

*Assessment of Health Safety Management Practice in Building Construction Projects among Construction Workers in Jimma University.*



**A Research Report Submitted to the School of Graduate Studies of Jimma University in Partial Fulfillment of the Requirements for the Award of Master of Arts Degree in Project Management and Finance (MPMF)**

*By: Tsegamlak Kumlachew*

**JIMMA UNIVERSITY  
COLLEGE OF BUSINESS AND ECONOMICS  
SCHOOL OF GRADUATE STUDIES  
DEPARTMENT OF ACCOUNTING AND FINANCE**

**July 2021.  
Jimma  
Ethiopia.**

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***By: Tsegamlak Kumlachew***

Under the guidance of

**Main Advisor: Abiy Getahun**

**Co-advisor: Mr. Abebe Shentema (MSc)**

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## DECLARATION

I, the undersigned, declare that this study entitled “*Assessment of Health Safety Management Practice in Building Construction Projects among Construction Workers in Jimma University.*” is my original work and has not been presented for a degree in any other university, and that all sources of materials used for the study have been duly acknowledged.

Declared by:

Name: *Tsegamlak Kumlachew*

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## CERTIFICATE

This is to certify that this study, “*Assessment of Health Safety Management Practice in Building Construction Projects among Construction Workers in Jimma University.*” for the partial fulfillment of Master of Arts Degree in Project Management and Finance at Jimma University, is an original work and is not submitted earlier for any degree either at this University or any other University.

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**Research Advisor:**

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Mr. Abiy Getahun

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

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**Research Co-advisor:**

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*Mr. Abebe Shentema*

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## **ABSTRACT**

*The major objective of this study is to present findings of health and safety management practices in building construction recently constructed in Jimma University. A cross-sectional study was conducted in 05 licensed building construction companies in Jimma University. A multi-stage sampling was used to recruit 202 study participants. Data was collected using face to face interview and observational checklist. The data was entered to EPI-data and then exported to SPSS version 20 software. The quantitative data collected from sample respondents who are working in Jimma university construction were analyzed using frequency distribution, mean, and percentage calculation were employed for most variables to describe socio-demographic characteristics and to determine the magnitude of Occupational Injuries. And also by using Microsoft Excel calculate the important index to determine the factors that affect OHS practice. Accordingly, the factor, safety and health training personal protective equipment's got the highest priority index (131.06%) and to the other extreme, the other factor, whenever Emergency Planning and Procedures (81.06%) priority index as pointed out in the table above. Even if health and safety management practice is required throughout the construction phases of every building project, but the emphasis in each phase might be different. As respondent agreement, finishing work requires more focus or emphasis of health and safety management practice among the others.*

**KEY WORDS:** *Health and Safety management, Construction project, Employee/Worker, Accident, phase of constructions, Jimma University (RAMMA, AFRETSION, CHAINA, VARNERO, and YOTEK).*

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## ABBREVIATIONS AND ACRONYMS

BC	Building Contractor
COA	Cost of accident
COP	Cost of prevention
GC	General Contractor
GDP	Gross Domestic product
GTP	Growth and Transformation Plan
H & S	Health and safety
HSC	Health and Safety Commission
HSE	Health and Safety Executive
HSW	Health and Safety at Work
ILO	International Labor Organization
ISO	International Standardized Organization
NGO	Nongovernmental Organization
PLC	Private Limited Company
PM	Project manager
U.K	United Kingdom
U.S.A	United States of America
WHO	World Health Organization

# CHAPTER ONE

## INTRODUCTION

### 1.1) Background of the Study

The construction industry plays significant role within the growth of any economy. Particularly in many developing countries, major construction activities account for about 80% of the entire capital assets Lloyd (1987) cited in (wubshet, 2004). In these countries, construction accounts for 10% of their GDP and over 50% of the wealth invested on fixed assets. Additionally to it, the industry provides high employment opportunities, probably only second to agriculture ofori (2006) cited by (abadir, 2011). Similarly, in Ethiopia, public construction projects shared a mean annual rate of 58.2% of the capital budget between years 1997/98 and 2001/02 (wubshet, 2004). Moreover, housing industry accounted for 4%- 7.6% of the entire GDP of the country between years 2010/11- 2013/14 (Mofed, 2014). This shows that the development industry plays significant role in Ethiopian economic development. Its achievement in rebuilding areas devastated by both natural and man-made disasters, and in providing power, services and communications to satisfy the rising needs and expectations of individuals throughout the globe, has conferred great benefits on the humanity. Despite mechanization, construction remains a significant employer of labor it often employs between 9 and 12 per cent of a country's working population, and sometimes the maximum amount as 20 per cent throughout the planet. There has, however, been a price to procure this continuous growth and activity. Although it's difficult to get accurate statistics in an industry within which many accidents go undetected and unreported, in many countries known fatal accidents, and people involving loss of working time, frequently exceed those in the other manufacturing industry. Contributing to the high rate of accidents are those characteristics of the industry which distinguish it from the remainder of the manufacturing sector. These are high proportion of small firms and of self-employed workers, variety and relatively short lifetime of construction sites, the high turnover of workers, large numbers of seasonal and migrant workers, many of whom are unacquainted construction processes, exposure to the weather and lots of different trades and occupations. (ILO, 1999; ILO. safety and health in construction code of practice, 1992; ILO., global estimates of fatal work related diseases and occupational accidents.,2005;ILO.1.,2001).

Safety management is important knowledge during a project management area which

recognized within the guide to the project management body of information (pmbok guide, 2011, cited by cretu et al.). Safety management is anticipated to require account of all risks and accidents that will possibly be expected that put project employees in danger. The health and safety (H&S) of any workplace is incredibly important to diminish such risks, legally and ethically, but in mainly dangerous contexts like the development industry his takes on perilous importance as daily activities of the industry are highly unsafe. It's thus important to spot suitable safety activities and strategy, accommodating potential serious H&S problems. Past research within the areas like (Lucy Fekete, Emert. quezon, yolente c. macarubbo, 2016) show clearly that construction projects create frequent possible threats to the lives of employees, and high injuries and mortalities are frequent within the industry. Thus, the consideration and management of safety, together with consideration to H&S generally, is undeniably fundamental to any construction project. By proper H&S planning many of the myriad H&S risks in construction will be prevented. Accordingly, accidents on the development sites are principally due to hazardous human behavior (i.e. individual factors) and/or unsafe working conditions (i.e. system factors). Moreover, it's obvious that there's a significant problem with falls, which could be a common problem throughout the worldwide industry.

Safety management is that the procedure accustomed recognizes H&S risks and implement actions to decrease the likelihood of a risk materializing and to diminish or eliminate the potential consequences of identified project H&S risks. (Saeed, 2017). This research focused on principle kind of risks in construction projects: risk of construction on health and safety (H&S) of employees. The improvement of safety, health and dealing conditions depends ultimately upon people working together, whether government, employers or workers. Safety management involves the functions of designing, identifying problem areas, coordinating, controlling and directing the security activities at the work site, all geared toward the prevention of accidents and health problem. Effective safety management has three main objectives: to form the environment safe; to form the work safe; and to create worker safety conscious.

