

THESIS ABSTRACT

Master of Public Health

Adventist University of Africa

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Title: A COMPARATIVE ANALYSIS OF KNOWLEDGE, ATTITUDES AND PRACTICES ON OCCUPATIONAL SAFETY AND HEALTH COMPLIANCE AMONG SMALL-SCALE BAKERIES IN HARARE, ZIMBABWE

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This study sought to analyze the knowledge, attitudes, and practices on Occupational Safety and Health compliance among small-scale bakeries. Data were collected from 137 participants from the small-scale bakeries in Willowvale industrial area, Harare, Zimbabwe period (September to October 2021). Questionnaires, interviews, observation checklists and heat and light measurements were used for data collection. Negative binomial regression was used to assist in establishing the strength of the relationship between variables and know which independent variable was a significant predictor of compliance with OSH standards. Statistical Package for Social Sciences SPSS, version 23 was used for data analysis. The majority of the participants were males 99% and their age range was 19-30 years. The study revealed that 83% of small-scale bakeries functioned outside the requirements of the Zimbabwean OSH

legislation and regulations by failing to register their operations under the Factories and Works Act Chapter 14:08. OSH management structures were essentially not there and OSH programs implementation was very poor and minimum. Employees were unprotected from several hazards including heat exposure and poor lighting. The findings obtained from the study are not statistically significant. This is shown by the P values ($P > |z|$) obtained which are all greater than 0.05.

In conclusion, several recommendations were made for improved OSH knowledge, attitude, practices and compliance in the small-scale bakery industry. These include, management taking responsibility of the employee's safety and health through implementation of occupational safety and health programs including OSH training. Employees need to develop a positive attitude towards OSH and implement daily safety practices. The legislators should offer tailor made and considerate interventions for such operations with main thrust on awareness and training promotions to develop and foster the essential knowledge, attitudes as well as positive practices that will result in sustainable OSH compliance in small-scale bakery industry.

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A thesis

presented in partial fulfillment
of the requirements for the degree
Master of Public Health

by

Gelien Busangavanye

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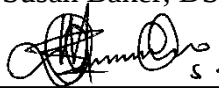
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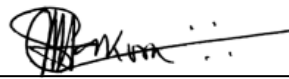
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To God for providing the resources and life for my
educational goals to come to pass.

To my Supervisors for their unwavering support.

To my husband Walter and my children

Tamirira, Tirivashe and Leeor for

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going got tough!

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CHAPTER 1

INTRODUCTION

Background of the Study

About 95% of Zimbabwe's economy is being sustained by Small to Medium Enterprises (SMEs) (Mudzviti & Mawanza 2014). Seventy percent of the Gross Domestic Product (GDP) is from SMEs that are capable of improving livelihoods of more than 70% of the population, while also occupying 75% – 80% of the business space in Zimbabwe (Tinarwo, 2016). In the same study, Tinarwo (2016) further mentions that SMEs provide 80% to 85% of employment in all divisions of the economy including the bakery industry, thus making SMEs a vital component of the industry. Another author augments to say that SMEs are significant in the sustainable growth of developing economies such as Zimbabwe (Tonis, 2015).

Though small-scale bakeries contribute to poverty alleviation, this industry, just like most other industries is prone to safety and health hazards resulting in illness, injury, and preventable fatalities. This is supported by research showing that SMEs have higher incidence and magnitude of work-related accidents and also have poor level of compliance to OSH compared to large sized organizations (Bonafede et al., 2016).

A study in the UK revealed that the average work-related injury incident rate for confectioners and bakers averaged 18.2 times the average workplace and qualifies these operations to be in the top ten dangerous jobs in the UK (Blythe, 2022).

The figure 1 below shows how OSH is organized in Zimbabwe.

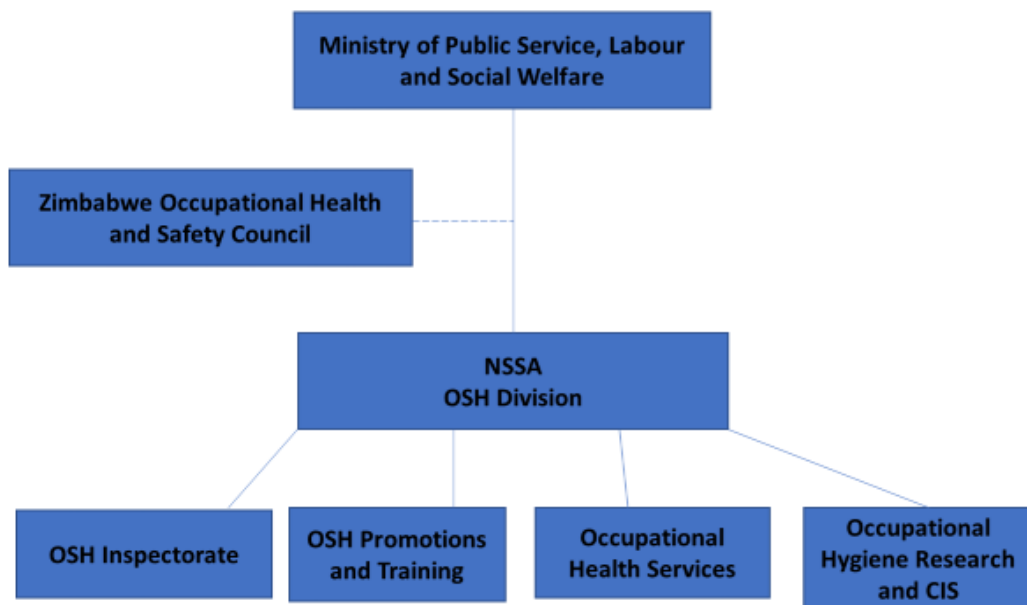


Figure 1. OSH Organization in Zimbabwe

Zimbabwe, like other countries, through the Minister of Public Service, Labour and Social Welfare introduced the Zimbabwe National Occupational Safety and Health Policy (ZNOSHP) in August 2014. The idea of this national policy is to eliminate occupational accidents, injuries, diseases and fatalities and its task is the promotion of Occupational Safety and Health (OSH) in Zimbabwe through the tripartism of government, employer organizations and Labour unions (GoZ, 2014). This tripartite body is known as the Zimbabwe Occupational Safety & Health Council (ZOSHC).

The minister of labour and social services works with the ZOSHC that acts as the advisory body. The mandate of ZOSHC is to ensure national consensus on all OSH issues and formulating and promulgating national OSH policy.

The same National Policy formulated by ZOSHC recognizes under its economic sectors SMEs as a contributor to economic growth that are expected to comply with OSH national standards. It is also acknowledged that SMEs have limitations in capital, skills training, work knowledge, OSH awareness,

professionalism and support services which may hinder OSH compliance, (GoZ, 2014).

NSSA OSH promotions and training department offers safety and health training programs in industry. The occupational health services department establishes national standards on pre-placement and periodical medical assessments. They carry out industrial clinic audits, workplace occupational health inspections and assessments, conduct occupational health courses (Occupational Health Nurses' Course and ILO x-ray reading course), investigate occupational diseases, conduct comprehensive health surveillance programmes through the occupational health center and the NSSA mobile clinic. They carry out corporate social responsibility through medical outreach programs.

