BINDURA UNIVERSITY OF SCIENCE EDUCATION

DEPARTMENT OF ENVIRONMENTAL SCIENCE

AN INVESTIGATION INTO EMPLOYEE EXPOSURE TO HAZARDS ASSOCIATED WITH CONSTRUCTION INDUSTRY. A CASE STUDY OF FOSSIL CONTRACTING COMPANY

RESEARCH PROJECT

SHOKO RACHEL RUBIMBO

(B200721B)

A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE BACHELOR OF SCIENCE HONOURS DEGREE IN SAFETY HEALTH AND ENVIRONMENTAL MANAGEMENT (BSC-SHEM)

DEDICATION

My brother Innocent Gwenzi, who served as my motivation and constantly prayed for me, is remembered in my dissertation. Additionally, I dedicate this research to my family, who have always supported me without fail, and to my close friends, who have always been there for me when I needed them most. Finally, I dedicate this dissertation to the All-Powerful God who created everything and brought me to this point in my life. With you, nothing is insurmountable. I praise the Lord.

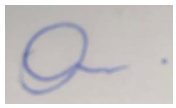
DECLARATION

To be complied by the student

Registration number B200721B

I, Rachel Shoko do hereby declare that this work related project is my original work and has not been submitted before. All the information derived from other sources is indicated in the project.

Student name: Rachel Shoko

Signature of the student 

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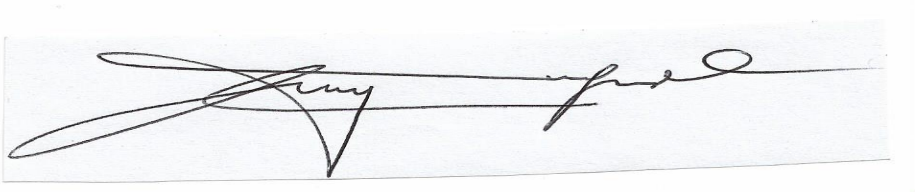
Signature: 

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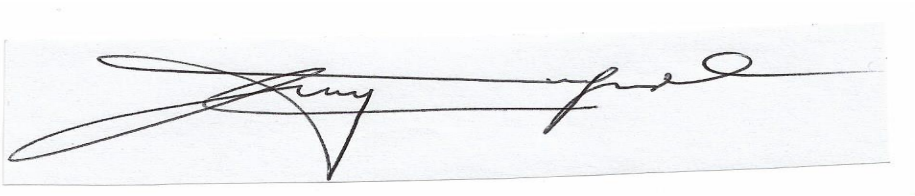
Signature: 

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ABSTRACT

The construction industry poses a wide range of occupational hazards, from falls and machinery accidents to toxic exposures and ergonomic risks, underscoring the critical need for enhanced

safety measures and policy interventions to protect the wellbeing of construction workers. The study objectives aimed at evaluating the particular risks in relation to construction activities, identify the hazards that are common in the industry, and evaluate the safety measures and protocols that Fossil Contracting Company currently implements to reduce employee exposure to construction-related risks. The study used an IBM SPSS 20 application for data analysis and a cross-sectional research methodology. Study participants were selected by stratified random sampling techniques. According to the study, occupational hazards associated with construction activities were dominated by ergonomics 42%, physical 36 %, chemical 12%, biological 8% and combination of two or more 2%, with potential to cause injuries and illnesses. The study recommends that Fossil Contracting Company has to, increase frequency in safety training, conduct safety awareness campaign and allocate funds to support OSH throughout the organization."

LIST OF ABBRIVIATIONS AND ACRONYMS

1. OSHA - Occupational Safety and Health Administration

2. PPE - Personal Protective Equipment

3. HSE - Health, Safety, and Environment

4. MSDS - Material Safety Data Sheet

5. SWMS - Safe Work Method Statement Response

6. HAZCOM - Hazard Communication

7. HSWA - Health and Safety at Work Act

8. NSSA -Zimbabwe National Statistics Agency

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CHAPTER 1:

1.0 INTRODUCTION

1.1 Background to the study

Globally, business in construction gives an upper hand in boosting socioeconomic growth and secures a portion of international trade ILO (2022). The existing laws and regulations in the construction industry are not being fully and properly enforced which is the key challenge. According to Sanni-Anibire (2020), the construction industry harbours a lot of hazards including dust, poor lighting, excavations, wild animals, poor hygiene, falling from heights and extreme weather conditions amongst many other hazards. Global estimates points that over 60 000 fatalities and many more non-fatal health and safety incidents are encountered in construction workplaces yearly ILO (2020). These hazards are sometimes overlooked due to the ill norm of productivity over safety which is a huge problem to the employees. ILO (2021) states the 2 million fatalities are recorded yearly. Work-related illness, injuries and fatalities strain health systems, slows down the productivity has a huge impact on household incomes. (WHO 2021).

The construction sector in the African region is among the least digitalized sectors and it's a challenge when addressing pressing issues of hazards and risks in the industry (Obioye et al., 2021). Many African countries have adopted the laws and regulations on Occupational Health and Safety but have not fully implemented the National Polices and also some countries have not yet adopted this safety culture. ILO (2021) states that the Africa has the highest fatality rates due to occupational injuries and the reports also points out major causes which includes inadequate health and safety legislation and lack of enforcement. Given that Africa is home to many developing nations, the continent's construction sector essentially has to enhance the training standards for better production. This further supported by (Moyo et al., 2019) by mentioning the need for decent working conditions in Zimbabwe.

According to Chapter 28.01 of the National Labour Act of Zimbabwe and Chapter 17.04 of the National Social Security Authority (NSSA) Act, every worker in Zimbabwe is entitled to safety and health benefits (Musungwa 2022). However, according to NSSA trends the construction

industry is accountable for many injuries and fatalities. Though not every company is registered with NSSA and their statistics do not add to the NSSA statistics in line with occupational safety and health (NSSA 2022).

Industries in the Zimbabwean region have not been operating at full capacity as per industry expectations as stated by Nhokovedzo (2022) and Fossil Contracting has not been excluded. Zimbabwe as a developing country has construction industry falling under civil engineering as part of the major contributors to the economy. Civil engineering is a part of engineering that concentrates mainly on design, maintenance of infrastructure and construction Nyanga (2022).

Therefore this study is a way of identifying and picking hazards experienced in the construction industry and finding all possible mitigations and solutions to the risks posed.

1.2 AIMS

To enhance construction workers' health and safety and minimize occupational diseases and injuries

1.3 PROBLEM STATEMENT

Numerous civil and mechanical projects, both inside and outside of Zimbabwe, involve fossil contracting; these endeavours carry risks and hazards to workers' health and safety that could compromise their well-being. To date, no thorough investigation of this kind has been conducted; this study aims to close this gap.

1.4 JUSTIFICATION

This research identifies major and minor hazards in the construction industry, educating employees, contractors, and stakeholders. The benefits of increased safety protocols and training for construction workers include reduced risk of work-related injuries, illnesses, and fatalities. Employers benefit from reduced compensation claims, improved productivity, and a positive brand reputation. Construction industry regulators gain insights to develop effective safety regulations, enabling targeted interventions to address pressing hazards. This commitment to worker safety is demonstrated by the industry's commitment to improving safety. The general public gains from lower expenses connected to injuries, better lives for workers and their families, and the encouragement of a safer, more environmentally friendly sector of the economy.

Investments in infrastructure, urbanization, and housing are boosting the construction industry, with 80% of workers employed in small to medium enterprises (Rahhou et al., 2020).

Occupational hazards cause acute and chronic effects, such as pneumonia, hearing loss, musculoskeletal disorders, and cancers. These risks not only cause losses to organizations but also affect employees and their families. In Zimbabwe, the construction industry takes the second lead in most recorded accidents; this is supported by the 2020 NSSA annual reports. In recent years, safety in the industry has increased, resulting in a reduced number of incidents. The construction industry in the Asian and African regions has seen growth Pushak (2020), and this study aims to enhance research skills and fill gaps in occupational safety in Zimbabwe. Legal institutions can also benefit from this research, as a healthy working environment is best achieved by mitigating and controlling hazards associated with activities that cannot be eliminated. Zimbabwe's on-going infrastructural development projects contribute to the emergence of new construction-related hazards.

