PREVALENCE OF WORK-RELATED INJURIES AND ASSOCIATED FACTORS AMONG WORKERS AT TWO SUGAR INDUSTRIES IN TANZANIA

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PREVALENCE OF WORK-RELATED INJURIES AND ASSOCIATED FACTORS AMONG WORKERS AT TWO SUGAR INDUSTRIES IN TANZANIA.

By

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A Dissertation Submitted in (Partial) Fulfilment of the Requirements for the Degree of Master of Public Health of Muhimbili University of Health and Allied Sciences

October, 2024

CERTIFICATION.

The undersigned certifies that he has read and hereby recommends for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled; **Prevalence of work-related injuries and associated factors among workers at two sugar industries in Tanzania.",** in (partial) fulfilment of the requirements for the degree of Master of Public Health of Muhimbili University of Health and Allied Sciences.

_____

Prof Simon Mamuya

(Supervisor)

_____

Date

DECLARATION AND COPYRIGHT.

I, **Isaya Charles Mwera,** declare that this **dissertation** is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature: ……. **Date…**……

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DEDICATION.

To my beloved family,

Your unwavering love, support, and encouragement have been my constant source of strength. This work is dedicated to you, for without your sacrifices and belief in me, this journey would not have been possible. Thank you for always standing by my side.

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ABBREVIATION.

CI	Confidence Interval.
HIRA	Hazards Identification and Risk Assessment
ILO	International Labour Organization.
OSH	Occupational Safety and Health.
OREP	Occupational Risk Exposure Profile
OSHA	Occupational Safety and Health Authority.
PI	Principal Investigator
PPE	Personal Protective Equipment.
SD	Standard Deviation.
SEM	Social Ecological Model
SDG	Sustainable Development Goal
SPSS	Statistical Package for Social Science.
WHO	World Health Organization.
WRI	Work-Related Injuries.

DEFINITION OF OPERATIONAL TERMS

Occupational Safety and Health (OSH): refers to the discipline focused on promoting and ensuring workplace safety, health, and welfare. It involves identifying hazards, implementing safety measures, and creating regulations to prevent work-related injuries and illnesses. The ultimate goal is to protect workers' well-being and improve overall workplace conditions.

Occupational Injuries (Work-Related Injuries): Occupational injuries are physical injuries or health conditions that occur due to work-related activities or environments. They can be acute (e.g., accidents) or chronic (e.g., repetitive strain) and may lead to medical treatment and lost work time.

Sleeping disorders: are conditions that disrupt normal sleep patterns, affecting sleep quality, duration, or timing. Common types include insomnia and sleep apnea. These disorders can lead to daytime sleepiness and cognitive impairments, increasing the risk of work-related injuries by compromising concentration and reaction times. Addressing sleep disorders is crucial for improving workplace safety and reducing injury rates.

The sugar industry involves the production, processing, and distribution of sugar derived from sugarcane and sugar beets. This sector plays a significant role in global agriculture and the economy, providing raw sugar for food and beverages. It also delves into various by-products, such as molasses and ethanol, contributing to renewable energy and other industries.

ABSTRACT

Background

Work-related injuries pose significant challenges to public health and socioeconomic development. According to the International Labour Organization, an estimated 2.3 million workers die globally from work-related injuries and diseases, with approximately 340 million occupational injuries reported annually. This study addresses information gaps regarding occupational safety and health practices in work environments. Assessing the prevalence and factors associated with work-related injuries in Tanzania's sugar industry is crucial for informing policy and improving safety measures, ultimately aiming to reduce injury rates and enhance worker well-being.

Methods

This analytical cross-sectional study employed a quantitative approach and involved 338 workers from two sugar cane industries in Tanzania who participated in the last production season. A stratified sampling technique was used to recruit participants. Data collection included a questionnaire with structured questions and an environmental observation checklist. Data were analyzed using SPSS version 20, with descriptive, bivariate, and multivariate analyses presented in tables, figures, and text. For multivariate, a p-value of < 0.05 was considered statistically significant at the 95% confidence level.

Results

The overall prevalence of work-related injuries for the last production season was 14.8%. Significant factors associated with the occurrence of these injuries included being aged 51 years and above [AOR: 3.119, 95% CI (1.279 – 34.821)], having a tertiary or higher educational status [AOR: 2.063, 95% CI (1.581–7.322)], alcohol consumption [AOR: 1.958, 95% CI (1.706 – 5.433)], and experiencing sleeping disorders [AOR: 1.391, 95% CI (1.358–5.406)]. In contrast, regular Occupational Safety and Health supervision [AOR: 0.307, 95% CI (0.171–0.581)] and the use of personal protective equipment (PPE) [AOR: 0.875, 95% CI (0.199–0.890)] were identified as protective factors against work-related injuries.

Conclusion and recommendations

The prevalence of work-related injuries was low compared to Sub-Saharan countries. Key factors included old age, educational status, alcohol consumption, and sleeping disorders.

Implementing an occupational health and safety management system, controlling workplace hazards, providing personal protective equipment, and offering relevant training could have helped prevent these injuries.

CHAPTER ONE.
1.0 INTRODUCTION.

1.1 Background Information.

Work-related injuries pose significant challenges to public health and socioeconomic development, especially in developing countries where occupational safety and health receive limited attention [1]. This lack of focus is particularly prominent in low-income countries, leading to epidemic levels of work-related injuries that result in adverse health outcomes and impede socioeconomic progress in these regions.

According to the latest data from the International Labour Organization (ILO) 2023, nearly 3 million individuals, both men and women, die from work-related accidents and diseases globally, which translates to over 7,500 deaths each day [2]. In addition to this alarming statistic, approximately 374 million occupational accidents are reported annually worldwide [3]. These figures highlight the critical need for improved workplace safety measures and effective health management systems to mitigate the risks associated with occupational hazards.

Globally, around 884 million individuals are engaged in agricultural production, making up 50% of the workforce [4]. Only 9% of these workers are in industrialized countries, with the Asia-Pacific region housing the largest share at 74%, followed by Africa at 16% and Latin America at 3% [4]. These figures highlight agriculture's critical role as a source of employment, especially in developing regions, and underscore the need for targeted policies to improve worker safety and well-being in the sector.

The sugar industry is vital for the country's development, but workers in industrial and agricultural roles face various injuries and illnesses due to unfavourable conditions, ranging from minor to potentially fatal incidents [5]. These injuries also result in chronic pain, psychological stress, and social exclusion, negatively impacting workers' quality of life. To enhance worker well-being and productivity, it is essential to implement improved safety measures and health programs that address these challenge.

The agricultural and agro-processing sectors are recognized as among the most hazardous occupations globally. In many countries, the incidence of fatal accidents in agriculture is twice the average rate in other industries. According to ILO estimates, of the 335,000 fatal workplace accidents reported worldwide, about 170,000 occur within the agricultural workforce [6]. The extensive use of machinery and agrochemicals, particularly pesticides, further heightens the risks associated with these occupations.

Agriculture is the primary source of employment in sub-Saharan Africa, where work-related injuries are common [7]. A study published in the Journal of Occupational Health in 2018 reported that the prevalence of work-related injuries in the region varies from 1.6% to 20.4%, depending on the country and specific employment sector [8]. A study by the Workers Compensation Fund in Tanzania found that individuals working in the agriculture, food, and beverage sectors face an increased risk of work-related accidents [9]. This underscores the need for enhanced safety measures and training to mitigate these risks in these high-hazard industries.

Tanzania has set a goal to elevate its economic status to that of an upper-middle-income country by 2050, primarily through industrialization [10, 11]. However, this transition towards industrialization presents various obstacles, one of which involves effectively tackling issues related to occupational safety and health practices, delivery of occupational health services, occupational injuries, and diseases [9]. It is imperative to address these challenges comprehensively to ensure the achievement of Tanzania's vision for full industrialization.

It is unacceptable for individuals to suffer due to work-related factors, as this raises issues of equity. Occupational injuries lead to significant financial losses, affecting national health systems, social security, and overall productivity [12]. These negative impacts impose considerable costs on employers and society. Fortunately, many effective and affordable preventive measures have long been established to mitigate these consequences.

Work occupies a significant portion of individuals' lives, making occupational safety and health essential for fostering a thriving community. In Tanzania, work-related injuries are prevalent, yet there is limited understanding of their extent and impact. This study aims to

assess the occurrence of work-related injuries and identify contributing factors, which is crucial for informed decision-making and resource allocation. By gaining insights into the prevalence and underlying causes of these injuries, we can develop targeted interventions that enhance the physical and mental well-being of employees. Ultimately, this knowledge will support the creation of safer workplaces, improving overall productivity and quality of life in Tanzania.

1.2 Problem Statement.

Work-related injuries pose a significant challenge in low-income countries like Tanzania, where there is limited attention to occupational safety and health (OSH) [13]. The goals of OSH include preventing workplace injuries, illnesses, and deaths; fostering a positive work environment; and establishing programs that prioritize worker safety; hence achieving United Nations Sustainable Development Goal 11 [14].

From 2016 to 2019, 4,578 work-related injuries were reported to the Workers Compensation Fund, including 236 fatalities, likely underreported due to insufficient documentation and a lack of a unified national reporting system [9]. The absence of comprehensive surveillance hinders the collection of critical data on occupational injuries across various sectors, such as agriculture and manufacturing [15]. While established risk factors are recognized, there is a pressing need to explore additional, previously overlooked variables that may contribute to work-related injuries [9]. This study aims to investigate these factors, providing insights to enhance workplace safety and prevent injuries in Tanzania. Conducting this study on work-related injuries at two sugar industries in Morogoro and Kilimanjaro regions is essential for several reasons. First, the sugar industry is a major employer and economic contributor in Tanzania, making worker safety a priority. However, limited research exists on the specific risks faced by workers in these factories. The unique working conditions, such as machinery use and handling agrochemicals, expose workers to heightened injury risks. By assessing the prevalence and contributing factors of these injuries, the study can provide valuable insights for developing targeted safety interventions.

Additionally, the findings will align with national and global public health goals focused on ensuring safe working environments. This study aims to enhance understanding of

occupational health issues in Tanzania and inform better policies and resource allocation for worker safety in the sugar industry.

1.3 Conceptual Framework

This study was guided by a theoretical framework adapted from the Socio-Ecological Model (SEM) by Bronfenbrenner U. (1979) [16]. The SEM offers a comprehensive lens for examining the complex interplay of factors that contribute to work-related injuries within the sugar industry, emphasizing that individual behaviours and health outcomes are influenced by a dynamic web of interconnected systems.

At the individual level, personal characteristics such as sex, age, marital status, educational attainment, type of employment, job title, work experience, and departmental assignment are crucial in shaping workers' risk profiles. For instance, younger workers may lack the experience necessary to navigate hazards effectively, while educational background can affect knowledge of safety practices. Recognizing these individual attributes helps identify those at a higher risk for injury.

Moving to the interpersonal level, the impact of social relationships and peer dynamics is significant. Interactions with colleagues and supervisors can greatly influence safety-related behaviours. Factors such as drug and alcohol use, smoking habits, job satisfaction, and adherence to personal protective equipment (PPE) protocols are often shaped by social norms and peer support (or lack thereof). Positive mentorship and active supervision promote a culture of safety, encouraging workers to adopt safer practices and enhance their overall job satisfaction.

At the organizational level, various workplace factors are essential for cultivating a safe environment. Comprehensive health and safety training programs, the number of hours worked per week, effective workplace supervision, and regular medical check-ups are pivotal in reducing injury risks. Organizations that take a proactive approach to safety through routine safety drills and consistent oversight empower their workers to take ownership of their safety and well-being.

The community level also plays an integral role in shaping individual health behaviours. Access to community resources, such as health services and awareness programs, along with local policies addressing substance use and occupational safety, can significantly influence workers' health outcomes. Communities that prioritize health education and resources are likely to see a reduction in risky behaviours among workers.

Finally, at the societal level, overarching regulatory and policy frameworks are essential for establishing occupational safety standards. These regulations not only dictate organizational practices but also reflect societal values regarding worker safety. Legislative support is crucial for implementing effective safety measures and ensuring compliance across industries. By addressing these interconnected levels, the SEM highlights the multifaceted nature of factors influencing work-related injuries. It advocates for a holistic approach to interventions that can lead to significant improvements in worker safety and health outcomes in the sugar industry.

