Addis Ababa University

School of Commerce

Assessment of Health and Safety management in Constructing High-rise Buildings in Addis Ababa:

The case of sunshine construction plc

BY:

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A PROJECT WORK SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF AAU IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF ARTS IN PROJECT MANAGEMENT

Advisor: **Wasihun Mohammed** (PhD) JUNE, 2022

DECLARATION

I, DESTA FEKADU, certify that this thesis is my original work, which I completed under the supervision of Assistant Professor DR.WASSIHUN MOHAMMED. All sources of information utilized in the thesis have been properly credited. I further affirm that the thesis has not been submitted to any other higher learning institution, in part or in whole, with the intention of acquiring a degree.

Name: _____

Signature: _____

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LETTER OF CERTIFICATE

This is to confirm that DESTA FEKADU'S final project work, "Assessment of Health and Safety in Constructing High-Rise Buildings in Addis Ababa, Ethiopia: The Case of Sunshine Construction Plc," had been completed and presented in partial fulfillment of the Master of Arts in Project Management degree requirement that conforms with university requirements and fulfills acceptable criteria in terms of originality and quality.

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ABSTRACT

The existing health and safety measures employed in the construction of high-rise structures in Addis Ababa that are constructed by sunshine construction plc, were evaluated in this study. The study has given importance to health and safety concerns that have been overlooked by the building industry. A descriptive research design was adopted in this study.

Questionnaires were provided and 87.5 percent of the example company's employees had responded. A total of 56 employees from the example firm were surveyed. The data gathered from the surveys were analyzed primarily using descriptive statistical analysis. SPSS version 21 software was used to evaluate and analyze the data, which was imported into Excel.

The study had discovered that, the necessary safety and health training is not given to construction workers on how to manage safety and health practices on high rise building projects of the study area. Top officials in construction projects doesn't give special attention on the implementation of safety training for construction workers in high rise buildings of the study area. Also there is gap on controlling system of, if safety training is implemented on construction site. The safety training program also doesn't have a planned schedule as other high-rise building projects activities.

According to the researcher, every real estate company should have an internal health and safety policy, designated personnel, appropriate facilities, and personal protective equipment (PPE) for all workers on the job site, and should include health and safety duties in contracts with outside contractors.

Client of project should not only concentrate on finishing their project on time and schedule additionally they must be concerned protecting their construction workers from any hazard that may cause severe accident or death.

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ACRONYMS

(SHMS)	Effective Safety and Health Management Systems
(HSA),	health and safety authority
(HSE)	Health and Safety Excusive
(NSC)	National Safety Council
(NBE)	National Bank of Ethiopia
(OSHA).	Occupational Safety and Health Administration
(PPE).	Personal protective equipment
(RII)	Relative important index
(WHO)	world health organization

CHAPTER ONE

INTRODUCTION

1.1BACKGROUND OF THE STUDY

Construction nowadays is a noteworthy portion of society culture, an appearance of its different qualities and complexity and a degree of its dominance of characteristic powers, which can deliver a broadly changed built environment to serve the assorted needs of society. Construction is a critical segment that contributes significantly to the financial development of a country. The construction Industry is an investment-led segment where the government appears tall intrigued. Government contracts with Development Industry to create found dating related to health, transport as well as a school division. For the success of any country, the construction industry plays a significant role. **According to Khan (2008),** the construction industry and its operations are regarded as one of the most important sources of economic growth, development, and activity.

The data from the **National Bank of Ethiopia (2012),** shows that, construction accounts for half of all the nation's industries. What's more, the industry is growing fast. Information from the NBE moreover proposes that during 2013/14, the building division developed by 37%. Industrial activity accounted for 15% of Ethiopia's total output using these data, it can be seen that construction accounted for 7.5% of Ethiopia's add up to GDP during this period. Agreeing to African Financial Viewpoint, this equates to 9.4% of add up to yield at current prices. This would donate the development industry a market value of around 6 billion dollars. Construction is one of the foremost dangerous industries to work within, the positive control and administration of dangers and dangers to attaining a sufficiently high level of security is exceptionally critical, and is frequently a lawful necessity.

Utilizing **2011-2019 information from the Fatal Occupational Injuries**, analysts distinguished 1,102 development laborer fatalities in 2019 – a 41.1% increment from the introductory year of the ponder period. The increment in deadly wounds was particularly articulated among Hispanic specialists, taking off 89.8% over the nine years and distant outpacing the group's 55% rise in work over that time.

According to (**Mouleeswaran ,2014)** - The key causes of accidents, for this study are the industry's distinctive character, human behavior, difficult work site worksites, and

poor safety management, all of which results dangerous work practices, equipment, and procedures. In Ethiopia, small work has been done on the safety of construction workers, particularly on building construction laborers. Because of inadequate occupational hazard knowledge, a lack of workplace safety and health policy, and ineffective safety management systems, construction safety and health issues are becoming serious difficulties in Ethiopia.

An accident is defined by the **National Safety Council (2015)** as an occurrence in a series of events that results in unintentional injury, death, or property damage. According to the city's Fire and Emergency Services, 23 persons died in Addis Ababa in 2015 due to construction-related operations. Safety is defined by the **National Safety Council (2015),** as "the control of identified risks to achieve an acceptable level of risk. Work can only be done efficiently when workers are in a good mood and are healthy **(Okoye, Ezeokonkwo, & Ezeokoli**, **2016).** Working at heights, underground, in confined spaces, near falling materials, handling loads manually, handling hazardous substances, dust, using planted equipment, fire, exposure to live cables, and poor housekeeping are just a few of the health and safety risks that come with constructing high rise building. In the United States of America.

A high-rise is defined as a structure with a height of more than 75 feet (23 meters), or around seven floors, according to the National Fire Protection Association. A high-rise is defined by most building engineers, inspectors, architects, and other professionals as a structure that is at least 75 feet tall. High-rise building is a complicated endeavor with many hidden dangers and risks, it is defined by constant change and the employment of a variety of tools. Various resources, bad working conditions, a lack of consistent employment, difficult working conditions (noise, vibration, etc.)Dust, cargo handling, and exposure to stochastic components such as weather, soil qualities, and traffic incidents **(Zainiet et al, 2015).**

Investment in construction health and safety, on the other hand, has been shown to enhance profitability by enhancing productivity, improving staff morale, and lowering attrition (Mohammed, 2003). This paper will investigate the health and safety-related issue during the construction high rise buildings in the Addis Ababa region, specifically in sunshine construction plc.

1.2 STATEMENT OF THE PROBLEM

Accidents and injuries on construction sites happen all the time, and they're usually extremely serious. Because of the nature of construction work, many people who are engaged in accidents suffer life-altering injuries. Construction accidents come in a variety of shapes and sizes, with many of them being fatal. **According to the Centers for Disease Control and Prevention 2011 data**, more than 3.5 million nonfatal injuries and illnesses are recorded each year, with construction workers accounting for 9% of those. Every year, about 5,000 construction workers are killed on the job, according to the Occupational Safety and Health Administration (2002).

The researcher contends that no one should suffer disease or, worse, die while attempting to make living as a result of the employer's negligence or sole concentration on exploiting the worker's labor as a stepping stone to profits**.** Previous research has shown that the construction sector is one of the most dangerous**.**

The building construction sector is quite hazardous, the industry's performance in terms of occupational health and safety is appalling and in underdeveloped nations, the quality of occupational health and safety is significantly lower. (**Kanchana et al 2015**).

The safety hazard in building high-rise buildings is worse in developing countries, like Ethiopia. Construction workers in poor nations confront more occupational health and safety risks than those in developed countries, where the highest concentration of the world's workforce is concentrated, and the impact is also 10 to 20 times greater. **(Adane et al 2013).** Many construction workers are becoming ill and dying on the job in high-rise structures in Addis Ababa, but health and safety concerns are not being addressed adequately even though many accidents go unreported, the current scenario is quite concerning.

Health and safety are rarely given much consideration on construction sites. Most construction enterprises in Ethiopia, based on their practices and experience, do not have well-articulated and created risk policies and response plans. As a result, most building sites do not have proper health and safety precautions in place.

Health management has been put in place, but there are several hurdles to overcome. As well as security. Numerous accidents/injuries, as well as health issues, occur on construction sites.

Especially, less concentration is given to daily labor workers on construction sites. From my experience in Addis Ababa, I had seen the top officials in the construction project wear proper safety equipment properly, but the low employees like daily labor

workers do not wear proper safety equipment. In comparison to budgeted cost, quality, and planned time, health and safety management is not prioritized. True, maintaining a construction project on schedule and under budget is critical to its success and project Management, but costs will rise if a project falls behind schedule

According to an **EBC news report in May 2022**, 16 daily labor workers died in Mexico street in Addis Ababa working drainage system of a building project and when the daily labor workers had interviewed with news channel, they told that the accident is the result of not implementing the necessary precaution on the site and the ignorance of the top management when they told them the danger coming before it happens.

A variety of issues might cause a project to be delayed, but in a high-hazard business like building construction, accidents continue to be an all-too-common cause of delays and a risk to employees. The human dimension, law, and financial concerns are the reasons to take safety and health into consideration (Adan, 2004).

They ascribed the gap in part to underdeveloped nations' inadequate regulatory frameworks. Because the recording method is not standardized internationally, recent data on construction fatalities is difficult to come by. Given the lack of good accident recording, particularly in developing nations, it's evident that estimates are based mostly on data from industrialized countries, with minimal data from developing countries. Construction sites in Addis Ababa are getting increasingly dangerous. Anyone, without needing to be a construction specialist, may see the hazardous and unhealthy conditions on building sites just by walking through Addis Ababa's streets. **According to the Addis Ababa construction office report**, during the 2016/17 fiscal year, more than ten workers died as a result of risky building practices.

As a result, the **Addis Ababa Fire Protection Agency has noted** the construction tragedy in which over 42 construction experts were injured or killed as a result of risky practices between the years 2015-and 2016/17. In Ethiopia, just a few research on safety and health management have been conducted.

However, based on practice and experience in the construction business, earlier literature in Ethiopia has insufficient documentation on high-rise building safety and health management, and health and safety management are not prioritized above budgeted cost, quality, and planned time. A detailed assessment is not done on prior studies on the safety and health of high rising construction sites in Addis Ababa, because many high-rise buildings in Ethiopia are located in Addis Ababa.

The researcher aspired to do research on health and safety management practices in high-rise real estate buildings in Addis Ababa city and provide progressive solutions that would help develop a culture of effective health and safety management.

1.3 RESEARCH QUESTION

1.3.1 GENERAL RESEARCH QUESTION

- In Addis Ababa, Ethiopia, how does sunshine construction plc implement health and safety management practices in high-rise real estate development projects**?**

1.3.2 SPECIFIC RESEARCH QUESTION

- How does the policies and regulations implemented to the development of high-rise building structures in terms of health and safety?
- When it comes to the construction of high-rise real estate structures, are staff provided enough health and safety training?
- How the important safety and health precautions does implemented in today's high-rise building projects?
- What are the most serious safety and health hazards connected with high-rise construction?

1.4 OBJECTIVE OF THE STUDY

1.4.1 MAIN OBJECTIVE OF THE STUDY

-The general objective of this research is to assess the health and safety management practices during the implementation phase of high-rise building projects in Addis Ababa, Ethiopia.

1.4.2 SPECIFIC OBJECTIVES OF THE STUDY

- To assess the implementation of health and safety laws and regulations that are employed in the construction of high-rise structures**.**
- To examine if enough health and safety training is given to the staff of high-rise building projects.
- To assess the implementation of the most important safety and health precautions in today's high-rise building projects.
- To identify the primary safety and health hazards related to the development Of high-rise buildings in Addis Ababa.