The occupational hygiene and research department conducts occupational researches in high risk industrial settings and gives appropriate preventive measures.

Compliance to OSH in the Zimbabwe factories is enforced through the Factories and Works Act Chapter 14:08 which is the legislative body that is mandated to ensure that operations defined as factories observe the statutory requirements. These statutory instruments in Zimbabwe are the Factories and Works Act Chapter 14:08 and the following regulations, RGN numbers 262 Registration and Control of Factories, RGN 263 General regulations (general safety), RGN 264 Building and Construction, RGN 278 Elevator and Escalator regulations, RGN 279 Boiler regulations, RGN 302 Machinery regulations, RGN 303 Pressure vessels regulations, RGN 304 Electrical regulations as well as the Pneumoconiosis Act Chapter 14:08. These, including the National policy, become the minimum OSH standards that factories should comply with in Zimbabwe.

The national policy states as one of its objectives that factories shall comply through ensuring that statutory inspections are done (GoZ, 2014). If inspections are carried out, minimum OSH compliance is expected hence prevention of accidents.

The area of study Willowvale, is an industrial zone (refer to appendix A) located in the Southern part of Harare city. This area is one of the heavy industrial areas and has more small-scale bakeries compared to other industrial zones. The presence of more small-scale bakeries in Willowvale makes the zone a good representative area to study the knowledge, attitude and practices on small scale bakeries compliance with OSH standards. The graph below indicates factory inspections that were done in Willowvale industrial area period 2017- 2021. Total number of inspections was 1325. Of the factories inspected 39% were not registered, by the end of each of the respective calendar years 59% of those that were not registered had been registered. From all these inspected and registered factories there did not seem to be records of small-scale bakeries.

Factory registration process is done through an inspector visiting factory premises and ensuring that they are complying with minimum requirements of the Factories and Works Act. Once satisfied the factory makes the necessary registration payments and completion of registration forms and the inspector processes the certificate of registration of the operations. These registered factories become known and through the regular inspectors visits they become compliant to the minimum requirements which include factory registration and keeping of accident records and reporting.

Figure 2, Frequency Distribution of Factories inspected, registered and non-registered factories period 2017 to 2021 Adapted from (NSSA, Factories Inspectorate records)

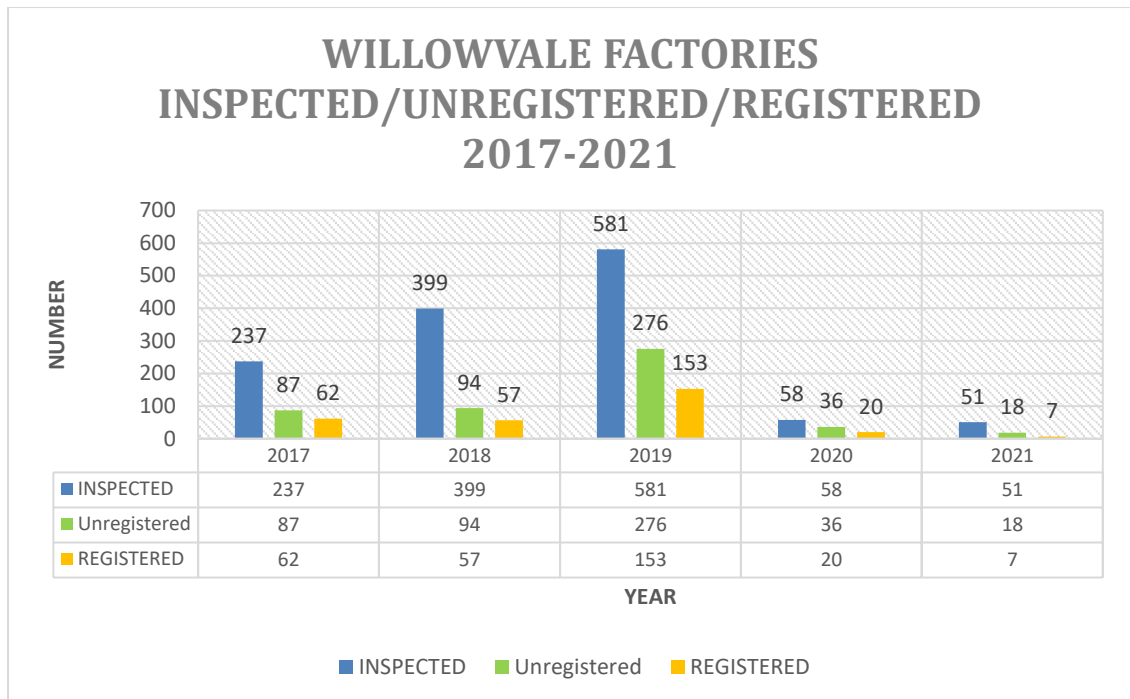


Figure 2. Frequency Distribution of Factories Inspected, Registered and Non-registered 2017 to 2021

One author state that SMEs do not give priority to OSH and the few who comply are only motivated by their significant customers and not legislative influence (Zwetsloot, 2017). Most occupational injuries occur because organizations do not comply with safety and health measures (Surienty, 2019). This provokes the mind of a safety-conscious person especially when the other authors say that SMEs are characterized by severe underreporting of accidents and high frequency of both fatal and non-fatal accidents compared to large workplaces (Merich et al., 2019).

While occupational hazards are injuries or illnesses and ailments resulting from the work done by an individual or the work environment they work in, Aluko et al. (2016) describe OSH as, the controlling of most of those hazards to acceptable risk levels. The same author states that OSH is a very important issue for the reason that it involves high mortality and morbidity rates of exposed workers (Aluko et al, 2016).

A research carried out on bakeries in developing countries had the following findings. The prevalent occupational hazards include musculoskeletal disorders due to poor working postures and reaching out, skin irritation, hearing loss, accidents mainly caused by slips, trips and falls because of wet floors and respiratory problems (Aguwa & Arinze-Onyiwa, 2014). In addition, workers in bakeries are exposed to high temperatures from ovens and contact with hot products (Orisa-Ubi, Ogwueru & Chimecha, 2023).

Musculoskeletal disorders (MSDS) are injuries that occur in the musculoskeletal system and are also known as repetitive motion injuries. MSDS can affect various body parts including shoulders and extremities (feet, legs, arms, hands), the neck, upper and lower back (Motaqi and Ghanjal, 2019).

One study suggests that in bakery industry the highest prevalence of MSDS is in the upper shoulder region because of the poor design of the workstations, poor hand tools which then causes then to use postures and movement of shoulder that are injurious (Afshari, Dianat, Joudaknia and Nouroollahi, 2019).

The body parts that suffer most from musculoskeletal disorders among bakery workers are the neck, shoulder, back, waist, elbow, arm, hand, thigh, knee, shin and ankle. These resulted from poor work postures (Torkaman and Attari, 2022). These may result in employees suffering carpal tunnel syndrome, back pain, tendinitis, hand vibration syndrome among other conditions (Motaqi and Ghanjal, 2019).

One study brings in another dimension to understand better how musculoskeletal disorders develop and states that if the length of working time is prolonged the risk of developing musculoskeletal disorders also increases (Bonsu, Adei and Agyemang-Duah, 2020).