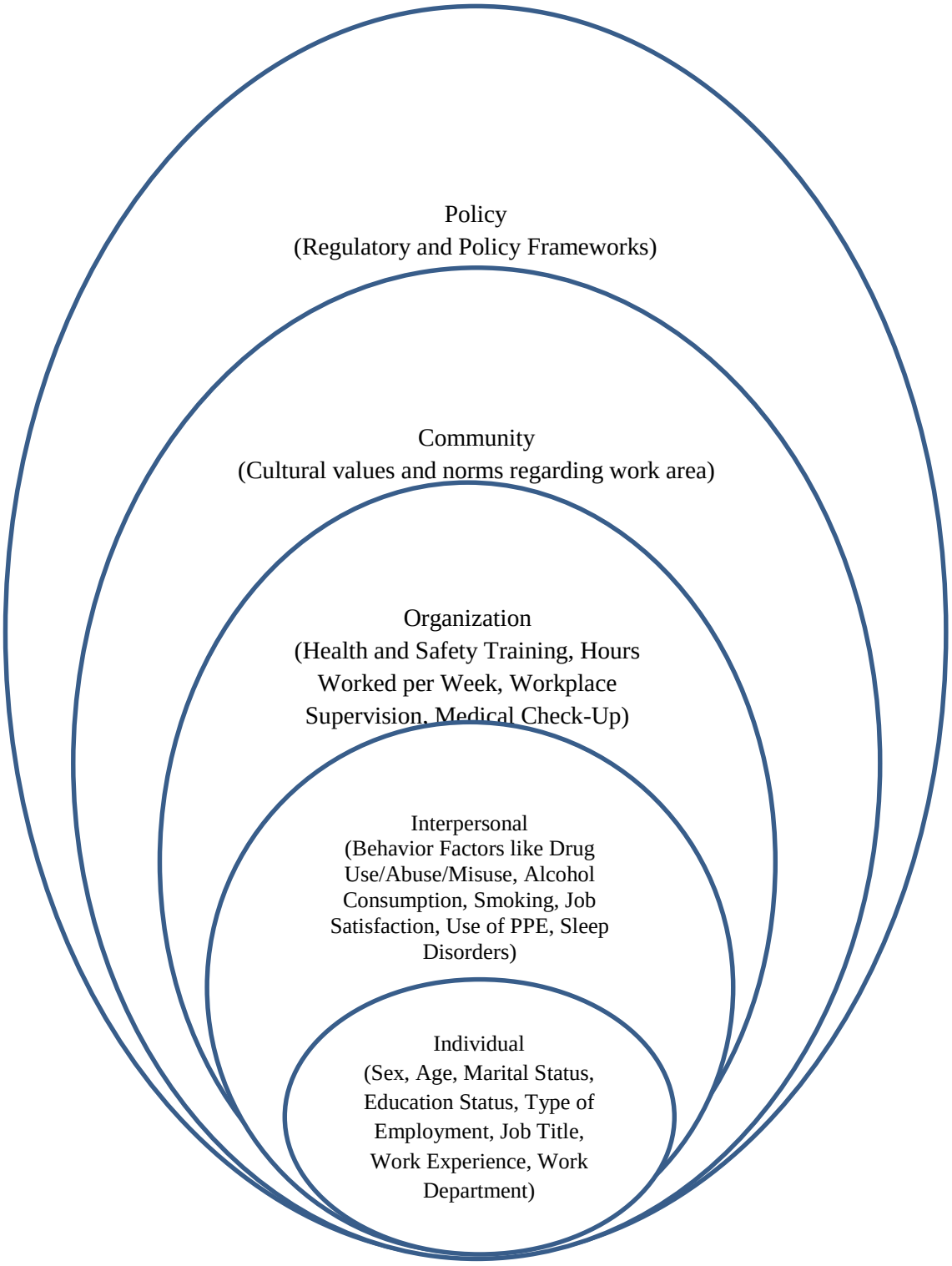


Figure 1: Theoretical framework adapted from the socio-ecological model by Bronfenbrenner U. (1979) [16].

1.4 Research Question

1.4.1 Main research question

What are the prevalence and associated factors for work-related injuries among workers in sugar industries in Tanzania?

1.4.2 Specific Research Questions.

1. What is the prevalence of work-related injuries among workers in sugar industries in Tanzania?
2. What are the workers-related factors associated with work-related injuries among workers in sugar industries in Tanzania?
3. What are behavioural factors associated with work-related injuries among workers in sugar industries in Tanzania?
4. What are work environment-related factors associated with work-related injuries among workers in sugar industries in Tanzania?

1.5 Research Objectives

1.5.1 Broad Objective.

To assess prevalence and associated factors for work related injuries at sugar industries in Tanzania.

1.5.2 Specific Objectives.

1. To assess prevalence of work-related injuries among workers at sugar industries in Tanzania.
2. To assess worker related factors associated with work related injuries among workers at sugar industries in Tanzania.
3. To assess behaviours factors associated with work related injuries at sugar industries in Tanzania.
4. To assess work environment related factors associated to work related injuries among workers at sugar industries in Tanzania.

1.6 Rationale of the Study

This study investigated work-related injuries and their associated factors in the sugar industry, a sector characterized by high-risk conditions. The findings had several significant implications that could enhance workplace safety and overall health outcomes.

First, by identifying key factors contributing to work-related injuries, the study informed the development of targeted safety interventions. Understanding specific worker-related, interpersonal, organizational, community, and societal factors allowed for the design of tailored training programs and safety protocols that addressed the workforce's unique needs. This targeted approach could lead to more effective risk mitigation strategies, ultimately reducing the incidence of injuries.

Second, addressing the factors that contributed to work-related injuries enhanced overall worker well-being and job satisfaction. Safer workplaces not only reduce the risk of injuries but also improve employee morale and productivity. By promoting a safety-first culture, organizations could create an environment where workers feel valued and protected, leading to increased retention and job satisfaction.

Moreover, this research contributed to the existing body of literature on occupational health and safety, providing a basis for future studies in this area. By identifying gaps in knowledge, the study paved the way for further investigations into specific aspects of workplace safety, including the effectiveness of various interventions. This ongoing research was vital for continuously improving safety practices.

By utilizing the SEM, the study highlighted the interconnectedness of individual, interpersonal, organizational, community, and societal factors. This holistic approach encouraged collaboration among employers, workers, and healthcare providers to comprehensively address occupational safety, aiming to create lasting change in the sugar industry's safety culture.

The findings of this study are instrumental in enhancing safety practices, and worker well-being, fostering community engagement, guiding future research, and promoting a collaborative approach to occupational health and safety in the sugar industry.

CHAPTER TWO
2.0 LITERATURE REVIEW

2.1 Prevalence of work-related injuries

In Europe, work-related injuries present a significant concern, with approximately 3,347 workplace fatalities reported across the EU in 2021, alongside 2.88 million non-fatal accidents leading to at least four days off work [17]. The European Trade Union Confederation notes that men are disproportionately affected, representing 68.3% of non-fatal accidents, particularly in male-dominated industries such as construction and manufacturing [17]. In the United States, while comprehensive statistics can vary, it is estimated that millions of non-fatal workplace injuries occur each year. The Bureau of Labour Statistics reported over 2.6 million non-fatal injuries in 2021 alone [18]. Both regions grapple with issues of under-reporting and the urgent need for enhanced safety regulations to address risks associated with workplace hazards.

In 2020 ILO reported Africa exhibits the highest rate of fatal occupational accidents worldwide, with an approximate annual count of 81,000 work-related fatalities [6]. In Asia, small and medium enterprises constitute over 80% of the total number of industries, yet they often lack comprehensive medical surveillance [19]. For example, a study in Jeddah, Saudi Arabia, revealed a high prevalence of work-related injuries among healthcare workers at 52%, with back injuries (32.6%), eye/mouth splashes (20.4%), and needle stick injuries (19.9%) being the most common [20]. Additionally, significant disparities exist in fatal versus non-fatal injury rates across the region; in Korea, the non-fatal injury rate was only one-fifth of the average in EU15 countries, while the fatal injury rate was five times higher [21]. This trend of high fatal injury rates relative to non-fatal injuries is also evident in other Asian countries. Notably, about two-thirds (65%) of global work-related mortality is estimated to occur in Asia [22], highlighting the urgent need for improved safety measures and regulations in this region, particularly in industries with high injury rates.

A systematic review and meta-analysis by Debela et al. (2023) found a troubling pooled prevalence of occupational injuries in Africa at 57%. The manufacturing sector had the highest prevalence at 62%, followed by construction at 57% and mining at 51% [23]. Complementarily, a study published in the Journal of Occupational Health in 2018 highlighted that the prevalence of work-related injuries in sub-Saharan Africa ranged from 1.6% to 20.4%, reflecting significant disparities across countries and sectors. Additionally, a study in the Journal of Occupational Health (2018) reported that work-related injury rates in sub-Saharan Africa varied significantly, ranging from 1.6% to 20.4% across different countries and sectors. More recently, Atalay et al. (2023) noted that small-scale industrial workers in sub-Saharan Africa had a pooled prevalence of 53.23% for occupational injuries [24]. The body of research underscores the heightened vulnerability of workers in agriculture, construction, and mining to occupational injuries [25–28], pointing to an urgent need for improved safety measures and regulations in these high-risk industries.

The prevalence of work-related injuries in Tanzania lacks comprehensive documentation, and reliable statistics are scarce in this regard. However, available information suggests that work-related injuries constitute a notable concern within the country [9, 29]. Particularly, the agriculture and construction sectors in Tanzania face significant challenges related to work-related injuries. ILO the estimated incidence rate of work-related injuries in Tanzania stands at 4.7 per 100 workers per year [30]. It is essential to acknowledge that the actual prevalence of work-related injuries in Tanzania may surpass the reported figures, as many incidents go unreported due to a lack of reporting mechanisms or limited awareness among workers [9].

This objective was to establish the prevalence of WRI in agro-processing industries specifically in Sugar industries in Tanzania.

Despite the critical importance of understanding work-related injuries in Tanzania, there remains a significant research gap regarding their prevalence, particularly in agro-processing industries like sugar production. While general estimates indicate that work-related injuries pose a considerable concern, and the ILO suggests an incidence rate of 4.7 per 100 workers, the specific rates and nature of injuries within the sugar industry have not been

comprehensively documented. Furthermore, the scarcity of reliable statistics and the potential underreporting of incidents highlight the need for targeted research in this sector. Future studies should aim to systematically investigate the prevalence, types, and contributing factors of work-related injuries in Tanzania's sugar agro-processing industry to inform effective safety regulations and improve worker protection.

2.1.1 Factors Associated with Workers-Related Injuries

Studies across various countries consistently show that men face a higher risk of occupational injuries and diseases compared to women, a trend also observed in Tanzania where men often engage in more hazardous activities [5, 9, 31–33]. However, a contrasting study conducted in Ethiopia found no significant statistical association between occupational injuries and the gender of the worker [32]. This discrepancy highlights the complexity of gender-related risk factors in occupational health, suggesting that while gender may influence injury rates in some contexts, other variables, such as workplace environment and type of industry, may also play crucial roles. Further investigation is needed to explore these dynamics more thoroughly.

Several studies have consistently indicated that younger workers face a higher incidence of occupational injuries compared to older counterparts. One specific study further demonstrated a clear correlation between youth and an increased prevalence of work-related injuries, highlighting the vulnerabilities that younger employees may experience in the workplace [1, 31]. Factors contributing to this trend include a lack of experience, lower awareness of safety protocols, and a propensity to engage in riskier behaviours. Additionally, younger workers may be less likely to speak up about unsafe conditions due to fear of reprisal or a desire to fit in [1, 31]. This trend underscores the need for targeted safety training and risk management strategies aimed at protecting younger workers, as well as fostering a workplace culture that encourages open communication about safety concerns. Implementing mentorship programs could also help bridge the experience gap, ensuring that younger employees receive guidance from more seasoned workers.

Numerous occupational safety and health studies conducted in developing countries have consistently demonstrated a positive association between higher levels of education among

factory workers and a decrease in work-related injuries [23, 32, 34]. However, previous research indicates that merely increasing educational attainment is insufficient to reduce accident rates in hazardous work environments. These studies reveal that the type of occupation or job role significantly influences the severity of injuries and the likelihood of fatal outcomes in such settings [5, 35]. Factors such as specific job hazards, work processes, and safety practices are critical in determining injury risk. Therefore, while enhancing education is important, it must be accompanied by targeted interventions that address the unique risks associated with different occupations. This comprehensive approach is essential for effectively reducing injury rates and improving overall workplace safety in high-risk industries. Other factors positively associated with work-related injuries, as reported in various studies, include job tenure, remuneration, and overall employee well-being [5]. Specifically, low-wage workers often struggle to meet their basic needs, which can negatively impact their safety practices and increase injury risk. Additionally, longer job tenure may lead to complacency or increased exposure to hazardous conditions [5].

The objective of this research was to identify and analyze worker-associated factors that contributed to work-related injuries, emphasizing the importance of addressing these issues to enhance workplace safety and protect vulnerable employee populations. The literature revealed a need for a cross-sectional study in Tanzania's sugar industry to investigate the relationship between job tenure, educational levels, and the prevalence of work-related injuries among workers. This research specifically examined how these factors influenced workers' safety behaviours and their attitudes toward safety training. By focusing on a diverse range of employees, the study aimed to identify critical areas for intervention, ultimately informing the development of tailored safety programs designed to reduce injury rates in the industry. Such insights could have significantly enhanced workplace safety and worker well-being in this sector.

2.1.2 Work Environment-Related Factors for Occupational Injuries

Inadequate working conditions and a lack of safety measures significantly impact the occurrence of injuries in the workplace. Numerous studies emphasize that workplace injuries

often stem from poor interactions between individuals and their environments, leading to increased job stress and a higher risk of occupational injuries [32, 36, 37]. Factors such as insufficient safety protocols, inadequate training, and poorly designed workspaces can exacerbate these interactions, creating an environment where accidents are more likely to occur. Additionally, employees facing high levels of job stress may be less attentive and more prone to mistakes, further elevating their risk of injury. Understanding these dynamics is crucial for developing interventions that address both environmental conditions and the psychosocial factors influencing worker safety.