(ILO, 1999. Safety and health in construction code of practice, 1992; ILO, global estimates of fatal work related diseases and occupational accidents, 2005; ILO. L, 2001). Injuries and fatalities resulted in accidents within the housing industry still an obstacle clings housing industry to its infamous position because the industrial sector liable for more occupation accidents, than the other. Consequently, the advance of H&S in

construction continues to be a necessary goal for all contributors within the construction processes. Safety management is taking account of all risks and accidents that will believably be expected that put project employees in danger, to attenuate such risks. It's thus important to spot appropriate safety actions and techniques to accommodate potential serious H&S problems. (saeed, 2017)

## **1.2) Statement of the Problem**

The development industry is partitioned into three major portions. Development of buildings temporary workers or common temporary workers builds private, mechanical, commercial, and other buildings. (dadzie, 2013). Every year, all through the world, an assessed number of 271 million individuals endure with work-related wounds, and 2 million kick the bucket as a result of these injuries.

The assessed financial misfortune caused by work-related injuries was proportionate to 4 % of the world's net national item. (Eijkman's, 2003). The development industry, utilizing the biggest labor constrain, has accounted for almost 11% of all work related wounds and 20% passing's coming about from work related mishaps. Worldwide labor organization gauges that at slightest 60,000 fatalities happen at development locales around the world each year.

This implies that one deadly mishap happens each ten minutes within the division. Most of these mishaps are made due to risky behavior and risky conditions, (K.Mouleeswaran, 2015).Hence, wellbeing and security issue in building development is the major and around the world issue which needs solid thought since it influences the life of the laborers (labor), project time, venture taken a toll conjointly extend quality. Be that as it may security thought in development building may has may has not however been examined and assessed as issue in Ethiopia.

Ethiopia focused on to be one among lower middle-income nations by 2025g.c (gtp2, 2016-2020). It is arranged to attain through mechanical change. Development industry which takes 8.5% share of GDP enlisted exceptional average growth rate of 28.7% within the to begin with development and change plan implementation years (gtp1, 2010-2015 national arranging commission Ethiopia). Development could be a tremendous and a dynamic division, which could be a spine of the world's economy in common and Ethiopia in specific; mobilizing a gigantic sum of different assets and budgets and grasping gigantic labor by making a huge work opportunity. However, there is a lack of research in this area in the context of developing countries with specific requirements. Although much research has been directed at health and

safety, very little is concerned with the Ethiopia and the particular characteristics of health and safety management practice in their environment. (Alhajeri, 2011). some prior studies, evaluation of health and safety practice in building construction a case study in Addis Ababa by (Fekele et.al, 2016). Occupational safety and health profile for Ethiopia by (DawitSeblework, ILO consultant, oct.2016), study of health and safety performance indicators on Ethiopia public (road & building) construction project in case of AddisAbaba city by (Zeru Tariku, July 2014) and others few studies has been done in relating to safety and health management in Ethiopia.

Jimma University due to a part of development and counseling companies and building development found here. (ManayeMosiye\*,ArunAsokan, 2019), this investigate managed with the current circumstance of security thought and the ways of accomplishing free of damage and zero mischance environment of building development. An assortment of considers, for case (Glendon and Litherland, 2001, Kheni, 2008, Zeru Tariku, July 2014) have explored the development wellbeing and security inside created nations. Within the larger part of these considers, analysts have either created a modern system show or 5 reproduced an as of now tried one with a see to moving forward its ampleness. but from practice and experience in the construction industry injuries and fatalities resulted from accidents in the construction industry still are an obstacle in the building constructions so my research was conducted the purpose of To Assessment the current Health Safety Management Practice in Building Construction Projects among Construction Workers in Jimma University. , Jimma, Southwest Ethiopia, 2021

### **1.3 Basic research question**

- What are the major affecting the Health Safety Management Practice in building construction projects among Construction Workers in Jimma University?
- Which construction phase needs more health safety management practice among Construction Workers in Jimma University?

### **1.4) Objectives of the Study**

#### **1.4.1) General Objective**

To Assessment the current Health Safety Management Practice in Building Construction Projects among Construction Workers in Jimma University. , Jimma, Southwest Ethiopia, 2021

#### **1.4.2) Specific Objectives**

- To identify the major factors affecting the Health Safety Management Practice in building construction projects among Construction Workers in Jimma University, Jimma, Southwest Ethiopia,2021
- To identify the construction phase which needs more health safety management practice among Construction Workers in Jimma University, Jimma, Southwest Ethiopia,2021

#### **1.5) Significance of the study**

The importance of the research stems from the need to develop an understanding and investigate the problem of health and safety in construction company Jimma University (JU) and make a contribution to knowledge in this area where very little information exists as far as investigator level of search. Addressing health and safety issues should not be seen as a regulatory burden as it offers significant opportunities and benefits to the construction companies. So this study can contribute as a source of information about health safety management practice in building construction projects among construction workers in JU.

#### **1.6) Scope of the Study**

The scope of the research was limited to assess safety and health management practice in building construction projects which are constructed among construction workers in JU, (Ramma, Afretsion, Chaina, Varnero, Yotek Construction) and projects located in Jimma university, Jimma town, Oromia region, south west Ethiopia. Because of the time limitation the research addresses only building construction projects that constructed in Jimma University.

#### **1.7) Limitation of the study**

Since the questioner for data collection was limited to five construction and building projects located at Jimma University, It was difficult to collect sufficient data and gave more empirical results and the finding of the result may not represent as a general representation in the construction industry. In addition this study would be better if it was studied with qualitative type of study.

#### **1.8) Operational Definitions**

Occupational safety and health is an area concerned with the development, promotion, and maintenance of the workplace environment, policies and programs that ensure the mental,

physical, and emotional well-being of employees, as well as keeping the workplace environment relatively free from actual or potential hazards that could injury employees (Nyirenda V, Chinniah Y, Agard B 2015)

**Health safety management Practice;** Safety management is the procedure used to recognize H&S risks and implement actions to decrease the possibility of a risk materializing and to diminish or eliminate the potential consequences of identified project H&S risks. (Saeed, 2017).

in my research occupational health and safety management practice is a management process which tries to identify the major factors affecting the health safety management practice; to analyze the effect of safety and health practice in building construction and also to identify the construction phase dose safety health management practice needs more among construction workers according to OHS performance indicators of (ILO 2016).

**Daily laborers:** for this study is defined as workers who involved in manually carrying and transporting building materials within the site. However, they didn't engage in professional activities like masonry work, plastering, and painting etc.