Statement of the Problem

Indigenization in Zimbabwe has seen the rise in SMEs including bakeries. These are prone to serious OSH hazards such as flour dust, high temperature and ergonomic hazards, (standing, bending, seating repetitively) and risks including excessive coughing, rhinitis, wheezing and eye irritation. In spite of these hazards and risks the Factories and Works department within the National Social Security Authority (NSSA) which is the custodian of OSH in Zimbabwe does not appear to have records indicating small-scale bakeries compliance with the minimum OSH standards which includes, the Factories and Works Act Chapter 14:08 of 1996 and the supporting 8 (eight) Regulations.

The Zimbabwe Factories and Works Act Chapter 14:08 of 1996, section 3(1.a) and 2(1.b) which is the law that governs the safety and health in factories defines factory as one employing a minimum of 5 employees, or, if less than 5 employees, uses power generated from steam, gas, electricity or any other source. This definition includes bakeries. Despite being defined as such, records of factory registration, accident records among other crucial records to indicate compliance seem not to be available in the authority records.

Small to Medium Enterprises infringe the law and often lack required licenses, factory registration certificates and even trading licenses from other regulators. There are no records of injuries specific to small-scale bakeries. The absence of the minimum evidence of compliance from these SMEs intrigued the researcher to assess the knowledge, attitude, and practices on occupational safety and health in the small-scale bakeries in Willowvale industrial area, Harare, Zimbabwe.

Research Objectives

This research analyzed knowledge, attitudes, and practices on Occupational Safety and Health compliance among small-scale bakeries in Willowvale industrial area, Harare. The research objectives were therefore as follows:

1. Identify the level of:
 - Knowledge of employees and management on OSH standards.
 - Attitude of employees and management with regards to OSH standards.
 - Practice of the company towards OSH standards.
2. Evaluate the level of compliance with OSH standards.
3. Assess whether there was a significant relationship between knowledge, attitudes, and practices toward OSH and compliance with OSH standards

Conceptual Framework

The conceptual framework illustrates expected relationships between the independent variables--knowledge, attitudes and practices--and the dependent variable--compliance with OSH standards. The assumption is that the independent variable causes change in the dependent variable. The presence of knowledge, positive attitude and desirable practices results in compliance with OSH standards and the absence of knowledge, attitude and good practices results in poor compliance with OSH compliance.

The social demographic characteristics are important in small scale bakeries in that they may impact the dependent variables and, therefore, the independent variable. For example, after data collection results may indicate that OSH knowledgeable people who comply with OSH standards are mainly woman or are more educated. Results may reveal that those employees whose practices conform to occupational safety and health standards have standard operating procedures at their organization.

Intervening variables are important in small scale bakeries because they help realize the strength or the relationship between the dependent and the independent variables.

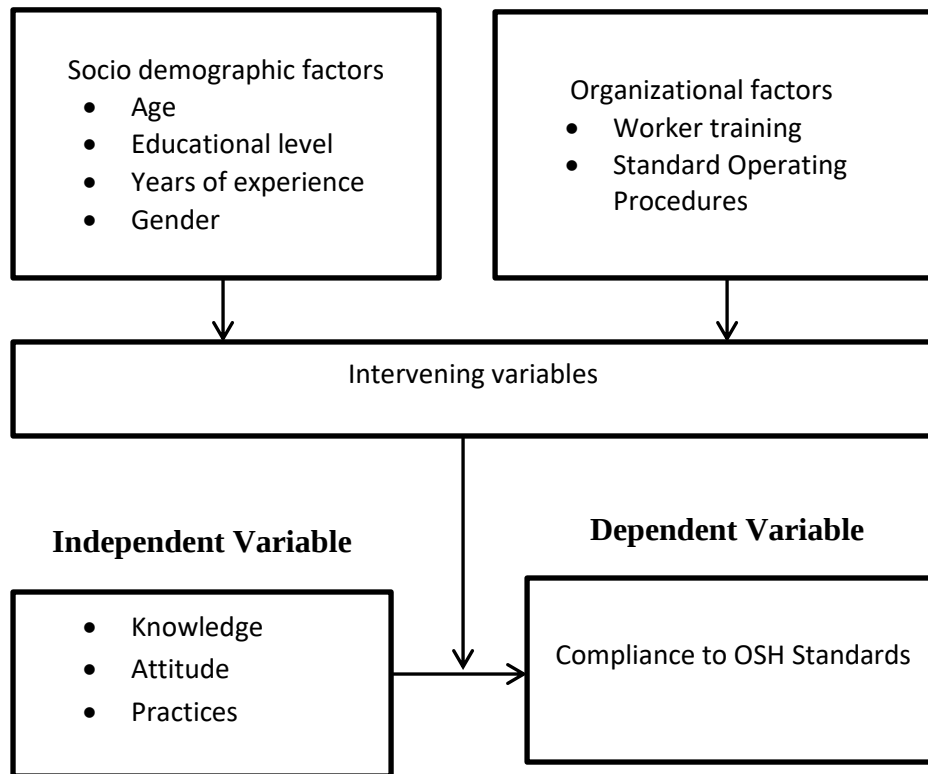


Figure 3. Conceptual Framework

Purpose of the Study

The purpose of this research was to conduct an analysis of knowledge, attitudes, and practices on occupational safety and health compliance among small-scale bakeries in Willowvale industrial area, Harare, Zimbabwe by:

1. Evaluating the level of knowledge of OSH among management and employees in small-scale bakeries in Willowvale.
2. Assessing the attitudes towards OSH among management and employees in small-scale bakeries in Willowvale.

3. Establishing the practices in small-scale bakeries in Willowvale that impact on compliance with OSH standards.
4. Measure the level of compliance with OSH standards.
5. Determining the relationship between OSH knowledge, attitudes and practices, and compliance to OHS standards in the small-scale bakeries.

Significance of the study

SMEs are considered to be the force behind economic growth and a major instrument in the generation of employment in Zimbabwe (Chinomona, 2016). This sector comprises of 2.8 million entrepreneurs of different sizes who hire 60% of the employees, contributing about 50% of the nation's Gross Domestic Product (Nyoni & Bonga, 2018). This percentage accounts for a significant number of factory workers who daily face occupational hazards and thus are susceptible to injury and even death.

Because of the significance of the small-scale bakery industry in Harare Zimbabwe, an understanding of their knowledge, attitudes, and practices on OSH and the impact on compliance to OSH standards is of great importance. The findings from this study will inform the Government and the OSH policy makers such as NSSA on reasons why small-scale bakeries do not comply and aid them in developing appropriate and relevant strategies to ensure compliance. The small-scale bakery industry will also benefit from this study as they will be made aware of aspects they need to incorporate in their operations to ensure safety and health of their employees and comply with the OSH standards.

Assumptions of the Study

The main assumption of the study was that knowledge of and attitude towards OSH standards impacts the practice of OSH among small-scale bakeries.

Limitation of the Study

The research sought to ascertain the impact of knowledge, attitudes, and practices on compliance with OSH standards in small-scale bakeries in Zimbabwe. Some industrial zones were dominated by a certain type of industry such as plastic manufacturing. Not all small-scale bakeries were in Willowvale industrial area but, this area seemed to have a significant concentration of such small-scale bakeries and hence would give fair representation of this nature of industry. A survey conducted by the researcher indicated there were twelve small-scale bakeries in the area. Willowvale industrial area is located on the Southern part of Harare city, (Refer to the Map on Appendix A).