Moreover, psychological factors such as anxiety, job dissatisfaction, and mental workload have a statistically significant association with musculoskeletal disorders and work-related injuries [38]. Research indicates that when workers experience high levels of anxiety or dissatisfaction, their overall focus and productivity can decline, increasing the likelihood of accidents and injuries. A study revealed that female workers who worked more than 8 hours a day and had job tenures exceeding 10 years were particularly susceptible to musculoskeletal injuries [39–41]. This correlation highlights the need for organizations to monitor employee workload and ensure that staff are not subjected to excessive hours without adequate breaks or support. By addressing these psychological and physical demands, employers can create a healthier work environment that mitigates injury risks.

The industrial physical environment encompassing factors such as noise, light, and temperature also significantly correlates with work-related injuries [5, 42]. High noise levels can lead to communication breakdowns and increased stress, while inadequate lighting can impair visibility and increase the likelihood of accidents. Extreme temperatures, whether hot or cold, can affect workers' performance and safety, further contributing to injury rates. A well-designed physical environment that addresses these factors is essential for reducing injury risks. Therefore, organizations should prioritize improvements in workplace conditions, such as enhancing lighting, reducing noise, and regulating temperature, to foster a safer work atmosphere.

Occupational injuries are strongly correlated with several key factors, including health and safety training, job stress, additional hours of work, workplace supervision, and the

utilization of PPE. Effective training programs are critical in equipping workers with the knowledge and skills necessary to recognize hazards and implement safety measures. Additionally, job stress and excessive hours can lead to fatigue and reduced vigilance, increasing injury susceptibility [1, 32, 42]. Proper workplace supervision ensures adherence to safety protocols, while the consistent use of PPE can significantly mitigate risks associated with hazardous tasks. Other factors such as ventilation, manual handling of objects, visual concentration, and regular maintenance of machinery also play vital roles in maintaining a safe working environment. By recognizing and addressing these work environment-associated factors, organizations can develop comprehensive safety strategies aimed at reducing the incidence of work-related injuries.

The literature reveals several gaps that warrant further investigation, including the need for research on the interaction between environmental and psychological factors affecting workplace injuries, as most studies address these aspects in isolation. Additionally, while the importance of health and safety training is acknowledged, empirical studies evaluating the effectiveness of various training methodologies on injury rates are scarce. Cultural and contextual influences on safety practices are often overlooked, necessitating research that considers local beliefs and conditions. Finally, there is insufficient exploration of the correlation between mental health and work-related injuries, particularly regarding how mental health support can reduce risks. Addressing these gaps could enhance our understanding of work-related injuries and inform more effective prevention strategies.

2.1.2.1 Behavioural Factors Influencing Work-Related Injuries

Studies have indicated a significant association between work accidents and alcohol consumption, suggesting that alcohol impairs judgment and coordination, thus increasing the likelihood of workplace injuries [32]. In contrast, research has shown that cigarette smoking does not correlate with an increased risk of work-related injuries, indicating that smoking's impact on safety may be less direct. Additionally, numerous studies across various countries have identified sleep disorders and job dissatisfaction as critical factors associated with occupational injuries among industrial workers. For example, a case-control study in

India found that workers who reported high job satisfaction had a significantly lower risk of experiencing occupational injuries [38]. This highlights the importance of a positive work environment, where satisfied employees are more likely to adhere to safety practices and remain vigilant, thereby reducing the incidence of accidents. Overall, addressing alcohol consumption, sleep disorders, and job dissatisfaction is essential for enhancing workplace safety and minimizing injury risks.

This suggests that workers who perceive their physical environment positively and adhere to safety precautions are less prone to injuries. Additionally, studies highlight the negative impact of poor person-environment fit, which can increase job stress and the risk of occupational injuries. A case-control study among railway workers in France found that individuals with sleep disorders were significantly more susceptible to injuries compared to those who were well-rested [32, 43]. This underscores the importance of both psychological well-being and environmental factors in workplace safety. Addressing job satisfaction, sleep quality, and the overall work environment is crucial for reducing injury risks and fostering a healthier, safer workforce.

Work social environments, shaped by the relationships and behaviors of subordinates, peers, and supervisors, significantly influence the incidence of work-related injuries [5, 37]. Positive interactions can foster a culture of safety, improving adherence to protocols and reducing accident likelihood, while negative dynamics may elevate risks. In Ethiopia, studies have identified key factors associated with WRIs, including alcohol consumption, cigarette smoking, sleep disturbances, and inadequate occupational safety training [5]. Alcohol consumption is linked to impaired judgment, and increasing workplace accident risks, whereas cigarette smoking shows no direct correlation. Additionally, sleep disturbances can impair concentration and reaction times. The lack of proper safety training and insufficient use of PPE are also critical contributors to WRIs, highlighting the need for comprehensive safety programs and effective PPE use. These findings emphasize the importance of addressing both individual behaviours and the social environment to enhance workplace safety and reduce injury prevalence.

Research on work-related injuries reveals that individual behaviours and social environments significantly influence injury rates. Studies show a strong link between alcohol consumption and increased accidents due to impaired judgment, while cigarette smoking does not correlate with WRIs. Additionally, sleep disorders and job dissatisfaction are critical factors; for instance, a case-control study in India found that higher job satisfaction is associated with a lower risk of injuries. This indicates that positive work environments enhance safety adherence. Poor person-environment fit can elevate job stress and injury risks, as seen in a study of railway workers in France, where those with sleep disorders were more susceptible to injuries. Social dynamics among subordinates, peers, and supervisors also impact WRIs, with research in Ethiopia identifying factors such as alcohol consumption, sleep disturbances, and inadequate safety training as key contributors. These findings highlight the need for comprehensive safety programs and a supportive work culture to effectively reduce injury risks and promote a safer workforce.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study area

Two factories were selected for this study from a total of six in Tanzania. Factory A is situated in the Morogoro region, located in the eastern part of the country, where three factories operate. This factory has been in operation since the 1960s and employs over 4,500 workers, making it one of the largest in the region. It has a long-standing reputation for producing quality products and has implemented various safety protocols over the years.

Factory B, on the other hand, is located in the Kilimanjaro region in the northern part of Tanzania, where two factories are established. This factory has a rich history, having been in operation since the 1930s, and currently employs more than 2,900 individuals. Known for its commitment to sustainable practices, Factory B has adopted innovative technologies to enhance productivity while minimizing environmental impact [44, 45].

These two factories were selected for the study to represent the geographical diversity of other factories in Tanzania. The remaining factories, located in the Kagera region in the western part of the country, share similar operational settings and challenges with those in the northern region. By including representatives from both the eastern and northern parts of Tanzania, this study aims to provide a comprehensive understanding of the factors influencing workplace safety and health across different geographical contexts.

3.2 Study design

An analytical cross-sectional study design approach was applied, which was deemed appropriate for assessing the prevalence and identifying associated factors.

3.3 Study population

The study population included employees from the selected sugar industries, specifically Factory A in the Morogoro region and Factory B in the Kilimanjaro region. Participants were required to be 18 years or older, ensuring they could provide informed consent. This age criterion allowed the study to capture the experiences and perspectives of both younger and

more experienced workers, enriching the understanding of occupational safety and health dynamics in the sugar industry.

3.4 Sample size

Since the total number of workers in the sugar industry was known, the study employed a formula for calculating sample size for finite populations. This approach ensured that the sample accurately represented the entire workforce while considering the limitations of the population size. The sample size formula used is:

$$N = \frac{N \times Z^2 \times P \times (1-P)}{E2 \times (N-1) + \{(Z2 \times P \times (1-P)\}}$$

Whereas,

n = Estimated Sample Size

Z = standard normal deviation of 1.96 using a 95% Confidence Level.

P = prevalence of work-related injuries 20.4% which is the highest prevalence of work-related injuries in Sub-Saharan Africa [25]

ε = Margin of error, 0.05 on using 5%.

N = Total number of populations 6,771

/ = Divide sign

Thus, $n = \frac{4 \times 0.2\ (1 - 0.2)/0.0025}{1 + (4 \times 0.2\ (1-0.2)/0.0025 \times 6771)}$

n = 328

A 10% non-response rate was incorporated into the sample size calculation to account for potential participants who might not respond or complete the study. The initial minimum sample size was determined to be 328. However, after adjusting for the non-response rate and considering the statistical power required for the study, the final sample size was set at 360. This adjustment ensured that the study maintained adequate power to detect meaningful results.

3.5 Sample selection.

In determining the factors influencing work-related injuries within the sugar industry, a comprehensive multistage sampling approach was implemented. This method ensured a

robust representation of the workforce across different operational areas in two selected sugar factories from Tanzania's Morogoro and Kilimanjaro regions.

Stage I: Factory Selection

The study began with the convenient selection of two sugar factories from the seven available in Tanzania, specifically targeting those in the Morogoro and Kilimanjaro regions. This selection was based on practical factors, such as accessibility, willingness to participate, and operational stability. By choosing factories that were easily accessible and cooperative, researchers facilitated efficient data collection. This strategic approach not only ensured meaningful insights into work-related injury factors but also aimed to capture the diverse operational practices and environments within the sugar industry.

Stage II: Formation of Sample Strata

Following factory selection, the sampling procedure involved creating two primary strata: Agriculture and Manufacturing. These strata represented the distinct departments within the factories, facilitating a focused investigation of work-related injury factors.

Stage III: Sub-strata Division

Each stratum was further subdivided based on specific work functions:

- **Agriculture Stratum:** This included sub-strata for crop production, agricultural engineering, and optimization.
- **Manufacturing Stratum:** This was divided according to various operational sections and shifts, ensuring a comprehensive view of the manufacturing processes.

Stage IV: Participant Selection

For participant selection, systematic sampling was employed within each sub-stratum. Each individual was assigned a unique number, and a sampling interval (nth) was determined based on the total population and the target sample size of 360. Participants were then selected by systematically choosing every nth individual from the numbered lists, guaranteeing a representative sample across all work areas.

This structured approach provided valuable insights into the factors influencing work-related injuries in the selected sugar factories, allowing for targeted interventions and improvements in workplace safety.

3.6 Eligibility criteria.

3.6.1 Inclusion criteria.

Participants had to be at least 18 years old and provide written informed consent. Eligible employees included those directly involved in production within the agriculture and manufacturing departments. Additionally, participants needed to have worked during the previous production season, from May 2022 to February 2023, ensuring relevant experience in the sugar industry.

3.6.2 Exclusion criteria.

Participants were excluded from the study if they held administrative positions, such as finance staff, commercial staff, human resources personnel, security guards, gardeners, and office messengers. Additionally, workers who were physically or mentally unfit were also excluded to ensure that the study focused on employees directly engaged in production roles and capable of providing relevant insights into occupational safety and health dynamics in the sugar industry.

3.7 Data collection tools.

Data were collected using a standard tool adapted and modified from the ILO occupational health surveillance methods to suit the local context and objectives of the study [46]. The tool aimed to gather key information on various factors affecting workers' health and safety, including the number of days employees were hospitalized, instances of work absence, and consumption levels of alcohol and cigarettes. Additional questions regarding health and safety training attendance were included to assess workers' exposure to safety protocols and their understanding of risk management.

The inclusion of these specific questions was essential for identifying patterns of behaviour that could impact occupational safety and health outcomes. Understanding the relationship between substance use and health-related absences allowed for a more comprehensive analysis of factors contributing to work-related injuries. Furthermore, evaluating training

attendance helped to determine the effectiveness of safety programs in improving workplace practices.

To ensure clarity and comprehensibility, the tool was translated into Kiswahili, allowing participants to respond in their preferred language. After modifications were made, the tool was piloted to test its effectiveness and ensure that it accurately captured the intended data. This piloting phase helped identify any issues with question clarity and allowed for further refinement before full implementation in the study.

3.8 Variables.

3.8.1 Dependent variable.

There was one dependent variable in this study, which was work-related injury. This ordinal categorical variable was classified and measured into three main groups, namely mild injuries, moderate injuries, and severe injuries. Mild injuries were all injuries that didn't require medical attention whereby the injured worker was treated as a first aid case and was not taken to the hospital. Moderate injuries were all injuries attended at the hospital and discharged equal to or less than two days or working days loss (sick leave) due to injury equal or less than three days. Severe injuries were all injuries where hospital admission of the injured worker was more than two days or working days loss (sick leave) due to injuries for more than three days.

3.8.2 Independent Variables.

Three main variables were assessed in this study namely worker-related factors, work-related environmental factors and behaviour factors. These main variables were further described as followed below.

3.8.2.1 Workers related factors.

Sex.

This was the state of being male or female and was assessed as self-reported by study participants.

Age

The length of time that a person has lived, was assessed as self- reported in years. Were analysed as ordinal categorical variable classified into specific age group first being from 18 to 30, second from 31 to 40, third from 41 to 50 and the last from 51 and above.