1.5 SIGNIFICANCE OF THE STUDY

The relevance of this study is that, it aimed to expose present health and safety management procedures and pinpoint the root causes of injury and death in construction projects. The research's findings can be utilized to develop self-defense skills, Make the workplace the safest place to work and the job the safest place to work.

Because high-rise building development is new to Ethiopia, the possibility of catastrophic dangers in the business is unavoidable.

Despite the efforts of many participants, the construction industry's safety and health problems remain unabated. As a result, this study will assist all stakeholders in comprehending the importance of controlling the risk of safety and health in high-rise building projects, as it impacts the lives of many people, and decreasing the danger needs a collective effort.

The study can also serve as a springboard for other researchers who wish to go more into the subject or for students who want to write their dissertation on it.

1.6 SCOPE OF THE STUDY

The study exclusively will look at high-rise building projects in Addis Ababa, Ethiopia, which is constructing by sunshine construction plc, a local grade one contractor. The justification for this delimitation is that high-rise structures pose the greatest health, safety, and danger, and they are now being built more often in our capital**.** Local grade one contractor is chosen because, when compared to their international counterparts, they are the most comparable of all the contractors in our country's grades. Finally, Addis Ababa, Ethiopia was chosen since it is convenient for the researcher.

1.7 LIMITATION OF THE RESEARCH

Due to time constraints, the study exclusively looks at high-rise building construction projects completed by Sunshine Construction Plc. It was challenging to gather enough data and provide more empirical results, and the findings may not be representative of the construction sector as a whole.

1.8 THE ORGANIZATION OF THE REPORT

There are five chapters in the research report.

Chapter 1: Introduction – this section contains information about the study's background, such as a description of the case company, the Problem Statement, the general and specific research questions, the general and specific research objectives, the study's Significance, Scope, and Limitations, the paper's organization, and definitions of key terms.

Chapter 2: Evaluation of Related Literature - includes an empirical review of previous results on health and safety from various researchers; a theoretical review that includes definitions and brief explanations of the issue areas, as well as the study's theoretical framework.

Chapter 3: Study Methodology - the research design, the target population and sample size, data collecting kinds and instruments, data processing procedures, and validity and reliability test methodologies are all discussed in this chapter.

Chapter 4: Data Presentation, Analysis, and Interpretation — explains how the data was gathered, analyzed, and the results were interpreted.

Chapter 5 Conclusion, Recommendation and suggestion for future work – – The researcher's conveyed ideas for health and safety procedures in high-rise real-estate structures, as well as information for future studies and the major findings of the research is presented.

CHAPTER TWO
REVIEW OF RELATED LITERATURE

INTRODUCTION

The theoretical and empirical reviews are included in this chapter. The theoretical review aids in comprehending the numerous definitions, scope, components, and relevance of the topic's primary topics. This is a summary of each point on the topic. Variables are identified in this chapter, as well as the research's conceptual framework included. The empirical section goes on prior studies on building construction health. Regarding high-rise building safety from a variety of published and unpublished sources. As today's studies build on yesterday, it adds the researcher's perspective.

2.1 THEORETICAL REVIEW

2.1.1 HEALTH, SAFETY, HAZARD AND SAFETY MANAGEMENT

Health

The 1948 constitution of the World Health Organization (WHO) defines health as "Health is more than just the absence of sickness or weakness; it is a condition of total physical, mental, and social well-being". The WHO clarified it further in 1986, defining it as follows: "Not the goal of living, but a resource for everyday life." Health is a positive term that emphasizes social and personal resources in addition to physical abilities". (Stokes et al., 1982) define health as "A capacity to execute individually valued family, job, and community tasks; an ability to manage with physical, biologic, psychological, and social stress; anatomic, physiologic, and psychological integrity". "Health" refers to the protection of people's bodies and minds from sickness caused by materials, methods, or procedures employed at work. (Hughes and Ferret, 2008)

Safety

The Cambridge dictionary defines safety as "a situation or location where you are safe and not in danger or the state of not being likely to inflict injury or damage". Wikipedia defines safety as the condition of being "safe," that is, shielded from harm or other risks controlling identified dangers to attaining an acceptable level of risk is referred to as safety.

According to Hughes and Ferret (2008), safety refers to the protection of individuals from physical harm. According to Nas,S.(2015). safety is the state of being free of

dangers posed by natural forces or human mistakes on an ad hoc basis. Natural factors and/or human blunders provide the cause of danger. Safety may also be described as the absence of danger, a state of protection, or a situation free of risk (Lingard et al, 2005)

Hazard

Whittow et al (1999), defines a hazard as "a perceived natural event that poses a threat to both life and property."

Safeopedia discusses Hazard as follows;

Many different types of hazards might arise in the workplace. Some risks are severe, posing a direct threat to the worker's or visitors' health and physical well-being. Others take longer to manifest and can have a cumulative impact, such as some chemicals, fumes, dust, and radiation, which can cause chronic medical disorders if exposed repeatedly or for an extended period.

It classifies hazards into four types:

Physical hazards; Extremes of temperature, ionizing or non-ionizing radiation, excessive noise, electrical exposure, working from heights, and unprotected machinery

Mechanical hazards; are caused by machinery that has projecting or moving parts.

Chemical hazards; occur when a worker is exposed to chemicals at work. Even ordinary treatments might cause sickness, skin irritation, or respiratory issues for employees who are particularly sensitive to chemicals.

Biological hazards; include viruses, bacteria, fungi, parasites, and any other living entity capable of infecting or transmitting the disease to humans.

"A hazard is best thought of as a naturally occurring or human-induced activity or occurrence that has the potential to cause loss, i.e. a broad source of danger" (Smith, 1996).

"Hazard is a condition or situation which has the potential to create harm to people, property, or the environment". Gravley, D. (2001). When a critical threshold is exceeded, a hazard is a phenomenon related to geologic processes that can cause a disaster and result in considerable loss of life or property" (Coates, 1996).

2.1.2 Ethiopian construction health and safety regulations

The Constitution of the Federal Democratic Republic of Ethiopia, as well as the Civil Code (Proclamation # 165/1960) and the Labor Code (Proclamation No 377/20003), form the main legal framework for Ethiopian health and safety regulations. These general laws contain numerous articles/provisions pertaining to people's health and safety.

The Labor Code protects worker-employer relations and allows workers and employers to coexist peacefully in the workplace. It strengthens and clarifies the authorities and responsibilities of the organ in charge of inspecting labor administration, specifically labor conditions, workplace safety, health, and the environment.

The following rules are in place:

Article 92 lays out an employer's basic responsibilities in terms of putting in place all necessary safeguards to guarantee that workplaces are safe, healthy, and free of any threat to workers' well-being. In the same article, the employer is required to take the following actions to protect the workers' health and safety.

Article 93 outlines workers' responsibilities in terms of needed cooperation and implementation of the employer's regulations and instructions in order to ensure workplace safety, health, and working conditions. Occupational injuries, as well as all other connected rules, are explicitly stated in the legislation.

2.1.3 HEALTH AND SAFETY MANAGEMENT IN THE WORKPLACE

Workplace health and safety management are to create conditions, capacities, and habits that enable the person and his or her organization to do their jobs effectively while avoiding incidents that could hurt those (Garcia-Herrero et al., 2012). Health and Safety Management is a set of procedures and efforts aimed at identifying workplace dangers and reducing accidents as well as exposure to hazardous circumstances and chemical, Business Dictionary (2019).

It is undeniable that safe working conditions have an impact on employee behavior, which in turn has an impact on productivity. This means that employees who work in a safe environment are more likely to perform in a way that does not endanger them. Employee health and safety programs need to be a top priority for management to save

lives. Increase productivity and reduce costs and these health and safety programs should emphasize employee involvement.

Continuous monitoring and overall wellness component (Anthony et al., 2007).

The management of health and safety is critical to the effective completion of projects. To be able to work, an individual must be healthy, and the working environment must be safe so that tasks may be carried out effectively.

2.1.4 WHY WE NEED HEALTH AND SAFETY MANAGEMENT IN THE WORKPLACE

The goal of health and safety management is to keep your employees, subcontractors, customers, and members of the public safe while they are working for you. The Health and Safety at Work Act of 1974 imposes a responsibility of care on employees of the workplace, but it's also smart business practice to follow health and safety regulations. Organizations that break the law risk losing employees, incurring greater recruitment expenses, lowering retention rates, and losing money.

"Effective Safety and Health Management Systems (SHMS) have shown to be a crucial component in lowering the number and severity of work-related accidents and illnesses," according to OSHA.

According to the health and safety authority (HSA), the benefit of health and safety management includes;

Economic Motives

Effective safety and health management improve corporate productivity in addition to lowering expenses. Every year, the Health and Safety Authority receives thousands of reports of job-related incidents that result in more than three days off work. Because of the long latency period, job-related illnesses and ill-health are more difficult to quantify, yet they account for almost one million days missed at work each year. These incidents and illnesses are the results of organizational failures and weaknesses in occupational safety and health management.

Legal reasons

The Safety, Health, and Welfare at Work Act 2005, requires all duty holders to ensure the safety, health, and welfare of workers and members of the public, as far as is reasonably practicable, and to manage and conduct all work activities in such a way as to ensure their safety, health, and welfare. This necessitates that everyone with this legal responsibility is proactive in managing their safety, health, and welfare obligations and

deal with them methodically the mention should assist organizations in improving their safety and health performance by giving guidance on how to manage safety and health and, as a result, assisting them in meeting their legal obligations.

Reasons for Moral and Ethical Importance

Proactive workplace safety and health management aid businesses in avoiding workplace injuries and illnesses. This advice should assist organizations in reducing personal loss as a result of workplace accidents and illnesses

2.1.5 HEALTH AND SAFETY CHALLENGES IN DEVELOPING COUNTRIES

In different parts of the world, different countries, and different sectors of the economy, economic structures, occupational structures, working conditions, work environment, and worker health varies greatly. As a result, the construction industry's mechanization is not uniform over the world.

However, as previously noted, the building industry is critical to the economic growth of any country, particularly a developing country. It provides the infrastructure that allows other economic sectors to thrive. Many studies, such as Coble and Haupt (1999), have demonstrated that the construction industry mirrors the country's economic development. Everywhere, the building industry is confronted with issues and challenges. These obstacles and challenges, on the other hand, are evident in emerging countries, coupled with a general level of socio-economic stress and a lower productivity rate as compared to developed countries (Ofori,2000).

Nonetheless, the construction industry is often regarded as a good source of employment at many skill levels, ranging from general labor to semi-skilled, skilled, and specialist workers.

Other significant factors affecting this industry include a lack of research and development, a lack of trade and safety training, client dissatisfaction, and steadily rising building costs (all of which result in less profitability). Construction in developing countries frequently falls short of meeting the needs of modern competitive enterprises in the marketplace, and it rarely gives the best value for clients and taxpayers (Datta, 2000). Additionally, because to the lack of any strong safety and building laws, this sector performs poorly in terms of health and safety.

2.1.6 HEALTH AND SAFETY IN CONSTRUCTION

The most important health and safety site requirements in construction include clean sites and suitable living quarters, protection of falls from heights, manual handling, and on-site transportation. Site operators are often expected to plan and organize their activities, as well as ensure that they are trained and competent, and are aware of the unique hazards that they face. Their craft and bring issues to the attention of their site supervisor or safety representative (HSE, 2009).