1.5 OBJECTIVES

1. To assess hazards common at Fossil Construction Company,

2. To assess risks associated with construction activities at Fossil Contracting Company.

3. Assess the current safety measures and protocols implemented by Fossil Contracting Company to mitigate employee exposure to construction-related hazards.

1.6 RESEARCH QUESTIONS

1. What specific risks are there in the construction business, specifically at Fossil Contracting Company, and their impact on safety issues for employees?

2. How effective are the current safety measures and protocols implemented by Fossil Contracting Company in mitigating employee exposure to construction-related hazards, and what areas require improvement?

3. What is the impact of employee exposure to construction hazards on the health and well-being of individuals within Fossil Contracting Company, considering both short-term and long-term effects?

4. What are the best practices and successful strategies employed by other construction companies in reducing employee exposure to hazards, and how can these be adapted to propose effective recommendations for enhancing safety within Fossil Contracting Company?

1.67LIMITATIONS OF THE STUDY

1. Single-Company Focus

The study's focus on Fossil Contracting Company may limit the generalizability of findings to the broader construction industry, as company-specific practices and conditions may differ.

2. Data Accuracy and Reporting Bias

Reliance on reported data assumes accuracy and completeness, but potential underreporting or bias in incident records may affect the comprehensiveness of the analysis.

3. Dynamic Nature of Hazards

Construction hazards evolve over time, and the study may not capture emerging risks or changes in the industry landscape after the data cutoff point.

4. Resource Constraints

Limitations in time, budget, or access to certain information may restrict the depth and breadth of the study, impacting the thoroughness of the analysis.

5. Human Factor Variability

Individual differences in employee behavior, perception of risk, and adherence to safety protocols may introduce variability that is challenging to fully account for in the study.

6. External Influences

The study assumes that external factors (e.g., economic changes, regulatory updates) remain relatively stable during the research period, but unforeseen events could influence the study's findings.

7. Historical Data Reliance

The study relies on historical data, assuming that past records accurately represent the conditions and practices at Fossil Contracting Company. Changes over time may not be fully captured.

CHAPTER 2:

2.0 LITERATURE REVIEW

2.1 OVERVIEW OF THE CONSTRUCTION INDUSTRY

The industry is dominated by the small to medium-sizes enterprises (SME's) up to 90% World Bank (2020). Mining and quarrying, manufacturing plants, refineries, and chemical processing mills are all included in the category of industrial construction. Most projects are of low value mainly housing, road construction and bridges however commercial building and infruscture is done by large companies which work on high value projects Maskuriy (2019).

According to ILO (2021) report, approximately 1, 3 million people are employed in the construction industry with over 60 000 small to medium-sizes enterprises (SME's) involved in the sector. Most of these SME's lacks adequate financing and other resources since they are not legally registered. The industry heavily depends on imports thus 70% of the materials used are imports United Nations (2021).

Being a developing country, Zimbabwe has the construction sector as part of the economy booster. There is an increase in the demand for housing hence the sector has the opportunity to play a major role also creating many job opportunities Taruvinga (2019). According to the report by the World Bank (2020), the construction industry has a shot of improving the country's economic situation by increase in private sector participation and increase in funding.

Furthermore, Taruvinga (2019) points out a number of challenges being faced in the construction industry which includes high inflation, lack of skilled labour and lack of investments showing how these challenges are hindering the industry from reaching its full potential and also providing recommendations.

Despite the many challenges being faced by the industry, there is an improvement in the private sector investment in many projects. Also there is a positive change in foreign direct investment. Adding onto that, the local government made a major input in improving the business environment in the construction works including the new regulation and policies Zimbabwe National Statistics Agency (2022).

The Zimbabwean construction industry is governed by various laws and regulations which regulate different aspects of the industry the likes of project approval, environmental impact

assessments and the safety and health standards. These laws and regulations also clearly show stakeholder role and responsibilities.

The Labour Act [Chapter 28.01], the Pneumoconiosis Act [Chapter 15:08], the Factories and Works Act [Chapter 14.08] and the Environmental Management Act [Chapter 20:27] are the primary laws and regulations that typically govern the construction industry.

2.2 EVALUATION OF SPECIFIC HAZARDS IN THE CONSTRUCTION INDUSTRY

According to Ayodele (2020), a foundational understanding of common construction hazards, emphasizing the need for a nuanced approach is very necessary. Smith et al., (2017) emphasize the importance of adapting safety measures to the evolving nature of construction projects. Yamin et al., (2018) emphasize the holistic implications of construction-related hazards on the workforce. Hinze & Thurman (2014) guide the exploration of alternative safety program scenarios, ensuring a targeted, evidence-based analysis for safety enhancement recommendations.

The construction industry faces various hazards, including those associated with advanced technologies and social factors. Smithson's work of (2020) emphasizes the importance of recognizing traditional risks while staying updated on emerging hazards. Garcia et al., (2021) explore the social aspects of construction hazards, focusing on worker behavior and collaboration. Jones and Wang (2019) provide insights into environmental hazards, particularly in environmentally sensitive areas or materials with known ecological risks.

According to Chen et al., (2022), discuss the implications of global trends on construction safety, emphasizing the need for an evaluation that transcends regional boundaries. Li and Liang (2018) highlight the psychological aspects of construction hazards, emphasizing stress and fatigue. Patel and Desai (2017) explore the role of sensors, artificial intelligence, and data analytics in enhancing construction safety.

By incorporating these perspectives, Fossil Contracting Company can navigate the complexities of an ever-evolving construction landscape, considering not only existing hazards but also anticipating and adapting to emerging challenges. Smithson's research (2020) highlights the importance of staying abreast of the evolving landscape shaped by innovations in construction methodologies. Garcia et al., (2021) emphasize the impact of interpersonal dynamics and communication on hazard recognition and mitigation.

Jones and Wang's study (2019) highlights the potential environmental hazards associated with construction activities, particularly in environmentally sensitive areas or materials with known ecological risks. By incorporating these diverse sources, the evaluation of specific hazards within Fossil Contracting Company becomes enriched with a nuanced understanding of emerging, social, and environmental dimensions.

2.2.1 PHYSICAL HAZARDS

The industry has many physical hazards which include harsh temperatures, radiation, noise, vibration, and inadequate lighting Lama et al., (2019). Working on heights, welding, operating earth moving machines amongst many other activities and they pose hazards like falling from heights (scaffoldings and ladders), electrocution, vibrations, being ran over by machines OSHA (2020). Studies say that 74% of respondents agreed noise as major physical hazard Shrestha (2020) and also falls are another common type of physical hazard. Workers should be aware of these hazards and their sources and following safety guidelines and standard operating procedures can help prevent these hazards Ball (2021). Also leadership, training and communication help in creating a safe working environment.

2.2.2CHEMICAL HAZARDS

Ball (2021)mentions that there are also many chemical hazards encounters in the construction industry which come in various forms the likes of fumes, dust, vapors, gas, and mists. Silica is ma mineral found in many construction materials like concrete, mortar and bricks Malley (2020). These chemicals come in various forms some are liquid and semi-liquid for example glues or can be in form of powders like cement. Additionally, it was noted by Lama et al., (2019) that hazardous gases, chemical spills, and dusts including cement, sand, and silica provide the most frequent chemical hazards at the site. Mesothelioma is an uncommon kind of cancer that can be brought on by asbestos exposure (Roby 2016). Utilizing engineering controls, such as the installation of a controlled ventilation system (such as a chemical fume hood or biological safety cabinet), PPE, and administrative controls, such as signs, training, documented safety plans, supervision, operating procedures, etc., can assist prevent exposure, according to NIOSH (2021).

2.2.3 BIOLOGICAL HAZARDS

Biological threats include germs, viruses, infectious waste, infestations, and other allergies, according to Shrestha (2020). In the construction industry, biological hazards are the stressors

mostly faced by women Mirrian (2021). The climate in Zimbabwe is hot and humid thus it creates ideal conditions for mold growth in materials like wood, drywall and concrete which cause a variety of health problems like allergies, asthma and other respiratory issues Gallon et al., (2020). Dust mites are another biological hazard as they live in the dust and cause allergic reaction to some people when inhaled as they are found in carpets, upholstered furniture and other places where dust can accumulate Miller et al., (2019). Use of pesticides and other chemicals in construction industry create biological hazard if workers get in contact with them. These chemicals causes skin irritations, skin burns and skin dermatitis among other conditions Aalto-Korte et al., (2020).