Marital status

Classified through self-reporting in the nominal categories of single, married, divorced, separated, widowed, or living together.

Education level

This was the highest academic attainments of the worker, was assessed as ordinal categorical variable as self-reported by study participant as no academic attainment, primary, secondary, or tertiary education.

Employment types

Legal status at work that may affect employment rights that work entitled too. Was assessed as nominal categorical variable as self- reported by worker either being permanent, special contract, seasonal or temporary.

Work experience

This was the length of time a person has worked for a particular job title. Was assessed as ordinal categorical variable as less than three years, four years to nine years or more than ten years.

Job title

A name that describes worker job or position. Was assessed as nominal categorical variable as self-reported by work and analysed based on general worker/unskilled or specialized/skilled worker.

Work department

This was the department under which the study respondent is working as further outlined in the sampling selection section. Was assessed as a nominal categorical variable.

3.8.2.2 Work related Environmental factors

Hours worked per week.

The number of hours in a week that worker ordinarily works. Was categorically assessed into two groups those who work equal or less than forty-five hours and those who are working more than forty-five hours.

Regular supervision of the workplace

Regular supervision done by authorised competent personnel in the workplace at least once from previous last production season which is under this study. Was categorically assessed as self-reported by respondent.

Health and safety training

Training given to workers about occupational safety and health at least once from previous last production season which is under this study. This was assessed as self-reported by study participant.

Medical examination

This was assessing medical examination as self-reported by study respondent. Was categorized as nominal categorical variable and measured into two group those who have at least once medical examination done to them and those who didn't have medical examination to them for the previous last production season under the study.

3.8.2.3 Behaviour factors

Smoking

This variable was assessing if study participant smokes any kind of drug including cigarette. Was analysed as nominal categorical variable and grouped into two group all that smoke and

those who do not smoke. In smoking group was furthered classified into two main sub group mild/occasional smoker who smoke less or equal to fourteen cigarette in a week and regular smoker who smoke more than fourteen in a week.

Alcohol consumption

The act of ingesting/drink a beverage containing alcohol. This was categorized as nominal categorical variables and was assessed as self-reported by study participants and classified into two groups those who drink alcohol and those who do not drink alcohol. In alcohol consuming group was furthered classified into two subgroup occasional drinkers who consume less or equal to ten glasses/bottles per week and those who consume more than ten bottles/glasses per week.

Sleeping disorder

The presence of sleepiness problem when the worker is at work. This was categorized as nominal categorical variable and classified into two groups those who report to have sleeping problem and those who report not to have sleeping problem.

Job satisfaction

A feeling of fulfilment or enjoyment that a worker derives from his/her job. This was assessed as nominal categorical variable into two group those who self-report to be satisfied and those who report not to be satisfied.

Personal Protective Equipment usage (PPE)

Proper and full utilization of specialized clothing or equipment by a worker for protection against health and safety hazards while performing his/her work. Was assessed as a nominal categorical variable and grouped into two groups those who properly and fully use PPE and those who do not use proper and full PPE as being self-reported by study response. Those who partly used were categorized as not using PPE.

3.8.3 Recruitment and training of research assistants

Two research assistants with diplomas in clinical medicine were recruited from the local district to facilitate data collection. To ensure they were well-prepared for their roles, a comprehensive two-day orientation program was conducted.

On the first day, the training focused on foundational research concepts and the study's objectives. The research assistants were introduced to the significance of the research and ethical considerations, including the importance of obtaining informed consent and maintaining participant confidentiality. They engaged in discussions about the study protocol, which outlined methodologies and data collection procedures. Additionally, they participated in interactive sessions where they reviewed the questionnaire and observational checklist, allowing them to familiarize themselves with the specific questions and data points to be collected.

On the second day, the training emphasized practical skills for administering the tools effectively. The research assistants practiced conducting mock interviews, where they learned how to engage participants, clarify questions, and record responses accurately. Role-playing scenarios helped them prepare for various participant reactions and potential challenges. The day concluded with a session on data security, equipping them with strategies to protect participant information and address any sensitive topics that might arise during interviews.

By the end of the training, the research assistants were well-equipped to undertake the data collection activities, armed with the knowledge and skills necessary to gather accurate and reliable information while fostering a positive rapport with study participants. This preparation was vital for the successful execution of the study and the attainment of meaningful findings.

3.9 Data collection procedure

The data collection process began with the data collectors introducing themselves and the study to the participants. Respondents were asked to provide consent to participate, and to ensure confidentiality and anonymity, their names were excluded from the data collection

materials. A structured, pretested questionnaire and observational checklist were utilized for gathering data, with the questionnaires being self-administered by the participants.

Two data collectors were recruited for the study and underwent a comprehensive two-day training. This training covered the study's objectives and relevance, the importance of confidentiality and anonymity, respondents' rights, procedures for the pre-test, informed consent, and techniques for using the observational checklist. A pre-test of the questionnaire was conducted two weeks before the main study, allowing the principal investigator to make necessary adjustments to the tools. This process helped identify and address previously unanticipated challenges before the actual data collection began.

The recruited research assistants participated in the pre-test as part of their practical training, gaining valuable experience with field procedures. Throughout the data collection phase, the principal investigator conducted regular checks to monitor the process, including a 5% cross-check of the data to ensure validity, accuracy, consistency, and completeness.

The questionnaire, initially written in English, was translated into Kiswahili to provide both versions for the study. This ensured that the research assistants could engage with participants in a language they were familiar and comfortable with, enhancing the quality of the data obtained. Participants were better able to comprehend the questions and express themselves freely in their mother tongue. After data collection, the Kiswahili responses were translated back into English for analysis. Field data collection took place in December 2023 and January 2024.

3.10 Ethical issues and consideration

The Ethical Review Board at Muhimbili University of Health and Allied Sciences (MUHAS-ERB) has granted ethical clearance for this study, under reference number MUHAS-REC-12-2023-1983. Additionally, permission and consent to conduct the research and publish its findings were obtained from the management of the selected sugar industries. Prior to participation, informed consent was secured from respondents after they were provided with detailed information regarding the study's purpose and implications. Throughout all stages

of the research, the confidentiality and anonymity of both the study participants and the selected sugar industries were strictly upheld.

3.10.1 Data management plan

All data collected on the designated days were securely stored by the principal investigator in a safe location. Digital data were protected using a password known only to the principal investigator. This data was utilized solely for the purposes of this study and will not be shared publicly or with any individuals or organizations outside those involved in the dissertation process. The data will be retained for a maximum of three years, after which it will be permanently discarded.

3.11 Data analysis

The data underwent a thorough cleaning process to ensure validity, accuracy, consistency, and completeness, as detailed in the data collection procedures section. Once verified, the data were entered and analyzed using SPSS version 20. To assess the normality, linearity, and symmetrical distribution of the data, tests such as the Shapiro-Wilk test, skewness, and kurtosis were conducted. Continuous variables were evaluated for normality to determine the appropriate statistical tests for subsequent analyses, with a significance level set at $p < 0.05$.

Data presentation included tables, frequencies, and percentages. Continuous variables were summarized using means and standard deviations, while categorical responses were analyzed using the Chi-square test. In cases where the expected number was less than 50 or the criteria for the Chi-square test were not met, Fisher's exact test was employed instead.

To identify factors associated with work-related injuries, both univariate and multivariate binary logistic regression analyses were performed. All independent variables, along with any variables that showed a p-value < 0.25 in bivariate analyses, were included in the binary logistic regression analysis. The statistical association was measured using odds ratios, and statistical significance was indicated by a 95% confidence level, expressed as p-values < 0.05.

Table 1: Data Analysis Techniques by Objective

Research objective	**Data Analysis Technique**
Objective 1: To assess the prevalence of work-related injuries among workers in sugar industries in Tanzania.	- Descriptive statistics presented with frequencies, mean, and standard deviation.
Objective 2: To assess worker-related factors associated with injuries among workers in sugar industries in Tanzania.	- Bivariate regression analysis and multiple regression analysis were used for analysis.
Objective 3: To assess behaviour factors associated with work-related injuries in sugar industries in Tanzania.	- Bivariate regression analysis and multiple regression analysis were used for analysis.
Objective 4: To assess work environment-related factors associated with work-related injuries among workers in sugar industries in Tanzania.	- Bivariate regression analysis and multiple regression analysis were used for analysis.

CHAPTER FOUR

4.0 RESULTS PRESENTATION

4.1 Introduction

This chapter contains a presentation of the research findings. The data presented in this chapter were collected and processed using quantitative techniques. The presentations are based on the research objectives and questions addressed in Chapter One.

4.2 Social demographic characteristics of the respondents

A total of 338 workers participated in this study, yielding a response rate of 93.89%. Among the participants, 185 (54.7%) were male and 153 (45.3%) were female. The mean age of the respondents was 26.9 years (± 3.58). In terms of marital status, 207 (61.2%) were married, while 109 (32.2%) were single.

Regarding educational attainment, 142 (42%) had completed primary school or lower, 130 (38.5%) had completed secondary education, and 66 (19.5%) had attended college or university. Employment types varied, with 166 (49.1%) in seasonal positions, 110 (32.5%) as permanent employees, and 62 (18.4%) in temporary roles. Service duration also varied: 133 (39.3%) had 1 to 3 years of service, 97 (28.7%) had 4 to 7 years, 80 (23.7%) had 8 to 10 years, and 28 (8.3%) had over ten years of service.

Regarding departmental allocation, 194 (57.4%) workers were from the agriculture section, while 144 (42.6%) were from factory operations. The socio-demographic characteristics of the respondents are detailed in Table 2.

Table 2: Socio-demographic characteristics of the selected sugar industrial workers in Tanzania. (n=338)

NB: - Others = Separated, Divorce and widowed

Characteristics	Frequency	Percentage
Sex		
Male	185	54.7%
Female	153	45.3%
Age (years)		
18 — 30	184	39.1%
31 — 40	68	27.7%
41 – 50	55	21.2%
> 50	31	12%
Marital status		
Married	207	61.2%
Unmarried	109	32.2%
Others	22	6.6%
Educational level		
Primary school and below	142	42%
Secondary	130	38.5
College/University	66	19.5%
Employment type		
Permanent/ Special contract	110	32.5%
Seasonal	166	49.1%
Temporally	62	18.4%
Work experience		
1 – 3 years	133	39.3%
4 – 7 years	97	28.7%
8 – 10 years	80	23.7%
>10 years	28	8.3%
Department		
Factory	194	57.4%
Agriculture	144	42.6%

4.2.1 Work environment characteristics

Three hundred twenty-five (96.2%) of the study participants work less than or equal to 45 hours per week whereas only thirteen (3.8%) workers were engaged in overtime work that exceeds the weekly working time limit which is 45 hours. Regarding to the provision of Occupational Safety and Health training to the workers two hundred ninety-five (87.3%) workers had occupational safety and health training, whereas forty-three (12.7%) workers were not trained for occupational health and safety. Among the total of two hundred ninety-five (100%) OHS-trained workers, two hundred eighteen (73.9%) workers trained within the past 12 months, sixty-six (21.4%) workers trained more than 12 months, and fourteen (4.7%) workers were not remembering when they had their last training.

Two hundred ninety-one (86.2%) of the respondents' workstations were supervised by the competent person/authority whereas forty-seven (13.8%) respondents' workstations were not supervised for their occupational safety and health issues by the competent authority or person. Periodic medical examination is one of the occupational health hazard confirmatory procedures that should be done by the authority of the employers. Three hundred thirty-two (98.3%) respondents replied that they had medically checked for the last production session whereas six (1.7%) respondents had not taken a periodic medical examination.

Table 3: The environmental characteristics of sugar industries workers in Tanzania

Characteristics	Frequency (n=338)	Percentage
Hours worked per week.		
≤ 45 hours per week	325	96.2%
Greater than 45 hours per week	13	3.8%
Presence of OHS training		
Yes	295	87.3%
No	43	12.7%
Presence of workplace OSH supervision		
Yes	291	86.2%
No	47	13.8%
Medical Examination		
Yes	332	98.3%
No	6	1.7%

4.2.2 Workers' behaviour characteristics

Regarding sleep disorders, 47 respondents (13.9%) reported having issues. Among them, 30 workers (63.8%) cited juggling multiple jobs, 12 (25.6%) attributed it to night shifts, and 5 (10.6%) mentioned working more than 8 hours without a break.

In terms of job satisfaction, 320 respondents (94.7%) were satisfied with their jobs, while 18 (5.3%) were not.

Regarding PPE usage, 210 workers (62.1%) used the PPE provided by their employer. However, 73 workers (21.6%) did not use PPE due to incomplete sets, 16 (4.7%) faced work limitations, 13 (3.8%) lacked proper PPE, 11 (3.3%) encountered various other issues, 9 (2.7%) were unaware of its importance, and 6 (1.8%) did not know how to use it.