Definition of Terms

A *KAP* survey is a study that represents a specific population to collect data on what is known, believed, and done concerning a subject matter. The KAP in this study was measured using a questionnaire that had sections asking about OSH knowledge, attitude and practices.

OSH regulations. These are Compliant legal products that are enforceable, unequivocal, and are meant to impose the safeguarding of safety, health, and welfare of individuals who may experience negative effects from operations in the workplace directly or indirectly (Umeokafor, Umeadi, and Jones, 2014). The OSH regulations that were used in this study were the Factories and Works Act Chapter 14:08 and the supporting regulations.

Occupational Safety and Health (OSH). OSH is usually defined as the science of anticipation, acknowledgment, assessment, and control of hazards stemming from the workplace which could result in weakening the workers' health and well-being,

taking into consideration the probable impact on the people around and the environment in general (Alli, 2008).

Standards. Standards are a written definition, boundary, or law, permitted and supervised for compliance by an authoritative agency or specialized or recognized body as a minimum acceptable benchmark.” Standards” shall mean the Occupational Safety and Health Standards. The standards that were applied in this study were the Zimbabwe national policy which had some aspects captured in the questionnaires as well as the Factories and Works Act Chapter 14:08 and the supporting regulations. These standards define what a factory is, the minimum expectations in a factory such as openable windows and doors, floors that are even and properly graded without cracks. These standards are also the ones approved by the Government of Zimbabwe to be applied in the enforcement of safety and health compliance in Factories and Works.

OSH compliance. The state of being in agreement with OSH recognized standards and regulations or a process of becoming compliant. For the purposes of this study OSH compliance was assessed through data collection from participants and objective data collected through the use of the observational checklist.

Standard Operating Procedures (SOP). Designed safe work procedures to be followed by employees to protect them. These could be basically job instructions on how the operation is supposed to be carried out or how a certain machinery should be operated. Standard operating procedures were measured through data collection from the participants and the use of the observational checklist. Checking if there were procedures mounted on strategic places such as the walls or on specific machinery.

Personal protective clothing equipment (PPC/E). This is equipment that is meant to protect the user from risk of accidents or from suffering negative effects

from the work environment or practices on health. Such personal protective equipment includes gloves, eye protection, safety foot wear and respiratory protective equipment (International labour organization, 1996-2023).

Small to Medium Enterprises (SMEs). Definition of SMEs according to the Zimbabwe Revenue Authority (ZIMRA) in terms of point scored based on levels of employment according to study done by Nyoni and Bonga (2018).

Table 1. Levels of Employment

Base	Range
Employment Levels	Up to 5 employees
	6-40 employees
	41-75 employees
	76 and above

Source of Data: ZIMRA (2016)

Minor accident. Is a work-related accident with negligible effects and these include bruises, abrasions, scratches or sprains and may not result in the worker being away from work

Serious accident. This is an accident that results in major injury(ies) to the affected person and results in them being absent from work. (International Labour Organization, 2015). Serious accident injuries may be life threatening or disabling.

Fatal accident. This is an accident that results in loss of life of the worker following an occupational accident, injury or an occupational disease (International Labour Organization, 2015).

CHAPTER 2

LITERATURE REVIEW

Knowledge, Attitude, and Practices (KAP)

A KAP survey is a model used to gather information on what an individual knows or understands (knowledge) and particular to this study OSH knowledge, feelings (attitude), or inclinations that workers have and how they prove this knowledge and attitude through their actions (practices) (Muleme, Kankya, Ssempebwa, Mazeri, and Muwonge, 2017). It helps identify the actual problem in a community regarding a specific topic of concern. The main resolution of a KAP study is to discover the changes in knowledge, attitudes and practices of a community (Haloi, Ingle and Kaur, 2021). The same authors go on to say that this survey is carried out as a representative of a population to gather information on what they know, what they believe and what they do in relation to a specific topic. This means that a KAP study helps us know how much OSH knowledge the population of interest has, and how much of that acquired knowledge do they use in their daily operations and if they are inclined or interested or if they feel putting that knowledge into practice is important.

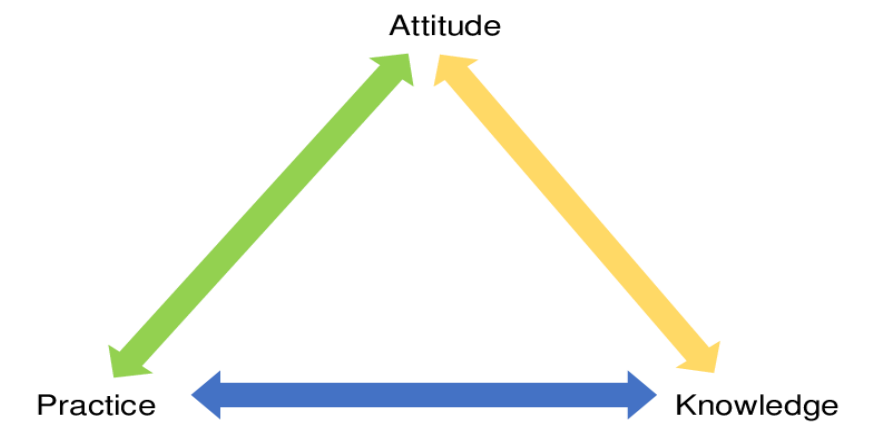


Figure 4. KAP Assessment (Budh, 2017)

One scholar suggests that a KAP model has the notion that if the level of knowledge is increased, there will also be change in behavior and results from this model are simple to interpret and have a brief presentation (Budh, 2017).

The diagram below gives a visual appreciation on how to ensure KAP gives the desired results. KAP model or theory focusses on change. Change is brought about through improving the knowledge levels of people on the topic of interest, creating an interest that results in positive attitude development and ultimately demonstrated through accepted practices. In this case OSH compliance is realized through following a lot of interventions statutory as well as organizational.

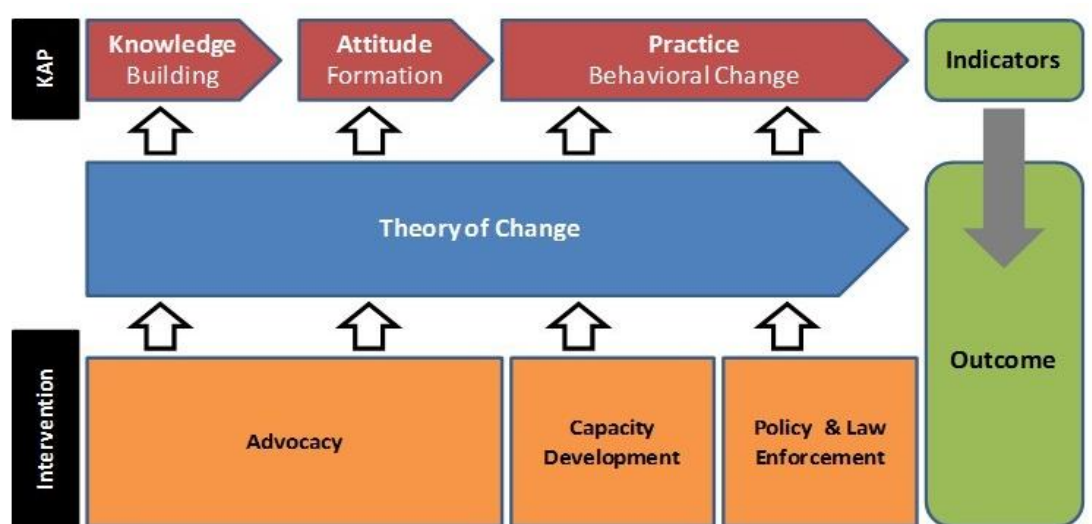


Figure 5. How to Make KAP Surveys Work. (Lindgren, 2015)

Others have defined KAP as a survey that reveals what is said against what is done, what the people know and what is done in relation to the particular area of interest and also assist in measuring if educational activities are effective in realizing behavior change (Laar et al., 2020). Another school of thought concurred with this definition (Andrade, Menon, Ameen & Praharaj, 2020).