2.2.4 ERGONOMIC HAZARDS

To minimize the number of fatalities associated with confined spaces, ergonomic risks arising from physical hazards must be closely monitored Arifin (2023). Proper ventilation and lighting are two ergonomic dangers that are often disregarded in the workplace. Because most construction jobs involve maintaining the same position for extended periods of time, construction workers frequently experience pain and discomfort in their shoulders, backs, necks, legs, and other body components Ishwarya et al., (2021). Nevertheless, many workers turn to conventional treatments to get over their discomforts because of financial difficulties or social standing, but occasionally the majority of construction workers get musculoskeletal illnesses (MSDs) that render them incapable of performing their jobs. Workers who perform physical operations like welding are at risk for musculoskeletal problems due to the repetitive motions and awkward working postures involved in the job Chiboyiwa (2022). Lama et al., (2019) state that in support operations such as rock bolting and shotcreting, etc. Additionally, drilling a basic platform is employed, which increases the risk of back, neck, leg, and other pains.

2.2.4PSYCHOLOGICAL HAZARDS

Despite safety safeguards, workers in the construction industry nevertheless experience stress related to mental and physical health problems. Stress and strain lead to psychological risks Shrestha (2020).

The failure to apply ergonomic principles can also result in risks, such as improperly constructed machinery, mechanical devices, worker tools, etc. (Lama et al., 2019).

2.3 ASSESSSMENT OF FOSSIL CONTRACTING COMPANY'S SAFETY MEASURES

Fossil Contracting Company is undergoing an evaluation of its safety measures to ensure employee well-being and a secure work environment. The assessment will consider industry standards, best practices, and the company's adaptability to its unique operational context. The evaluation will evaluate the company's safety policies, training programs, and equipment implementation. It will also assess the company's safety training, its coverage of hazards, and employee reinforcement of safety knowledge. Comparative analysis will be used to benchmark Fossil Contracting's safety measures against industry standards and successful practices. The evaluation will also assess organizational culture, leadership involvement, employee involvement, incident analysis, and commitment to continuous improvement aiming to identify opportunities for improvement beyond regulatory compliance.

2.4 IMPACT OF EMPLOYEE EXPOSURE ON HEALTH AND WELL-BEING

The main research objective focuses on the impact of employee exposure to construction hazards on health and well-being. The study explores the physical and mental health implications of prolonged exposure to construction-related risks, including immediate health issues such as respiratory issues and musculoskeletal disorders. The demanding nature of construction work and the potential for accidents contribute to heightened stress levels and mental health concerns Yamin et al., (2018). Long-term exposure to construction hazards may result in chronic health conditions, impacting overall well-being.

The analysis will consider both short-term effects that manifest during or immediately after exposure and long-term consequences that become apparent over an extended period. A holistic approach is essential for preserving and enhancing the overall health and well-being of the workforce. Yen et al., (2021) provide insights into the short-term physical effects, emphasizing the immediate health toll associated with construction-related exposures. Zhang and Liu (2019) emphasize the importance of recognizing stress as a precursor to more severe mental health conditions, emphasizing the significance of early interventions and support mechanisms to safeguard employees' overall well-being. Chen and Wang (2020) add depth to the understanding of chronic health conditions resulting from prolonged exposure to construction hazards, emphasizing the need for continuous health monitoring and proactive management strategies within the workplace.

In Fossil Contracting Company, an individualized analysis will consider the unique challenges associated with the company's projects and operational practices, ensuring that health and safety

measures are not only aligned with industry standards but also tailored to address the specific risks faced by employees. Transformational leadership, as advocated by Smith et al., (2017), plays a pivotal role in shaping a positive work environment and fostering a safety-conscious culture.

CHAPTER 3:

3.0 RESEARCH METHODOLOGY

3.1 INTRODUCTION

An overview of the study approach used to look at workplace injuries in the construction industry is given in this chapter. It addresses the demographic sample size and composition in addition to data collection, analysis, and design. The study's limits and ethical issues are examined, and the results are intended to enhance industry safety and make the workplace safer and healthier for all workers.

3.2 STUDY AREA

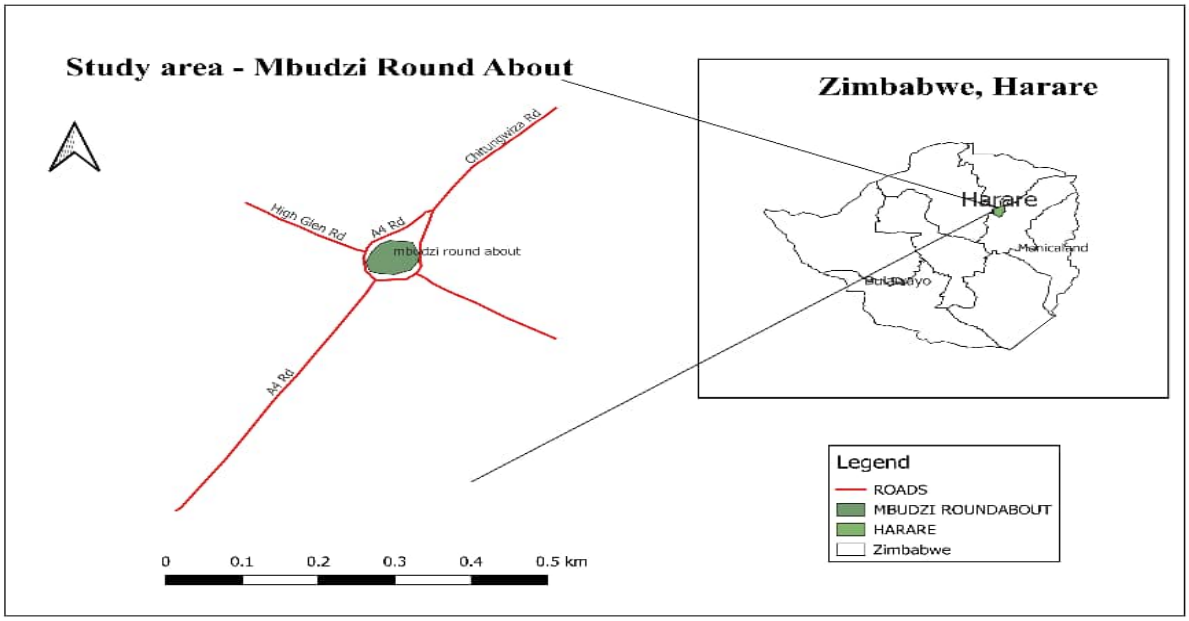


Fig 3.1Study area map for Fossil Contracting Mbudzi Roundabout Area

Fossil Contracting Company is a contracting company based in Zimbabwe that ventures into civil engineering that's design, construction, maintaining of the infrastructure the likes of roads, bridges and buildings it also does contract mining. The company emerged into existence in 2010 having over 100 workers. It has ventured into many projects collaborating with companies like Masimba Construction Company. Currently it has 14 on-going projects the likes of the Mbudzi Roundabout Rehabilitation along Masvingo highway, which is a joint project with Tensor Construction Company, Fossil Contracting and Masimba Construction Company commonly known as TEFOMA. This analysis is mainly based on the Mbudzi Roundabout Rehabilitation along the Masvingo highway from Harare.

3.3 CROSS SECTIONAL RESEARCH DESIGN

Investigating the risks that construction workers encounter as well as the contributing factors was the reason of the research. Using a cross-sectional methodology, the study examined workers' exposure to hazards as well as personal and work-related variables at a specific moment in time. Data were gathered from workers at several employment sites. The researchers used interviews, questionnaires, and observations to gather data. This approach allowed for a snapshot of hazardous conditions and worker characteristics across multiple sites and projects, identifying the most prevalent hazards and understanding how individual, job-related, and organizational factors contribute to worker exposure and risk.

3.4 TARGET POPULATION

Employees at Fossil Contracting Company, a medium-sized construction company with its headquarters located in Harare, Zimbabwe's capital, make up the study's target demographic. The company employs about over 100 people, working in a range of construction trades such as carpentry, electrical, plumbing, and HVAC; its workforce is made up of both union and non-union workers as well as full- and part-time workers; these workers come from a diverse range of backgrounds and experiences.

