Practice on Firm Growth. *Int. Journal of Business Science and applied Management*, 4(2), Athens Greece. Graduation
- Yanar B., Lay M., Smith P. (2014). The Interplay Between Supervisor Safety Support and Occupational Health and Safety Vulnerability on Work Injury: *Safety and Health at Work* 10, pp. 172-179
- Zewdie, AD. and Takele T. (2011). Determinants of Occupational Injury: A Case Control Study among Textile Factory Workers in Amhara Regional State, Ethiopia. *Journal of Tropical Medicine*.

Annex I: English version of Questionnaire

Addis Ababa University College of Business and Economics School of Commerce.

Questionnaire for assessment of factors influencing occupational injuries among Steely RMI workers in Bishoftu town.

Verbal consent form before conducting interview

Greeting

Hello, I am Birhanu Woldeyes. I am working in the research team of Addis Ababa University College of Business and Economics School of Commerce. I would like to ask you a few questions about occupational related injuries that happened to you in the past 12 months. Your name will not be written in this form and will never be used in connection with any information you tell us. All information given by you will be kept strictly confidential. Your participation is voluntary and you are not obliged to answer any question you do not wish to answer. If you feel discomfort with the interview please feel free to drop it any time you want. But, your willingness to answer all of the questions would be appreciated. Your correct answer to the questions can make the study achieve the goals. Therefore, you are kindly requested to respond genuinely and voluntarily with patience. Do I have your permission to continue?

1. If yes, continue to the next page
2. If no, skip to the next participant by writing reasons for his/ her refusal

Name and Signature of the data collector who sought the consent_____

Questionnaire identification number _____

(Adapted from Gizachew Z. et. Al (2014) and Gebretsadik M., et.al (2014))

No	Question	Possible Response	S K I P	
Section one: Socio demographic information				
101	Sex	1. Male 2. Female		
102	Age	_____years		
103	Religion	1. Orthodox 4. Muslim 2. Catholic 5. Others specify 3. Protestant		
104	Educational status	1. Illiterate 2. Can write and read 3. Primary education(1 - 8) 4. Secondary(9 - 12) 5. Technical and vocational 6. Diploma 7. 1 st Degree 8. 2 nd Degree		
105	Marital status	1. Married 4. Widowed 2. Single 5. Separated 3. Divorced		
106	Job category	1. Operator 2. Mechanic 3. Welder 4. Attendant 5. Electrician 6. Cutter 7. Sorter 8. Feeder 9. Remover 10. Others(Specify)_____		

107	Service duration in month or year	_____		
108	Daily or monthly income in birr	_____		

Section Two: Work related injury characteristics

201	Have you had an incident at job that resulted in an injury to you in the last 12 Months?	1.Yes 2.No		
202	If yes to Q201 or, how many	1. Once 2. More than once		
203	Have you had an incident at job that resulted in an injury to you in the last four weeks?	1.Yes 2.No		
204	If yes to Q201 or /and 202, how many times?	1. Once 2. More than once		
205	Part of the body Affected	1. Eye 1.Yes 2. No 2. Elbow 1.Yes 2. No 3. Knee 1.Yes 2. No 4. Toe 1.Yes 2. No 5. Hip 1.Yes 2. No 6. Finger 1.Yes 2. No 7. Ear 1.Yes 2. No 8. Right Hand 1.Yes 2. No 9. Left Hand 1.Yes 2. No 10. Head 1.Yes 2. No 11. Right Leg 1.Yes 2. No 12. Left Leg 1.Yes 2. No 13. Shoulder 1.Yes 2. No 14. Tooth 1.Yes 2. No		

		15. Neck 1. Yes 2. No 16. Back 1. Yes 2. No 17. Chest 1. Yes 2. No 18. Others ,specify-----		
206	Type of injury	1. Abrasion 2. Cut 3. Burn 4. Puncture 5. Fracture 6. Sprains/ dislocation 7. Eye injury 8. Ear injury 9. Blockage /irritation of nasal cavity 10. Electric Shock 11. Disability 12. Poisoning 13. Other, specify_____		
207	Causes/mechanisms of injury	1. Machinery Repetitive motion 2. Hit by Falling objects 3. Electric 4. Flying object 5. Hand tools / equipment 6. Fire 7. Hot Material 8. Falls /Slip 9. Collision with objects 10. Lifting heavy objects 11. Other, specify_____		
208	Time of injury	1. In the morning 2. In the Afternoon 3. In the Night		
209	Number of days lost due to injury at work last one year	1. 0 – 3 days 2. >3 days		