When you consider knowledge, it combines academic accomplishment, ability to use the acquired information through experience, good decision making, and skill. Attitudes refer to the emotions caused by certain events as well as the interpretation of certain feelings affected by predetermined philosophies towards that event and practices are the actions that prove the understanding and use of the instructions, philosophies, notions, or methods (Chiwungwe, 2017).

The basic principle of a KAP review is that knowledge fashions attitude and both knowledge and attitude are the stepping stones that influence practice (Ahmad, Noor and Ismail, 2015). An understanding of KAP is enhanced by some scholars who outline the objectives of KAP studies as being, identification of deficiencies, planning of appropriate interventions and use as an evaluation tool (Jha, Bajracharya, and Shankar, 2013). A KAP study conducted in the petrochemical companies found that the attitude level is significantly affected by the level of knowledge that employees have and concluded that OSH training improves both the knowledge and attitudes (Mukhtar, Yusof and Lokman, 2020).

The KAP model also submits that practices are defined by a person's attitude and knowledge towards the behaviors (Alzghoul & Abdullah, 2016). A KAP study among the public in Taiwan on COVID-19 had conclusions that agree to the above where a higher level of COVID-19 knowledge did not automatically result in behavior change but rather positive attitudes of the people had much influence on change in

practices (Luo, Chen, Yang & Hong, 2022). Another school of thought gives a better appreciation of KAP as they describe it to be a model that assists in appreciating why employees do not observe specific advice or instructions by assessing their behavioral determinants (Asgedom, Bratveit, and Moen, 2019). This is indicative that KAP affects compliance with OSH standards.

Findings from a study conducted at a Philippines state university on waste management were that a high level of knowledge and positive attitude did not automatically change to satisfactory practices (Barloa, Lapie, and de la Cruz, 2016). This means acquiring knowledge and change of attitude may not change the practices. Similarly, an OSH KAP study conducted in Ethiopia reported 71.2% of an understanding of hazards in their work but actual practice was 42% (Esaiyas, Sanbata, and Mekonnen, 2018). This suggests that knowledge did not automatically translate into good practice. Another author reiterates that a wrong attitude towards safety and health contributes towards accidents and affects compliance with safety regulations (Tobór-Osadnik, Wyganowska, and Manowska, 2017). Employees who may have OSH knowledge may not carry out desired or expected practices due to the attitude that they may have.

Sociodemographic Factors Contributing to Knowledge, Attitude, Practices and Compliance

Level of Education

There is a link between knowledge and attitude in that the level of education can bring positive change in a person's attitude regarding safety and knowledgeable people are inclined to having a positive attitude and are not involved much in occupational accidents because they consider a safer way of undertaking their work (Hosseinabadi et al., 2018). Another school of thought concurs with this idea by

stating that increasing the education level reduces negative attitude (Gharibi, Mortazavi, Jafari, Malakouti and Hosseinabadi, 2016)

This aligns with an investigation carried out in Nigeria where findings indicated that the level of education affects worker's attitudes towards safety, the less educated fail to appreciate safety and health (Okafoagu et al., 2017).

Another finding from a study conducted in Uganda stated, practicing safety is not only dependent on knowledge and attitude. It is positively connected with being given adequate information on safety precautions that must be followed (training), being provided with the required safety clothing and appliances together with sufficient and correct supervision (Wekoye, Moturi and Makindi, 2019).

Illiteracy (lack of knowledge) is a challenge that confronts OSH, safety training results in a reduction in occupational accidents hence improved compliance with OSH standards (Mostafa & Momen, 2014). Okonkwo, Okoro and Ikechukwu (2015) gave a recommendation that for employers to realize behavior change in their employees as well as safety compliance they must engage in safety training.

Age

The International Labor Organization (ILO, 2018) states that young workers are more prone to OSH risks because they are undergoing physical and psychological development. Their level of education and work experience may be little as well as job skills among other factors. ILO defines young workers in two groups: 15-24 years of age, the vulnerable ones who have protection under the child labor standards and hazardous prohibitions and age group 18-24 years those considered to be adults and are protected by general laws and guidelines on employment and working conditions that apply to adults.

Another author shares similar findings that young workers have less awareness on OSH issues, OSH legal framework and hence are less likely to comply. It is therefore important to increase training and awareness for young workers to improve their OSH knowledge and compliance (Dragano et al, 2018).

A study conducted in Ethiopia had these findings, 40% of workers who are aged below 18 years are at high risk of OSH accidents and injuries due to lack of knowledge, inadequate training, exposure and immaturity (Amabye, 2016). In a study that had 40% participants below the age of 20 and 40% below the age of 30 stated that these young workers are more likely to have poor occupational hazards knowledge and are less likely to wear personal protective clothing as they carry out their duties (Lakshmi, Deepika and Bindu, 2021). This helps gain an understanding of the effect that age has on OSH knowledge and practice with the above scholars suggesting and agreeing that young workers have little knowledge on occupational safety and health and do not have good OSH practices as compared to older employees.

Field, Burke & Cooper (2013) points out that older employees have more experience, knowledge and can compensate for physical work demands by the skill they have acquired over the years. This also entails their mature age has positive result on OSH knowledge, attitude, and practice. Older employees are perceived to have more positive attitude towards work (Blomé, Borell and Hakansson, 2018).

Gender

Findings from a study conducted on the use of personal protective clothing among building construction workers in Kampala, Uganda revealed that female employees wore their personal protective equipment as compared to their male counterparts (statistics not provided in research report). This concurred with the ILO

report that stated that males are less likely to assume precautionary and protective measures at work as compared to woman (Izudi, Ninsiima and Alege, 2017).

Organizational Factors Contributing to Knowledge, Attitude, Practices and Compliance

The ILO (2015) on their session in Geneva entitled,” *Expanding the Outreach and impact of Occupational Safety and Health Standards in micro and small enterprises*” highlighted challenges faced by SMEs. These challenges include, absence of safety culture, prohibitive administrative burden of trying to comply and defined them as high-risk operations compared to bigger enterprises who need efficient risk prevention measures. The same session submitted the need to establish OSH legislation that meets SMEs characteristics, their requirements and new challenges which include non-standard forms of employment as well as tailored action-oriented low-cost approaches that address their specific needs to achieve improved safety and health and provide decent work.