Employers, employees, governments, and project partners should all be concerned about construction health and safety and Construction site health and safety is concerned with the physical and psychological well-being of construction employees as well as those people whose health is likely to be harmed by construction operations (Kheni's et al,2008). It might be difficult to implement 'best' health and safety procedures on building sites. These difficulties might be explained by a variety of factors, including worker migration, employment methods, labor standards, and various backgrounds and experiences. (Mohamed et al,2009)

The construction industry pays little attention to the implementation of "best" health and safety procedures. This is because stakeholders are primarily motivated by profit and pay little attention to health and safety (Priyadarshani et al., 2013 ;) Employees are required to operate at considerable heights with potentially risky building materials and heavy gear. To limit the risk of harm and preserve employees' lives, it is critical that health and safety rules are strictly observed. (Monica and Sikora, 2016).

Workers regard construction operations as detrimental to their health, according to the study's findings, and are more concerned with monetary rewards Due to a lack of Health & Safety training, they have little or no understanding of what Health & Safety in construction entails. Workers believe that the amount of years of experience in a trade impacts the level of danger they face and how they should handle it (Kukoyi and Smallwood, 2017).

Many different writers have explored the relationship between construction safety and other elements. (Aksorn and Hadikusumo, 2008) proposed four characteristics that these plans should address from the standpoint of safety plan management: worker participation, a safety preventive, and control system, a safety arrangement, and management commitment are all important factors to consider.

Construction health and safety management is critical in order to improve the industry's future. This covers a number of actions aimed at developing, monitoring, and managing occupational risks in the industry, as well as mitigating and protecting against them. The purpose is to ensure that work is completed safely, with an emphasis on preventing accidents. (Zhou et al., 2012). Argaw (2017) According to the findings of the study, health and safety procedures in high-rise real-rise structures in Addis Ababa are distant from those of health and safety management systems. It is possible to say that health and safety practices are only found in the country's written conventions. Occupational health and safety regulations and standards may have been established several decades ago, but the sad fact is that they have yet to be implemented, Alemu (2020)

2.17 SAFETY PRECAUTIONS IN CONSTRUCTION SITE

According to EMMA, (2019)"https://www.haspod.com/blog/construction/10-simple-construction-site-safety-rules, she listed important safety precaution on construction site. This include;

- **Always putting on your personal protective equipment (PPE).**

Making sure of having all of the necessary PPE before entering the site. PPE is crucial since it is the last line of protection if you come into contact with a hazard on the job. The use of high-visibility clothing ensures that you are spotted. Safety boots provide traction and protection for your feet. Hard hats can be replaced, but not your head. If you don't wear it, it won't protect you. Wear a hard hat, safety boots, and a high-visibility vest, as well as any other PPE essential for the activity at hand.

.-**Do not begin work without first receiving an induction.**

Each site has its own set of dangers and work procedures. There are no two sites that are alike. The importance of your induction cannot be overstated.

-Observing warning indicators and procedures

Observe all construction-related safety signs and procedures. Your employer should ensure that your activities are subjected to a risk assessment. Make certain you have read and comprehended it. For your protection, control steps have been implemented. Before you begin, double-check that they are in place and operational.

-**Never work in a dangerous environment.**

Make sure the working environment is secure. Keep an eye on what's going on around you. Be alert of your surroundings. According to the HSE, 14 percent of construction

fatalities were caused by anything collapsing or overturning, while 11 percent were caused by being hit by a moving vehicle (2014/15-2018/19).

Working at a height without appropriate safety rails or other fall prevention is not recommended. Do not enter trenches that are not supported. Ascertain that you have secure access. Don't labor underneath crane loads or engage in other potentially hazardous activities.

2.2 EMPIRICAL REVIEW

2.2.1 HEALTH AND SAFETY MANAGEMENT IN CONSTRUCTION

Muirur and Mulinge(2014), assessed health and safety management on construction projects sites in Kenya using both survey and descriptive designs and discover that Inadequate personal and protective equipment, poor maintenance of personal protective equipment, lack of top management support in the management of health and safety in construction sites, inadequate enforcement mechanisms, inadequate welfare facilities, absence of safety and health committees, and worker ignorance of health and safety issues were some of the major challenges identified by the survey.

Tam and Fung (1998), studied on Effectiveness of safety management strategies on safety performance in Hong Kong, A total of 45 construction businesses were analyzed and contrasted. Each has a distinct approach to safety management. They selected 11 small, 25 medium, and 9 major construction enterprises among the 45. Site casualty rates were used to assess a construction company's safety performance. The accident rates are first calculated and compared to industry norms using the data gathered from the survey.

The following safety procedures and tactics of Hong Kong contractors, as well as their safety performance, were compared: Top-level management engagement in safety management; new employee safety orientation programs; safety rewards or incentive schemes; usage of post-accident investigation systems; safety training schemes; safety committees; the amount of subcontracting. Using a series of tables, the first section of the study investigated the relationship between these metrics and safety performance. These approaches have enhanced site safety, according to the findings. The second section of their study examines the combined influence of these schemes and practices on safety performance using multiple regression analysis. The study suggested that providing safety training, using directly engaged labor, using the post-accident investigation as a feedback mechanism, and promoting safety behaviors through safety

award campaigns and incentive schemes are the most successful methods for reducing site casualties.

Sara (2012), assessed the Health and Safety risk management of Tanzania construction, the study's findings revealed that the contractor has exclusive responsibility for risk management, which occurs solely during the building period. The study also revealed that risk assessment is not based on a systematic technique, but rather on human judgment driven by experience, educational background, and current legislation.

Meanwhile, risk information was shared through toolbox meetings and informal talks and was managed through the use of personal protective equipment (PPE). The regulatory system, the organization/company system, the person system, and the work environment all have an influence on health and safety risk management, according to the research. The study's findings also suggested that the biggest obstacles to health are site location, site layout, procurement system, and design complexity. **Argaw (2017**), assessed, Construction Safety and Health Management in High Rise Building in Addis Ababa, the study used surveys and descriptive designs, and The study focused on high-rise construction projects built by Chinese multinational contractors and local grade one contractors in Addis Ababa, According to the study, Chinese contractors have comparatively strong health and safety management procedures, but local grade one contractor have poor practices.

The most common cause of injury and fatality during high-rise building construction work is objects falling from a height, scaffolding and ladders, and the collapse of soil during excavation, followed by noise, tools and machinery, stairways, and ladders, electric power accidents, construction elevators, and hazardous substances. Furthermore, the majority of respondents agreed that the owner's attitude, the role of government and engineering society, and the environment are the most important factors affecting the performance of health and safety in high-rise building construction, followed by risk assessment, safety, and health policy, fire prevention and control, first-aid provision, project cost, and safety and health training.

2.2.2 LEGAL ASPECT OF SAFETY AND HEALTH MANAGEMENT

Developed vs developing countries

In comparison to the developed world, developing nations have a poor health and safety record, which may be due to a lack of technology, labor-intensive procedures, and

limited employee engagement in health and safety concerns. According to research conducted by Peckitt et al. (2002) on health and safety in the Caribbean construction sector, directors and project managers were frequently unaware of their responsibilities under health and safety regulations, and health and safety legislation was seldom implemented. Contractors and employers in India, according to Koehn et al. (1995), routinely disregard fundamental health and safety requirements. There were also no established

Safety processes for handling health and safety issues. The construction sector has been greatly influenced by the privatization of state-owned companies in most Sub-Saharan African nations. In these developing nations, according to Wells (2001), the standard building system is gradually being displaced by informal construction. To achieve their final project at a minimal cost, clients and contractors go through restrictions and official processes. Whereas in developed countries legal aspect of safety and management is implemented strongly in every construction of high-rise buildings. Running safe construction projects is the most critical stage in cost management for contractors in industrialized nations. As a result, contractors are driven to make safety a business strategy, which has resulted in recent improvements in construction safety records across the world (Farooqui, Arif, & Rafeeqi, 2008).

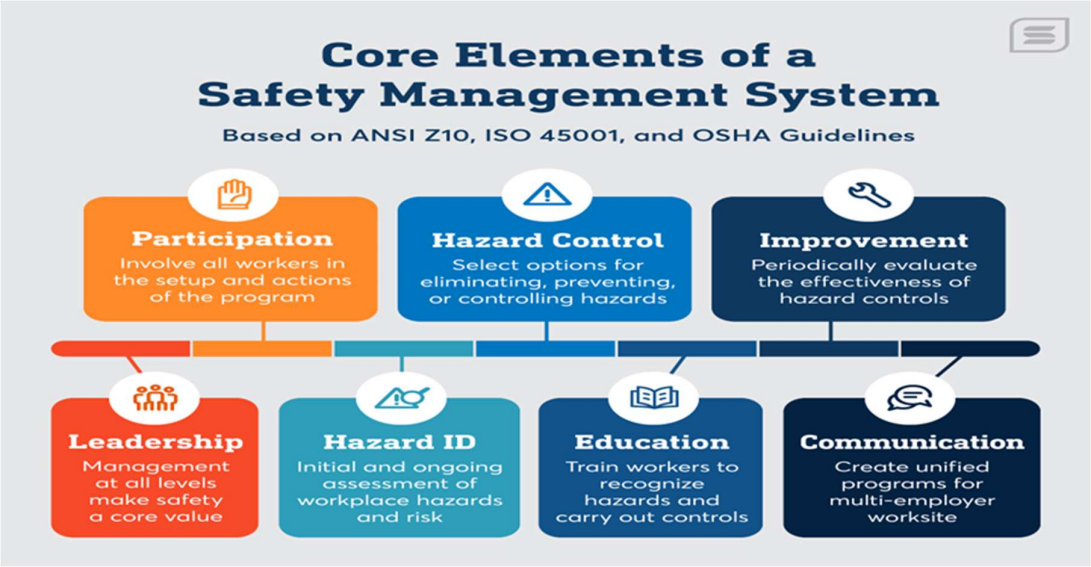
2.2.3 IMPORTANCE OF HEALTH AND SAFETY MANAGEMENT SYSTEM IN CONSTRUCTION

According to (Hämäläinen **et al, 2015),** the number of accidents will rise in tandem with the expansion in industrialization in nations, which will have a direct impact on construction workers' quality of life. Furthermore, the lack of industry-specific legislation and regulations encourages accidents to become increasingly widespread in building projects **(Kheni et al, 2010)**. This emphasizes the need of incorporating o safety and health policies and procedures into building projects in order to prevent, mitigate, or eliminate risks during construction operations (**Hinze et al, 2000)**.

(slim et al, 2015) a study conducted on The importance of occupational safety and health in management systems in the construction industry: a case study of construction in Hermosillo, At two construction sites in the city of Hermosillo, Sonora, Mexico, a case study was conducted to highlight the need of integrating occupational health practices into construction industry management systems, found that Including Construction companies' health and safety practices bring a variety of economic,

welfare, and labor benefits, including a significant improvement in the work environment, a reduction in injuries and illnesses, which translates to a lower risk premium, higher quality and efficiency in the work done, and lower expenses for work-related accidents and disabilities, among others.

Furthermore, they assist the construction sector in moving toward a more sustainable reality and improving workers' quality of life. At the conclusion of this study, it may be determined that the bulk of construction-related tasks pose health concerns. Current management systems do not fully integrate health and safety procedures, resulting in the prevalence of health concerns for workers.



Source; OSHA

FIGURE1; CORE ELEMENTS OF SAFETY MANAGEMENT SYSTEM

2.3 RESEARCH CONCEPTUAL FRAMEWORK

The following research conceptual framework is set out based on the theoretical and empirical literature review to provide the research project with a practical structure.