	(in days)			
Section three: Work environment information				
301	Days worked per week	_____		
302	Hours worked per Day	-----		
303	Have you had any work safety training in connection with employment?	1. Yes 2. No		
Section four: Information on workers behavior				
401	Do you drink Alcohol?	1. Yes 2. No		
402	If yes to 401, how often?	1. Every day 2. 1-3 days/wk 3. Occasionally		If no go to Q403
403	Do you chew chat?	1. Yes 2. No		
404	If yes to Q404, how often?	1. Every day 2. 1-3 days/wk 3. Occasionally		If no go to Q403
405	Do you smoke cigarette?	1. Yes 2. No		
406	If yes to Q406, how often?	1. Every day 2. 1-3 days/wk 3. Occasionally		If no go to Q403
407	Do you have any sleeping disorders	1. Yes 2. No		
408	If yes to Q407, what is the reason	1. Working greater than 8 hours without Shifting 2. Working in evening 3. Trying to work more than one task at a time 4. Excessive heat 5. Others, Specify___		If no go to Q409
409	Job satisfaction (Use Minnesota job satisfaction questionnaire)	1. Yes 2. No		
410	Did your employer provide personal protective equipments?	1. Yes 2. No		
411	If yes for Q 409, do you always make use of the protective materials at work?	1. Yes 2. No		

412	If yes for Q 410, What are your reasons for not using personal protective Equipment?	<ol style="list-style-type: none"> 1. Lack of protective equipment. 2. Lack of safety and health education. 3. Not comfortable to use 4. Decrease work performance 5. Create safety and health hazards 6. Protective equipments are of poor quality 7. Other, specify_____ 		
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That is the end of our questionnaire. Thank you very much for taking time to answer these questions. We appreciate your help.

Annex 2: Amharic version questionnaire

አዲስ አበባ ዩኒቨርሲቲ፣ ቢዚነስና ኢኮኖሚክስ ትምህርት ክፍል፣ የንግድ ስራ ት/ቤት

ይህ መጠይቅ ስቲሊ አር. ኤም. አይ. ፋብሪካ ሰራተኞች መካከል ከሥራ ጋር በተያያዘ የደረሱ ጉዳዮችን እና ምክንያቶች ለማጥናት የተዘጋጀ ነው።

በጥናቱ ላይ ለሚሳተፉ የሚሰጥ የመተማመኛ መረጃ

ጤና ይስጥልኝ፡ እኔ ብርሃኑ ወ/የስ እባላለሁ። እዚህ የመጣሁት ይህንን ጥናት ለማካሄድ የአዲስ አበባ ዩኒቨርሲቲዬ የጥናት ቡድን ሆኖ ነው። ፡ ከሙያ ጋር በተያያዙ ጉዳዮች እና መንስኤ ሊሆኑ ስለሚችሉ ነገሮች ከ20-30 ደቂቃ ብቻ የሚፈጅ 50 ጥያቄ ልጠይቅዎት እፈልጋለሁ ። እርስዎ የሚሰጡን ትክክለኛ መልስ ለህግ አርቃቂዎች በቀላሉ ከሙያ ጋር በሚደርሱ ጉዳዮችን በመከላከል እና በመቆጣጠር ጤናማ የሰራተኛ ሀይል እንዲፈጠር ይረዳል። እርስዎ የተመረጡት በባለፈው ቅድመ ጥናት ዳሰሳ በሰጡት መልስ ነው። በዚህ ጥናት ላይ የሚሳተፍ ማንኛውም ሰው ከዚህ በታች ስለ ጥናቱ የተሰጠውን መረጃ በትክክል ተረድቶ ፍቃደኝነቱን ሲያሳይ ብቻ ነው።

የጥናቱ ርዕስ፡ በቢሾፍቱ ከተማ በስቲሊ አር. ኤም. አይ. ፋብሪካ የሚሰሩ ሰራተኞች ላይ ከሥራ ጋር በተያያዘ የሚደርሱ ጉዳዮችን እና መንስኤዎቻቸውን ለማጥናት የተዘጋጀ ነው።

የጥናቱ ዋና አላማ፡ በቢሾፍቱ ከተማ በስቲሊ አር. ኤም. አይ. ፋብሪካ የሚሰሩ ሰራተኞች ላይ ከሥራ ጋር በተያያዘ የሚደርሱ ጉዳዮችን ብዛታቸው እና አጋላጭ መንስኤዎቻቸውን ለይቶ ማወቅ።

የተጠኝዎች መብት፡ በጥናቱ ላይ መሳተፍም ይሁን አለመሳተፍ ይችላሉ። ተሳታፊዎች ጥናቱን በፈለጉት ቦታ ማቋረጥ ይችላሉ። መመለስ ያልፈለጉትንም ጥያቄ መዝለልም ይችላሉ። ተሳታፊዎች ማንኛውንም ያልገባቸውን ጥያቄ መጠየቅ ይችላሉ።