**Low back pain (LBP):** was defined as any “non-traumatic musculoskeletal disorder affecting the low back.” it included all back pain, regardless of diagnosis, that was not secondary to another disease or injury cause (e.g., cancer or motor vehicle accident). It included Lumbar Disk problems (displacement, rupture) and sciatica but excluded cervical spine problems, such as neck pain or neck twisting problems (punnett et al., 2005).

**Personal protective equipment (PPE):** utilization of the worker specialized clothing or equipment worn by employees for protection against health and safety hazards at the time of interview or visit (Yiha and Kumie, 2010).

**Work related injury:** for the purpose of this study was defined as any personal injury or disease in the course of work like falling, injured by object, lower back pain, skin disorders, eye problem, breathing difficulty and hearing problem, resulting from an accident or long term exposure to occupational hazard (Yiha And Kumie, 2010).

## **1.9 Organization of the paper**

This study paper is organized into five chapters. Chapter one provides the introductory aspect of the study which encompasses the background of the study, statement of the research problem, objective of the study, the research question, significance of the study, scope of the study,



limitation of the research and organization of the research. Chapter two presents literature review with general descriptions by different researchers on construction, safety and health management practice. Chapter three will be about research design and methodology Chapter Four will present data analysis and interpretation. And the last Chapter will present conclusion and recommendation and the last chapter will present conclusion and recommendations.

# **CHAPTER TWO**

## **REVIEW OF RELATED LITERATURE**

### **2.1 Introduction**

This chapter deals about different literatures' which was conducted on the area that provides the theories used for this research. Most of the literatures' discussed here under are conducted on different countries and situations to ascertain the fact that construction site involves a lot of activities and participants, and to understand the process and the interacting elements in construction safety.

### **2.2 Theoretical review**

#### **2.2.1 Definitions of safety**

Occupational safety and health is an area concerned with the development, promotion, and maintenance of the work environment, arrangements and programs that guarantee the mental, physical, and emotional well-being of workers, as well as keeping the work environment generally free from real or potential risks that may harm workers relatively free from actual or potential hazards that could injure employees (Nyirenda V, Chinniah Y, Agard B 2015).

Occupational safety and health is a discipline dealing with the prevention work related injuries and diseases and the protection and promotion of the health of worker it aim at the improvement of working condition and environment.

occupational safety and health (OSH in construction is for the most part characterized as the science of the expectation, acknowledgment, assessment and control of risks emerging in or from the working environment that might impede the health and well-being of laborers taking into account the possible impact on the surrounding communities and the general environment. Safety defined as the fact of being free from danger or risk or to take safety precaution or safety measures to make sure something safe (dictionary of human resource and personnel management 2003).

Agreeing to (Mwombeki, 2005) security characterized as the condition of being ensured against any sort of occasions (mishaps) which can be considered non-desirable by controlling risks to attain an satisfactory level of chance. Also accident defined as some sudden and unexpected event taking place without expectation that causes injury, damages or death. (Mwombeki, 2005)

Anton (1989) defined a construction safety program as “the control of the working environment, equipment, processes, and the workers for the purpose of reducing accidental injuries and losses in the workplace.

### **2.2.2 Construction Health safety in Ethiopia**

The construction sector is a major contributor to the Ethiopian economy and it's one of the fastest-growing sectors. Adane Mm, GelayeKa, BeyeraGk, Sharma Hr, YalewWw (2013) said that developing countries like Ethiopia are striving hard to improve their basic services by building schools, hospitals, housing complexes, shops, offices, highways, power plants, industries, bridges and other infrastructures. In any case, all these construction activities are carried out by incompetent labor strengths at cheap rate. Work related wounds and mishances among these laborers are tall due to absence of education, destitution, need of wellbeing and security preparing and data on wellbeing risks and dangers at the work put. Such workers are known to face rapidly changing workplaces, a high degree of competition and attacks of unemployment.

As the emerging sector of Ethiopian economy, the status of the construction workers particularly their safety condition ought to be given accentuation and the security of the working environment ought to be kept up. In show disdain toward of the noteworthy rate of increase within the industry over the past decades, as it were few ponders have been conducted to investigate the occupational safety and health status of workers working in the construction industry. (Hanna Mersha, SeidTikuMereta and LamessaDube, 2016).

Therefore, in developing countries the occupational health and safety hazards faced by construction workers are greater than those in industrial countries. The impact is also 10 to 20 times higher in these counties, where the greatest concentration of the world's workforce is located. (Dong, 2005).

unsafe working environments are the major cause of most workplace injuries, individual related factors such as young age, lack of formal education, lack of experience, job dissatisfaction, lack of physical exercise, extended working hours, night work and non-use of personal protective equipment are important factor (Wong, 1994; Huang And Chen, 2002; Chau Et Al., 2004; Bresciani Et Al., 2012, Dong Et Al., 2015). About three-fifth of building personnel are not positive whether they have to put on protecting tools on the building site. They felt that it is not convenient and tight when wearing defensive tools at work (griffin and Neal, 2000).

## **2.3 Empirical review**

### **2.3.1 Factors affecting safety in developing countries**

Safety in developing countries in particular is often at much lower levels mainly due to an absence of strict safety regulations. In developing countries, safety rules hardly exist and can often not work appropriately and effectively. This problem is generally due to the lack of effectiveness of the authority in implementing safety rules and programs (Hinze 1997). Some research findings from developing countries also apply to Ethiopian construction sites. Kartam et al. (2000) have observed, at Kuwaiti construction sites, that the problems arise due to disorganized labor, poor accident record-keeping and reporting systems, extensive use unskilled laborers, a lack of safety regulations and legislation, the low priority given to safety, the small size of most construction firms, and competitive tendering. tam et al. (2004) conclude from their research of Chinese construction companies that the main factors affecting safety performance include top management's poor safety awareness, lack of training, project managers' poor safety awareness, reluctance to input resources for safety, and reckless operations. One study in Taiwan (Cheng et al. 2010) also identified problems that included not valuing the importance of safety measures implemented at workplaces, not giving sufficient safety education to new workers, and not hiring well-trained safety personnel to implement safety measures.

### **2.2.1 Health and safety integrated management systems**

Research suggests integrating the health and safety management function of a business with other management functions could enhance the overall performance of the business (Kam And Bansch 1998, Koehn And Datta 2003, Taylor Et Al. 2004:544). Besides the benefits to be derived from such an integrated management system, Gibb and Ayoade (1996) have pointed out client pressure, cost reduction, legislation and total project management as factors promoting their adoption.

Many management systems, especially health and safety, environment and quality have many identical elements. For instance, policy, training of personnel, auditing, responsibility for task and controls are common elements in all three areas of management. This, therefore, makes it possible to integrate them as a single management system. Proponents of integrated systems argue that such an integrated system will lead to management effectiveness reduced duplication, elimination of conflicting responsibilities and harmony of objectives (Douglas and glen 2000, Scipioni et al. 2001).