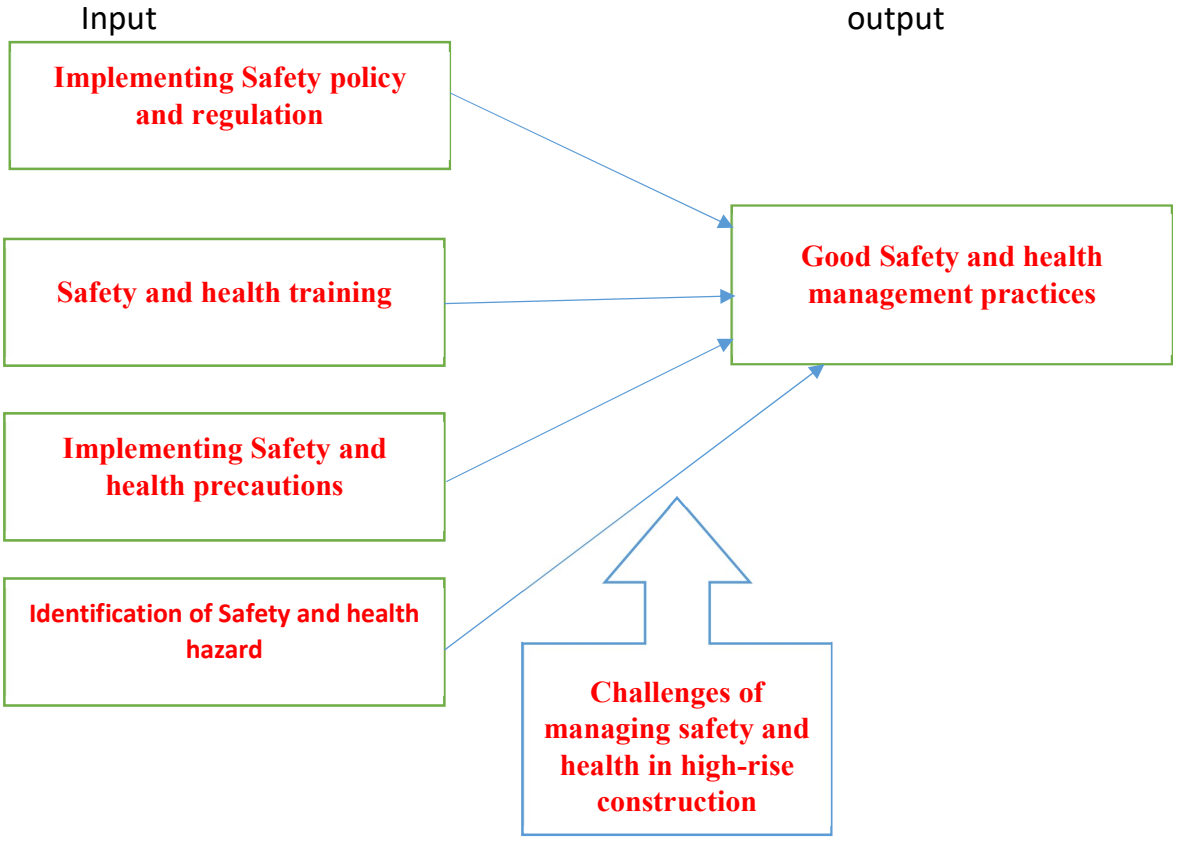


FIGURE2; RESEARCH CONCEPTUAL FRAMEWORK

Source (the researcher)

CHAPTER 3
RESEARCH METHODOLOGIES

3.1. RESEARCH DESIGN

The study will employ a combination of qualitative and quantitative methods. As a result, it entails more than just gathering and evaluating both types of data; it also entails Combining both methodologies such that a study's total strength is stronger than either qualitative or quantitative research. This study will employ descriptive research, which will aid in identifying the nature of the health and safety measures utilized on construction sites as well as evaluating their enforcement methods. The study will be cross-sectional since the researcher will only be able to view the locations at one time due to the little amount of time available to perform the research. Information will be gathered by. The design will be adaptable, suitable, efficient, and cost-effective in general.

3.2 TARGET POPULATION

The target population for this research will be construction workers working in 4 high rise buildings constructed by sunshine construction plc in Addis Ababa, Ethiopia.

TABLE1; LIST OF TARGET POPULATION

Target population
Project managers
Safety engineers
Site engineers
Foreman
Residential engineer
Daily labor workers
structural managers
Total=80 peoples

3.3. SAMPLING TECHNIQUE AND SAMPLE SIZE

The study will employ a non-probability convenience sampling strategy, in which samples will be chosen from the target population based on their proximity to the researcher. Non-probability sampling is a sampling approach in which not all

individuals of the population have an equal chance of participating in the research. I will use a convenience type of non-probability sampling technique which includes samples from the population will be chosen since they are readily available to the researcher.

3.3.1 SAMPLING SIZE

The sample size is determined using the Taro Yamane technique, which was developed by Taro Yamane in 1967 to calculate the sample size from a given population.

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

n=the sample size is indicated by the letter.

N= denotes the research population,

e= denotes the margin error = (0.05)

N = 80(total personnel of the firm in the three projects)

n = 80/ (1 + 100 (0.05) 2) = 64 in this scenario (confidence level of 95 percent)

3.4 SOURCE OF DATA

There will be a mix of primary and secondary materials used. Self-observations and questionnaires will be used to acquire primary materials.

3.5 DATA COLLECTION INSTRUMENTS

A questionnaire with closed-ended questions will be used based on the data gathering tools and procedures. The research questions will be used to create the questions. The information is then disseminated and gathered. Employees will be provided the primary data for this study, which will be collected by closed-ended questionnaires. The questionnaire will be using a Likert scale (1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree) Documents related to the topic will be gathered as well.

3.6 DATA ANALYSIS METHODS

The primary data obtained from the selected sample respondents in the targeted sector will be examined and interpreted using qualitative and quantitative data analysis methodologies based on the qualitative and quantitative nature of the data to be deployed. The data acquired from the questionnaires was analyzed using descriptive statistical analysis techniques in this study. The data was loaded into Excel, and the SPSS version 21 software application was used to evaluate and analyze it. The questionnaires collected from the company's various construction professionals were examined utilizing descriptive methods.. Percentages, frequency, mean, and standard deviation will be used to summarize the results of the descriptive data analysis. As a result, table will be used to show the data. he Relative Important Index (RII) technique was calculated in excel to rank the important safety management practices based on the respondents answer to the questions of the questionnaires.

$$\text{Relative important index (RII)} = \frac{5N5 + 4N4 + 3N3 + 2N2 + 1N1}{A * N}$$

N5= number of respondents for strongly agree

N4= number of respondents for agree

N3= number of respondents for neutral

N2= number of respondents for disagree

N1= number of respondents for strongly disagree

A (highest weight)

N (total number of respondents)

3.7 VALIDITY AND RELIABILITY

Every piece of information acquired from official sources will be cross-checked against information gathered from other secondary sources. It will be remembered to collect the most recent data, as this will aid in drawing a picture of the present situation. The primary goal of cross-checking is to eliminate inaccuracies from data and provide total data confidence. This will aid in the conclusion of a more meaningful and dependable outcome. Cronbach's alpha test will be performed to determine the questionnaire's internal reliability by using the formula in aid of SPSS 21 software

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N-1) \cdot \bar{c}}$$

N=stands for the number of items

$\bar{c}$= stands for covariance between items

$\bar{v}$ = stands for average variance.

TABLE 2; CRONBACH ALPHA RESULT

No	Variables	Cronbach Alpha value	Number of questions
1	Safety and health policy and regulation	0.860	7
2	safety and health training	0.702	7
3	Safety and health precautions	0.867	7
4	identification of safety and health hazard	0.790	8
5	safety and health management practices	0.822	8
	overall	0.933	

Individual variables have a value range of 0.790 to 0.867, according to the Cronbach Alpha values in the above table, indicating that they have internal consistency and are reliable for further investigation.

3.8 ethical consideration

Ethical considerations in research activity, according to Kumar and Kandasamy (2012), include the following: and they were all taken into account during the research.

• The freedom to choose whether or not to take part in the study.

• The right to be safe: from psychological harm such as anxiety during the interview.

• The right to know what's involved, how long it'll take, and what the data will be used for.

• The right to privacy entails the control of personal information and the avoidance of unwelcome communication. Individual responses should never be identified, and their privacy and rights must be protected

CHAPTER FOUR 4

DATA ANALYSIS, INTERPRETATION, AND DISCUSSION

INTRODUCTION

This chapter explains how the data acquired through questionnaires how they are analyzed. It entails data analysis and interpretation in order to form a conclusion and provide suggestions for high-rise building health and safety management practices. This chapter also includes descriptive statistics which contains broad demographic traits, and educational background, and respondent's response is analyzed and presented. It is explained in light of the study's research aims.

To achieve the stated aims, five research questions were identified, and qualitative and quantitative research methodologies were used. In order to acquire the essential data and information in order to answer the study questions, questionnaires were used as a data collection instrument. SPSS version 21 is used for statistical testing and interpretation of the findings.

4.2. GENERAL INFORMATION OF THE RESPONDENTS

This section provides a summary of the construction experts who took part in the study. A total of 64 questionnaires were issued, however, only 56 were returned. Which yielded 87.5 response rate. The questionnaire had a significant number of questions in order to obtain comprehensive information on current health and safety measures, but they were simple to respond to. It was difficult to collect all of the disseminated questionnaires due to the unwillingness of some personnel and the removal of some respondent responses from analyzing their result due to the data they give is filled carelessly.

4.2.1 PROFILE OF DEMOGRAPHICS

The background information of respondents who completed the questionnaire, such as gender, age, job position and educational qualification, work experience, and employment status in the project, is shown in the figure below.

TABLE3; GENDER OF RESPONDENTS

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	43	75.4	75.4	75.4
	female	14	24.6	24.6	100.0
	Total	56	100.0	100.0	

Source; own survey (2022)

According to the demographics of the respondents, 43 (75.4 percent) are male and 14 (24.6 percent) are female. We may deduce from the above table that, more men took part in our data collection through questionnaires.

TABLE4; AGE OF RESPONDENTS

age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-30	37	64.9	64.9	64.9
	>30	20	35.1	35.1	100.0
	Total	56	100.0	100.0	

Source; own survey (2022)

People between the ages of 20-30 make up the largest majority of responses, accounting for 37 (64.9 percent). 35.1 percent of respondents were above the age of 30. The majority of responders w

ere young, as seen by their ages.

TABLE5; JOB POSITION OF RESPONDENTS

JOB POSITION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Foreman	7	12.3	12.3	12.3
	site engineer	23	40.4	40.4	52.6
	safety engineer	5	8.8	8.8	61.4
	Consultant	3	5.3	5.3	66.7
	project manager	6	10.5	10.5	77.2
	residential engineer	6	10.5	10.5	87.7
	daily labor	3	5.3	5.3	93.0
	structural engineer	4	7.0	7.0	100.0
	Total	56	100.0	100.0	

Source; own survey (2022)

Out of all respondents, 40.4% were site engineers, 12.3% were foremen, 10.5% were project managers and residential engineers, 8.8% were safety engineers,7% were structural engineers 5.3% were consultants and daily labor workers. From this, we can analyze that, the majority of the respondents were site engineers. The researcher feels that health and safety are the responsibility of all professions involved in the study in some manner, and has attempted to engage as many as feasible

TABLE 6; EDUCATIONAL BACKGROUND OF RESPONDENTS

EDUCATION BACKGROUND

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma	8	14.0	14.0	14.0
	bachelor degree	39	68.4	68.4	82.5
	master Degree	7	12.3	12.3	94.7
	below diploma	3	5.3	5.3	100.0
	Total	56	100.0	100.0	

Source; own survey (2022)

According to the graph above, 68.4 % of the respondents had a bachelor's degree, 12.3 % had a master's degree, 14% had a diploma, and 5.3 were below a diploma. From this, we can analyze that the majority of the respondents were bachelor's degree holders. The daily labor workers were with the educational status of below diploma.