Training

Most SMEs do not have adequate safety management practices which then affects their adherence to safety and health standards. This is aided by the fact that they do not have safety training programs for their employees (Unnikrishnan, Iqbal, Singh and Nimkar, 2015)

One study on determinants of poor OSH rules compliance of construction workers revealed that poor safety culture within the organization which resulted in employees not being aware of OSH contributed to non-compliance (Akboğa, 2020). This implies that compliance with OSH standards can improves if employees receive the relevant training.

A study done in Nigeria revealed that employee training has a positive meaningful relationship with the performance of the company. This means that when employees are trained, they perform better resulting in better production for the organization. The study made a conclusion that organizational performance and skills enhancement is promoted by both on- the- job as well as formal off-the-job training. (Friday & Chibundu, 2017).

Appropriate training improves knowledge, relevant knowledge supported by positive attitude results in desirable practice—in this case, safety and health practice (Honarbakhsh, Jahangiri, and Ghaem, 2017). While an enquiry conducted on effects of safety education in the construction industry concludes that the training only develops intentions towards safety and health and not practical attitude change (Loosemore & Malouf, 2018). Halawi & Haydar (2018) explain that, programs to train employees are meant to develop in them the relevant knowledge and skill which is evidenced in the proper execution of duties and compliance.

Safety training in recent studies continues to be identified as a predictor of knowledge on safety, compliance with safety standards, motivation to improve on safety which is ultimately evidenced in the adoption of safe practice. This, school of thought comes from a study conducted by Liu, Nkrumah, Akoto, Gyabeng, and Nkrumah (2020). From the literature discussed, training continues to be reported as an important aspect that increases knowledge, improves attitudes, changes practices and result in better compliance to safety and health standards.

An interesting dimension towards attitude change came from one study carried out whose findings were that employees who have been involved in an occupational accident can effectively develop a positive attitude towards OSH as compared to those

who have never experienced an accident (Gharibi, Mortazavi, Jafari, Malakouti and Abadi, 2016).

Some authors discuss that organizations must have in place safety management programs that include standard operating procedures, work standards and regulations that should be known and followed by every employee entering the workplace. This will reduce accidents, avoidable loss of life and compliance with the OSH standards (Singh and Misra, 2020).

There are other several factors that affect an individual's attitude and behavior (practice) towards work. These include the work environment, type of task being undertaken and equipment in use, the way instructions are given, mental and physical stresses as well as individual factors (Mostafa and Momen, 2014).

Edem & Pepple (2017) discuss in their study that a poorly structured physical environment can result in low worker morale thus affecting their attitude towards work, examples of such environmental factors include lighting, temperatures, adequate ventilation.

OSH Standards and Compliance

Occupational safety compliance signifies following safe working techniques and safely executing the work (Cornelissen, Van Hoof and De Jong, 2017).

Safety compliance involves setting up clear rules that all employees are expected to follow in order to have a safe working environment. It involves having the desired behaviors being stated as part of the workers roles and responsibilities as attitude affects compliance These behaviors include, following the standard operating procedures, wearing the provided personal protective clothing and appliances and reporting all accidents that occur while at work (Isa et al., 2021).

This suggests that when there are laid down standard operating procedures and employees carry out their operations in the stated manner then they are deemed compliant. An organization is considered to be compliant if they conform to international and local regulations, standards and specifications that apply to their nature of operations (Biggeri, Borsacchi, Braitto, & Ferrannini, 2023).

The main objective of having OSH legislation is to make sure that accidents, injuries and fatalities are avoided. SMEs may not comply with these regulations and do not implement safety programs because of various reasons which include: minimal supervision, absence of internal safety audits and inspections, substandard equipment, absence of training programs including risk, management that is not committed to safety and health, working conditions that are not conducive, no skilled workforce, poor investigation of accidents and incidences as well as poor risk assessment (Mashwama, Thwala and Aigbavboa, 2018).

Another author explains that small-scale operations have a high likelihood of serious accidents, tend to have the worst safety records and high rate of fatal and serious injuries in these small workplaces (classified as those with fewer than fifty employees) which is twofold compared to big workplaces (defined as those with more than two hundred employees (Alli, 2008). This assumes that very low occupational accidents are reported yet the small-scale bakery industry is faced with hazards that cannot be ignored. Organizations in all industries are obliged to comply with safety regulations relevant to their nature of the industry. The Factories and Works Act Chapter 14:08 of 1996 and its regulations numbers Rhodesia Government Numbers (RGN) RGN 262 Registration and Control of Factories, this regulation covers among other aspects Approval of factory building plans to meet requirements e.g. lighting,

ventilation, sanitary facilities, individual floor space, change room facilities and dining facilities.

The RGN 263 General regulations (general safety), which expects the following aspects to be provided in every factory, personal protective clothing and equipment, provision of first aid facilities and trained first aiders with valid training certificates, making sure that employees are sent for medical examinations with the employer covering the medical cost.

RGN 264 Building and Construction. Construction work should be carried out in a safe manner and the builder should ensure the use of properly and safely erected scaffolding, barricaded trenches, use of inspected hoists and cranes, access ladders which are stable and do not have cracks, provision of drinking water and protection against dust.

The RGN 278 Elevator and Escalator regulations. The elevator regulations enforce the use of inspected elevators and escalators that have been authorized to operate by the inspector. This also applies to RGN 279 Boiler regulations.

RGN 302 Machinery regulations. Machinery that is in use at any factory premises should be under the charge of an appointed responsible person who ensure that only machinery that has a factor of safety is used in the factory operations. All machinery has planned maintenance done, standard operating procedures posted to prevent accidents.

RGN 303 Pressure vessel regulations. All pressure vessels in use at factory premises such as compressors, autoclaves among others have their statutory inspections done and certified safe for use.

RGN 304 Electrical regulations. The electrical regulations is there to ensure safe use of electricity and electrical machinery at workplaces including maintenance

of all electrical equipment, installation and proper insulation on all electrical connections.

These are tools for monitoring and enforcing safety and health compliance in Zimbabwe Factories through National Social Security Authority (NSSA) Factory Inspectorate Department.

Registration and control of factories. The Factories and Works Act Chapter 14:08 of 1996 section 8 states that premises shall not to be used as factory unless registered (1) No person shall occupy or use a factory unless he is the holder of— (a) a registration certificate issued in respect of such factory under subsection (2) of section ten; or (b) a current provisional factory permit issued in respect of such factory under subsection (3) of section ten.

Chapter 7 of the same Act says the occupier of a factory shall exhibit the registration certificate or provisional factory permit issued to him in terms of this section in a glazed frame on the factory premises.

Accident register and notification of accidents. Management is obliged to record and report to a competent authority any accident that occurs at work that results to an injury or fatality (ILO, 2023). According to Chapter 14:08 of 1996 section 14(1) of the principal Act (machinery and accidents), Every occupier of any factory and every builder shall keep in the form and manner prescribed an accident register and shall record in such register the particulars of any accident which he is required to notify in terms of subsection (3). (2) Every occupier of a factory and every builder shall retain any register kept in terms of this section for three years after the last date upon which an entry was made therein and shall, on-demand by an inspector made at any reasonable time during the said period of three years, produce such register for inspection. (3) Whenever any accident occurs in a factory or on-premises

where structural work is being performed or in connection with machinery and such accident causes loss of human life or injury to an employee or building employee which results in his absence from work for three days or more or injury to any person not employed on the premises, the occupier of the factory or the builder or user of the machinery, as the case may be, shall, as soon as possible thereafter in the manner and the form prescribed, notify an inspector in writing of the accident and the prescribed particulars.