Dias (2000) examined the possible integration of the elements of families of standards, ISO 9000, ISO 14000 and a similar standard in health and safety in construction. Many elements of the three standards were found to be candidates for possible integration. Hamid et al. (2004) investigated the integration of safety, health, environment and quality in the construction industry. Their findings indicate that safety, health, environment and quality have many common grounds which make integration possible. Based on the similarities in many areas of these management functions, the authors proposed a model of integrated management system for the construction industry. Similarly, Kirbert and Coble (1995) explored the integration of health and safety regulations with environmental regulations in the construction industry. Arguing that environmental issues are safety issues, the authors suggest a single administrative procedure for safety and environment via an environmental safety plan. The benefits of such a procedure include fewer processes involved in regulatory agency reviews and workers benefiting from training in both environmental and safety aspects of their work environment.

### **2.2.2) behavioral approaches to health and safety management**

Seventy to ninety per cent of accidents are caused by unsafe behavior. A number of theories have linked accidents to the failure of persons (by their actions or omissions) in the accident chain to avert accidents (Adams 1976, Bird 1974, Haslam Et Al. 2003, Suraji Et Al. 2001). These explanations have therefore formed the basis of psychological approaches to health and safety management which have as their aim, the modification of behavior so as to break the chain of events leading to most accidents.

Duff et al. (1994) reported on behavioral modification procedures used in improving construction site safety. The authors of the study used a combination of goal-setting and feedback to influence the behavior of site operatives. The findings of the study suggest goal setting and feedback can greatly enhance health and safety performance. Duff (1998) has pointed out that behavioral methods should not be restricted to site operatives but could be extended to include site management staff and senior corporate management. Lingered and Rawlinson (1994) examined the effectiveness of the goal-setting and feedback approach in the Hong Kong construction industry. It was found that labor commitments to the group and to the organization are intervening variables in the application of behavioral techniques.

### **2.2.3) integration of health and safety with project management**

Studies in construction accidents suggest many accidents on construction sites could be prevented by taking appropriate steps in all phases of the project life. Thus, participants in a

project have a role to play in improving the health and safety performance of construction sites and completed projects. Current thought on health and safety in construction put emphasis on integrating health and safety management into the entire construction process. This view of health and safety management is, at least to some extent, largely driven by developments in health and safety legislation in Europe and USA.

This view of integration of health and safety management into construction processes requires responsibility for health and safety to be equitably shared between the key participants in a construction project. This view therefore requires project participants to “think health and safety” throughout the phases of a project. AsHinze (1998) has emphasized, addressing the safety of construction workers in the design phase involves recognizing the potential impact designers’ 21 decisions can have on the health and safety of construction site workers. Similarly, owners’ involvement in construction safety could reduce cost of safety to minimum.

Factors affecting safety and health performance in construction previous literatures have pointed out different factors that affect the performance of safety and health in construction. These factors includes

#### **2.2.4) weather condition**

Extreme weather conditions have direct effect on safety and health performance. There are signs for heat stress like: nausea, headache, fatigue, excessive thirst, profuse sweating, confusion, painful large muscle cramps and loss of consciousness. those signs of heat stress can lead to heat cramps, heat exhaustion, or heatstroke, which if untreated or sufficiently severe, may lead to death (Brake & Bates, 2002), (Neitzel, et al., 2001).

#### **2.2.5) complexity of the design**

Safety and health performance was found to be influenced when designers improve awareness to the safety consequences of their design decisions like reduction in injuries and decrease in redesign costs and in operating costs for special procedures and protective equipment (Hinze&Wiegand, 1992), (kartam, et al., 2000).

type of owners can take processes to accomplish better safety and health performance such as: provide safety and health guidelines that the contractor must follow; implement, the use of work permit systems for potentially harmful activities; oblige the contractor to elect a responsible supervisor to coordinate safety in the workplace; discuss safety at owner-contractor meetings; conduct safety audits during construction; enforce prompt reporting and full investigation of accidents (Hinze&Gambatese, 2003), (report-a-3, 1982).

Project duration tight project schedule had high rank on safety performance of the project (Zou, et al., 2007), (report-a-3, and 1982)

### 2.2.6) safety and health policy

the reduction of accidents would be accomplished when top management takes a dynamic attention and is dedicated to safety and health improvement as well as maintaining good safety and health policy (Sawacha, Et Al., 1999), (Shibani, Et Al., 2012).

### 2.2.7) safety signals, signs and barricades

Warnings in the forms of signs and symbols have been recognized as one of the effective tools to influence behavior and develop the risk awareness of stakeholders (Chapanis, 1994), (Edworthy& Adams, 1996).

## 2.3 Conceptual Frame Work

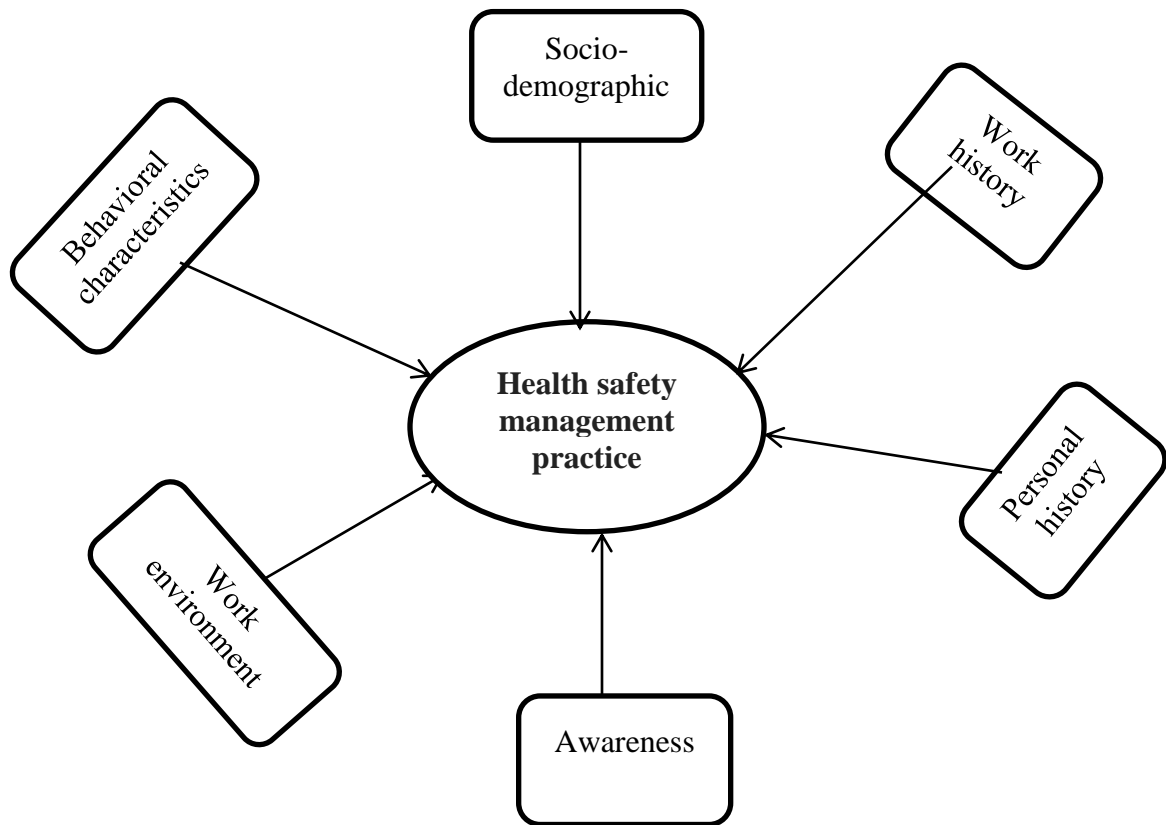


Figure1:- Conceptual Frame Work For Health Safety Management Practice In Building Construction Projects Among Construction Workers In JU, South West Ethiopia, 2021.