TABLE 7; EMPLOYMENT STATUS OF RESPONDENTS

Employment status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	permanent	40	70.2	70.2	70.2
	contract	17	29.8	29.8	100.0
	Total	56	100.0	100.0	

Source; own survey (2022)

From the above figure, we can understand that 70.2% of our respondents were permanent workers and 29.8 were contract workers .from this we can analyze the majority of our respondents were permanent employees.

4.3 HEALTH AND SAFETY MANAGEMENT PRACTICES

On a five-point Likert scale ranging from 1 to 5, respondents were given a series of questions about safety and health management practices.(1=strongly disagree, 2=disagree, 3=neutral, 4=agree, and 5=strongly agree). The following assumption underpins the mean score analysis.

If the mean statistical value falls between 0 and 1.5, the respondents strongly disagreed.

If the mean statistical value is between 1.5 and 2.5, the respondents disagreed.

If the mean statistical value falls between 2.5 and 3.5, the respondents are undecided.

If the mean statistical value is in the range of 3.5 to 4.5, the respondents agreed.

If the mean statistical value is more than 4.5, the respondents strongly disagreed.

4.3.1. DESCRIPTIVE ANALYSIS OF SAFETY POLICY AND REGULATION ON CONSTRUCTION SITE

TABLE8; MEAN AND STANDARD DEVIATION OF SAFETY POLICY AND REGULATION RELATED ISSUES

Descriptive Statistics							
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Inspections are conducted by local authorities and health and safety enforcement organization	56	4.00	1.00	5.00	3.7143	1.21677	1.481

Workers are well educated on how to properly care for and maintain personal protective equipment	56	4.00	1.00	5.00	2.3393	1.21021	1.465
There is a proper health and safety policy in place at your construction company	56	4.00	1.00	5.00	2.8036	1.18198	1.397
The safety policy and regulation are the latest up to date	56	4.00	1.00	5.00	2.5714	1.35991	1.849
The safety policy and regulation are implemented through all phases of the project	56	4.00	1.00	5.00	2.2857	1.24629	1.553

There is a specific department that manages the safety policy and regulation of the construction site	56	4.00	1.00	5.00	2.2321	1.27908	1.636
there is a strong safety policy and regulation on site	56	4.00	1.00	5.00	2.3750	1.07132	1.148
Valid N (list wise)	56						

Source; own survey (2022)

Regarding Inspections conducted by local authorities and health and safety enforcement organizations, the mean value score is 3.71, which indicates that the majority of the respondents agreed that local authorities check the health and safety performance of their construction site. Regarding Workers being well educated on how to properly care for and maintain personal protective equipment, the mean values score is 2.33, which indicates that the majority of the respondents disagreed that workers are well educated on how to manage personal protective equipment. Regarding there being a proper health and safety policy at their construction company, the mean score is 2.80, which indicates that the majority of the respondents are neutral on the existence of proper safety and health policy on their construction site. Regarding the safety policy and regulations are the latest updated form, the mean score is 2.57, which indicates the majority of the respondents are neutral in the existence of updated safety and health regulation .regarding the safety policy and regulations are implemented through all phases of the project the mean score is 2.28, which indicated that they disagree on the implementation of safety policy and regulation on all stages of the project. Regarding there is a specific department that manages the safety policy and regulation of the construction site the

mean score is 2.23, which indicated they disagreed on the existence of a specific department that manages the safety policy and regulation on the construction site. Regarding there is a strong safety policy and regulation on site the mean score is 2.37, which indicates they disagreed on the existence of strong safety and policy regulations on the construction site.

Analysis of the standard deviation result

Regarding Inspections conducted by local authorities and health and safety enforcement organizations, the standard deviation result is 1.21, which tells us that the respondent's response for this specific question is far from the total average mean by 1.21. Regarding of Workers being well educated on how to properly care for and maintain personal protective equipment. , the standard deviation result is 1.21, which tells us that the respondent's response for this specific question is far from the total average mean by 1.21. Regarding the existence of a proper health and safety policy in place, the standard deviation result is 1.18, which tells us that the respondent's response for this specific question is far from the total average mean by 1.18. Regarding the safety policy and regulations is the latest update, the standard deviation result is 1.35, which tells us that the respondent's response for this specific question is far from the total average mean by 1.35. Regarding the safety policy and regulations are implemented through all phases of the project, the standard deviation result is 1.24, which tells us that the respondent's response for this specific question far from the total average mean by 1.24. Regarding there is a specific department that manages the safety policy and regulation of the construction site, the standard deviation result is 1.27, which tells us that the respondent's response for this specific question is far from the total average mean by 1.27. Regarding there is strong safety policy and regulation on site the standard deviation result is 1.07, which tells us that the respondent's response for this specific question is far from the total average mean by 1.07.

-from the above data we can analyze the following points related to safety policy and regulation

-authorities of health and safety enforcement conduct the necessary inspection if the necessary safety policy and regulation is implemented in the construction of high rise building .but, there is a gap on the knowledge of construction workers on important safety policies and regulation that are related in constructing high rise building.

-we can analyze from the above data, there is no proper health and safety related policy in high rise building project of the study area and also the safety policy and regulations are not updated daily based on the change of the method of the construction of high-rise building from time to time.

-we can analyze from the above data that, the necessary safety policy and regulation that related to the construction of high rise building in the study area are not implemented through all life time of the high rise building projects which indicates that there is a gap in the consistency of implementing the necessary safety policy regulation in high rise buildings.

-lastly, we can analyze from the above data that there is no specific department or part of office system that manages the proper implementation of the important safety policy and regulation on high rise building projects. From this we can understand that there is gap in the existence of strong safety policy and regulation in high rise building projects.

TABLE 9; FREQUENCY AND PERCENTAGE OF RESPONDENTS' ON SAFETY POLICY AND REGULATION RELATED ISSUES.

	Likert Scale											
	Strongly disagree		disagree		Neutral		agree		Strongly agree		Total	
	F	%	F	%	F	%	F	%	F	%	F	%
Inspections are conducted by local authorities and health and safety enforcement organizations	1	1.8	10	17.5	15	26.3	8	14	22	38.6	56	100
Workers are well educated on the important safety policy and regulation.	13	22.8	27	47.4	5	8.8	6	10.5	5	8.8	56	100
There is a proper health and safety policy in place at your construction company	7	12.3	19	33.3	13	22.8	12	21.1	5	8.8	56	100
The safety policy and regulation are the latest up to date	13	22.8	22	38.6	4	7	10	17.5	7	12.3	56	100

The safety policy and regulation are implemented through all phases of the project	16	28.1	24	42.1	5	8.8	6	10.5	5	8.8	56	100
There is a specific department that manages the safety policy and regulation of the construction site	19	33.3	21	36.8	5	8.8	6	10.5	5	8.8	56	100
There is a strong safety policy and regulation on our site	11	19.3	26	45.6	7	12.3	11	19.3	1	1.8	56	100

Source; own survey (2022)

Now, we can use a relative important index to rank the issues that are related to safety policy and regulation to identify the most important issues related to safety policy and regulation by using the following formula.

$$\text{Relative important index (RII)} = \frac{5\,N5 + 4\,N4 + 3N3 + 2N2 + 1\,N1}{A * N}$$

N5= number of respondents for strongly agree

N4= number of respondents for agree

N3= number of respondents for neutral

N2= number of respondents for disagree

N1= number of respondents for strongly disagree

A (highest weight)

N (total number of respondents)

TABE10; RELATIVE IMPORTANT INDEX RESULT OF SAFETY POLICY AND REGULATION RELATED ISSUES.

	Relative important index(RII)	Importance rank
Inspections are conducted by local authorities and health and safety enforcement organizations	0.74	1
There is a proper health and safety policy in place at your construction company	0.56	2
The safety policy and regulation are the latest up to date	0.51	3
There is a strong safety policy and regulation on our site	0.47	4
There is a strong safety policy and regulation on our site	0.46	5
The safety policy and regulation are implemented through all phases of the project	0.45	6
There is a strong safety policy and regulation on our site	0.44	7

Source; own survey(2022)

-from the above Relative important index data we can analyze that the inspection by local safety authority, the existence of proper safety policy and regulation, and updating the safety policy and regulation are the top three important related issues of safety policy and regulation with Relative important index (RII), 0.74,0.56 and 0.51 respectively. So, giving special attention to this important issues is important in the implementation safety policy and regulation in high rise building projects.

4.3.2. DESCRIPTIVE ANALYSIS OF SAFETY AND HEALTH TRAINING ON CONSTRUCTION SITE

TABLE11; MEAN AND STANDARD DEVIATION OF SAFETY AND HEALTH TRAINING RELATED ISSUES

Descriptive Statistics							
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
There is an appropriate program for workers to learn about health and safety	56	4.00	1.00	5.00	2.3393	1.21021	1.465
I am well trained on safety and health-related issues.	56	4.00	1.00	5.00	2.6607	1.01403	1.028
Safety training is implemented on construction site	56	3.00	2.00	5.00	3.8036	1.10239	1.215
Top management gives emphasis on the safety training program	56	4.00	1.00	5.00	2.1786	1.30881	1.713

There is a control program for the implementation of a safety training program	56	4.00	1.00	5.00	2.5714	1.05928	1.122
An advanced safety training program is implemented	56	3.00	1.00	4.00	2.2500	1.04881	1.100
There is a schedule for safety and health training	56	4.00	1.00	5.00	2.3571	1.34067	1.797
Valid N (list wise)	56						

Source; own survey(2022)

Regarding there is an appropriate program for workers to learn about health and safety the mean score is 2.33, which indicates that the majority of the respondents disagreed on the existence of an appropriate program to give knowledge about health and safety issues on their construction site. Regarding how well are they trained on safety and health-related issue the mean score is 2.66, which indicates that the majority of the respondents remain neutral on the competency of their training status. Regarding Safety and health training that was implemented on the construction site, the mean score is 3.80, which indicated the majority of the respondents agreed with the implementation of safety training on their construction site. Regarding Top management giving emphasis on the safety training program, the mean score is 2.17, which indicated the majority of the respondents disagreed with top management giving the necessary attention to their safety and health-related issue on the construction site. Regarding there is a control program for the implementation of a safety training program the mean score is 2.57, which indicates that the majority of the respondents remain neutral on the existence of a control mechanism for the implementation of a safety training program. Regarding an advanced safety training program implemented the mean score is 2.25,

which indicates that the majority of the respondents remain disagreed on the existence of the latest safety and health training program on their construction site. Regarding there is a schedule for safety and health training the mean score is 2.35, which indicates that the majority of the respondents disagreed with the existence of a scheduled training program on their construction site.

Analysis of the standard deviation result

Regarding there is an appropriate program for workers to learn about health and safety, the standard deviation result is 1.21, which tells us that the respondent's response for this specific question is far from the total average mean by 1.21. Regarding how well are they trained on safety and health-related issue, the standard deviation result is 1.01, which tells us that the respondent's response for this specific question is far from the total average mean by 1.01. Regarding Safety and health training that was implemented on the construction site the standard deviation result is 1.10, which tells us that the respondent's response for this specific question is far from the total average mean by 1.10. Regarding Top management giving emphasis on the safety training program, the standard deviation result is 1.30, which tells us that the respondent's response for this specific question is far from the total average mean by 1.30. Regarding there is a control program for the implementation of a safety training program, the standard deviation result is 1.05, which tells us that the respondent's response for this specific question is far from the total average mean by 1.05. Regarding an advanced safety training program is implemented, the standard deviation result is 1.04, which tells us that the respondent's response for this specific question is far from the total average mean by 1.04. Regarding there is a schedule for safety and health training, the standard deviation result is 1.34, which tells us that the respondent's response for this specific question is far from the total average mean by 1.34.