3.5 SAMPLE AND SAMPLING PROCEDURES

The population was segmented into smaller groups and selecting a random sample from each stratum. This method increased the representativeness of the sample. The sample was stratified based on work position and full-time versus part-time employment. The study's 50 participants resulted in a 95% confidence level and a 5% margin of error. IBM SPSS Statistics was utilized for data analysis, while paper-based methods were employed for administering the questionnaire.

The formula is: n = N * (n'/N')

n = total number of samples (50 in this example)

N is the total population.

n' = each stratum's intended sample size

N' = number of people in each stratum

The entire population size (N) and the entire size for each stratum (N').

- Entire population size (N) = 200

- There are 4 strata, with the following population sizes:

- n'1 = 50 n'2= 60 n'3= 40 n'4= 50

Now, to calculate the sample size for each stratum (n'):

n'1 = 50 * (50/200) = 12.5 (rounded to 13)

n'2 = 60 * (50/200) = 15

n'3 = 40 * (50/200) = 10

n'4 = 50 * (50/200) = 12.5 (rounded to 13)

n = 13 + 15 + 10 + 13 = 51 (rounded up from 50)

3.6 DATA COLLECTION INSTRUMENTS

3.6.1 DATA SOURCES

Interviews and questionnaires were used as data collecting techniques to get the information required for this study. This type of data is gathered by researchers straight from primary sources via surveys, experiments, interviews, and other means. Since primary data are usually collected directly from the source of the data, they are regarded as the best kind of data in study. The target population and the study's objectives must be established before choosing the data collection source. Market research and student dissertations are two examples.

For this study, secondary data sources included internal sources of information such as reports, financial statements, and other internal documentation. Secondary data examined previously obtained data that was not needed for the current purpose and was presented in a format that made evaluation simple. Secondary data is the information that has been made accessible for use in research initiatives by secondary sources. It consists of previously acquired historical data. Newspapers, books, journals, government documents, and personal sources are examples of secondary data sources.

3.6.2 COLLECTION INSTRUMENTS

Questionnaires were used to gather data for the study. A questionnaire, according to Khothari (2019), is a document that the researcher creates with different types of questions that respondents are required to answer. He continued by stating that there are two types of questionnaires: structured and unstructured (meaning no possible answers). Kumar (2018) put into practice the notion that the questions should be clear and uncomplicated so that everyone could understand their meaning. It is possible to reach a reasonable conclusion because surveys are easy to evaluate. Questionnaires are not only cost-effective but also have a wide geographic reach Saunder (2019).

However, using surveys has disadvantages and there's no guarantee you'll get a response. Kothari (2019) asserts that incomplete questionnaires are typical in domains where study participants lack comprehension of the topic matter. Furthermore, participation is limited to the literate, and respondents may misunderstand queries.

Interviews

The participants were interviewed face-to-face in a two-way conversation. The researcher conducted interviews as a means of gathering data. The researcher found that conducting interviews was advantageous as it allowed them to observe nonverbal signs from the respondents and form a more reliable assessment of their responses. Generally speaking, interviews allowed the researcher to gather rich data. On the other hand, some interviewers could reserve their responses because they believe that certain topics are delicate or private.

3.7 DATA ANALYSIS AND PRESENTATION

Analysing and presentation of data is another important part of the research process. This section will describe how the data was analysed and interpreted, and how the findings are presented. There are a few steps that should be taken when analysing and presenting data from a cross-sectional study on employee exposure. The first step was the data collection, including measures of central tendency and dispersion. It was followed by summarizing the findings from the data, including any significant findings and trends. Comparing the findings to existing literature on the topic was done. The findings are supposed to be presented in an easy-to-understand format, such as tables, graphs, or figures. Lastly interpret the findings and discuss their implications.

3.7.1 RELIABILITY ANA VALIDITY

Validity refers to how well a study evaluates what it is meant to measure. Here, it's critical to make sure that the methods of assessment are precise in determining the level of exposure to

potential risks and the resulting health effects. The importance of the data in answering the study's goals and research questions was taken into account while determining whether the data was legitimate. The accuracy and dependability of the tools used to evaluate exposure is referred to as measurement validity. The question of whether the variables being measured are genuinely connected to risk exposure is known as construct validity.

The consistency and repetition of the study's findings are referred to as reliability. This implies that if the study is conducted again, the same procedures ought to yield comparable outcomes. According to Cook and Campbell (2018), a researcher's measurement consistency is known as reliability. The accuracy of the data is determined by the manner in which the events are done. For the measurements to be dependable, the researcher had to be accurate. Accuracy and precision levels, as well as a description of how events are conducted, are also components of reliability. The precision and accuracy of the instrument might be referred to as reliability.

Test-retest reliability is the capacity to repeat a study and get the same findings. The question of whether various researchers witnessing the same situation would yield identical results is known as inter-ratter reliability. The question of whether the study's many components are consistent with one another is known as internal consistency.

3.7.2ETHICAL CONSIDERATION

Throughout the whole research procedure, the study's ethical considerations were closely monitored. All participants gave their informed consent after being made aware of the study's objectives and the possible risks and rewards of taking part, which was the first step in the research process. Second, the researcher employed pseudonyms and removed identifying information from the transcripts in order to protect the participants' privacy and anonymity. Third, the researcher ensured that participants were allowed to drop out of the research at any point and ensuring their safety during the research process.

The researcher made sure that the research was carried out with respect for the employees in addition to the ethical considerations mentioned above. To make sure the research was carried out in a way that was appropriate for the workers, the researcher conferred with management team. In order to guarantee that the study's conclusions would be disseminated in a way that would benefit the employee community, the researcher also got in touch with local stakeholders. Additionally, the researcher took care to recognize the efforts made by both the employees and the study's participants to the dissemination of the results.

Finally, no material found in the study was plagiarized because the researcher conducted the research herself, not by replicating data from another source. The section of references included a list of all the references for the literature and structure used in this investigation. Thus, the researcher conducted the study in its entirety.

CHAPTER 4:

4.0 Results

4.1 DEMEGRAPHIC DETAILS

Table 4.1 displays the results of the demographic data collected from Fossil Contracting Company personnel. The findings indicate that men make up the majority of employees (54%). The most dominant age group is 30-44 years (46%) and the least dominant are the elderly with 2%. Most of the employees are either married (40%) or single (38%) and the rest are widows and widowers. The results show that most of the majority of the worker have tertiary education (76%) and the least qualification is O'Level (22%). Most of the worker are permanent workers (50%) with at least a year to five years of experience Shona (48%) being the most common language.

GENDER	**FREQUENCY**	**PERCENTAGE**
MALE	26	52
FEMAL	23	46
OTHER	1	2

Table 4.1 Gender of participants

Age range (years)	**Number of participants**
18-29	16
30-44	23
45-59	10
60+	1
Total	**50**

Table 4.2 Age of participants

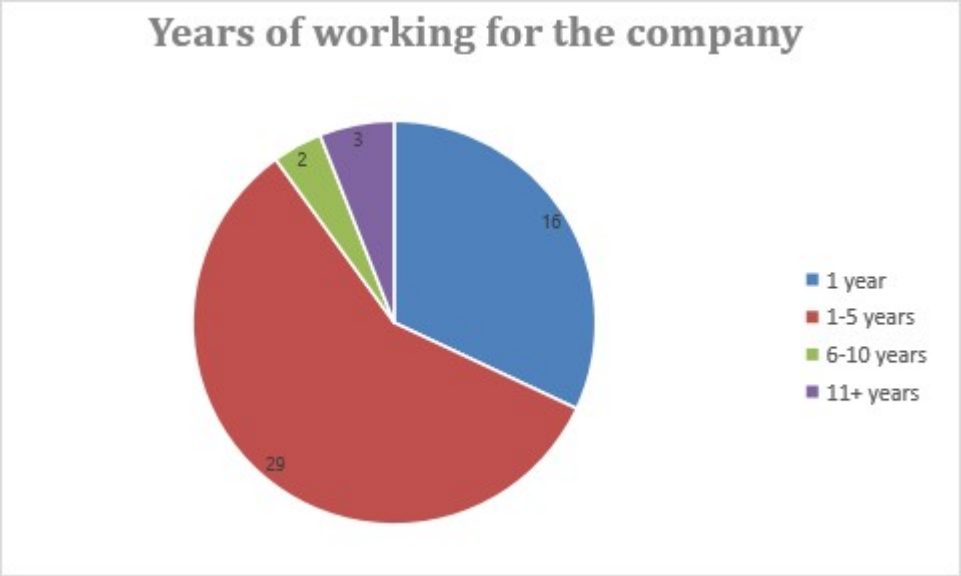


Fig 4.1 Years of working for the company

4.2 OCCUPATIONAL HAZARDS PREVALENT INT THE CONSTRUCTIONJ INDUSTRY

Findings indicate that the major hazards in the industry are ergonomic hazards (42%) followed by physical hazards (36%) and the least common hazards are the biological hazards (8%). The Fossil Contracting Company basically faced almost all the hazards. The construction workers frequently face musculoskeletal related diseases (26%) and noise (6%) is the least of their worries.