Table 4: The behavioural characteristics of sugar industries workers in Tanzania. (n=338)

Characteristics	Frequency	Percentage
Sleeping disorders		
Yes	47	13.9%
No	291	86.1%
Cause of sleep disorders		
Due to working more than 8 hours without shifting	5	10.6%
Working in the night	12	25.6%
Working more than one work at a time	30	63.8%
Job satisfaction		
Yes	320	94.7%
No	18	5.3%
Utilization of PPE		
Yes	210	62.1%
No	128	37.9%
Reasons for not utilizing PPE		
Lack of PPE	73	21.6%
Not knowing its importance	9	2.7%
Not have knowledge how to use	6	1.8%
It limits work performance	16	4.7%
Lack proper PPE	13	3.8%
Others	11	3.3%

Sleeping disorders: like insomnia and sleep apnea, disrupt sleep quality and can lead to daytime drowsiness, increasing the risk of work-related injuries.

About three hundred twenty-five (96.2%) do not smoke at all, nine (2.6%) use less than fourteen sticks of cigarette per week and four (1.2%) use more than fourteen cigarette per week. Regarding to alcohol drinking two hundred sixty-eight (79.3%) didn't drink alcohol at all, forty-seven (13.9%) drink less than ten bottles/glasses of alcohol in a week and twenty-three (6.8%) drinks alcohol more than ten bottles/glasses per week.

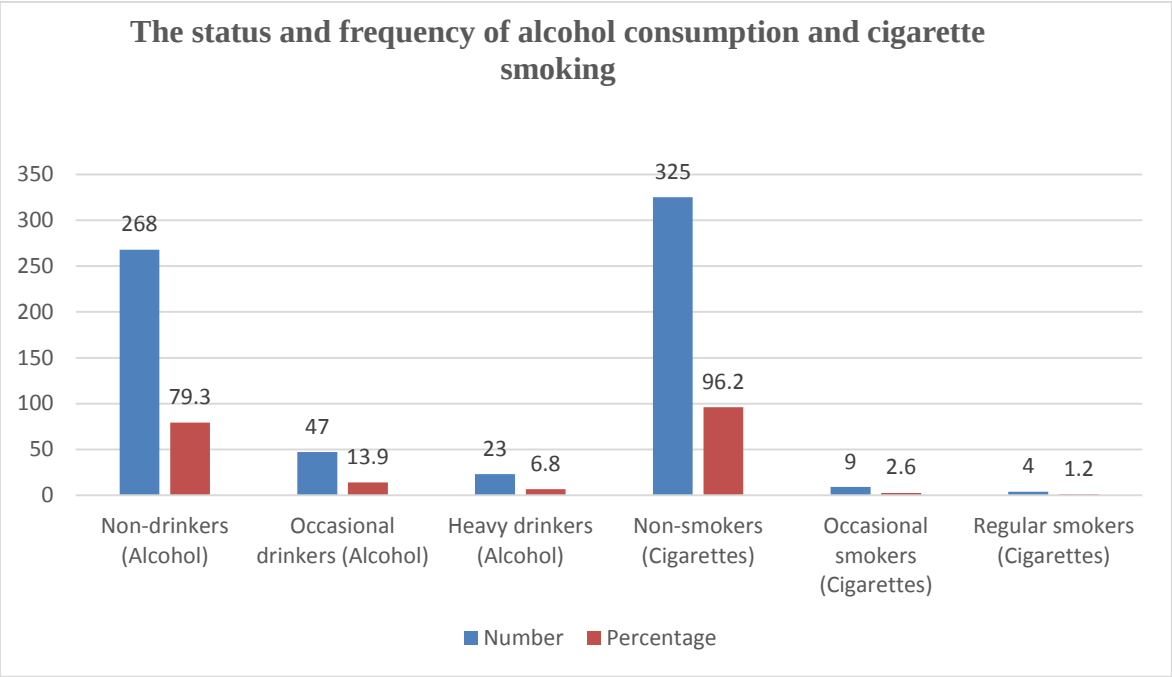


Figure 2: A stocked bar graph illustrating the status and frequency of alcohol consumption and cigarette smoking during the last production season industries in Tanzania. (n=338**)**

4.2.3 Work-related injuries characteristics

4.2.3.1 Injury Prevalence

In terms of injury status among the study participants, fifty workers (14.8%) reported being injured at least once in their body parts due to work during the previous production session, with a 95% confidence interval of (11.2% – 19.0%).

Table 5: Distribution of work-related injuries during the last production season among selected sugarcane industrial workers in Tanzania. (n=338)

Characteristics		Frequency	Percentage
Work-related injuries in the last season.			
	Yes	50	14.8%
	No	288	85.2%

4.2.3.2 Affected body parts due to work-related injuries.

The most affected body part due to work-related injuries was the upper arm/lower arm/or hands at the time of injury which accounts for sixteen (32%) followed by the leg which is thirteen (26%), multiple sites nine (18%), head seven (14%) and trunk five (10%).

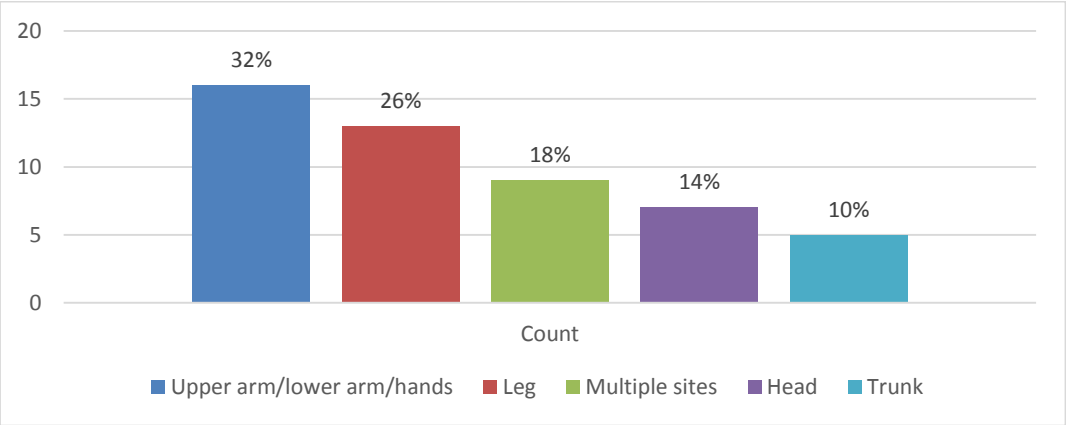


Figure 3: Distribution of work-related injuries in the last production season by affected body part among workers at sugar industries in Tanzania. (n=338)

4.2.3.3 Type of injuries.

The most prevalent type of injuries was abrasion 21(42.9%), cut 16 (32.1%), burn 10 (17.9%), and fracture 3 (7.1%).

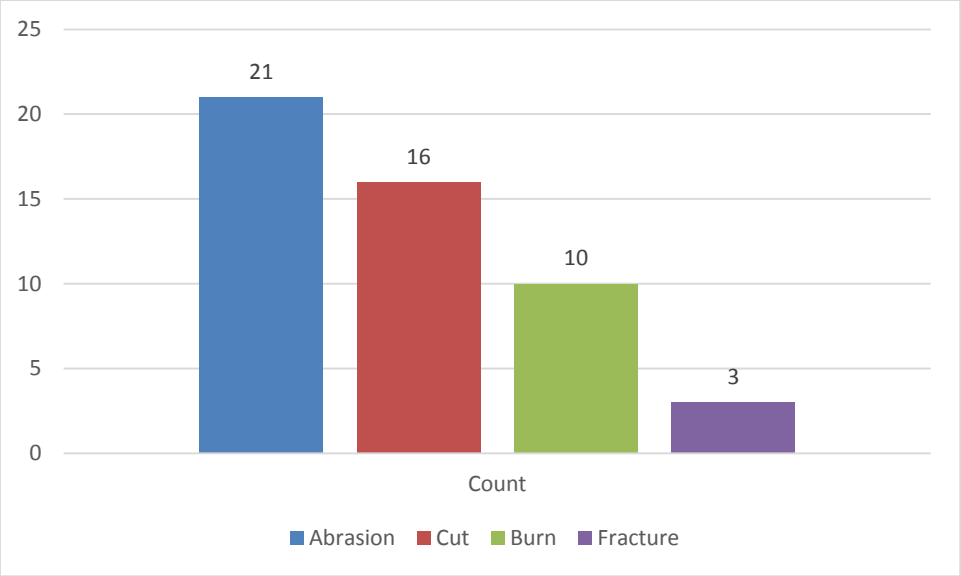


Figure 4: Distribution of work-related injuries by type of injuries among workers at sugar industries in Tanzania. (n=50)

4.2.3.4 Causes and sources of work-related injuries.

Among the fifty injured workers (100%), 44 workers (89.3%) were injured while performing their own tasks, 4 workers (7.1%) were injured due to other factors, and 2 workers (3.6%) were injured while assisting colleagues. The primary sources of these injuries included hand tools, which caused 17 injuries (35.7%), followed by fire or hot substances (11 injuries, 21.4%), other sources (11 injuries, 21.4%), machinery (9 injuries, 17.9%), and collisions with objects (2 injuries, 3.6%).

Table 6: Distribution of source of injuries and works done during an injury in the last production season at sugar industries in Tanzania. (n=50)

Characteristics	Frequency	Percentage
Works during injury		
Working their own work	44	89.3%
Other factors	4	7.1%
Helping workplace colleague	2	3.6%
Sources of injury		
Hand tools	17	35.7%
Fire/Hot	11	21.4%
Others	11	21.4%
Machinery	9	17.9%
Collision with Objects	2	3.6%

Others = Electricity and fall

4.2.3.5 Hospitalization and severity of injuries

Of the fifty injured respondents, forty (75.9%) received hospital care, while ten (24.1%) did not. Among those who were treated, all forty workers visited the hospital, with thirty-eight (95.7%) not requiring hospitalization and two (4.3%) being hospitalized. Of those hospitalized, one (2.5%) stayed for more than two days, while the other (2.5%) was hospitalized for two days or less.

In terms of lost workdays due to injuries, twenty-three (57.1%) workers lost more than three days, whereas seventeen (42.9%) lost three days or fewer.

Regarding the severity of the injuries, out of the forty workers who attended the hospital, twenty-four (60%) were hospitalized for more than two days, indicating a severe impact as they also lost more than three workdays.

4.2.3.6 Factors associated with work-related injuries

The study utilized bivariate and multivariate logistic regression models to identify significant factors associated with work-related injuries, using SPSS version 20. The outcome variable was coded as "Yes" for injuries (1) and "No" for no injuries (0).

Socio-Demographic Factors

In the multivariate analysis, age and educational status emerged as significant predictors of work-related injuries. Workers aged 51 years and older were found to be 3.1 times more likely to report injuries compared to those aged 18 to 50 (AOR: 3.119, 95% CI: 1.279 – 34.821). Additionally, workers with tertiary education or higher were 2.0 times more likely to experience injuries than those with high school education or less (AOR: 2.063, 95% CI: 1.581 – 7.322). Marital status did not show a statistically significant association with work-related injuries.

Environmental Factors

Among the environmental variables, workplace Occupational Safety and Health supervision was significantly associated with injury rates. Workers in environments regularly supervised by qualified personnel were 0.3 times less likely to report injuries (AOR: 0.307, 95% CI: 0.171 – 0.581). However, OSH training did not show a significant association with work-related injuries.

Behavioural Factors

The analysis also highlighted several behavioural factors linked to work-related injuries. Alcohol consumption was significantly associated, with workers who consume alcohol being 1.958 times more likely to report injuries compared to those who do not drink (AOR: 1.958, 95% CI: 1.706 – 5.433). Furthermore, workers with sleep disorders were 1.3 times more likely to report injuries (AOR: 1.391, 95% CI: 1.358 – 5.406). Conversely, proper use of Personal Protective Equipment (PPE) was protective against injuries (AOR: 0.875, 95% CI: 0.199 – 0.840).

Generally, the findings indicate that age, education level, alcohol use, sleep disorders, and effective workplace supervision play crucial roles in the occurrence of work-related injuries, while the use of PPE appears to mitigate risk.

Table 7: Factors associated with work-related injuries at sugar industries in Tanzania. (n=338), $p = 0.05$

4.2.4 Work Environment Observation

Characteristics	Work related injuries		COR (95%Cl)	AOR (95%Cl)
	Yes	No		
Age(year)				
18 — 30	27(14.7%)	157(85.3%)	1.00	1.00
31 – 40	10(14.7%)	58(85.3%)	1.01(0.85 – 1.88)	1.12(0.781 – 2.21)
41 – 50	9(16.4%)	46(83.6%)	1.13(0.78 – 4.90)	1.14(0.91 – 2.45)
> 50	3(10.7%)	25(89.3%)	2.314(0.97 - 5.51)	3.119 (1.279 – 34.821)
Educational status				
≤Secondary school	40(14.3%)	239(85.7%)	1.00	1.00
≥ College/University	10(17.2%)	48(82.8%)	3.299(1.63 - 6.69)	2.063(1.581 – 7.322)
Drink Alcohol				
Yes	12(17.1%)	58(82.9%)	1.736(0.84 - 3.59)	1.958(1.706 – 5.433)
No	38(14.2%)	230(85.8%)	1.00	1.00
Sleep Disorders				
Yes	6(12.8%)	41(87.2%)	2.849(1.27 - 6.35)	1.391(1.358 – 5.406)
No	44(15.1%)	247(84.9%)	1.00	1.00
Regular OSH supervision				
Yes	37(12.6%)	256(87.4%)	0.05(0.018 - 0.14)	0.307(0.171 – 0.581)
No	13(28.9%)	32(71.1%)	1.00	1.00
PPEs usage				
Yes	32(15.2%)	178(84.8%)	0.05(0.018 - 0.14)	0.875(0.199 – 0.890)
No	18(14.1)	110(85.9%)	1.00	1.00

The assessment of the work environment, conducted using an environmental work observation checklist, identified several occupational hazards in both the agricultural and factory departments. These hazards included excessive heat, dust, awkward postures, biological risks from animal and insect bites, as well as chemical exposure to substances like sulfuric acid and lead.