From the above data, we can analyze the following points related to safety and health training on construction site

-there is no fixed plan and system for construction workers to learn the important safety and health training in high rise building projects. From this we can analyze that, there is a gap in having well trained construction workers on the important safety and health related issue.

-from the above data we can analyze that, top officials in construction projects doesn't give special attention on the implementation of safety training for construction workers

in high rise buildings of the study area. Also there is gap on controlling system of, if safety training is implemented on construction site.

-from the above data we can also analyze, an advanced safety and health training program is not implemented on high rise building projects of the study area. Lastly, the above data tells us that there is no fixed schedule on safety and training to construction workers on high rise building projects.

TABLE 12; FREQUENCY AND PERCENTAGE OF RESPONDENTS' ON SAFETY AND HEALTH TRAINING RELATED ISSUES

	Likert Scale											
	Strongly disagree		disagree		Neutral		agree		Strongly agree		Total	
	F	%	F	%	F	%	F	%	F	%	F	%
There is an appropriate program for workers to learn about health and safety	13	22.8	27	47.4	5	8.8	6	10.5	5	8.8	56	100
I am well trained on safety and health-related issues.	4	7	27	47.4	11	19.3	12	21.1	2	3.5	56	100
Safety training is implemented on construction site	0	0	7	12.3	19	33.3	8	14	22	38.6	56	100
Top management gives emphasis on the safety training program	22	38.6	18	31.6	5	8.8	6	10.5	5	8.8	56	100
There is a control program for the implementation of a safety training program	10	17.5	16	28.1	20	35.1	8	14	2	3.5	56	100

An advanced safety training program is implemented	16	28.1	19	33.3	12	21.1	9	15.8	0	0	56	100
There is a schedule for safety and health training	18	31.6	19	33.3	6	10.5	7	12.3	6	10.5	56	100

Source; own survey (2022)

Now, we can use a relative important index to rank the issues that are related to safety and health training to identify the most important issues related to safety and health training .

Relative important index (RII) = $\frac{5\,N5 + 4\,N4 + 3N3 + 2N2 + 1\,N1}{A * N}$

N5= number of respondents for strongly agree

N4= number of respondents for agree

N3= number of respondents for neutral

N2= number of respondents for disagree

N1= number of respondents for strongly disagree

A (highest weight)

N (total number of respondents)

TABE13; RELATIVE IMPORTANT INDEX RESULT OF SAFETY AND HEALTH TRAINING RELATED ISSUES.

	Relative important index	Importance rank
Safety training is implemented on construction site	0.76	1

An advanced safety training program is implemented	0.56	2
I am well trained on safety and health-related issues	0.53	3
There is a control program for the implementation of a safety training program	0.51	4
There is a schedule for safety and health training	0.47	5
There is an appropriate program for workers to learn about health and safety	0.46	6
Top management gives emphasis on the safety training program	0.43	7

Source; own survey (2022)

-from the above Relative important index data we can analyze that , the implementation of safety training, the existence of advanced safety training, and the training of construction workers on safety and health related issue are the top three important related issues of safety policy and regulation with Relative important index (RII), 0.76,0.56 and 0.53 respectively. So, giving special attention to this important issues is important in the implementation safety and health training in high rise building project

4.3.3. DESCRIPTIVE ANALYSIS OF SAFETY AND HEALTH PRECAUTIONS ON CONSTRUCTION SITE

TABLE14; MEAN AND STANDARD DEVIATION OF SAFETY AND HEALTH PRECAUTIONS RELATED ISSUES

Descriptive Statistics							
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Safety precautions are implemented	56	4.00	1.00	5.00	2.5536	1.27806	1.633

on the construction site.							
I wear personal protective equipment during work on the construction site.	56	4.00	1.00	5.00	3.8750	1.12916	1.275
All necessary safety materials exist on my construction site.	56	4.00	1.00	5.00	2.2679	1.25757	1.581
Our construction site includes all important safety precaution signs.	56	4.00	1.00	5.00	2.7857	1.41054	1.990
Top management gives emphasis on important safety precautions on construction sites.	56	4.00	1.00	5.00	2.1964	1.28516	1.652
There is a controlling	56	4.00	1.00	5.00	2.2321	1.27908	1.636

mechanism for the implementation of all necessary precautions on the construction site.							
All levels of workers in my construction site implement safety and health precautions.	56	4.00	1.00	5.00	2.3750	1.07132	1.148
	56						

Source; own survey (2022)

Regarding Safety and health precautions implemented on the construction site, the mean score is 2.55, which indicated that the majority of the respondents remain neutral on the implementation of safety and health precaution on their construction site. Regarding if they wear personal protective equipment during work on the construction site the mean score is 3.87, which indicated that the majority of the respondents agreed that they wear personal protective equipment during work on their construction site. Regarding All necessary safety materials that exist on their construction site, the mean score is 2.26, which indicated that the majority of the respondents disagreed on the existence of all important safety materials on their construction site. Regarding construction sites including all important safety precaution signs, the mean score is 2.78, which indicated that the majority of the respondents remain neutral that their construction site gives a warning by using all important safety precaution signs. Regarding Top management giving emphasis on important safety precautions on construction sites, the mean score is 2.19, which indicated that the majority of the

respondents disagreed that the top management gives all necessary attention to important safety and health precaution on their construction site. Regarding there is a controlling mechanism for the implementation of all necessary precautions on the construction site the mean score is 2.23, which indicated that the majority of the respondents disagreed with the existence of a controlling mechanism for the implementation of all necessary precautions on their construction site. Regarding all levels of workers in construction site implement safety and health precautions, the mean score is 2.37, which indicated that the majority of the respondents disagreed in if all levels of workers implement safety and health precautions on their construction site

Analyzing the standard deviation result

Regarding Safety and health precautions implemented on the construction site, the standard deviation result is 1.27, which tells us that the respondent's response for this specific question is far from the total average mean by 1.27. Regarding if they wear personal protective equipment during work on the construction site, the standard deviation result is 1.12, which tells us that the respondent's response for this specific question is far from the total average mean by 1.12. Regarding All necessary safety materials that exist on their construction site, the standard deviation result is 1.25, which tells us that the respondent's response for this specific question is far from the total average mean by 1.25. Regarding construction sites including all important safety precaution signs, the standard deviation result is 1.41, which tells us that the respondent's response for this specific question is far from the total average mean by 1.41. Regarding Top management giving emphasis on important safety precautions on construction sites, the standard deviation result is 1.28, which tells us that the respondent's response for this specific question is far from the total average mean by 1.28. Regarding there is a controlling mechanism for the implementation of all necessary precautions on the construction site, the standard deviation result is 1.27, which tells us that the respondent's response for this specific question is far from the total average mean by 1.27. Regarding all levels of workers in construction site implement safety and health precautions, the standard deviation result is 1.07, which tells us that the respondent's response for this specific question is far from the total average mean by 1.07.

From the above data we can analyze the following points related to safety and health precautions on high rise building projects

-there is a gap on implementing the important safety and health precautions on high rise building projects and the existence of all necessary safety and health materials in construction site

-from the above data we can also analyze that, top management doesn't give the necessary attention to the safety and health precaution that must be available in high rise building projects.

-we can also analyze from the above data that, the controlling mechanism for the implementation of safety and health precaution is very poor. Lastly, the data tells us that all level of workers in high rise building projects doesn't implement the needed safety and health precaution on construction site.

TABE15; FREQUENCY AND PERCENTAGE OF RESPONDENTS' OF SAFETY AND HEALTH PRECAUTIONS RELATED ISSUES.

	Likert Scale											
	Strongly disagree		disagree		Neutral		agree		Strongly agree		Total	
	F	%	F	%	F	%	F	%	F	%	F	%
Safety precautions are implemented on the construction site.	10	17.5	27	47.4	3	5.3	10	17.5	6	10.5	56	100
I wear personal protective equipment during work on the construction site.	1	1.8	7	12.3	12	21.1	14	24.6	22	38.6	56	100
All necessary safety materials exist on my construction site.	17	29.8	23	40.4	5	8.8	6	10.5	5	8.8	56	100
Our construction site includes all important safety precaution signs.	10	17.5	20	35.1	10	17.5	4	7	12	21.1	56	100

Top management gives emphasis on important safety precautions on construction sites.	20	35.1	21	36.8	4	7	6	10.5	5	8.8	56	100
There is a controlling mechanism for the implementation of all necessary precautions on the construction site.	19	33.3	21	36.8	5	8.8	6	10.5	5	8.8	56	100
All levels of workers in my construction site implement safety and health precautions.	11	19.3	26	45.6	7	12.3	11	19.3	1	1.8	56	100

Source; own survey(2022)

Now, we can use a relative important index to rank the issues that are related to safety and health precaution to identify the most important issues related to safety and health precaution.

$$\text{Relative important index} = \frac{5N5 + 4N4 + 3N3 + 2N2 + 1N1}{A * N}$$

N5= number of respondents for strongly agree

N4= number of respondents for agree

N3= number of respondents for neutral

N2= number of respondents for disagree

N1= number of respondents for strongly disagree

A (highest weight)

N (total number of respondents)

TABE16; RELATIVE IMPORTANT INDEX RESULT OF SAFETY AND HEALTH PRECAUTIONS RELATED ISSUES.

	Relative important index	Importance rank
I wear personal protective equipment during work on the construction site.	0.77	1
Our construction site includes all important safety precaution signs	0.55	2
Safety precautions are implemented on the construction site.	0.51	3
All levels of workers in my construction site implement safety and health precautions.	0.47	4
All necessary safety materials exist on my construction site.	0.45	5
There is a controlling mechanism for the implementation of all necessary precautions on the construction site.	0.44	6
Top management gives emphasis on important safety precautions on construction sites.	0.43	7

Source; own survey (2022)

- from the above Relative important index data we can analyze that, wearing personal protective equipment, the availability important safety precaution signs, and the

implementation of safety precaution related issue are the top three important related issues of safety and health precaution with Relative important index (RII), 0.77,0.55 and 0.51 respectively. So, giving special attention to this important issues is important in the implementation of safety precaution in high rise building projects.

4.3.4 DESCRIPTIVE ANALYSIS OF IDENTIFICATION OF SAFETY AND HEALTH HAZARD THAT OCCUR OFTEN ON THE CONSTRUCTION SITE

TABLE17; MEAN AND STANDARD DEVIATION IDENTIFICATION OF SAFETY AND HEALTH HAZARD THAT OCCUR OFTEN IN HIGH RISE BUILDINGS OF RELATED ISSUES

Descriptive Statistics							
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
Crane or hoist accidents	56	4.00	1.00	5.00	3.5536	1.24929	1.561
Falls from heights.	56	4.00	1.00	5.00	3.6786	1.28073	1.640
Falling and slipping	56	4.00	1.00	5.00	3.5179	1.38815	1.927
Gas leaks, flames, and explosions	56	4.00	1.00	5.00	2.6250	1.05421	1.111
Electricity (Electric power Accidents)	56	4.00	1.00	5.00	2.3571	1.03447	1.070
Accidents involving forklifts	56	4.00	1.00	5.00	2.5714	1.26286	1.595

Accidents involving machinery.	56	4.00	1.00	5.00	3.0893	1.50486	2.265
Repetitive motion accidents	56	4.00	1.00	5.00	3.7500	1.28275	1.645
Valid N (list wise)	56						

Source; own survey (2022)

Regarding Crane or hoist accidents the mean score is 3.55, this indicates the majority of the respondents agreed that crane or hoist types of accidents occur often on their construction sites. Regarding falls from heights accidents, the mean score is 3.67, this indicates the majority of the respondents agreed that fall types accidents occur often on their construction sites. Regarding Falling and slipping accidents, the mean score is 3.51, this indicates the majority of the respondents agreed that Falling and slipping types accidents occur often on their construction sites. Regarding Gas leaks, flames, and explosions accidents, the mean score is 2.62, this indicates the majority of the respondents remain neutral that Gas leaks, flames, and explosions types of accidents occur often on their construction sites. Regarding Electric power accidents, the mean score is 2.35, this indicates the majority of the respondents disagreed that Electric power types accidents occur often on their construction sites. Regarding Accidents involving forklifts the mean score is 2.57, this indicates the majority of the respondents remain neutral that Accidents involving forklifts types of accidents occur often on their construction sites. Regarding Accidents involving machinery the mean score is 3.08, this indicates the majority of the respondents remain neutral that Accidents involving machinery types of accidents occur often on their construction sites. Regarding Repetitive motion accidents, the mean score is 3.75, which indicates the majority of the respondents agreed that Repetitive motion types of accidents occur often on their construction sites.