# **CHAPTER THREE**

## **RESEARCH DESIGN AND METHODOLOGY**

### **3.1) Study area and period**

This study was carried out among building construction projects among construction workers in JU, (Ramma, Afretsion, Chaina, Varnero, Yotek) construction from Mar 01-april 7. Jimma university is found in Jimma town, Oromia regional state, which is 365 km away from the capital city of the country to the south western direction.

### **3.2) Study design**

Institutional based cross-sectional study design was carried out in Mar 2021 in Jimma University, Jimma town, Oromia region, south west Ethiopia; many building construction activities are being held in Jimma University. By the time of this study, about ten level 1 building construction industries were performing building construction work in the University. It helped to identify the nature of the health and safety measures used on the construction sites and evaluate their enforcement mechanisms on construction sites. Direct observation was also used in visits to construction sites to directly observe and document the identified hazards, tasks, job site organization, work practices, equipment and tools being used.

### **3.3) Target population**

The population of the study all male and female workers (1,397) in the selected building construction projects in Jimma University (excavation work, daily laborer, mason, plasterer, painter, welder, and machine operators) construction Projects.

### **3.4 Sampling technique**

A stratified multi-stage sampling technique was used to select the study participants. From 10 construction sites 5 sites (50%) were randomly selected using random number generator (Sambo et al., 2003). The building construction industry workers were first stratified by their job category, namely excavation work, daily laborer (carrying and transporting building materials within the site), mason, plasterer, welder, painter, and machine operator. It is apparent that work-related injuries could differ with the nature of the work and working conditions since a particular job will generate predominantly a specific hazard (Rai sharma et al., 2008; Yiha and Kumie, 2010).



### 3.5) Sample size determination and procedure

Single population proportion formula was used to determine the sample size by taking 38.7% expected proportion of injury (Adane et al., 2013), 5% confidence limit, 95% confidence level, 10% nonresponse rate. To make the study is representative simple random sampling technique was used by applying proportional allocation of respondents to the size of sample of each stratum.

The initial sample size ( $n_o$ ) was estimated as:

$$n_o = \frac{\left( Z_{\alpha/2} \right)^2 P(1-P)}{\alpha^2} = \frac{(1.96)^2 0.387(1-0.387)}{(0.05)^2} = 365$$

Then, Since the Total Number of selected construction in Jimma University, is Less Than 10,000 ( $N=1,397$ ), We Applied Finite Population Correction Formula to Calculate the Final Sample Size ( $N_f$ ).

$$n_f = \frac{n_o}{1 + \frac{n_o}{N}} = \frac{365}{1 + \frac{365}{1,397}} = 202$$

The appropriate sample size of workers from each stratum was determined by using proportional allocation. (i.e. 26 to excavation work ( $n_1 = 60$ ), 107 to daily laborer ( $n_2 = 247$ ), 21 to mason ( $n_3 = 49$ ), 17 to plasterer ( $n_4 = 39$ ), 18 to painter ( $n_5 = 41$ ), 07 to welder ( $n_6 = 15$ ), and 06 to machine operators ( $n_7 = 12$ )). The researcher used the payroll as a sampling frame to pick the study participants using simple random sampling technique. Five experienced nurses participated in the data collection processes.

Sample Size from Each Stratum =  $\frac{\text{Sample Size}}{\text{Population Size}} * \text{Stratum Size}$