Lighting. Factories and Works (Registration and Control of Factories)

Regulations (262) of 1976 section 5 states that no occupier shall require or permit any person to work in any room in a factory in which the means of obtaining effective natural light are less than fifteen per centum of the floor space of such room.

(5) Such intensity of lighting shall not be less than three hundred lux at the point of operation of any process unless an inspector allows a lesser value according to the nature of the work undertaken.

Research points out that good lighting in the workplace is important as it decreases visual disturbance, pain of shoulders and neck, and reduces eye fatigue and headaches. Good and excellent lighting gives balance and helps the adjustment between a person and their area of work (Akbari, Dehghan, Azmoom, and Forouharmajd, 2013). Another author augments to say the correct level of illuminance improves visual perception of occupants, reduces signs of fatigue, eye pain, and headaches. If illuminance is well maintained it also improves the mood and alertness of occupants which translates to increased performance (Katabaro & Yan 2019).

Jayawardena, Duffy and Manahan (2015) say lighting has an impact on work performance of human beings hence has an impact on the safety in industrial environments.

Protective clothing and appliances. Section 8 of the same RGN (263)

articulates that, (1) Every factory occupier or builder—

- (a) shall supply, free of charge, and maintain in good condition, adequate protective clothing, and appliances, as may be required by an inspector, including head-covering, gloves, leggings, foot-wear, eye-protection and protective ointments of a type approved by an inspector, to each employee who is exposed to wet or dusty, cold or hot conditions, or any poisonous, corrosive or other dangerous substances; and
- (b) 3. Employees shall wear the protective clothing or appliances supplied to them in terms of this section and the occupier or builder shall take all reasonable steps to ensure that the protective clothing and appliances are worn or used by such employees.

Heat stress. People engaged in bakery operations are frequently exposed to extreme heat. Extreme heat exposure has health related problems which includes, heat exhaustion, heat stroke, heart or lung diseases, accidents, injuries or death (Habib, EI-Haddad, Elzein & Hojeij, 2020). A school of thought concurs with the previous authors by stating that too much exposure to heat can result in the following health related problems, heat rashes, heat exhaustion, heat rush, fainting and heat stroke (Rabei, 2019). Afshari, Moradi, Angali and Shirali (2019) added that bakery workers especially those who work close to ovens are susceptible to heat strain.

Heat strain is the body's response to heat exposure. The heat strain can be a combination of environmental heat stressors such as the air temperature or humidity and physical work (Flouris et al, 2018). Effects of excessive occupational heat strain include heat-related illnesses ranging from headache, nausea, and vomiting to severe forms of heat stroke, which, if untreated, can lead to death (Parameswarappa and

Narayana, 2017). Heat strain is being discussed for the benefit of the reader though the scope of this study did not include heat strain.

Another scholar added that prolonged effects of heat exposure include, heart diseases, mental problems, chronic kidney diseases and an increase in accidents and injuries. High temperature and dehydration have a negative impact on behavior. These adverse behavioral effects are, physical exhaustion, bad temper, fatigue, diminished judgment, reduces alertness, coordination, and attentiveness, possibly resulting in compromised occupational safety performance (Xiang, Bi, Pisaniello and Hansen, 2014).

Copies of Acts and regulations. According to Factories and Works Regulations, RGN (263) of 1976 section 27, Every occupier, builder, and the user shall have in his possession a copy of the Act and the regulations made thereunder and shall at all times keep a copy on his premises available for perusal by persons working thereon. This ensures that both employer and employee have access to knowledge about OSH which will assist in safeguarding their safety and health at work.

OSH policy. The Zimbabwe national OSH policy encourages employers and employees to consider self-regulation through embracing and implementation of a systems approach to manage occupational safety and health which can realize a reduction in occupational accidents and fatalities (GoZ, 2014).

A key primary factor to risky work environment in Sub-Saharan Africa is failure to comply with OSH legislation while compliance is key in the reduction of occupational injuries and illnesses (Maseko, 2016). A core factor in the improvement of OSH performance is through compliance with OSH regulations (Umeokafor,

Umeadi and Jones, 2014). Sadly, SMEs have been labeled lower level when it comes to safety compliance ranking (Osman, Khalid and Alfqeeh, 2019).

One author attributes failure to comply as being influenced by, lack of knowledge on the necessity to invest in OSH systems and programs. Hence knowledge, attitudes, and practices are important in compliance with OSH standards (Arewa & Farrell, 2012).

Small to Medium Enterprises have a challenge in compliance. This is because of challenges they face which include, limited expertise, staffing capabilities of adequate and relevant personnel such as OSH experts, and financial capacity among others (Surienty, 2019).

A research done on SMEs in Zimbabwe suggested that SMEs work-related accidents were due to lack of knowledge, poor access to information (training) and pressure to make profits at whatever cost. Lack of financial capital which in turn affects staffing of OSH experts, affects acquisition of OSH knowledge which ultimately results in non-compliance as well as more accidents and injuries (Kazomba, 2017).

Considering other parameters that influence compliance, training is significantly associated with good practice but if not backed up by enabling resources good practice cannot be achieved (Arinze-Onyia, Ndu, Aguwa and Modebe, 2018).

CHAPTER 3

RESEARCH METHODOLOGY

This section explains the methodology that the researcher used for data collection, presentation, analysis, and interpretation.

Study Design

A descriptive cross-sectional study was used. This study depicted the characteristics of the sample that was studied. This study collected dependent and independent variables all at once thereby making it a snapshot.

The advantages of using a descriptive cross-sectional study in this study were that, it could be used to collect data with many variables that existed in the defined population and be able to measure prevalence for all factors under investigation. It also has an advantage that the relationship between the presence of exposure and outcome can be assessed, hence useful for generating a hypothesis. In this case, the level of knowledge, attitude and practices of management and employees towards OSH standards was determined.

Quantitative information was collected to analyze the light intensity and heat stress levels within the bakeries. Questionnaire, interview and observation checklists to check compliance with legislation, policies, standard operating procedures, management systems, and procedures in place to demonstrate knowledge, attitudes and practices towards OSH were also used.

Population

While the study sought to assess the impact of knowledge, attitude, and practices on OSH in small-scale bakeries in Harare, Zimbabwe, the research was confined to 12 small-scale bakeries in Willowvale industrial area. The twelve bakeries were the total number of bakeries in Willowvale industrial area. These employed 145 workers including management. Because in small-scale bakeries, there were few employees who did not have relationships with each other, it was difficult to distinguish management and employees. Therefore, the researcher did not try to distinguish these relationships and participation was not limited by relationships within the facility. For this study, small-scale bakeries were those employing between 5 and 30 employees.

Sample Size

Due to the small population size, the 145 employees represented the sample.