የጥናቱ ሚስጢራዊነቱ፡ በመላሾች የሚሰጥ ማንኛውም አይነት መልስ በሚሰጠር ይያዛል። ስማቸውም አይገለፅም።

የተሳታፊዎች የፈቃደኝነት መጠየቂያ ቅፅ

ይህ መጠይቅ በቢሾፍቱ ከተማ በስቲሊ አር. ኤም. አይ. ፋብሪካ በሚገኙ ሰራተኞች ላይ በሚደርስ ከስራ ጋር የተያያዙ ጉዳዮችን ለማጥናት የተዘጋጀ ነው።

ከላይ ያለውን ፎርም አንብበው ወይም ተነብቦልዎት ስለ ጥናቱ ፍሬ ሀሳብ እንደተረዱ እገምታለሁ፤ ስለዚህ ወደ ጉዳዩ መግባት እንችላለን?

1. ከተስማሙ ወደሚቀጥለው ገጽ ይሂዱ
2. አይ ካሉ ወደሚቀጥለው ሰው ቃለመጠይቅ ይሂዱ፡ የተቃወመበትን ምክንያት ይጻፉ

ክፍል አንድ፡ ማህበራዊና ስነ ህዝባዊ ገፅታዎችን በሚመለከት

ተ.ቁ	ጥያቄዎችና ማጣሪያዎች	አማራጭ መልሶች	ይሻገሩ
101	ዎታ	1. ሴት 2. ወንድ	
102	እድሜ በአመት	-----	
103	ሀይማኖት	1. ኦርቶዶክስ 2. ካቶሊክ 3. ፕሮቴስታንት 4. ሙስሊም 5. ሌላ ካለ ይጠቀስ	
104	የትምህርት ደረጃ	መፃፍና ማንበብ 1. የማይችል/የማትችል 2. መፃፍና ማንበብ የሚችል/የምትችል የመጀመሪያ ደረጃ ት/ት (1-8) 3. ያጠናቀቀ/ች ሁለተኛ ደረጃ ት/ት (9-12) 4. ያጠናቀቀ/ች ከቴክኒክና ሙያ ትምህርት ቤት 5. የተመረቀ/ች 6. ዲፕሎማ 7. የመጀመሪያ ዲግሪ 8. ሁለተኛ ዲግሪ	
105	የጋብቻ ሁኔታ	1. ያገባ/ች 2. ያላገባ/ች 3. የፈታ/ች 4. የሞተበት/ባት 5. ተለያይተው የሚኖሩ አግብቶ/ታ	
106	የሙያው አይነት	1. አፕራተር 2. መካኒክ 3. ዌልደር 4. አቴንዳንት 5. ኤሌክትሪሻያን 6. ቆራጭ 7. ሶርተር 8. መጋቢ 9. ሚል ክሊኒር 10. ሌላ ካለ ይግለጹ	

<p>107 በስራ ቦታዎ ስንት ወር ወይም አመት አገልገሉ አገልገሉ? በወር/በአመት</p>	<p>-----</p>
<p>108 የወር ደመወዝ ወይም የቀን ገቢ በብር</p>	<p>-----</p>

206	የጉዳዩ አይነት	1. ጭረት	
		2. መቆረጥ	
		3. ቃጠሎ	
		4. መውጋት	
		5. ስብራት	
		6. ወለምታ	
		7. አይን ላይ የደረሰ ጉዳት	
		8. ጆሮ ላይ የደረሰ ጉዳት	
		9. መታፈን	
		10. በኤሌክትሪክ መያዝ	
		11. የአካል መጉደል	
		12. መመረዝ	
		11. ሌላ ካለ ይጠቀስ	
207	የጉዳዩ ምክንያት	1. ማሸኖች	
		2. በሚወድቁ እቃዎች	
		3. ኤሌክትሪክ	
		4. በተፈናጣሪ ነገሮች	
		5. የእጅ መሣሪያዎች	
		6. እሳት	
		7. ትኩስ ነገሮች	
		8. ማዳለጥ/መውደቀ	
		9. ግጭት	
		10. ከባድ እቃዎችን በማንሳት	
		11. ሌላ ካለ ይጠቀስ	
208	ጉዳዩ የደረሰበት ሰዓት	ጧት	
		ከሰዓት	
		ምሽት	
209	ከሥራ ጋር በተያያዘ ጉዳዮች ምክንያት ባለፉት አስራ ሁለት ወራት ውስጥ ከሥራ የቀሩበት ቀናት ብዛት	1. 0-3 ቀን 2. >3 ቀን	