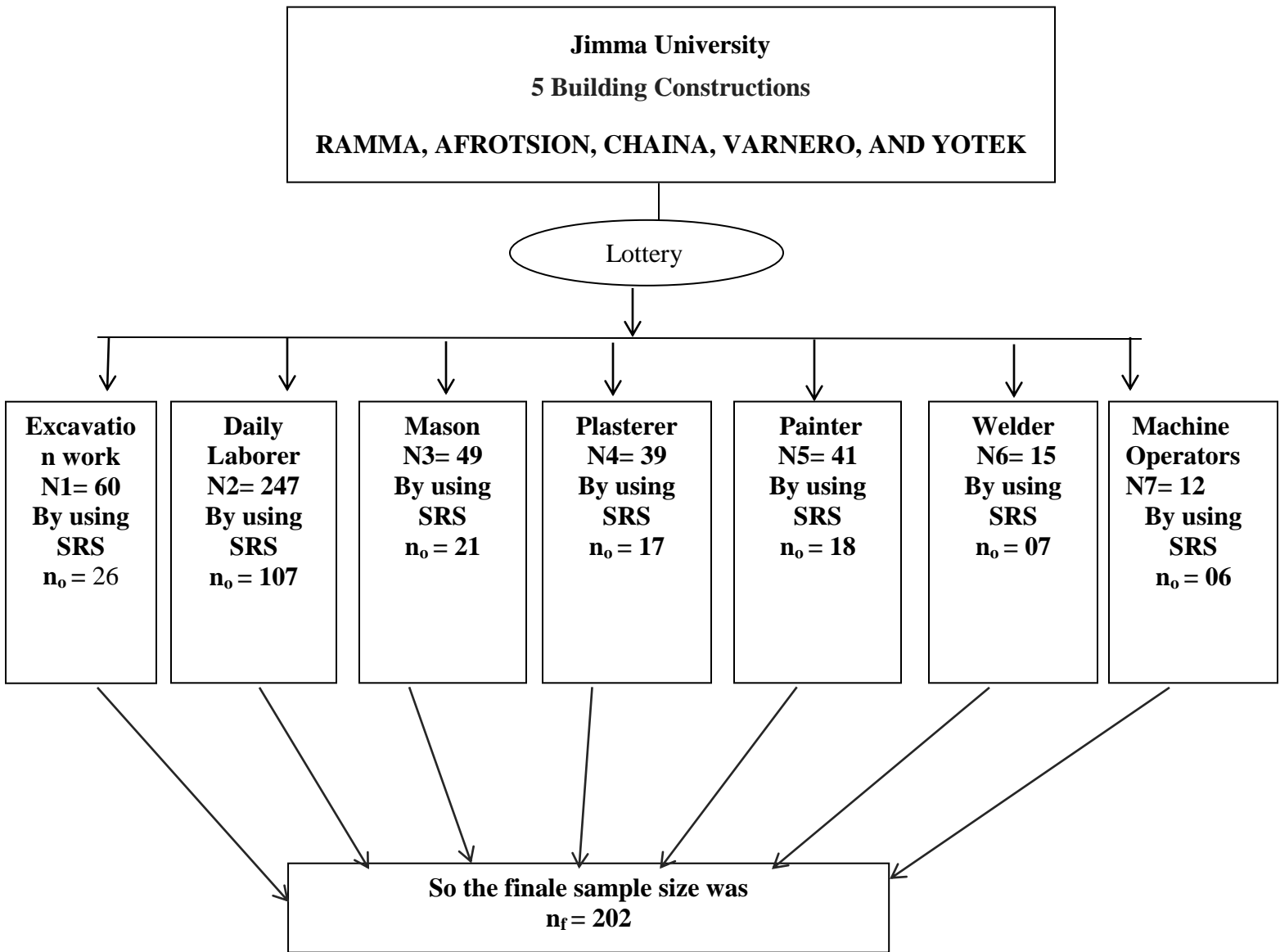


Figure 2:- Thematic Representation of Sampling Frame for Study Subjects. in Building Construction Projects Among Construction Workers In JU, South West Ethiopia, 2021

### 3.6) Data collection and data quality control

Data was collected from all workers including sample size who were directly involved in the construction activity until the required sample size was attained. A structured and pre-tested interview questionnaire was used to collect the data. Physical examination by experienced nurses was done to complement self-reported information. Detailed information about the socio-demographic, behavioral characteristics, work environment, personal history, work history, awareness and practice towards safety and health in the work place among construction workers and occurrences of injuries in the preceding one year were collected.

Data quality was assuring with tool development and pretest, training, data collection, coding, entry and analysis. The training of data collectors and supervisors mainly focused on issues such as data collection tools, field methods, inclusion–exclusion criteria and record keeping. The investigators coordinated the interview process, and reviewed the completed questionnaire on a daily basis to ensure the completeness and consistency of the data collected. The questionnaire was pre-tested on 5 construction workers outside the companies selected for this study.

Safety practices assessment a likert scale items were designed to evaluate regulatory activities of the construction industry regarding on the implementation of safety practices. The responses from “strongly disagree” to “strongly agree” were numerically assigned 1 to 5. Lower mean scores point out stronger disagreement while higher mean scores show stronger agreement for each of the questions. All foremen and site engineers will be interview with semi structured self-administered questioner. The cronbach's coefficient alpha of the consistency and validity of the instrument was put at 0.995. This is highly acceptable and the instrument has met the reliability requirement for the study.

### **3.7) Data management and analyses**

The data was entered to EPI-data and then exported to SPSS version 20 software. The quantitative data collected from sample respondents who are working in Jimma university construction were analyzed using frequency distribution, mean, and percentage calculation were employed for most variables to describe socio-demographic characteristics and to determine the magnitude of Occupational Injuries. And also by using Microsoft Excel calculate the important index to determine the factors that affect OHS practice. Tables and figures used as data presentation tools to answer safety and health measures used, weakness and strength of safety and health management, reinforcement techniques on safety regulation in currently construction of building sites. The observed and document reviewed data were analyzed separately but presented in combination with the quantitative information.

### **3.8) Rating Scale**

Rating scale is one of the most common formats for questioning respondents on their views or opinions of an event or attribute. In this regard, participants were asked to indicate degree of impact of factors (research variables) by rating them on a five point scale, (1= very low, 2 = low, 3 = high average, 4 high and 5 = very high). This statistical technique is intended to establish the

importance of the factors. Each of the factors has been assigned an importance index or degree of influence index, to help rank them according to their importance, as follows.

$$\text{Importance index} = \frac{(\sum_{i=1}^n W_i \times f_{xi}) \times 100}{3n} \dots\dots\dots [4.1]$$

Where  $W_i$  = weight given to the response;  $i = 1, 2, 3, 4, 5$

$f_{xi}$  = Responses frequency

$n$  = total No of responses

### **3.9) Reliability and Validity**

Neuman (2007) emphasizes that reliability and validity are important in establishing the truthfulness, credibility, or believability of findings. Reliability refers to the extent to which the same answers can be obtained using the same instruments more than one time. ‘Reliability is a concern every time a single observer is the source of data, because we have no certain guard against the impact of that observer’s subjectivity, (Babbie 2009, p.189)’. Validity, on the other hand, refers to the extent to which an empirical measure adequately reflects the real meaning of the concept under consideration. In Neuman’s (2007) words, it refers to ‘how well an idea about reality fits with actual reality’.

In an effort to avoid/minimize problems related to reliability and validity, previously designed questionnaires and successively were be used in surveys that directly and indirectly relate to safety and health management will carefully be examined and adopted. In this regard, North Carolina State University (NC State 2015), KPMG (2013), Zhao, Hwang and Low (2015) and Deloitte and Touche (2014) are to be mentioned. Moreover, contents and structure of the questionnaire were discussed with practitioners in the construction industry prior to the finalization and administration of the questionnaire in order to test the relevance of the sections outlined in the questionnaire. To test the internal reliability of the questionnaire, Cronbach’s alpha test was used and found to be 0.78 which is higher than 0.7, thus the construct has been believed to have adequate reliability.

### **3.10) Ethical consideration**

Ethical clearance was obtained from institutional review board of business and economics college, Jimma University. Permission was also obtained from local administrative bodies and construction companies. Before starting the interview, oral informed consent was obtained from each respondent. Respondents were assured that individual information will be kept confidential.

### **3.11) Data presentation**

The analysis presents statistical results of the collected questionnaire based on quantitative method. The following section explains the number of survey questionnaires distributing to the projects of the construction company and provides a general picture of the response rate. The questionnaires was design and distribute to investigate health and safety management practice in building construction projects held by Jimma university (Ramma, Afrotsion, Chaina, Varnero, Yotek) construction. 202 copies was distributed to data collectors (professional nurses).

## CHAPTER FOUR

### DATA PRESENTATION, ANALYSIS AND INTERPRTATON

#### Data Presentation

#### Socio-Demographic Characteristics

From the total 202 workers, 202 (100% response rate) participated in the study. About 62.9% of the study participants were males. The age of the respondents' range from 18 to 70 years with a mean age of  $26.36 \pm 9.41$  years. The majority, 53.1% of the participants were in the age group of >26 years. 123 (60.9%) and 79 (39.1%) were unmarried and married, respectively. About half of the respondents (53.1%), had about 64.9% of the respondents attended primary education. religion orthodox 86(42.6) and ethnicity majority are Oromo 58(33.7) work experience 92(45.5) below 1 year and also (49.5%) of the workers are paid 501-1000 per month.