Analyzing the standard deviation result

Regarding in identifying if crane or hoist accident occur often, the standard deviation

result is 1.24, which tells us that the respondent's response for this specific question is far from the total average mean by 1.24. Regarding in identifying if Falls from heights accident occur often, the standard deviation result is 1.28, which tells us that the respondent's response for this specific question is far from the total average mean by 1.28. Regarding in identifying Falling and slipping accident occur often, the standard deviation result is 1.38, which tells us that the respondent's response for this specific question is far from the total average mean by 1.38. Regarding in identifying Gas leaks, flames, and explosions accident occur often, the standard deviation result is 1.05, which tells us that the respondent's response for this specific question is far from the total average mean by 1.05. Regarding in identifying Electric power accident occur often, the standard deviation result is 1.03, which tells us that the respondent's response for this specific question is far from the total average mean by 1.03. Regarding in identifying Accidents involving forklifts occur often, the standard deviation result is 1.26, which tells us that the respondent's response for this specific question is far from the total average mean by 1.26.

Regarding in identifying Accidents involving machinery occur often, the standard deviation result is 1.50, which tells us that the respondent's response for this specific question is far from the total average mean by 1.50.Regarding in identifying Repetitive motion accidents occur often, the standard deviation result is 1.28, which tells us that the respondent's response for this specific question is far from the total average mean by 1.28.

TABE18; FREQUENCY AND PERCENTAGE OF RESPONDENTS' OF IDENTIFICATION OF SAFETY AND HEALTH HAZARD THAT OCCUR OFTEN IN HIGH RISE BUILDINGS RELATED ISSUES.

	Likert Scale											
	Strongly disagree		disagree		Neutral		agree		Strongly agree		Total	
	F	%	F	%	F	%	F	%	F	%	F	%
Crane or hoist accidents	4	7	9	15.8	10	17.5	18	31.6	15	26.3	56	100

Falls from heights.	6	10.5	5	8.8	6	10.5	23	40.4	16	28.1	56	100
Falling and slipping	5	8.8	13	22.8	4	7	16	28.1	18	31.6	56	100
Gas leaks, flames, and explosions	6	10.5	25	43.9	11	19.3	12	21.1	2	3.5	56	100
Electricity (Electric power Accidents)	9	15.8	30	52.6	7	12.3	8	14	2	3.5	56	100
Accidents involving forklifts	11	19.3	22	38.6	9	15.8	8	14	6	10.5	56	100
Accidents involving machinery.	11	19.3	12	21.1	9	15.8	9	15.8	15	26.3	56	100
Repetitive motion accidents	3	5.3	7	12.3	15	26.3	7	12.3	24	42.1	56	100

Source; own survey(2022)

Now, we can use a relative important index to rank the hazard that occur often.

Relative important index= $\frac{5\,N5 + 4\,N4 + 3N3 + 2N2 + 1\,N1}{A * N}$

N5= number of respondents for strongly agree

N4= number of respondents for agree

N3= number of respondents for neutral

N2= number of respondents for disagree

N1= number of respondents for strongly disagree

A (highest weight)

N (total number of respondents)

TABE19; RELATIVE IMPORTANT INDEX RESULT OF IDENTIFICATION OF SAFETY AND HEALTH HAZARD THAT OCCUR OFTEN IN HIGH RISE BUILDINGS RELATED ISSUES.

hazards	Relative important index	rank
Repetitive motion accidents	0.75	1
Falls from heights	0.73	2
Crane or hoist accidents	0.71	3
Falling and slipping	0.70	4
Accidents involving machinery	0.61	5
Gas leaks, flames, and explosions	0.52	6
Electricity (Electric power Accidents	0.47	7
Accidents involving forklifts	0.51	8

Source; own survey(2022)

-from the above Relative important index table, we can analyze that Repetitive motion accidents, Falls from heights, Crane or hoist accidents and Falling and slipping are the top 4 repetitive hazards that occur in high rise building having relative importance index of 0.75, 0.73, 0.71 and 0.70.so, this identified hazards needs special attention to stop them from occurring in high rise building projects.

4.3.5 DESCRIPTIVE ANALYSIS OF SAFETY AND HEALTH MANAGEMENT PRACTICES ON THE CONSTRUCTION SITE

TABLE20; MEAN AND STANDARD DEVIATION OF SAFETY AND HEALTH MANAGEMENT PRACTICES ON THE CONSTRUCTION SITE RELATED ISSUES

Descriptive Statistics							
	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance
we have a site-specific health and safety strategy for our construction site	56	4.00	1.00	5.00	3.5357	1.26440	1.599
There is a Safety Officer on your building projects/sites.	56	3.00	2.00	5.00	3.3214	1.14586	1.313
To guarantee worker well-being, your company's health and safety policies are coordinated with other human resource policies.	56	4.00	1.00	5.00	2.9107	1.11644	1.246
Your company creates a written circular/brochure informing employees of the risks involved with their jobs.	56	4.00	1.00	5.00	3.5179	1.38815	1.927
Before starting work in a specific location, workers get a health and safety induction.	56	4.00	1.00	5.00	2.6250	1.05421	1.111
Managers promote and support staff training on health and safety.	56	4.00	1.00	5.00	2.2679	1.10357	1.218
Managers keep a close eye on their projects' health and safety performance.	56	4.00	1.00	5.00	2.5714	1.26286	1.595

Managers ensure that the budget for health and safety is sufficient.	56	4.00	1.00	5.00	2.3929	1.48543	2.206
Valid N (list wise)	56						

Source; own survey (2022)

Regarding having a site-specific health and safety strategy for construction site, the mean score is 3.53, this indicates the majority of the respondents agreed that they have specific health and safety strategy in their construction sites. Regarding there is a Safety Officer in building projects/sites. , the mean score is 3.32, this indicates the majority of the respondents remain neutral that they have safety officer in their construction sites. Regarding company's health and safety policies are coordinated with other human resource policies, the mean score is 2.91, and this indicates the majority of the respondents remain neutral that company's health and safety policies are coordinated with other human resource. Regarding company creates a written circular/brochure informing employees of the risks involved with their jobs, the mean score is 3.51, and this indicates the majority of the respondents agreed that, their Company creates a written circular/brochure to inform employees of the risks involved with their jobs. Regarding workers getting a health and safety induction. , the mean score is 2.6, this indicates the majority of the respondents disagreed that workers having health and safety induction. Regarding Managers promote and support staff training on health and safety, the mean score is 2.26, this indicates the majority of the respondents disagreed that managers supporting training on health and safety. Regarding Managers keep a close eye on their projects' health and safety performance ,the mean score is 2.57, this indicates the majority of the respondents remain neutral that managers giving attention on their project health and safety performance. Regarding Managers ensure that the budget for health and safety is sufficient, the mean score is 2.39, this indicates the majority of the respondents disagreed that managers ensuring allocating enough budget for health safety in their construction site.

Analyzing the standard deviation result

Regarding having a site-specific health and safety strategy for construction site, the standard deviation result is 1.26, which tells us that the respondent's response for this specific question is far from the total average mean by 1.26. Regarding having a Safety Officer on the high-rise building projects/sites , the standard deviation result is 1.14,

which tells us that the respondent's response for this specific question is far from the total average mean by 1.14. Regarding company's health and safety policies are coordinated with other human resource policies, the standard deviation result is 1.11, which tells us that the respondent's response for this specific question is far from the total average mean by 1.21. Regarding company creates a written circular/brochure informing employees of the risks involved with their jobs, the standard deviation result is 1.38, which tells us that the respondent's response for this specific question is far from the total average mean by 1.38. Regarding workers getting a health and safety induction, the standard deviation result is 1.05 which tells us that the respondent's response for this specific question is far from the total average mean by 1.05. . Regarding Managers promote and support staff training on health and safety, the standard deviation result is 1.10 which tells us that the respondent's response for this specific question is far from the total average mean by 1.10. Regarding Managers keep a close eye on their projects' health and safety performance , the standard deviation result is 1.26 which tells us that the respondent's response for this specific question is far from the total average mean by 1.26. Regarding Managers ensure that the budget for health and safety is sufficient, the standard deviation result is 1.48 which tells us that the respondent's response for this specific question is far from the total average mean by 1.48.

From the above data we can analyze the following points on safety and health management practices high rise building projects

-there is a gap in coordinating safety and health polices with other human resources polices in high rise building projects of the researchers study area. Attention is not given to the safety and health polices as other human resource polices.

-the involvement of top managers in promoting the necessary safety and health management practices to the construction workers in high rise building projects in the researchers study area is very poor.

-the controlling mechanism or system of the practice of safety and health management in high-rise buildings of the study area has gap.

-the necessary budget for safety and health management in high rise building projects in the study area is very low and it is not coordinated with other budget of the projects.

-lastly, the general safety health management practice in high-rise building had not got the necessary attention from the concerned body.

TABLE 21; FREQUENCY AND PERCENTAGE OF RESPONDENTS' SAFETY AND HEALTH MANAGEMENT PRACTICES ON THE CONSTRUCTION SITE RELATED ISSUES.

	Likert Scale											
	Strongly disagree		disagree		Neutral		agree		Strongly agree		Total	
	F	%	F	%	F	%	F	%	F	%	F	%
we have a site-specific health and safety strategy for our construction site	1	1.8	15	26.3	12	21.1	9	15.8	19	33.3	56	100
There is a Safety Officer on your building projects/sites.	0	0	19	33.3	11	19.3	15	26.3	11	19.3	56	100
To guarantee worker well-being, your company's health and safety policies are coordinated with other human resource policies.	4	7	18	31.5	20	35.1	7	12.3	7	12.3	56	100
Your company creates a written circular/brochure informing employees of the risks involved with their jobs.	5	8.8	13	22.8	4	7	16	28.1	18	31.6	56	100
Before starting work in a specific location, workers get a health and safety induction.	8	10.5	25	43.9	11	19.3	12	21.1	2	3.5	56	100
Managers promote and support staff training on health and safety.	14	24.6	25	43.9	7	12.3	8	14	2	3.5	56	100
Managers keep a close eye on their projects' health and	11	19.3	22	38.6	9	15.8	8	14	6	10.5	56	100

safety performance.												
Managers ensure that the budget for health and safety is sufficient.	24	42.1	9	15.8	7	12.3	9	15.8	7	12.3	56	100

Source; own survey(2022)

Now, we can use a relative important index to rank the issues that are related to safety and health management practices to identify the most important issues related to safety and health management practices

Relative important index= $\frac{5\,N5 + 4\,N4 + 3N3 + 2N2 + 1\,N1}{A * N}$

N5= number of respondents for strongly agree

N4= number of respondents for agree

N3= number of respondents for neutral

N2= number of respondents for disagree

N1= number of respondents for strongly disagree

A (highest weight)

N (total number of respondents)

TABE22; RELATIVE IMPORTANT INDEX RESULT OF SAFETY AND HEALTH MANAGEMENT PRACTICES RELATED ISSUES.