Both sectors offer curative health services and have established safety and health divisions to enhance workplace safety. Warning signs, health instructions, and first aid personnel with appropriate supplies are present in all areas. Active occupational safety and health committees have convened in the last six months to discuss health and safety issues. Regular inspections help ensure adherence to safety standards, and initiatives focusing on prevention, advocacy, and capacity building are actively implemented.

While most workers use PPE, some agricultural labourers resort to non-standard gear. The industries also address training needs related to new equipment and operational changes. Moreover, drinking water and sanitary facilities, including toilets and handwashing stations, are available, meeting the standards outlined in the Employment and Labor Relations Act, with attention to gender and occupancy considerations.

CHAPTER FIVE

5.0 DISCUSSION

5.1 Discussion

This study found a low prevalence of work-related injuries in the sugarcane industry, with 148 injuries per 1,000 workers annually. Effective safety measures, including high levels of supervision (86.2%) and health and safety training (95.5%), likely contributed to these lower rates. The most common injury types were abrasions, cuts, and burns, predominantly affecting the upper arms and hands. Notably, workers with tertiary education were twice as likely to report injuries, potentially due to increased awareness and job responsibilities. Additionally, alcohol consumption and sleep disorders were linked to higher injury risks, emphasizing the need for targeted interventions in these areas. Overall, the study underscores the importance of robust safety protocols and comprehensive health strategies to reduce workplace injuries.

This study found that work-related injuries were comparatively less prevalent among workers in the sugarcane industry, with 148 injuries per 1,000 workers annually reported during the previous production season. This figure is significantly lower than those documented in other research, such as the prevalence rates of 257, 437, and 775 per 1,000 exposed workers per year reported in sugarcane plantations in Paraguay, Pakistan, and Tendaho, respectively [5, 47, 48]. These findings suggest that the sugarcane industry in this context may implement effective safety measures, warranting further investigation into the factors contributing to these lower injury rates.

Furthermore, this study indicated a lower incidence of work-related injuries compared to research conducted in Pakistan, Paraguay, and Ethiopia [49–51]. This reduction may be attributed to effective promotion and implementation of occupational health and safety measures within the workplace. High levels of workplace supervision (86.2%), health and safety training (95.5%), proper utilization of personal protective equipment (62.1%), and regular medical examinations (98.3%) likely contribute to mitigating the prevalence of

work-related injuries in this context. These findings underscore the importance of robust safety protocols in enhancing worker protection and reducing injury rates.

This study identified abrasions, cuts, and burn injuries as the most prevalent types of injuries in the study area. This finding is consistent with research conducted in the North Gondar zone [48], Tendaho agricultural development enterprise, and Tendaho sugarcane plantation [5], where similar types of injuries were reported as the most common occurrences. These results highlight the need for targeted interventions to mitigate these specific injury types in occupational settings.

In this study, the distribution of work-related injuries among workers revealed that the upper arm, lower arm, or hands were the most commonly injured sites, accounting for 32% of injuries, followed by legs at 26%, multiple sites at 7%, head injuries at 14%, and trunk injuries at 10%. These findings are consistent with a study conducted in Paraguay, which reported that injuries predominantly affected the hands, wrists, and fingers (33.3%), legs (25%), and feet, ankles, or toes (21.6%) [52, 53]. Additionally, similar patterns were observed in studies from the North Gondar zone and Tendaho agricultural development enterprise, reinforcing the prevalence of upper extremity injuries in various occupational settings [48, 54]. The high incidence of upper extremity injuries can be attributed to the nature of tasks performed in many workplaces, which often involve repetitive motions and manual handling that increase the risk of musculoskeletal disorders. Understanding these injury patterns is crucial for developing targeted prevention strategies aimed at reducing the incidence of specific types of injuries across different occupational environments.

This study identified the most common causes of work-related injuries as follows: hand tools (35.7%), fire or hot substances (21.4%), machinery (12.8%), and lifting heavy objects (8%). These findings are consistent with those from the Tendaho sugarcane plantation study in Afar, Ethiopia, which reported hand tools (21.3%), fire (13.8%), machinery (12.8%), and lifting heavy objects (8%) as prevalent causes of injuries [5, 48]. Previous research has highlighted various factors associated with the occurrence, severity, type, and sources of work-related injuries, including socio-demographic factors, working environment

characteristics, and workers' behavioural tendencies [55–57]. These elements are recognized as significant risk factors contributing to workplace injuries.

Additionally, research suggests that while older workers may have lower overall injury rates, the severity of their injuries tends to be higher, which can be attributed to factors such as muscle strength loss and sensory impairments like hearing and vision decline [58, 59]. These findings emphasize the need for targeted safety interventions that accommodate the specific vulnerabilities of older workers, such as enhancing workplace ergonomics and providing tailored training focused on their unique challenges [60]. The above evidence supports the notion that age significantly influences injury risk in the workplace, necessitating a proactive approach to protect older employees.

Our study found that workers with tertiary or college education are twice as likely to sustain work-related injuries compared to those with secondary education or below, presenting a complex issue. This phenomenon may stem from increased awareness and reporting of injuries, as educated workers typically possess greater knowledge of safety protocols, leading to more frequent incident reporting [61]. Furthermore, higher education often correlates with job roles that involve greater responsibility and exposure to hazards, alongside heightened work pressure and stress. While some research indicates that education generally fosters better safety practices, our findings highlight the need for targeted interventions to address the specific risks faced by educated workers [62]. Future research should further explore these dynamics to improve injury prevention strategies across varying educational backgrounds in the workplace.

Occupational safety and health supervision is statistically significantly associated with a reduced incidence of work-related injuries. Workers who reported regular supervision by competent personnel were 0.307 times less likely to experience work-related injuries compared to their counterparts. This finding aligns with research conducted at the Tendaho sugarcane plantation in Ethiopia [5], suggesting that effective supervision enhances workplace safety. The positive impact of supervision can be attributed to several factors, including the enforcement of safety protocols, immediate identification and mitigation of hazards, ongoing training and education, prompt responses to incidents, promotion of a

safety culture, and regular safety audits and inspections [63]. Such comprehensive oversight fosters a safer work environment, ultimately reducing the likelihood of injuries among workers.

Occupational safety and health training has shown no statistically significant association with reducing work-related injuries, suggesting that merely providing training may not be effective. Factors undermining training effectiveness include poor content quality, lack of practical application, inadequate reinforcement, and a workplace culture that does not prioritize safety [5, 50]. Additionally, employees' attitudes toward safety, the relevance of training to specific hazards, and communication barriers can hinder the intended impact of training programs. However, some research indicates that when training is combined with management commitment, employee involvement, and effective communication, it can lead to improved outcomes [64, 65]. Engaging learners actively during training sessions is also crucial for influencing behaviour change post-training.

The utilization of PPE was significantly associated with a reduction in work-related injuries, with workers who properly used PPE being 0.8 times less likely to report injuries compared to those who did not. Consistent with our findings, existing studies underscore the importance of proper PPE utilization in significantly reducing the incidence of work-related injuries [66, 67]. Safety training is a critical component in promoting effective PPE usage, as workers who receive education on the significance and correct application of PPE are more inclined to adhere to safety protocols [67, 68]. This increased compliance contributes to a notable decline in reported injuries. However, several barriers hinder effective PPE utilization, including discomfort, insufficient awareness of its importance, and inadequate training on proper usage techniques [69, 70]. To enhance compliance among workers, it is essential to address these challenges through comprehensive training programs and by ensuring the availability of appropriately designed and comfortable equipment. Such measures can foster a culture of safety and significantly mitigate workplace hazards.

Alcohol consumption was found to have a significant association with work-related injuries, with workers who consumed alcohol being 1.9 times more likely to experience such injuries compared to their counterparts. This finding aligns with research conducted in the Afar

Tendaho and Tendaho sugarcane plantations in Ethiopia, which also highlighted the link between alcohol use and increased injury risk [5]. The mechanisms underlying this association may include impaired judgment and reduced hazard perception, leading to risk-taking behaviours among intoxicated individuals. Furthermore, alcohol can affect motor skills and coordination, increasing the likelihood of accidents as workers may struggle to maintain balance or respond effectively to potential dangers in their environment [5, 48]. Consequently, addressing alcohol consumption in occupational health strategies could be vital for reducing the prevalence of work-related injuries.

Sleeping disorders have been significantly associated with an increased risk of work-related injuries. This study shows that workers with sleep disorders are 1.3 times more likely to sustain such injuries compared to their counterparts without these issues. This finding is supported by a systematic review and meta-analysis indicating that individuals experiencing sleep problems face a 1.62 times greater risk of work-related injuries [71, 72]. Approximately 13% of occupational injuries have been attributed to sleep disturbances [73, 74]. Workers affected by sleep issues may suffer from cognitive impairments, slower reaction times, and diminished decision-making abilities, all of which elevate the risk of accidents in the workplace [75]. Given the strong link between sleep health and occupational safety, implementing interventions to improve sleep quality among workers could be a valuable strategy for reducing injury rates. Such interventions could include raising awareness about sleep hygiene and providing resources for the management of sleep disorders.

5.2 Study Strength and limitations

The strengths of this study stemmed from its focus on employees in the sugar industry in Tanzania, a sector with significant occupational health challenges. By examining work-related injuries within this context, the study provided valuable insights into how factors such as age, substance use, and educational background influenced injury prevalence and safety practices. Additionally, the use of a comprehensive data collection tool tailored to the local context enhanced the relevance of the findings.

However, the study had several limitations. Firstly, due to its cross-sectional design, establishing temporal relationships between variables was not possible. Secondly, excluding variables that did not show statistical significance may have impacted the regression estimates and overall findings. Thirdly, while data from the questionnaires provided useful information, they were subject to recall bias, particularly regarding past injury events. Lastly, the analysis did not account for hierarchical factors such as departmental differences or management practices, which could have provided a more nuanced understanding of work-related injuries.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

This chapter provides the study conclusion, recommendations, and potential areas for future research.

6.1 Conclusion

This study found that the prevalence of work-related injuries was relatively low at 14.8%. Contributing factors may include effective workplace supervision and the consistent use of PPE, which have been shown to mitigate injury rates compared to other studies. Statistically significant associations with work-related injuries were observed among employees aged 51 years and older, those who consume alcohol, individuals with sleeping disorders, and employees with college or tertiary education. While factors such as marital status and occupational safety and health training were noted, they did not show a statistically significant association with injury prevalence. Nevertheless, these factors remain relevant challenges in the workplace and warrant ongoing discussion among safety and health partners, including policymakers and stakeholders.

6.2 Recommendations

The following recommendations are forwarded from the findings of the study.

To sugar company management body

- Provide standard quality personal protective equipment as needed and its utilization should also be monitored regularly.
- Special attention to older and higher educated workers, as they are more prone to injuries.
- Establishment of a wellness program to address alcohol drinking habits and sleeping disorders of the employees.

To Workers

- To cooperate and followed the company's working rule and occupational health and safety management system.

- To avoid alcohol drinking during working hours and to have adequate rest or to seek medical help when necessary.
- Report injury incidence when it occurs.

To researchers

- Further studies on economic impacts of the work-related injuries.

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Appendices

Appendix 1: Questionnaire in English Version

Muhimbili University of Health and Allied Sciences.

School of Public Health Social Sciences.

A Questionnaire for assessing prevalence and associated factors for work related injuries among workers at sugar industries in Tanzania.