*Table 4.1 Frequency of socio-demographic characteristics*

Variables	Frequency	Percent
Age		
<26	115	53.1
>26	87	46.9
Sex		
Male	127	62.9
Female	75	37.1
Marital status		
Married	79	39.1
un married	123	60.9
Educational status		
Illiterate	13	6.4
Primary	131	64.9
Read & write	10	5.0
Secondary & above	48	23.8
Religion		
Orthodox	86	42.6
Muslim	72	35.6
Protestant	44	21.8
Ethnicity		
Amhara	46	22.8
Oromo	68	33.7
SSNP	52	25.7
Tigre	36	17.8
Work experience		

<1	92	45.5
1-5	60	29.7
>5	50	24.8
Monthly salary		
200-500	69	34.2
501-1000	100	49.5
1001-5000	20	9.9
>5000	13	6.4

### Factors that affect safety and health performance in the construction industry

*Table 4.3 Factors that affect safety and health performance in the construction, In Building Construction Projects among Construction Workers in JU, South West Ethiopia, 2021.*

no	Description	Mean	Important index
01	Complexity of the Design	2.7673	105.30
02	Type of Owner/attitude of owner/	2.9059	105.30
03	Weather Condition	2.7327	108.33
04	Project Duration	2.8812	111.36
05	Safety and Health Policy	2.3960	95.45
06	Accidents / Incidents / Near Miss Report	3.0198	99.2
07	Fire prevention and control	3.0792	93.93
08	Safety and Health Training	3.3960	131.06
09	Personal Protective Equipment (PPE	2.8267	130.30
10	Emergency Planning and Procedures	3.3564	81.06
11	Safety and Health Inspection	2.1436	125
12	Safety Signals, Signs and Barricades	2.1832	126.96
13	Work environment	2.3515	127.27
14	Reward and Punishment System (Incentives)	2.4950	121.21
15	Age of workers	3.5000	83.07
16	Employee experience	3.6386	90.23

Priority index is used for analyzing question in which respondents were asked to place a set of attitudes in ranking order, indicating their importance priorities or preferences. Accordingly, the factor, safety and health training personal protective equipment's got the highest priority index (131.06%) and to the other extreme, the other factor, whenever Emergency Planning and Procedures (81.06%) priority index as pointed out in the table above.

## Factors that affect safety and health performance in the construction industry

A likert scale items were designed to evaluate regulatory activities of the construction industry regarding on the implementation of safety practices. The responses from “strongly disagree” to “strongly agree” were numerically assigned 1 to 5. Lower mean scores point out stronger disagreement while higher mean scores show stronger agreement for each of the questions (table 4.4).

*Table 4.4 Factors that affect safety and health performance in the construction, In Building Construction Projects Among Construction Workers In JU, South West Ethiopia, 2021.*

Item No	Description	Degree of impact									
		Strongly disagree		disagree		neutral		Agree		Strongly agree	
		N	%	N	%	N	%	N	%	N	%
01	Complexity of the Design	13	6.4	44	21.8	68	33.7	37	18.3	40	19.8
02	Type of Owner/attitude of owner/	32	15.8	29	14.4	61	30.2	48	23.8	32	15.8
03	Weather Condition	5	2.5	57	28.2	61	30.2	37	18.3	42	20.8
04	Project Duration	14	6.9	52	25.7	56	27.7	56	27.7	24	11.9
05	Safety and Health Policy	16	7.9	28	13.9	41	20.3	28	13.9	81	40.1
06	Accidents / Incidents / Near Miss Report	20	9.9	69	34.2	40	19.8	41	20.3	32	15.8
07	Fire prevention and control	56	27.7	13	6.4	59	29.2	39	19.3	35	17.3
08	Safety and Health Training	64	31.7	32	15.8	40	19.8	52	25.7	14	6.9
09	Personal Protective Equipment (PPE)	44	21.8	16	7.9	56	27.7	33	16.3	53	21.8
10	Emergency Planning and Procedures	56	27.7	17	8.4	88	43.6	25	12.4	16	7.9
11	Safety and Health Inspection	9	4.5	13	6.4	64	31.7	28	13.9	88	43.6
12	Safety Signals, Signs and Barricades	20	9.9	16	7.9	41	20.3	29	14.4	96	47.5
13	Work environment	4	2.0	37	18.3	49	24.3	48	23.8	64	31.7
14	Reward and Punishment System (Incentives)	8	4.0	40	19.8	63	31.2	24	11.9	67	33.2
15	Age of workers	28	13.9	84	41.6	60	29.7	21	10.4	9	4.5
16	Employee experience	60	29.7	60	29.7	44	21.8	25	12.4	13	6.4

Most of the respondents realized, factors such as project cost, safety and health contractual specification of, policy, training, inspection, personal protective equipment (PPE), work environment, reward and punishment system (incentives) has a very high degree of impact on safety and health performance in the construction industry. As presented in the above table, safety and health performance in the construction industry is highly affected by project duration



and risk assessment. From respondents' perspective, type of owner/attitude of owner/, weather condition, emergency planning, age of workers and employee experience has an average high effect on safety and health performance in the construction industry. but the other factors, complexity of the design, accidents / incidents / near miss report and fire prevention and control has low degree of impact on safety and health performance in the construction industry.

**Construction Phase Which Require Emphasis of Health and Safety Management Practice**

*Table 4.5 Construction phase which needs more emphasis of health and safety management practice*

<b>Item No</b>	<b>Construction Phases</b>	<b>mean</b>	<b>Important index</b>	<b>Rank</b>
01	Excavation and Earth work	2.09	68.18	03
02	Concrete Work( concrete , form work & rebar)	1.88	59.84	04
03	Finishing Work	3.15	105.3	01
04	Electrical Work	2.85	90.90	02

Even if health and safety management practice is required throughout the construction phases of every building project, but the emphasis in each phase might be different. As respondent agreement, finishing work requires more focus or emphasis of health and safety management practice among the others (105.3). Respondent rank shows that electrical work comes to the second place (90.90), excavation and earth work is the third one (68.18) and concrete work takes the last rank (59.84).

# CHAPTER FIVES

## SUMMARY, CONCLUSION AND RECOMMENDATION

### 5.1 Summary of Major Finding

The construction industry has been seen as one of the hazardous industries. As empirical reviews revealed that the industry has poor health and safety performance record. This paper is conducted on health safety management practice in Jimma university constructions.

In this study Priority index is used for analyzing question in which respondents were asked to place a set of attitudes in ranking order, indicating their importance priorities or preferences. Accordingly, the factor, safety and health training personal protective equipment's got the highest priority index (131.06%) and to the other extreme, the other factor, whenever Emergency Planning and Procedures (81.06%) priority index as pointed out.