	Relative important index	Importance rank
Your company creates a written circular/brochure informing employees of the risks involved with their jobs.	0.73	1
we have a site-specific health and safety strategy for our construction site	0.70	2
There is a Safety Officer on your building projects/sites	0.66	3

To guarantee worker well-being, your company's health and safety policies are coordinated with other human resource policies	0.58	4
Before starting work in a specific location, workers get a health and safety induction.	0.53	5
Managers keep a close eye on their projects' health and safety performance	0.51	6
Managers ensure that the budget for health and safety is sufficient.	0.47	7
Managers promote and support staff training on health and safety	0.45	8

Source; own survey (2022)

from the above Relative important index data we can analyze that, creating a written circular/brochure to inform employees of the risks involved with their jobs, having a site-specific health and safety strategy for construction site, having safety officer in building projects related issue are the top three important related issues with safety and health management practices with Relative important index (RII), 0.73, 0.70 and 0.66 respectively. So, giving special attention to this important issues is important in the implementation of good safety and health management practices.

CHAPTER FIVE
SUMMARY, CONCLUSION, RECOMMENDATION AND SUGGESTION FOR FUTURE WORK

5.1. INTRODUCTION

This chapter summarizes the findings, delivers the study's conclusions and suggestions based on the goals, and concludes with a suggestion for further research

5.2 SUMMARY OF MAJOR FINDINGS

- The findings revealed a lack of health and safety measures in the construction of Addis Ababa's high-rise real-estate skyscrapers. The absence of a health and safety management system, the implementation of health and safety policies, the appointment of health and safety personnel, the creation of a health and safety awareness mechanism, good welfare facilities, the provision of PPEs, and evaluation techniques in companies were all identified as major issues. The construction of high-rise buildings is a complicated process that is impacted by a variety of circumstances. Excellent safety management is critical to the success of any construction project.
- The study also revealed that, the necessary safety and health training is not given to construction workers on how to manage safety and health practices on high rise building projects of the study area. Top officials in construction projects doesn't give special attention on the implementation of safety training for construction workers in high rise buildings of the study area. Also there is gap on controlling system of, if safety training is implemented on construction site. The safety training program also doesn't have a planned schedule as other high-rise building projects activities.
- The study also revealed that, the safety policy and regulation is not well known by construction workers in high rise building projects in the study area even by the top management of the projects. The safety policy and regulations are not updated daily based on the change of the method of the construction of high-rise building from time to time. This is so dangerous because new construction methods and technology is employed from time to time, that may need special policy and regulation to accommodate the changing risks associated to that advancement.

- The study also revealed that, the necessary safety and health precaution are not implementing in high rise building study area projects. All necessary safety precaution materials does not exist in the study area of high-rise building projects. Top management doesn't give the necessary attention to the safety and health precaution that must be available in high rise building projects. The controlling mechanism for the implementation of safety and health precaution is very poor. The data tells us that all level of workers in high rise building projects doesn't implement the needed safety and health precaution on construction site. specially low level construction workers like daily labor workers doesn't wear the necessary safety precaution on construction site because the top level construction workers doesn't give the necessary attention to them because of this reports show that construction related accidents and deaths mainly happen to low level construction workers.
- The study findings also show that, the necessary budget for safety and health management in high rise building projects in the study area doesn't have specific plan and it is not coordinated with other budget of the projects. Main emphasis is given finishing the project on time and budget rather than coordinating this project goal to the safety and health of the construction workers. the controlling mechanism or system of the practice of safety and health management in high-rise buildings of the study area has gap
- The study also find that, the most repeated type of hazard that occur in high rise building projects in the study area was, Repetitive motion accidents, Falls from heights, Crane or hoist accidents and Falling and slipping are the top 4 repetitive hazards that occur in high rise building projects of the study araea.so, construction workers and management team of high rise building projects must give extra attention and pre safety measures to avoid accidents and deaths dues to the causes of this identified hazards

5.3 CONCLUSION

According to the findings of the study, health and safety procedures in high-rise real estate structures in Addis Ababa are distant from those of health and safety management systems. It is possible to say that health and safety practices are only found in the country's written conventions. Occupational health and safety regulations and standards may have been established decades ago, but the sad reality is that they have yet to be

implemented. Construction employees are on the front lines of the industry. They are the first to suffer as a result of bad health and safety procedures. Although suitable health and safety law governs construction activity, rules are not enforced by the government, and regulatory agencies charged with assuring compliance are under-resourced to carry out their legal tasks. In managing health and safety on construction sites for high-rise buildings, management commitment and assistance are critical. Despite this, the study found that management commitment to health and safety management is lacking, since workers were not given health and safety training and a suitable health and safety budget was not allocated. Furthermore, managers do not encourage construction workers to participate actively in the management of health and safety on high-rise construction sites, and their monitoring of their project's health and safety performance is limited simply to demonstrate compliance with the rules and regulations. Human's life matters than having a non-living high-rise building. So, all players of the construction industry must give the necessary attention to avoid accidents and deaths in construction industry.

-government bodies must develop a strong safety and health management law and regulation by establishing a strong control mechanism to punish to people who don't respect the necessary safety and health management practices. Top management must get the necessary knowledge on safety health management practices in order to make organizational culture the necessary safety practices in high rise building projects to avoid accidents and deaths in the projects.

-The problem not only affects the employees, but it also affects a large number of other people, either directly or indirectly. Construction health and safety illiteracy affects employees' families, the owner, the customer, the contractor, the construction firm, the construction industry, the city, and the country. The task of creating a healthy and safe culture does not fall to one person, but rather to everyone participating in the sector

5.4. RECOMMENDATION

Suggestions for construction health and safety practices have been made in light of the findings of this study.

To the Construction Company:

-In order to reduce workplace dangers, construction companies should have established in-house health and safety policies and regulations that align with the country's labor law.

-When hiring external contractors, companies must incorporate contractual standards for health and safety management systems in the contract agreement.

-For proper implementation of health and safety practices, there should be a structured Health and Safety management structure.

-A designated health and safety officer should be in charge of implementing and monitoring HS procedures because other managers may be too preoccupied with construction operations.

-Regular health and safety training is required to keep personnel aware of the importance of working in a safe and healthy manner and to remind them of the repercussions of failing to do so.

-Good health and safety facilities should be provided to employees in order to establish a positive working environment and promote employee morale, which will increase the company's production.

- Personal protective equipment (PPE) should be supplied to all workers to assist protect them from injury.

To Construction Workers: -

Project managers, as project leaders, must ensure that HS practices are implemented in projects under their supervision.

-Workers should be primarily accountable for their own well-being.

-At work, employees must follow the health and safety regulations and protect one another.

-workers must report when they spot dangerous safety condition of construction site

To the government:

-In the construction industry, regulatory agencies should enforce OHS policies.

-Project locations should be inspected on a regular and unexpected basis.

-To discipline construction organizations, a reward and punishment system must be implemented.

5.5 SUGGESTION FOR FUTURE RESEARCH

-In the case of Addis Ababa or throughout the country, research may be undertaken to analyze the present system of Health and Safety performance on construction projects, taking into account all participants, builders, users, experts, government, and insurance companies.

-Engineering safety and health performance may be compared to other industries in Ethiopia, such as agriculture and manufacturing.

-Research may be undertaken in other construction sectors, such as tunnels, aviation fields, locomotives, destruction, and maintenance, to better understand the role of owners and consultants in preventing or mitigating construction project accidents.

-It is possible to conduct research to determine the level of harm (accidents and injuries) caused by the construction industry's lack of health and safety management.

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APPENDIX A

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

Dear respondent,

I am a graduate student at Addis Ababa University School of commerce undertaking a degree in Master's project management I am conducting research on the **assessment of health and safety management in constructing a high-rise building.** This questionnaire is designed to collect data on the aforementioned topic for academic purposes Therefore, I kindly ask you to give me a few minutes of your time to answer the questions. The information you will provide will be treated with the utmost confidentiality and will only be used for academic purposes. Thank you in advance for your cooperation. **If the company needs any information can contact me at**
destafekadu96@gmail.com

General Instructions

- You do not need to write your name
- use tick mark (√) to answer the questions on the space provided

Part One: Information about the respondent, company

Direction. Please indicate your response by checking [√], filling in the blanks, or leaving a remark, as applicable.

1.1Personal Information of Respondents

1. Gender Male [ ] Female [ ]

2. Age 20-30 [ ] 30-40[ ] 40-50[ ] Above 50[ ]

3. Job position foreman [ ] Site Engineer [ ] safety Engineer[ ]

structural 〔 〕 Project Manager [ ] residential engineer [ ] manager

Other: Please Specify_____

4. Education background

Diploma [ ] Advance Diploma [ ]

Bachelor's Degree [ ] Master's Degree [ ]

Ph.D. [ ] other: Please Specify_____

5. Work Experience

0- 5 years [ ] 5-10 years [ ] 10- 15 years [ ]

15-20 years [ ] above 20 years [other: Please Specify……..

7. Employment status

Permanent [ ] Temporary/ Contract [ ]

Part 2. Safety policy and regulation on construction site related questions

Choose the number and mark what you choose in the box

Items	Strongly disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly agree (5)
Inspections are conducted by local authorities and health and safety enforcement organizations					
Workers are well educated on how to properly care for and maintain personal protective equipment					
There is a proper health and safety policy in place at your construction company					
The safety policy and regulation are the latest up to date					
The safety policy and regulation are implemented through all phases of the project					
There is a specific department that manages the safety policy and regulation of the construction site					
there is a strong safety policy and regulation on site					

Part 3 safety and health training on the construction site related questions

Choose the number and mark what you choose in the box

Safety and health training	Strongly disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly agree (5)
There is an appropriate program for workers to learn about health and safety					
I am well trained on safety and health-related issues.					
Safety training is implemented on construction site					
Top management gives emphasis on the safety training program					
There is a control program for the implementation of a safety training program					
An advanced safety training program is implemented					
There is a schedule for safety and health training					

Part 4 Safety and health precautions on the construction site related questions

Choose the number and mark what you choose in the box

Items	Strongly disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly agree (5)
Safety precautions are implemented on the construction site.					
I wear personal protective equipment during work on the construction site.					
All necessary safety materials exist on my construction site.					
Our construction site includes all important safety precaution signs.					
Top management gives emphasis on important safety precautions on construction sites.					
There is a controlling mechanism for the implementation of all necessary precautions on the construction site.					
All levels of workers in my construction site implement safety and health precautions.					

Part 5 identification of safety and health hazard on the construction site related questions

Choose the number and mark what you choose in the box

Item no	Description	Hazards occur often.				
		Stronglydisagree(1)	**Disagree (2)**	**Undecided(3)**	**Agree (4)**	**Strongly agree (5)**
1	Crane or hoist accidents					
2	Falls from heights.					
3	Falling and slipping					
4	Gas leaks, flames, and explosions					

5	Electricity (Electric power Accidents					
6	Accidents involving forklifts					
7	Accidents involving machinery.					
8	Repetitive motion accidents					

Part 6 safety and health management practices on the construction site related questions

Choose the number and mark what you choose in the box

Items	Strongly disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly agree (5)
we have a site-specific health and safety strategy for our construction site					
There is a Safety Officer on your building projects/sites.					
To guarantee worker well-being, your company's health and safety policies are coordinated with other human resource policies.					
Your company creates a written circular/brochure informing employees of the risks involved with their jobs.					
Before starting work in a specific location, workers get a health and safety induction.					
Managers promote and support staff training on health and safety.					
Managers keep a close eye on their projects' health and safety performance.					
Managers ensure that the budget for health and safety is sufficient.					