Questionnaire Number:

A) WORKERS RELATED FACTORS:

Instructions: *Circle where appropriate and fill in the blanks where it is required.*

No.	Question.	Response.
1.	Sex	1. Male 2. Female
2.	Age	Fill ……. (*Years*)
3.	What is your marital status?	1. Never married 2. Married 3. Living together 4. Separated 5. Divorced 6. Widowed
4.	Education level?	1. Illiterate 2. Primary school (Standard 1 to 7) 3. Secondary school (Form IV to VI)

		4. Tertiary (Colleges & University)
5.	Employment type	1. Permanent 2. Special contract 3. Season 4. Temporally
6.	Work experience	…… years/months/days
7.	Job title	1. General worker 2. Artisan 3. Engineer 4. Other, specify……
8.	Department and section	1. Agriculture optimization 2. Agriculture engineering 3. Agriculture production 4. Manufacturing factoring K1 5. Manufacturing factoring K2
9.	Have you had an incident at job that resulted in an injury to you in the previous last production season?	1. YES 2. NO
10.	Part(s) of the body affected	1. Head 2. Upper arm, low arm, or hands 3. Trunk (Chest or Abdomen) 4. Leg or foot
11.	Types of Injury	1. Abrasion 2. Cut 3. Burn 4. Fracture 5. Other, specify …….
12.	What were you doing at the time of injury	1. Perform own duty

		2. Assist colleague in his/her duty 3. Introduction/orientation to a new work 4. Other, specify…….
13.	Sources of injury	1. Machinery 2. Hit by falling object 3. Hand tools 4. Fire or hot substance 5. Other specify…….
14.	Days of injury (encircle the answer	1.Monday 2. Tuesday 3. Wednesday 4.Thursday 5. Friday 6. Saturday 7.Sunday 8. Not remember
15.	Time of injury	1.In the morning 2. In the Afternoon 3. In the evening 4. In the midnight 5. Not remember
16	Did you notify your line manager about the injury?	YES NO
17	Where you attended at hospital following the injury?	YES NO
18.	If Yes for the Q. 17, Were you hospitalized as result of injury	YES NO
19.	If Yes Q. 18, For how long	1. Less or equal to two (2) days 2. More than two (2) days.
20.	Number of days lost due to injury at work	1.Less or equal to three (3) days 2. More than three (3) days

B) WORK ENVIRONMENT INFORMATION:

21.	Hours worked per day	1. Equal or less than nine (9) hours 2. More than nine (9) hours
22.	Workplace regularly supervised	1. YES 2. NO
23.	Have you had any safety training in connection with new employment?	1. YES 2. NO 3. Other, specify ……
24.	Have you had any safety training in connection new equipment?	1. YES 2. NO 3. Other, specify ……
25.	Have you had any safety training in connection other changes?	1. YES 2. NO 3. Other. Specify …….
26.	How long since your last training/education	---------- days/months/years
27.	Did you do medical examination for the previous last production season?	1. YES 2. NO

C) WORKERS BEHAVIOURAL CHARACTERISTICS.

28.	Do you smoke?	1. YES 2. NO
29.	If YES for the Q26 above, How many sticks/packs used in a week?	1. Less than fourteen (14) 2. More than fourteen (14) 3. Other, specify ……..
30.	Do you drink alcohol?	YES NO
31.	If YES to the Q28 above, how many bottles/glasses in a week?	1. Less than Ten (10) 2. More than Ten (10) Other, specify ……
32.	Do you have any sleeping disorders (sleepiness tendency during working hours)?	1. YES 2. NO
33.	If your answer for is Yes, what is your reason?	1. Working more than nine (9) hrs. 2. Working in evening/night. 3. Trying to work more than one task at a time 4. Others, specify-------
34.	Are you satisfied with your job?	1. YES 2. NO

35.	Does your work require you to use personal protective equipment (PPE)?	1. YES 2. NO
36.	If YES to Q31, do you have full and proper personal protective equipment?	1. YES 2. NO
37.	If YES, for Q 32, what type of personal protective equipment do you have?	1. Hard hat 2. Reflector 3. Mask 4. Noise protection device 5. Others …….
38.	If YES to Q33, do you always properly use all required personal protective equipment?	1. YES 2. NO
39.	If NO to Q34, what are your reason for not using?	1. Knowledge how to use it 2. Not have proper PPE 3. Not have full PPE 4. Limit you to do your work 5. Not knowing its importance 6.Others, specify……

This is the end of our questionnaire. Thank you very much for taking time to respond these questions. We appreciate your cooperation.

Appendix 2: Check List for Observation of Working Environment

Muhimbili University of Health and Allied Sciences.

School of Public Health Social Sciences.

Check list Identification No. ----------

Name of the Department ----------

Major hazardous operation in the work----------

Major focus duties of the work----------

Total number of employees directly employed in the Department------- M, ------- F-----Total.

Hazards in Working Environment

1. Is there excessive heat in the workplace? 1.YES 2.NO. A yes requires that a worker is found sweating or with light clothing if investigator feels are sudden heat wave when into the sites.

2. Is there excessive dust in the workplace? 1.YES 2. NO A yes requires if the investigator experiences sudden sneezing upon entering the workplace or if the workers eyebrows, hair, and nostrils and clothes are observed by investigator to be covered with dust particles

3. Is there excessive noise in the workplace? 1. YES 2.NO. A yes requires that it is difficult to communicate with nearby worker without shouting.

4. Is there warning signs or safety rules ?1. YES 2.NO. A yes requires no lack of such arrangement at inspection around

5. Does the employee use the necessary personal protective equipment? 1. YES 2.NO. A yes requires no lack in the use of safety devices seen during inspection around

6. Do all work equipment have the appropriate protective arrangement? 1. YES 2.NO. A yes requires no lack of such arrangement (poorly installed electric-wire or unguarded machine or equipment) at inspection around

7. What is the most dangerous incident in the site during the last production season, and any preventive measures been implemented? 1. YES 2. NO Attainment of yes requires specification of the incident and preventive measures

8. Does the site have copy of the most important safety and health regulations? 1. YES 2.NO. A yes requires a copy of the regulation

9. Does the site follow written health and safety plan for action in the workplace? 1.YES 2. NO. A yes requires completion of at least one of the measures in the plan.

10. Does the site arrange at least one meeting to discuss health issues with the employee in the last production season 1. YES 2. NO. A yes requires minutes with written conclusion for the meeting held during the period specified.

11. Does the site have the first aid service and equipment required for this? 1.YES 2.NO. A yes requires that the first aid equipment where the required standard equipment available in the working area of the site

These are our observation questions. We are very much grateful to you for giving us your precious time and appropriately responded for our queries.

Appendix 3: Questionnaire (Dodoso Kwa Kiswahili)

Chuo cha Afya na Sayansi Shirikishi Muhimbili

Shule Kuu ya Afya ya Uma/Jamii na Sayansi ya Jamii

Dodoso kwaajili ya kutathimini ajari zitokanazo na kazi na vihusianishi vyake kwa wafanya kazi katika viwanda vya sukari Tanzania.

Namba ya Dodoso

A: TAARIFA ZINAZOHUSIANA NA MFANYAKAZI.

Maelekezo: *Zungushia machaguo yanayohusika na jaza/andika maelezo kwenye vingele vinavyohitajika.*

No.	Question.	Response.
1.	Jinsi	1. Me 2. Ke
2.	Una umri wa miaka mingapi?	Andika umri……. (*Years*)
3.	Hali yako ya ndoa?	1. Sijawahi kuoa/kuolewa 2. Nimeoa/kuolewa 3. Ninaishi na mpenzi 4. Tumetengana 5. Taraka 6. Mjane/mgane
4.	Kiwango chako cha elimu?	1. Sijamaliza darasa la saba 2. Nimehitimu darasa la saba 3. Elimu ya sekondari 4. Elimu ya chuo/chuo kishiriki/kati/ufundi
5.	Aina ya ajira/mkataba	1. Wakudumu 2. Mkataba maalum 3. Mkataba wa msimu 4. Mkataba wa muda

6.	Uzoefu wa kazi	…… years/months/days
7.	Jina la kazi	1. Mfanyakazi wa jumla 2. Fundi 3. Muhandisi 4. Nyingine, taja …….
8.	Idara	1. Kilimo uhandisi 2. Kilimo uboreshaji 3. Kilimo uzalishaji 4. Kiwandani K1 5. Kiwandani K2
9.	Je, umekuwa na tukio kazini ambalo lilisababisha jeraha kwako katika msimu wa uzalizaji wa mwisho uliopita?	1. NDIO 2. HAPNA
10.	Sehemu ya mwili iliyoathirika/umia	1. Kichwa 2. Mikono 3. Kifua au tumbo 4. Miguu
11.	Aina ya majeraha	1. Michubuko 2. Kujikata 3. Kuungua 4. Mvunjiko
12.	Ulikuwa unafanya nini wakati wa kuumia	1. Unatimiza majukumu yako ya kazi 2. Unamsaidia mfanya kazi mwenzio kazi 3. Unaelekezwa kazi mpya 4. Nyingine taja…….
13.	Vyanzo vya majeraha/ajari	1.Mashine

		2. Kuangukiwa na kitu toka juu 3. Zana za kazi za mikono 4. Moto au kitu cha moto 5.Nyingine taja ……
14.	Siku uliyoumia (zungushia jibu)	1.Jumatatu 2. Jumanne 3. Jumatano 4.Alhamis 5. Ijumaa 6. Jumamosi 7.Jumapili 8. Sikumbuki.
15.	Muda uliopata majeraha	1.Asubuhi 2. Mchana 3. Jioni 4. Usiku 5. Sikumbuki.
16.	Je, ulimjulisha kiongozi wako wa kazi kuhusu majeraha uliyopata?	1. NDIO 2. HAPANA
17.	Je, ulienda hospitalini kutibiwa kutokana na majeraha uliyopata?	1. NDIO 2. HAPANA
18.	Kama ndio kwa swali namba 17, Je, ulilazwa hospitalini kutokana na jeraha	1. NDIO 2. HAPANA
19.	Kama ni NDIO kwa swali namba 18. Ni kwa muda gani ulilazwa	1. Siku mbili (2) au chini ya siku mbili 2. Zaidi ya siku mbili (2)
20.	Idadi ya siku ambazo hukwenda kazini kwa sababu ya jeraha	1. Siku tatu (3) au chini ya siku tatu 2. Zaidi ya siku tatu (3)

B) TAARIFA ZA MAZINGIRA YA KAZI:

21.	Saa za kazi kwa siku.	1.Masaa tisa (9) au chini ya masaa tisa (9) 2. Zaidi ya masaa tisa (9)
22.	Mahali pa kazi husimamiwa mara kwa mara	1. NDIO 2. HAPANA
23.	Je, umekuwa na mafunzo yoyote ya usalama kuhusiana na ajira mpya, vifaa vipya, au Mabadiliko mengine?	1. NDIO 2. HAPANA 3. Nyingine, taja ……
24.	Je, umekuwa na mafunzo yoyote ya usalama kuhusiana na vifaa vipya?	1. NDIO 2. HAPANA 3. Nyingine, taja ……
25.	Je, umekuwa na mafunzo yoyote ya usalama kuhusiana mabadiliko mengine?	1. NDIO 2. HAPANA 3. Nyingine, taja ……
26.	Ni muda gani umepita tangu upate mafunzo/elimu yako ya mwisho?	---------- Siku/Miezi/Miaka
27.	Je, ulifanyiwa uchunguzi wa afya kwa msimu wa uzalishaji uliopita?	1. NDIO 2. HAPANA

C)TABIA ZA WAFANYAKAZI.

28.	Je, unavuta sigara?	1. NDIO 2. HAPANA
29.	Kama ni NDIO kwa swali namba 26, Sigara ngapi unatumia kwa wiki?	1. Chini ya kumi (10) 2. Zaidi ya kumi (10) 3. Nyingine, taja ……
30.	Je, unakunywa pombe?	1. NDIO 2. HAPANA
31.	Kama NDIO kwa swali namba 28, chupa/bilauri ngapi za pombe?	1. Chini ya kumi (10) 2. Zaidi ya kumi (10)

		3. Nyingine, taja ……
32.	Je, una matatizo yoyote ya usingizi?	NDIO HAPANA
33.	Kama ni NDIO kwa swali namba 28, sababu yako ni nini?	1. Kufanya kazi zaidi ya masaa tisa (9) bila kupumzika 2. Kufanya kazi jioni/usiku. 3. Kufanya kazi nyingi kwa wakati mmoja. 4. Nyingine, taja-------
34.	Je, umeridhika na kazi yako?	NDIO HAPANA
35.	Je, kazi yako inakuhitaji utumie kifaa/vifaa vya kujikingia?	NDIO HAPANA
36.	Kama ni NDIO kwa swali namba 31, Je, unavyo vyote na kwahusahihi wake?	1. NDIO 2. HAPANA
37.	Kama ni NDIO kwa swali namba 32, Je, ni kifaa/vifaa gani unavyo?	1. Kofia ngumu 2. Kiakisi mwanga 3. Maski 4. Kifaa cha kuzuia kelele masikioni 5. Nyingine, taja…….
38.	Kama ni NDIO kwa swali namba 33, Je wakati wote unavitumia kwa usahihi?	1. NDIO 2. HAPANA
39.	Kama ni HAPANA kwa swali namba 34, Je ni sababu gani inayokufanya husitumie?	1. Ujuzi wa kutumia kwa usahihi 2. Sina kifaa sahihi 3. Sina vifaa vilivyokamilika 4. Vinanizuia kufanya kazi 5. Sijajua umuhimu wake 6.Nyingine, taja……

Huu ndio mwisho wa dodoso letu. Asante sana kwa kuchukua muda kujibu maswali haya.

Tunashukuru ushirikiano wako.

Appendix 4: Fomu ya orodha ya ukaguzi

Chuo cha Afya na Sayansi Shirikishi Muhimbili

Shule Kuu ya Afya ya Uma/Jamii na Sayansi ya Jamii

Nambari ya utambulisho wa orodha.....

Jina la Idara.....

Kazi zenye hatari zaidi.....

Majukumu makuu ya kuzingatia ya kazi.....