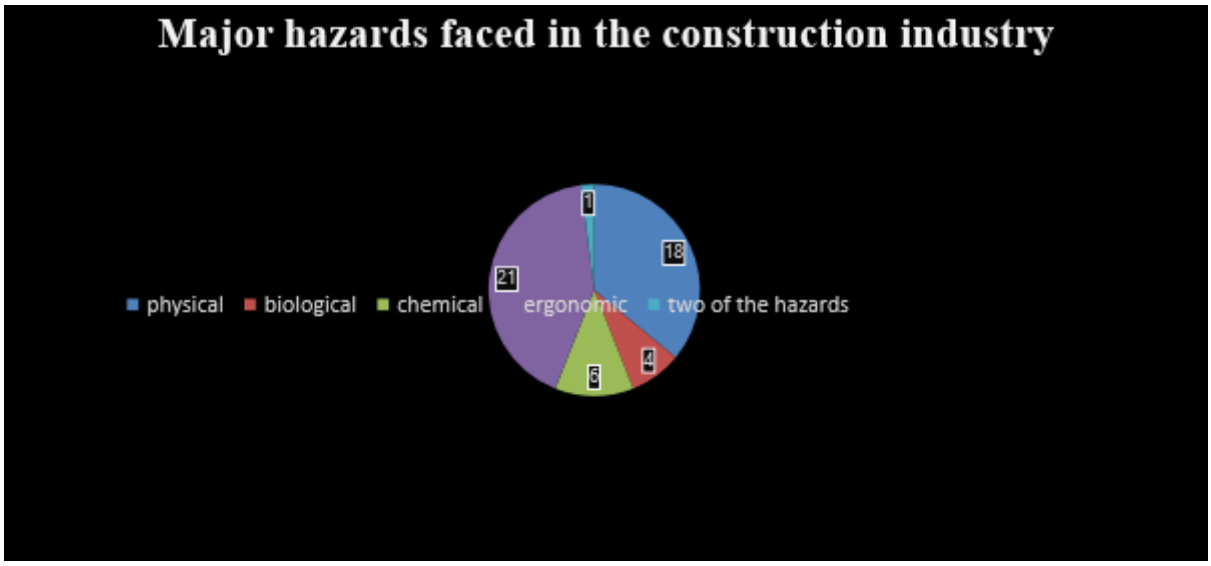


Fig 4.2 Major hazards faced in the construction industry

4.3 ASSESSMENT OF RISKS ASSOCIATED WITH CONSTRUCTION ACTIVITIES FOCUSING ON FOSSIL CONTRACTING COMPANY, IN REGARDS TO EMPLOYEEE HEALTH AND SAFETY

The risks associated with construction activities mostly emanate from ergonomic related activities as reported by almost half of the sample size (21 people) and less risks come from biological hazards (4 people). Majority of the risks arise due to engineering safety violations (30%) and administrative safety violations (28%) also PPE playing a significant part. 64% of the employees are moderately exposed to the hazards and 36% of the workers are extremely exposed.

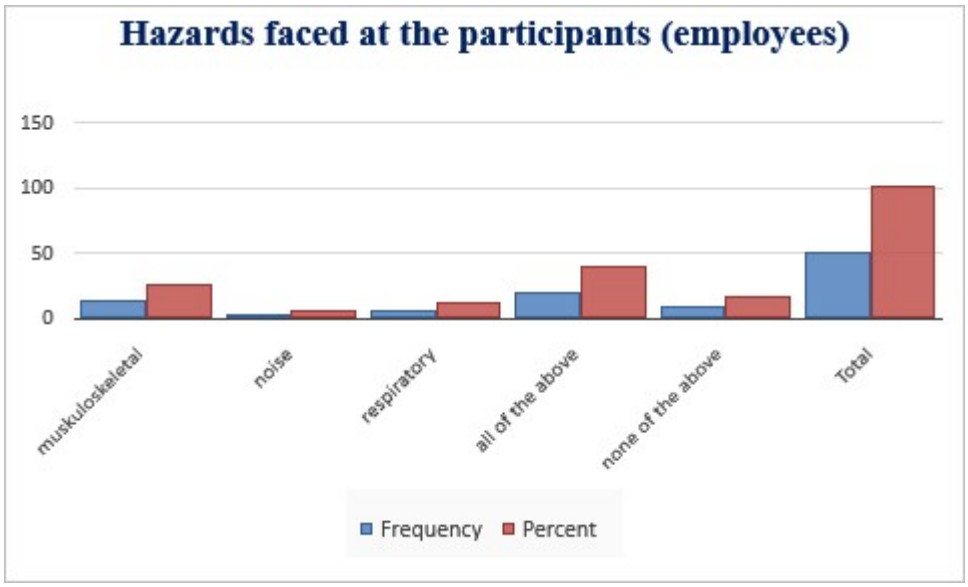


Fig 4.3 Hazards faced at the company

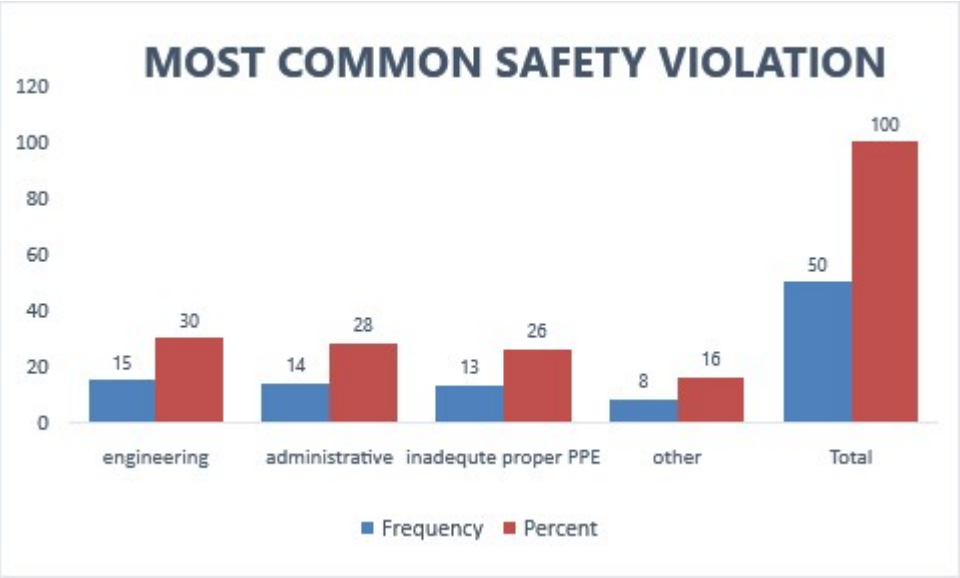


Fig 4.4 Most common safety violations done by the company

4.4. ASSESSMENT OF THE CURRENT SAFETY MEASURES ANAD PROTOCOLS IMPLEMENTED BY FOSSIL CPONTRACTING COMPANY TO MITIGATE EMPLOYEE EXPOSURE TO CONSTRUCTION RELATED HAZARDS

The company has safety measures and protocols which are 34% partially effective and 4% fully effective. These measure are communicated largely through meetings and e-communication (64%) and fewer communication are done through notice boards (36%). 54% of the employees are partially aware of the safety protocols and measure and 10% of the workers are not aware at all.