ክፍል ሦስት፡ የሥራ ቦታን በተመለከተ

301	በሳምንት ምን ያህል ሰዓት ይሰራሉ?	-----	
302	በቀን ምን ያህል ሰዓት ይሰራሉ?	-----	
303	የሥራ ቦታ ደህንነትን በተመለከተ አዲስ ሆነው ሲቀጠሩ ወይም በአዳዲስ አሰራሮች ወይም በሌሎች ለውጦች ምክንያት ሥልጠና ወስደው ያውቃሉ ?	1. አዎን 2. የለም	

ክፍል አራት፡ የሠራተኛውን ባህሪ በተመለከተ

401	አልኮል መጠጥ ጠጥተው ያውቃሉ?	1. አዎን 2. የለም	
402	የሚጠጡ ከሆነ ስንት ጊዜ ?	1. በየቀኑ 2. ከ 1-3 ቀን በሳምንት 3. አልፎ አልፎ	የለም ካሉ ወደ ተ.ቁ 403 ይሻገሩ
403	ጫት ቅመው ያውቃሉ ?	1. አዎን 2. የለም	
404	የሚቅሙ ከሆነ ስንት ጊዜ	1. በየቀኑ 2. ከ 1-3 ቀን በሳምንት 3. አልፎ አልፎ	የለም ካሉ ወደ ተ.ቁ 405 ይሻገሩ
405	ሲጋራ ያጤሳሉ	1. አዎን 2. የለም	
406	ለተራ ቁጥር 405 አዎ ካሉ ከሆነ ስንት ጊዜ ?	1. በየቀኑ 2. ከ 1-3 ቀን በሳምንት 3. አልፎ አልፎ	የለም ካሉ ወደ ተ.ቁ 407 ይሻገሩ
407	የእንቅልፍ ችግር አለብዎት ?	1. አዎን 2. የለም	
408	ለጥያቄ ቁ.507 መልሰዎ አዎ ከሆነ ምክንያቱ ምንድን ነው?	1. ያለ ዕረፍት/ቅያይ ከ8 ሰዓት በላይ መስራት 2. በምሽት መስራት 3. በእንድ ጊዜ ከእንድ በላይ ስራ መስራት 4. ከፍተኛ የሙቀት ጫና 5. ሌላ ካለይጠቀስ -----	የለም ካሉ ወደ ተ.ቁ 409 ይሻገሩ
409	በሚሰሩት ስራ ደስተኛ ነዎት	1. አዎን 2. የለም	
410	ድርጅቱ ተገቢውን የአደጋ መከላከያ ቁስ ያቀርባል	1. አዎን 2. የለም	
411	ጥያቄ ቁጥር 410 አዎ ካሉ፤ በስራ ቦታዎ የጉዳት መከላከያ መሣሪያዎችን ሁልጊዜ ይጠቀማሉ ?	1. አዎን 2. የለም	
412	ጥያቄ ቁጥር 410 የለም ካሉ፤ (የማይጠቀሙ ከሆነ) ምክንያትዎ ምንድን ነው ?	1. የመከላከያ መሣሪያዎባለመኖራቸው 2. የደህንነትና ጤንነት ትምህርት ስለማይሰጥ 3. ለአጠቃቀም ምቹ ስላልሆነ 4. የስራ አፈፃፀምን ስለሚቀንስ 5. የደህንነትና የጤና ጠንቅ ሊያስከትል ስለሚችል 6. ሌላ ካለ ይጠቀስ-----	

ይህ የጥያቄዎችን መጨረሻ ነው። እነዚህን ጥያቄዎች ጊዜ ወስደው በመመለስ ላደረጉልን ትብብር በጣም እናመሰግናለን።

Part V Work environment observational cheek list

No	Safety factors	Possible answers	Remark
1	Equipment put in a correct place and orderly	1.Yes 2.No	Yes requires all materials place in correct place.
2	Is there warning signs or safety rules in the work place?	1.Yes 2.No	Yes requires no lack of such signs or post while inspection around.
3	Do the employees use the necessary personal protective device?	1.Yes 2.No	Yes requires no lack of such equipment and used by each workers while inspection around.
5	Electrical panel knockouts are in place?	1. Yes 2. No	Yes requires the presence of electrical panel knockouts during data collection
6	Working equipment are safe and inspected	1.Yes 2. No	Yes requires the inspection logbook
7	Unsafe handling tools are prohibited by the supervisors?	1.Yes 2.No	Yes requires supervisor prohibited those worker from unsafe hand tool
8	Are all work areas adequately illuminated?	1.Yes 2.No	Yes requires if there is no difficulty of reading a paper written by a pencil.
9	Does the industry have of safety personnel?	1.Yes 2.No	Attainment of yes requires either implementation as result of initiative from safety personnel or written program for action worked out with them.
10	Are training needs considered in connection with new employment, equipment or other changes?	1.Yes 2.No	Yes requires an example of training given as a consequence of a change.