Workers who do not have vocational training on their current work were 3.4 times more likely to have injury than those workers who undertook vocational training. In china prevalence of injury among workers without safety education is reported as 16.2% (Hämäläinen et al., 2006). Our finding strongly suggests the importance of provision of training in prevention and control of work-related hazards and accidents. Injury prevention and safety education should include basic construction safety, machine operation safety, high working place safety, and chemical safety. According to the safety training requirements released in 2006 by the state administration of work safety, construction workers are required to receive at least 32h of vocational training before they first begin to work in construction industry and at least 8h of safety training annually (Nghitanwa and Lindiwe, 2017; Proffitt and Beacham, 2012; Yiha and Kumie, 2010; Zheng et al., 2010). The training is normally prepared by the construction company and directed by a certified safety specialist. Construction sites are, by definition, temporary places of work, where a number of firms are present at the same time to carry out work for short periods. On average, trained workers were present at construction sites for ten months, while a systematic training program could have a greater impact if measured in the long term (Bena et al., 2009; Kurpiowska et al., 2011). Likewise, use of PPE showed statistically significant association with work related injury; construction workers who didn't use PPE were 3.0 times more likely to face injury compared to their counter parts. Especially, in developing countries the construction regulation broadly requires protective equipment since conventional occupational safety control measures such as hazard elimination, engineering, and administrative methods remain a challenge to

implement. PPE is the last measure in the hierarchy of hazard control method, because it depends on workers' behavior and attitude (khan et al., 2010; Kines, 2002; Tadesse and Israel, 2016). In the present study more than 70% of the employees did not use PPE during work. This may indicate poor provision of PPE from the responsible bodies, and lack of awareness about its importance by the employees (Adaneetal., 2013; Tadesse And Israel, 2016; Tadesse And Kumie, 2007).

Even if health and safety management practice is required throughout the construction phases of every building project, but the emphasis in each phase might be different. As respondent agreement, finishing work requires more focus or emphasis of health and safety management practice among the others (105.3). Respondent rank shows that electrical work comes to the second place (90.90), excavation and earth work is the third one (68.18) and concrete work takes the last rank (59.84).

## **5.2 Conclusion**

This study demonstrates the assessment of safety and health on building construction project and highlights the factors affecting safety and the major causes of hazards on building construction projects. Most of the results are consistent with the former literature in other developing countries the researcher draws the following conclusions.

This study also shows that in their construction sites, the result showed most of respondents realized, factors such as project cost, safety and health contractual specification of, policy, training, inspection, personal protective equipment (PPE), work environment, reward and punishment system (incentives) has a very high degree of impact on safety and health performance in the construction industry. Work environment, reward and punishment system (incentives) has a very high degree of impact on safety and health performance in the construction industry.

Safety and health performance in the construction industry is highly affected by project duration and risk assessment. Perspective, type of owner/attitude of owner/, weather condition, emergency planning, age of workers and employee experience has an average high effect on safety and health performance in the construction industry. But the other factors, complexity of the design, accidents / incidents / near miss report and fire prevention and control has low degree of impact on safety and health performance in the construction industry. These results are similar

to a case study conducted on construction projects in Kenya on health and safety management on construction project sites (Wong, 1994; Catt ledge et al., 1996, Huang and Chen, 2002).

Even if health and safety management practice is required throughout the construction phases of every building project, but the emphasis in each phase might be different. As respondent agreement, finishing work requires more focus or emphasis of health and safety management practice among the others. Respondent rank shows that electrical work comes to the second place, excavation and earth work is the third one and concrete work takes the last rank.

### **5.3 Recommendation**

- Based on the study, the following are Key recommendations that can help improve health and safety practice in building construction.
- The contractors are highly recommendable to ensure that their labor force is properly trained for their specific tasks. This will empower them to teach their peers and regular safety meeting during the work in the construction site.
- More efforts need to be done by the construction company to improve awareness and the training for the workforces. In addition, an adequate budget for safety and health provision should be stated in the contract document which should be approved by all parties. Safety as a pay item in contract document is suggested to be included.
- It is highly advisable if the he contractors train the workers, promote the safety culture for workers and educate them on how to avoid the risk and use the equipment properly in the construction site and make sure that all the workers wear the personal protection equipment and punish the workers who make safety violation.

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## **Annexes**

### **Annexe1.concent form**

## **JIMMA UNIVERSITY**

### **School of business and economics**

#### **Department of Project Management**

Assessment of construction safety and health management practice in building construction projects in Jimma university: in case of Ramma, Afrotsion, China, Varnero, Yotek) construction.

Dear participant

This my thesis research questionnaire is designed to assess the practice of construction of health and safety management in building construction projects in Jimma University: in case of ramma construction plc. afrotsion construction., china construction . varnero construction ., and yotek construction.). The main objective will be to assess the current safety and health management practice in building construction sites at Jimma University.

The information obtained will be used for academic purpose only; all information and feedbacks will be kept strictly confidential. Your experience and educational background in the construction industry will greatly contribute to the success of my study and i believe this kind of study will be an input for the development of Ethiopian construction industry. So, i am kindly requesting you to respond each and every question and i would like to thank you in advance for sharing your time and information with me.

For further inquiry, if you have any questions you can reach me at

Tsegamlak Kumlachew

+251-912686431

Email: tsga441@gmail.com.

## Annexe2. Dummy tables

### I Socio-demographic data for the respondents

NO	QUESTION	RESPONSE
01	Age	-----YEARS
02	Sex	Male.....1 Female .....2
03	Marital status	Marred.....1            widow.....3 Un marred....2        divorce.....4
04	Educational Status	illiterate....1            red & write...3 primary...,2        secondary & above..4
05	Religion	Orthodox Christian .....1 Muslim .....2 Protestant .....3 Other (specify) .....77
06	Ethnicity	Amhara ..... 1 Oromo .....2 SSNP ..... 3 Tigre ..... 4 Others (specify)...77
07	Work Experience	<1.....1 1-5.....2 >5.....3
08	Monthly salary (in Ethiopian birr)	200-500.....1 501-1000....2 1001-1500.....3 >1500.....4

**II Factors that affect safety and health performance in the construction industry Please Mark “√” on the space provided.**

Item No	Description	Degree of impact				
		Very high	high	high average	Low	Very low
01	Complexity of the Design					
02	Type of Owner/attitude of owner/					
03	Weather Condition					
04	Project Duration					
05	Safety and Health Policy					
06	Accidents / Incidents / Near Miss Report					
07	Fire prevention and control					
08	Safety and Health Training					
09	Personal Protective Equipment (PPE)					
10	Emergency Planning and Procedures					
11	Safety and Health Inspection					
12	Safety Signals, Signs and Barricades					
13	Work environment					
14	Reward and Punishment System (Incentives)					
15	Age of workers					
16	Employee experience					

**IV In which construction phase does safety health management practice needs more focus or emphasis. Rank them from 1-4 on the space provided.**

Item No	Construction Phases	Rank

01	Excavation and Earth work	
02	Concrete Work( concrete , form work & rebar)	
03	Finishing Work	
04	Electrical Work	