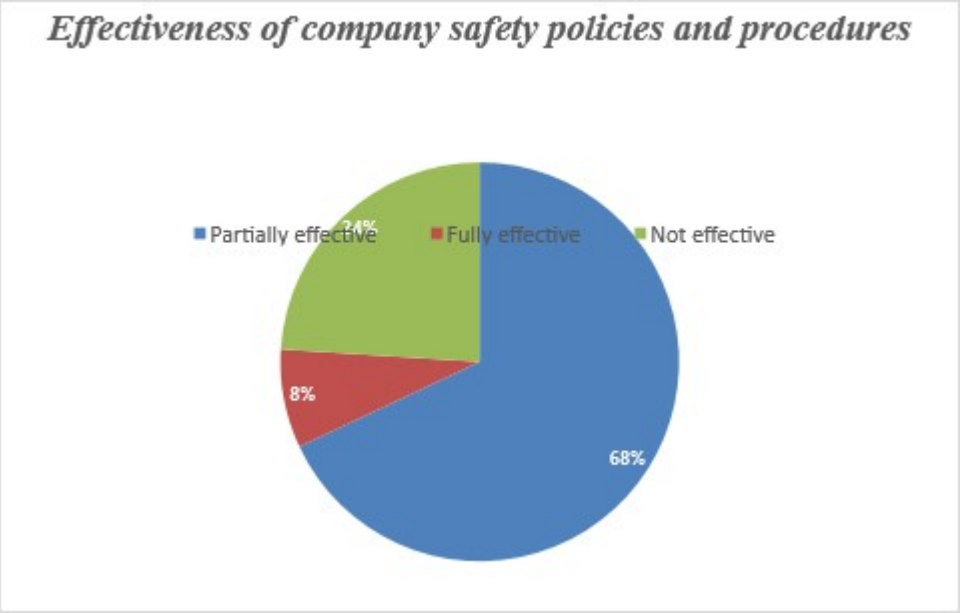
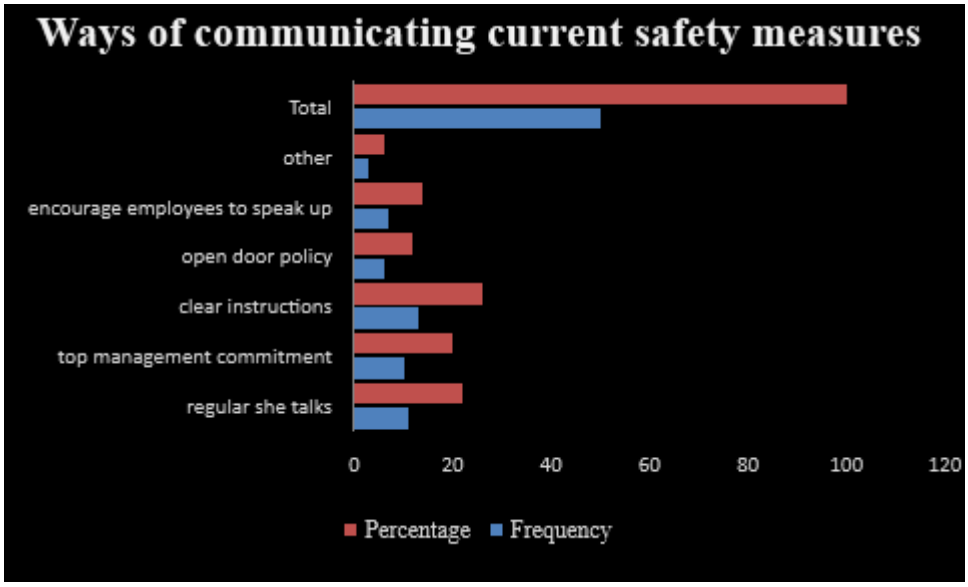


Table 4.3 Effectiveness of company safety policies and procedures



CHAPTER 5:

5.0 DISCUSSION

The previous chapter's primary subjects were the data presentation and the interpretation of the findings. This chapter's main topic is a discussion of study findings with a literary connection. The conclusions given in the previous chapter serve as the basis for the discussion. Chapter two literatures were used to support or contradict the main conclusions.

5.1 SPECIFIC HAZARDS PREVALENT IN THE CONSTRUCTION INDUSTRY

Results reveal that ergonomic and physical hazards pose major risks to the workforce. Physically demanding jobs including heavy lifting, repetitive motions, and extended standing are common in the construction industry. These activities may increase the risk of physical and ergonomic dangers Dias Barkokebas (2021). An increased risk of musculoskeletal injuries and poor body mechanics might result from inadequate training in safe work practices and correct ergonomics. According to Ndiwa (2020) ergonomic hazards may grow if engineering controls, such as ergonomic tools and equipment, are not implemented. One way to raise the risk of injury is to use old or incorrectly adjusted equipment. The construction business, one of the industries that cannot be avoided, requires large numbers of workers to collaborate at various stages in an atmosphere where high standards for safety and health must be met Rajkumar (2021).

There are frequently strict timelines and productivity goals for construction projects. Employees who are under time pressure may take shortcuts and put themselves at risk for ergonomic hazards Rahman(2023). Weariness and an elevated risk of ergonomic injuries might be caused by insufficient breaks and rest periods. Because exhaustion affects a worker's ability to think clearly and act with coordination, it increases the likelihood that they will get into an accident and get hurt. According to Patial (2022) hazard assessment has been shown to be an effective way to lower the frequency of these injury risk factors. However, construction workers lack full awareness and knowledge about the risks involved. The evaluation methods that are being employed can be broadly divided into five categories: wearable body sensors, direct measurement, distant sensing, self-report, and observation Yadav (2022)

Abukhashabah (2020) supports that the construction company has put in place extensive systems for communicating potential chemical and biological hazards, along with the risks connected with them and the essential precautions to take strict guidelines being put into place for the

handling, disposal, and storage of dangerous substances. By doing this, the chance of coming into contact with dangerous substances can be reduced. Workers can be shielded from chemical and biological threats by having access to and using (PPE) such as masks, gloves, and protective clothes Luhar (2019). Effective ventilation systems have been put in place by the organization to reduce and manage exposure to dangerous materials and airborne pollutants. The company has concentrated on adhering to pertinent laws and guidelines concerning chemical and biological dangers, which has enhanced safety procedures and decreased exposure.

5.2 RISKS ASSOCIATED WITH CONSTRUCTION ACTIVITIES ATA FOSSIL CONTRACTING COMPANY

Among the sample size, 21 participants at Fossil Contracting Company pointed that the majority of risks reported were associated with ergonomic activities. This shows that activities requiring awkward postures, strong exertions, repetitive actions, and manual material handling contribute significantly to the total risk profile. The construction manufacturing sector provides a regulated and controlled work environment, requiring fewer movements for tasks compared to traditional building Al-Hussein (2019)... Out of the total sample size, only four individuals reported biological hazard risks. This suggests that the construction operations under investigation involve relatively little exposure to biological agents, such as infectious diseases or dangerous biological elements Venugopal (2021).

The data shows that engineering safety violations account for a significant portion of the risks (30%). This implies that the hazards highlighted are a result of mishandled equipment maintenance, insufficient guarding, or a lack of safety devices—failures in the implementation of engineering controls. Of the hazards reported, 28% are related to administrative safety violations. According to Choe (2020) this suggests that inadequacies in safety regulations, protocols, and supervision could be a factor in the development of risks. Inadequate safety management systems, inadequate training, and poor danger communication are a few examples of administrative safety violations Singh (2021).

According to Hanani's (2024) research on comprehensive assessments of occupational hazards, information indicates that a significant contributing factor to risk reduction is the usage of personal protective equipment (PPE). This implies that providing and using PPE appropriately are useful strategies for reducing the risks that have been identified Lama (2019). According to the analysis, 36% of the employees are categorized as severely exposed, and 64% of the employees are classed as moderately exposed to the identified hazards. Kuye (2021) supports

that this analysis suggests that a sizeable section of the labour force is at a risk level that is greater, necessitating more focus and focused measures to reduce exposure and mitigate related risks.

5.3 THE CURRENT SAFETY MEASURES AND PROTOCOLS IMPLEMENTED BY FOSSIL CONTRACTING COMPANY

According to the data, 34% of safety regulations and measures are deemed moderately effective, while only 4% are assessed as entirely effective. This implies that there is potential for enhancing the overall efficacy of the safety protocols that have been put in place. Sanni-Anibire (2020) is in agreement with the continual improvement in efficiency and achieving zero incidents and optimal safety performance is currently the industry's motto (Zwetsloot et al., 2013, Zwetsloot et al., 2017). Safety measures have been developed in order to lower accident rates and enhance the overall safety performance of building projects. Meetings and electronic messages are the primary means of communicating safety procedures and guidelines (64%). This suggests that the organization heavily depends on these channels for the distribution of safety-related news and updates Abdel-Qader (2021). In addition, notice boards are used for 36% of communication. It's critical to make sure that the communication strategies selected reach every employee and promote comprehension and adherence to safety procedures Munsch (2021).