Jumla ya idadi ya wafanyikazi walioajiriwa moja kwa moja katika Idara

Me……Ke……. Jumla…….

Hatari katika Mazingira ya Kazi

1. Je, kuna joto kupita kiasi mahali pa kazi? 1. NDIO 2. HAPANA Ndio inahitaji mfanyakazi apatikane akitokwa na jasho au akiwa na mavazi mepesi ikiwa mtafiti anahisi kuwa kuna wimbi la joto la ghafla wakati anaingia mahala pa kazi.
2. Je, kuna vumbi kupita kiasi mahali pa kazi? 1. NDIO 2. HAPANA Ndio inahiaji ikiwa mtafiti atapiga chafya ghafula anapoingia mahali pa kazi au ikiwa nyusi, nywele, pua na nguo zinatazamwa na mpelelezi kuwa zimefunikwa na chembe za vumbi.
3. Je, kuna kelele nyingi mahali pa kazi? 1. NDIO 2.HAPANA. Ndio inahitaji kuwa ni vigumu kuwasiliana na mfanyakazi wa karibu bila kuongea kwa nguvu.
4. Je, kuna ishara za onyo au sheria za usalama ?1. NDIO 2.HAPANA. Ndio haihitaji ukosefu wa mpangilio kama huo wakati wa ukaguzi
5. Je, mfanyakazi hutumia vifaa vya kinga vya kibinafsi vinavyohitajika? 1. NDIO 2.HAPANA. Ndio haihitaji ukosefu wa matumizi ya vifaa vya usalama vinavyoonekana wakati wa ukaguzi kote

6. Je, vifaa vyote vya kazi vina mpangilio ufaao wa kinga? 1. NDIO 2.HAPANA. Ndio haihitaji ukosefu wa mpangilio kama huo (waya wa umeme ambao haujasakinishwa vibaya au mashine au vifaa visivyolindwa) wakati wa ukaguzi.
7. Ni tukio gani hatari zaidi mahali pa kazi lilitokea wakati wa msimu wa uzalishaji uliopita, na hatua zozote za kuzuia zilizochukuliwa? 1. NDIO 2. HAPANA Kufikiwa kwa ndio kunahitaji maelezo ya tukio na hatua za kuzuia
8. Je, mahala pa kazi kuna nakala ya kanuni muhimu zaidi za usalama na afya? 1. NDIO 2.HAPANA. Ndio inahitaji nakala ya kanuni
9. Je, mahala pa kazi panafuata mpango ulioandikwa wa afya na usalama? 1.NDIO 2. HAPANA. Ndio inahitaji kukamilishwa kwa angalau moja ya hatua katika mpango.
10. Je, mahali pa kazi palipanga angalau mkutano mmoja ili kujadili masuala ya usalama na afya pamoja na wafanyakazi katika msimu uliopita wa uzalishaji 1. NDIO 2. HAPANA. Ndio inahitaji muhtasari zenye hitimisho lililoandikwa kwa mkutano unaofanyika katika kipindi kilichobainishwa.
11. Je, huduma ya kwanza inatolewa mahala pa kazi na kuna vifaa vyote vinavyohitajika? 1.NDIO 2. HAPANA. Ndio inahitaji vifaa vya huduma ya kwanza ambapo vifaa vya kawaida vinavyohitajika vinapatikana katika eneo la kazi la kazi

Appendix 5 - Consent to Participate in Research – English Version

Muhimbili University of Health and Allied Sciences.

School of Public Health and Social Sciences.

A research study on the prevalence of work-related injuries and associated factors among workers in one of the sugar industry companies in Tanzania.

Dear Sir/Madam,

You are hereby invited to participate in a study conducted by Isaya Charles Mwera for a master's Dissertation at Muhimbili University of Health and Allied Sciences.

Your participation in this study is entirely voluntary. You should read the information below before deciding whether or not to participate in the study. Your participation in the study will involve participation in filling out the questionnaire.

PURPOSE OF THE STUDY: This study aims to assess the prevalence of work-related injuries and associated factors in one of the sugar industries in Tanzania.

VOLUNTARY PARTICIPATION: Participation in this study is voluntary and you have a right to refuse to consent. If you consent to participate, you have the right to withdraw from the study at any time if you wish to do so.

BENEFITS: There are no direct benefits to participating in the study. However, this study will provide information on the prevalence and associated factors for work-related injuries among workers at one of the sugar industries in Tanzania. This information will be useful to government and non-government actors to improve interventions.

RISKS AND DISCOMFORT: There are no risks or discomforts involved in this study.

COMPENSATION FOR TIME: You will not receive any payment or other compensation for participation in this study. There is also no cost to you to participate in the study except your time.

CONFIDENTIALITY: Your participation in this study will remain confidential and your identity will be disclosed. There will be not any link between your identity and response.

REVIEW AND APPROVAL: The review and approval of the study has been done by the Ethical committee of Muhimbili University of Health and Allied Sciences (MUHAS).

RESULTS: The results of the study will be made available to you through a planned means of research dissemination and will be compiled in a research paper for publication as part of a partial fulfilment of a master's degree.

CONSENT FORM: I confirm that I have read carefully, understood the information provided and consent to participate in the study.

CONTACT: If you ever have questions about this study, you should contact the Principal Investigator Isaya Charles Mwera from Muhimbili University of Health and Allied Sciences, P.O. Box 65001, Dar-es-Salaam.

Supervisors of this study Professor Simon Mamuya email address mamuyasimon2@gmail.com, P. O. Box 65001, Dar-es-salaam, and Mr Luco Mwelange email address mwelange@gmail.com, P. O. Box 65001, Dar-es-salaam.

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I, …… have read the contents of this consent form and my questions have been adequately answered. I therefore **agree to participate and provide consent for my child to participate in this study.**

Signature of the participant ……. Date …….2023

Signature of the interviewer ……..... Date …….2023

Appendix 6 - Ridhaa ya Kushiriki Kwenye Utafiti - Swahili Version

Chuo Kikuu Cha Afya na Sayansi Shirikishi Muhimbili.

Shule Kuu ya Afya ya Uma/Jamii na Sayansi ya Jamii

Utafiti kuhusu ajari zitokanazo na kazi na vihusianishi vyake kwa wafanya kazi katika viwanda vya sukari Tanzania.

Mpendwa Mshiriki,

Nakukaribisha kushiriki katika utafiti unaofanywa na Dkt. Isaya Charles Mwera, mwanafunzi wa shahada ya uzamili kutoka katika chuo kikuu cha afya na sayansi shirikishi Muhimbili.

Kushiriki kwako katika utafiti huu ni kwa hiari unatakiwa kusoma taarifa zote katika fomu hii na kuaamua kushiriki au kutokushiriki katika utafiti huu.

MADHUMUNI YA UTAFITI: Dhumuni la utafiti huu kutathimini ajari zitokanazo na kazi na vihusianishi vyake kwa wafanya kazi wa kiwanda kimojawapo cha sukari Tanzania.

USHIRIKI: Ushiriki katika utafiti huu ni wa hiari na una haki ya kukataa kushiriki katika utafiti. Kama umekubali kushiriki utatakiwa kuweka sahihi yako katika fomu hii nakujibu maswali katika dodoso utakalopewa.

FAIDA: Hamna faida ya moja kwa moja kwa wewe kushiriki katika utafiti huu. Ila matokeo ya utafiti huu yatasaidia kutathimini ajari zitokanazo na kazi na vihusianishi vyake. Taarifa hizi zitasaidia serikali na wadau wengine kuboresha usalama mahala pa kazi na kuweka mipango mikakati na hafua mbalimbali za kukinga ajari zitokanazo na kazi.

HASARA: Hakuna hasara za moja kwa moja zitakazotokana na utafiti huu.

FIDIA: Hakuta kuwa na malipo yoyote kutokana na ushiriki wa utafiti huu na pia kama mshiriki hutakuwa na gharama zozote za wewe kushiriki katika utafiti huu ispokuwa muda wako tu.

USIRI: Ushiriki wako katika tafiti hii utabaki kuwa siri na taarifa zote zitakazokusanywa zitashughulikiwa kwa usiri wa hali ya juu. Jina lako halitatumika katika taarifa zozote.

KUIDHINISHA UTAFITI: Mapitio na uidhinishaji wa utafiti huu umefanywa na kamati ya maadili ya utafiti ya chuo kikuu cha afya na sayansi shirikishi muhimbili.

MATOKEO: Matokeo ya utafiti huu yatapatikana kupitia uwasilishwaji katika chuo kikuu cha afya na sayansi shirikishi Muhimbili, uongozi wa kampuni ya sukari ambapo utafiti huu umefanyika na wadau, pia ripoti ya utafiti itachapishwa kwa umma ili iweze kusaidia kutekeleza shughuli za afya mahala pa kazi.

FOMU YA UTAFITI: Nakiri kwamba nimesoma maelezo yote kwa umakini na nimeelewa kila kilichoandikwa katika fomu hii. Ninaelewa kwamba ninaweza kujitoa muda wowote nitakaotaka kujitoa katika tafiti hi.

MAWASILIANO KUHUSIANA NA UTAFITI HUU

Kama una maswali kuhusiana na utafiti huu unaweza kuwasiliana na mtafiti mkuu, Isaya Mwera kutoka chuo kikuu cha afya na sayansi shirikishi Muhimbili, S.L.P 65001, Dar es Salaam.

Wasimamizi wa utafiti huu Profesa Simon Mamuya barua pepe mamuyasimon2@gmail.com, S. L. P 65001, Dar-es-salaam, na Mr Luco Mwelange barua pepe mwelange@gmail.com, S. L. P 65001, Dar-es-salaam.

MKURUNGENZI WA TAFITI, MACHAPUSHO NA UVUMBUZI (DRPI) S. L.P. 65001 Dar es Salaam Simu: +255 22 2152489, Simu: +255 22 2150302-6 (Ext. 1016 Director, Ext. 1038 OMS) Fax: +255-22-2152489 barua pepe: drp@muhas.ac.tz

Mimi, …… Nimesoma maelezo yote katika fomu hii na maswali yangu yameweza kujibiwa. **Nakubali kushiriki na natoa ridhaa kushiriki kwenye utafiti huu.**

Sahihi ya Mshiriki..... Tarehe ……

Sahihi ya Msahili ……..... Tarehe ……

Appendix 7 – Ethical Clearance Letter



UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR – RESEARCH, PUBLICATIONS AND INNOVATIONS



Ref. No.DA.282/298/01.C/ Date: 04/12/2023

MUHAS-REC-12-2023-1983
Isaya Charles Mwera
Shool of Public Health and Social Sciences
MUHAS

RE: APPROVAL FOR ETHICAL CLEARANCE FOR A STUDY TITLED: PREVALENCE OF WORK-RELATED INJURIES AND ASSOCIATED FACTORS AMONG WORKERS AT SUGAR FACTORIES IN TANZANIA.

Reference is made to the above heading.

I am pleased to inform you that the Chairman has on behalf of the University Senate, approved ethical clearance of the above-mentioned study, on recommendations of the Senate Research and Publications Committee meeting accordance with MUHAS research policy and Tanzania regulations governing human and animal subjects research.

APPROVAL DATE: 04/12/2023
EXPIRATION DATE OF APPROVAL: 04/12/2024

STUDY DESCRIPTION:
Purpose:
This study aimed to assess the occurrence of work-related injuries and recognize related factors. Acquiring knowledge about the frequency and significant risks of work-related injuries is vital for adequate planning and advancing the physical and mental health of employees in Tanzania.

The approved protocol and procedures for this study is attached and stamped with this letter, and can be found in the link provided:
https://irb.muhas.ac.tz/storage/Certificates/Certificate%20-%2014839.pdf and in the MUHAS archives.

The PI is required to:

1. Submit bi-annual progress reports and final report upon completion of the study.
2. Report to the IRB any unanticipated problem involving risks to subjects or others including adverse events where applicable.
3. Apply for renewal of approval of ethical clearance one (1) month prior its expiration if the study is not completed at the end of this ethical approval. You may not continue with any research activity beyond the expiration date without the approval of the IRB. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.
4. Obtain IRB amendment (s) approval for any changes to any aspect of this study before they can be implemented.
5. Data security is ultimately the responsibility of the investigator.
6. Apply for and obtain Data Transfer Agreement (DTA) from NIMR if data will be transferred to a foreign country.
7. Apply for and obtain Material Transfer Agreement (MTA) from NIMR, if research materials (samples) will be shipped to a foreign country.
8. Apply for and obtain permission to publish the results from National Institute for Medical Research. The application should be before submitting to a publisher and not concurrently through the email publications@nimr.or.tz.
9. Any researcher, who contravenes or fail to comply with these conditions, shall be guilty of an offence and shall be liable on conviction to a fine as per NIMR Act No. 23 of 1979, PART III section 10 (2)
10. The PI is required to ensure that the findings of the study are disseminated to relevant stake holders.
11. PI is required to be versed with necessary laws and regulatory policies that govern research in Tanzania. Some guidance is available on our website https://drp.muhas.ac.tz/.

Dr. Nahya Salim Masoud,
Chairperson, MUHAS Research and Ethics Committee