A significant percentage of the workforce needs more education and awareness training, as evidenced by the data that shows 54% of the workforce only has a limited understanding of the safety procedures and measures. According to Ahmed (2021), inadequate resources and lack of awareness and education are top ranked challenges.

Additionally, 10% of the employees is said to be completely ignorant of the safety procedures. This emphasizes the necessity of better training methods and communication techniques to guarantee that all staff members are aware of the safety procedures and guidelines in place Loosemore (2019).

To find areas that need improvement, safety procedures and processes must be thoroughly reviewed. This could entail risk analyses, more engineering controls, updated safety guidelines, and implementation resources. Given that people are less likely to remember safety precautions and regulations, visual aids, safety signage, and toolbox presentations can improve current communication channels Gao (2019). It is necessary to create a thorough safety training program

that includes on boarding, refresher courses, and focused sessions for certain hazards. Employees should be given clear safety guides. It is important to foster a safety-focused culture through committees, regular meetings, and participation initiatives You (2020).

CHAPTER 6:

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

These results suggest that Fossil Contracting Company should make it a top priority to address ergonomic dangers by putting engineering controls in place, providing appropriate training on ergonomics, and encouraging the use appropriate equipment that are ergonomically built. Reducing the total risk profile can also be achieved by correcting the found engineering and administrative safety violations and making sure that the safety requirements are followed. To prioritize risk reduction initiatives and identify areas requiring immediate attention, regular monitoring and assessment of exposure levels should be carried out.

6.2 RECOMMANDATIONS

A comprehensive safety program should be established to identify, evaluate, and reduce physical and ergonomic risks. This includes frequent safety meetings and staff training on safety protocols. A competent ergonomics professional should conduct an ergonomic examination of workstations, tools, and equipment to reduce musculoskeletal injuries. Proper personal protective equipment (PPE) should be provided to all employees, including hard helmets, safety goggles, earplugs, gloves, and steel-toed boots. Engineering controls should be implemented to reduce physical risks, such as barricades, ventilation systems, guardrails, and safety nets. A strong safety culture should be developed within the company, encouraging honest communication, rewarding safe conduct, and promptly resolving safety concerns. Regularly evaluating and updating safety policies is necessary to meet evolving ergonomic and physical risks and industry best practices.

REFERENCES

A Kuye, R., Nget, M., PS Jatta, S., & Barrow, A. (2021). Occupational Health and Safety Risks and Hazards among Workers in the Gambian Building Construction Sites: A Mixed-Method Study Design. *Journal of Scientific Research and Reports*, *27*(9), 19-31.

Aalto-Korte, K., Koskela, K. and Pesonen, M., 2020. Construction workers' skin disorders in the Finnish Register of Occupational Diseases 2005-2016. *Contact dermatitis*, *83*(6), pp.437-440-441.

Abdel-Qader, M. A., & Abdel, M. A. (2021). The influence of e-conferences and e-meetings on increasing communication skills among leaders in Jordanian mining and manufacturing industries

Abioye, S. O., Oyedele, L. O., Akanbi, L., Ajayi, A., Delgado, J. M. D., Bilal, M., ... & Ahmed, A. (2021). Artificial intelligence in the construction industry: A review of present status, opportunities and future challenges. *Journal of Building Engineering*, *44*, 103299.

Abukhashabah, E., Summan, A., & Balkhyour, M. (2020). Occupational accidents and injuries in construction industry in Jeddah city. *Saudi Journal of Biological Sciences*, *27*(8), 1992-1999.
Anwer, S., Li, H., Antwi-Afari, M. F., & Wong, A. Y. L. (2021). Associations between physical or psychosocial risk factors and work-related musculoskeletal disorders in construction workers based on literature in the last 20 years: A systematic review. *International Journal of Industrial Ergonomics*, *83*, 103113.

Arar, A.J., Papineau, C. and Poirier, E., 2022. An empirical evaluation of the causes leading to binding dispute resolution mechanisms in the Quebec construction industry. *International Journal of Construction Management*, pp.1-10.

Arifin, K., Ahmad, M.A., Abas, A. and Ali, M.X.M., 2023. Systematic literature review: Characteristics of confined space hazards in the construction sector. *Results in Engineering*, p.101188.

Ayodele, O.A., Chang-Richards, A. and González, V., 2020. Factors affecting workforce turnover in the construction sector: A systematic review. *Journal of construction engineering and management*, *146*(2), p.03119010.

Casal, B., Rivera, B. and Costa-Storti, C., 2023. Economic recession, illicit drug use and the young population: a systematic literature review and meta-analysis. *Perspectives in public health*, p.17579139231180751.

Choe, S., & Leite, F. (2020). Transforming inherent safety risk in the construction Industry: A safety risk generation and control model. *Safety science*, *124*, 104594.

Dias Barkokebas, R., & Li, X. (2021). Use of virtual reality to assess the ergonomic risk of industrialized construction tasks. *Journal of Construction Engineering and Management*, *147*(3), 04020183.

Gallon, V., Le Cann, P., Sanchez, M., Dematteo, C. and Le Bot, B., 2020. Emissions of VOCs, SVOCs, and mold during the construction process: Contribution to indoor air quality and future occupants' exposure. *Indoor air*, *30*(4), pp.691-710.

Gao, Y., Gonzalez, V. A., & Yiu, T. W. (2019). The effectiveness of traditional tools and computer-aided technologies for health and safety training in the construction sector: A systematic review. *Computers & Education*, *138*, 101-115.

Guerra, B.C. and Leite, F., 2021. Circular economy in the construction industry: An overview of United States stakeholders' awareness, major challenges, and enablers. *Resources, conservation and recycling*, *170*, p.105617.

Hajaghazadeh, M., Marvi-Milan, H., Khalkhali, H., & Mohebbi, I. (2019). Assessing the ergonomic exposure for construction workers during construction of residential buildings. *Work*, *62*(3), 410-420.

Hanani, A. D., Yuhan, A., Imron, I., Sutjipto, A. G. E., & Adesta, E. Y. T. (2024). A Multifaceted Assessments of Occupational Hazards in a Building Construction Site: Insights from a Case Study. *Engineering Headway*, *3*, 65-76.

https://www.alert-software.com/blog/author/caroline-duncan

Ishwarya, G. A., & Rajkumar, D. (2021). Analysis of ergonomic risk factors in construction industry. *Materials Today: Proceedings*, *37*, 2415-2418.

Kowalik, T., Logoń, D., Maj, M., Rybak, J., Ubysz, A. and Wojtowicz, A., 2019. Chemical hazards in construction industry. In *E3S Web of Conferences* (Vol. 97, p. 03032). EDP Sciences.

Lama, C., Sah, D. P., & Mishra, A. K. (2019). Occupational hazards identification and their risk assessment during the construction of head race tunnel in middle Bhotekoshi hydroelectric project. *International Journal of Research-Granthaalayah*, *7*(3), 226-249

Li, X., Gül, M., & Al-Hussein, M. (2019). An improved physical demand analysis framework based on ergonomic risk assessment tools for the manufacturing industry. *International Journal of Industrial Ergonomics*, *70*, 58-69.

Loosemore, M., & Malouf, N. (2019). Safety training and positive safety attitude formation in the Australian construction industry. *Safety science*, *113*, 233-243.

Luhar, S., & Luhar, I. (2019). Potential application of E-wastes in construction industry: A review. *Construction and Building Materials*, *203*, 222-240.

Mariam, A.T., Olalusi, O.B. and Haupt, T.C., 2021. A scientometric review and meta-analysis of the health and safety of women in construction: structure and research trends. *Journal of Engineering, Design and Technology*, *19*(2), pp.446-466.

Maskuriy, R., Selamat, A., Maresova, P., Krejcar, O., & David, O. O. (2019). Industry 4.0 for the construction industry: Review of management perspective. *Economies*, *7*(3), 68.

Miller, J.D., 2019. The role of dust mites in allergy. *Clinical reviews in allergy & immunology*, *57*(3), pp.312-329.

Moyo, T., Crafford, G. and Emuze, F., 2019. Decent working conditions for improved construction workers' productivity on Zimbabwean building projects. *Acta Structilia*, *26*(2), pp.1-38.

Munsch, A. (2021). Millennial and generation Z digital marketing communication and advertising effectiveness: A qualitative exploration. *Journal of Global Scholars of Marketing Science*, *31*(1), 10-29.

Ndiwa, S. C. (2020). *Ergonomic risk factors among workers in building construction sites in Mombasa County* (Doctoral dissertation, JKUAT-IEET).

Nyanga, T., 2022. Managerial Strategies to Curtail Workplace Induced Accidents in Small to Medium Enterprses (SMEs) in The Construction Industry in Masvingo Urban, Zimbabwe. *Business Excellence and Management*, *12*(1), pp.5-16.

Patial, R., Gusain, H., Yadav, B. P., & Siddiqui, N. A. (2022). A Review of Ergonomic Risk Assessment Techniques Employed in Construction Industry. *Advances in Construction Safety: Proceedings of HSFEA 2020*, 117-131.

Rahman, M. H., Ghasemi, A., Dai, F., & Ryu, J. (2023). Review of Emerging Technologies for Reducing Ergonomic Hazards in Construction Workplaces. *Buildings*, *13*(12), 2967.

Sanni-Anibire, M. O., Mahmoud, A. S., Hassanain, M. A., & Salami, B. A. (2020). A risk assessment approach for enhancing construction safety performance. *Safety science*, *121*, 15-29.

Shrestha, S., 2020. Occupational Hazards in Building Construction. *SCITECH Nepal*, *15*(1), pp.16-21.

Singh, A., & Misra, S. C. (2021). Safety performance & evaluation framework in Indian construction industry. *Safety science*, *134*, 105023.

Venugopal, V., & Sasidharan, A. (2021). Seafood industry effluents: Environmental hazards, treatment and resource recovery. *Journal of Environmental Chemical Engineering*, *9*(2), 104758.

V.S. Shaisundaram *et al.*,Investigation on the effect of thermal barrier coating at different dosing levels of cerium oxide nanoparticle fuel on diesel in a CI engine

Yap, J.B.H., Chow, I.N. and Shavarebi, K., 2019. Criticality of construction industry problems in developing countries: Analyzing Malaysian projects. *Journal of Management in Engineering*, *35*(5), p.04019020.

You, Z., & Feng, L. (2020). Integration of industry 4.0 related technologies in construction industry: a framework of cyber-physical system. *Ieee Access*, *8*, 122908-122922.

Sanni-Anibire, M. O., Mahmoud, A. S., Hassanain, M. A., & Salami, B. A. (2020). A risk assessment approach for enhancing construction safety performance. *Safety science*, *121*, 15-29.

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APPENDIX1: QUESTIONANNAIRE

Section A. Self-introduction

My name is Rachel Ruvimbo Shoko (B200721B), a final-year student at Bindura University of Science Education, pursuing a degree in safety, health, and environmental management. Please help me with my research project, "AN INVESTIGATION INTO EMPLOYEE EXPOSURE FROM HAZARDS ASSOCIATED WITH CONSTRUCTION INDUSTRY." A FOSSIL CONTRACTING COMPANY CASE STUDY. For academic purposes, volunteers who are willing to take part in this research will be asked to fill-in this questionnaire, which will collect information relevant to this study. We will be very grateful for your help.

Section B. Socio-Demographic Characteristics of the Respondent

- ✓ **Tick where applicable**

1) Sex Male Female

2) Age 15 – 29 yrs. 30 – 44 yrs. 45 – 59 yrs. 60yrs+

3) Marital status Single Married Widow Widower

4) Educational level 'O' level 'A' level ertiary Other Specify _____

5) Language spoken English Shona Ndebele Other Specify _____

6) Religion Christianity Muslim African Traditional Religion Other Specify__

7) Employment Contracting Permanent

8) Years of working for Fossil Contracting Company 1 year 1-5 years 6-10 years 11^{+} yea

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Section C. Objective 1: Evaluate the specific hazards prevalent in the construction industry, focusing on Fossil Contracting Company, to identify potential risks to employee health and safety.

1) What are the main hazards in the construction industry, and how might they impact employee health and safety?

Physical Biological

Chemical Ergonomic

Specify _

2) What are the specific hazards associated with working at Fossil Contracting Company?

- ☐ Musculoskeletal diseases
- ☐ Respiratory diseases
- ☐ Noise
- ☐ All of the above
- ☐ None of the above

3) are there any current company safety procedures and policies, and how effective are they at preventing employee injury?

- ☐ Partially effective
- ☐ fully effective
- ☐ Not effective
- ☐ none of the above
- ☐ There are no policies and procedures at all

Specify _

3) What additional safety measures would you recommend to improve the safety of Fossil Contracting Company's employees?

?

- ☐ Training and Awareness Programs
- ☐ Safety Leadership
- ☐ Health Surveillance
- ☐ Communication and Reporting

Specify _

Section C. Objective 2: Assess the current safety measures and protocols implemented by Fossil Contracting Company to mitigate employee exposure to construction-related hazards, and identify areas for improvement.

1) How are the current safety measures and protocols implemented by Fossil Contracting Company communicated to employees?

- Through meetings and e-communication
- Use of awareness campaigns and safety talks
- Notice boards
- None of the above

Specify _

2) How do employees respond to the current safety measures and protocols?

- Certain safety measures are too burdensome and might not follow them as a result.
- Employees might feel that the safety measures are not effective and might choose to take their own risks.
- Discouraged from following safety measures by the co-worker's behaviour.
- None of the above

Specify _

3) Are there any safety measures that have been particularly effective, or any that have been ineffective?

The effective measure:

- The use of personal protective equipment (PPE) has been effective
- Having a comprehensive written safety program that includes regular inspections and training.

☐ Having a clearly defined chain of command for reporting and investigating accidents and near-misses.

☐ Conducting regular risk assessments to identify and address potential hazards.

☐ Having a safety culture that encourages employees to speak up about safety concerns.

☐ None of the above

The ineffective measures:

☐ Safety rules that are too vague or complex to understand or follow.

☐ A lack of accountability for safety issues.

☐ Safety measures that are not tailored to the specific needs of the workplace.

☐ A lack of communication about safety policies.

☐ Safety measures that are not properly enforced.

☐ An over-reliance on personal protective equipment without addressing the root causes of hazards.

☐ A lack of regular training on safety policies and procedures.

Specify _

4) What are the company's most common safety violations, and the potential causes?

☐ Not properly training employees on safety procedures.

☐ Not properly maintaining equipment and machinery.

☐ Failing to enforce safety rules and policies.

☐ Not reporting and investigating accidents and near-misses.

☐ Not providing adequate personal protective equipment.

☐ Not properly labelling hazardous materials.

None of the above

5) . To what extent do you feel exposed to construction-related hazards in your daily work?

Not exposed at all

Slightly exposed

Moderately exposed

Highly exposed

Extremely exposed

Specify _

6) In your opinio[illegible]hat additional safety measures or improvements would enhance employee well-being in the workplace?

- [Open-ended response]

7) Are you aware of the procedure for reporting safety concerns or incidents at your workplace?

- [ ] Yes
- [ ] No
- [ ] Partially aware

8) Do you feel comfortable reporting safety concerns or incidents?

- [ ] Yes
- [ ] No
- [ ] Neutral

9) What challenges, if any, do you face in adhering to safety protocols at your workplace?

- [Open-ended response]

10). Do you believe there is enough collaboration between management and employees regarding safety issues?

- [ ] Strongly agree
- [ ] Agree
- [ ] Neutral
- [ ] Disagree
- [ ] Strongly disagree

11). What measures, if any, would you suggest to improve communication and collaboration on safety matters?

- [Open-ended response]

[END OF QUESTIONAIRE]

Thank you so much

APPENDIX 2: ANSWERING A QUESTIONNAIRE WITH ONE OF THE PARTICIPANTS

APPENDIX 3: EXPLAINING SOME OF THE QUESTIONS ON THE QUESTIONNAIRE TO THE PARTICIPANTS