Sampling Procedure

Total population sampling was used in this study. This sampling method was applied because of the small sample size. The entire population under study was 145 employees and the study were limited to only male or female small-scale bakery workers.

Instrumentation

The following pseudo coded instruments for each organization were used for data collection. A questionnaire which included the 5-point Likert scale with closed-ended questions and open-ended questions (Appendix D) was used to collect information regarding the knowledge, attitudes, and practices on Occupational Safety and Health in the small-scale bakery industry. An observational checklist (Appendix

E) developed by the researcher was used as a guide for observing the current OSH practices in the work area and an interview checklist (Appendix F) for interviewing management. Heat and light parameters were measured to assess the thermal comfort in the work environment and to measure the adequacy of lighting.

The researcher is a factory inspector who recruited two other inspectors who have twenty-five years of experience doing factory inspections for OSH compliance, carrying out measurements for parameters such as heat and light and OSH related researches to assist in the development of the questionnaire. All the instruments used ensured that all the research objectives were covered and that all the independent variables from the conceptual framework were addressed so as to determine their relationship with OSH standards compliance.

Validation of Instrument

The calibration status of all equipment used for hygiene measurements was established to ensure they had valid certificates. These calibration certificates are kept by the NSSA Research and Development Department who assisted with conducting the measurements and data analysis. Refer to Appendix B to view attached calibration certificates.

Validity and Reliability

The questionnaire was evaluated by two content experts in the Research and Development department in NSSA to determine its appropriateness for use in this research. Adjustments were made accordingly including grammatical errors to ensure suitability of the instrument for use in the study. The content of the questionnaire was deemed suitable for this specific study by the content experts and their feedback to the researcher.

A reliability coefficient of 0.7 or higher was expected as it is considered “acceptable” in most research situations. As a part of reliability measure, a pretest was conducted before administering the actual questionnaire to the study participants. In the pretest, the researcher picked five small-scale bakeries at random in a different industrial zone. The bakeries used in the pre-test were not part of the study sample in the Willowvale Industrial area. There was no fixed method of selecting the number of participants in the pilot study. The bakeries chosen had the same characteristics as the targeted population that is, they were small scale bakeries and their main activity was bread making. They also used similar type of premises for their operations, rented small premises for their operations some of them in complexes and operated in a similar way where they bake their daily supplies and close for sales. They did not operate all day. During the pretest, notes were taken, taking into consideration the reactions of the participants to the questions as well as the format and the researcher noted how long it took for the respondent to complete the questionnaire. The pretest indicated that participants understood the questionnaire and were able to finish answering all the questions within 15-20 minutes.

A Cronbach Alpha value of 0.75 was obtained for the study instrument. In a post-hoc decision during data analysis a Cronbach Alpha value of 0.75 was obtained for the Knowledge construct, while 0.86 was obtained for Practice, 0.313 for Attitude and 0.908 for Compliance. It was noted that the attitude construct did not meet reliability standard as it had a value of 0.313. As a result, data collected regarding attitude was reported but with the caveat that the instrument items were not reliable. SPSS version 23 was used in the analysis.

Data Collection Procedure

The researcher and one assistant with experience in the field administered the questionnaire to study participants. The questionnaire was split into sections, including demographic characteristics, OSH knowledge, attitudes and practices. In the process of data collection, the researcher explained the details of the questionnaire to the respondents and requested them to sign an informed consent form if they were willing to participate in the study. The participants were not coerced to participate and they had a right to withdraw from the study at will. During the process of responding to different questionnaire items, the researcher was available to assist in case there was need for further explanation. While participants completed the questionnaire, the researcher did a walk-through inspection in the bakery completing the observation checklist and as well as interview with the personnel representing management. This gave enough time for participants to complete the questionnaire without feeling pressured.

An ergonomist specialist conducted, light and heat measurements on a different day. Heat stress assessments were done using the Wet Bulb Globe Temperature (WBGT) Index. The Heat Stress Monitor had a valid reference calibration certificate number T-005-09-21 issued by the National Metrology Institute of the Scientific Industrial Research and Development Centre (SIRDC).

Wet Bulb Globe Temperature (WBGT) is the generally used index of heat stress and is a calculated parameter. The tool shows anticipated heat stress on the human body when they are in direct sunlight. It gives an estimate of the effect of temperature, relative humidity, the speed of the wind and radiation from solar on human beings and also determine the suitable levels of exposure to high temperatures (Ekici, 2017).

Heat stress measurements were taken at midday for two reasons, the bakery employees operated from around 8am to latest 1pm then they stop operations and sale their products. This being the case, towards midday the ovens would have heated enough and the outside temperatures will also be warm and reliable measurements could be established. This study was a snapshot of what was obtained on the ground at the time of data collection hence measurements were taken once and averages of heat exposures in the various areas which are the baking, proving, cooling and packing areas were recorded.

Light intensity measurements were done using the Extech Light Meter model 401027. The light meter had a valid reference calibration certificate number E-136-09-21 issued by the National Metrology Institute of the Scientific Industrial Research and Development Centre (SIRDC). The light measurements were done in different areas of the bakery the oven, prover and packing sections. Light measurements were done during the day at the normal working hours of the bakeries between 8am and 1pm and the averages were recorded.

Data Analysis

Descriptive statistics was used to analyze and report participant characteristics, questionnaire responses and observational data. Tables and graphs were plotted for summary data presentation. Negative binomial regression was used to establish the strength of the relationship between variables and know which independent variable was a significant predictor of compliance with OSH standards. Negative binomial regression was applied because it allows for analysis of variables that use count data. For example, on compliance one can count how many people are compliant and how many are not. The data was discrete and not continuous (Westgate et al, 2022). Data analysis was carried out using Statistical Package for Social Sciences SPSS version 23

and STATA version 14. The impact of intervening variables is recognized, however, examination of this impact was not in the scope of this study. The statistical significance of the relationship between the dependent variable Compliance with OSH Standards and the independent variables (knowledge, attitudes and practices) was not established by the findings in this study.

Research Ethical Considerations

The researcher wrote a letter to the NSSA Chief Inspector of Factories OSH Division requesting administrative authority to carry out the study in Willowvale before engaging participants. To ensure that ethical consideration was not breached, a letter to request for permission to carry out the study was written to each respondent and they signed informed consent before they answered questions in the study instrument. To protect the confidentiality of the participants, the names of the participants as well as their contact details were not indicated on the questionnaire.

The purpose of the study was explained to the participants and they were told that they would fill out the questionnaire at no cost, and there was no remuneration from participation. Anonymity and confidentiality were assured to the participant, and they were free to participate, refuse to participate or withdraw from participating in the study at any time. Data collection was limited to what was needed for the purpose of this study. The participants signed the informed consent form to indicate their consent.

CHAPTER 4

RESULTS AND DISCUSSION

Response Rate

The sample size projected for this study was 145 participants. Some individuals were not able to participate in the study and the final population was 137. Accordingly, the response rate was 94%.

Demographics

Gender of Participants

This study did not select specific gender for participation but it happened that the population in the small-scale bakery industry in Willowvale had 99% males. This result is similar to a study that was conducted in a Lebanese bakery which had (86%) males (Habib et al, 2020). In another study that had more male workers (72%) than females (28%), this was done to make the work easier and faster (Sunday, 2018).

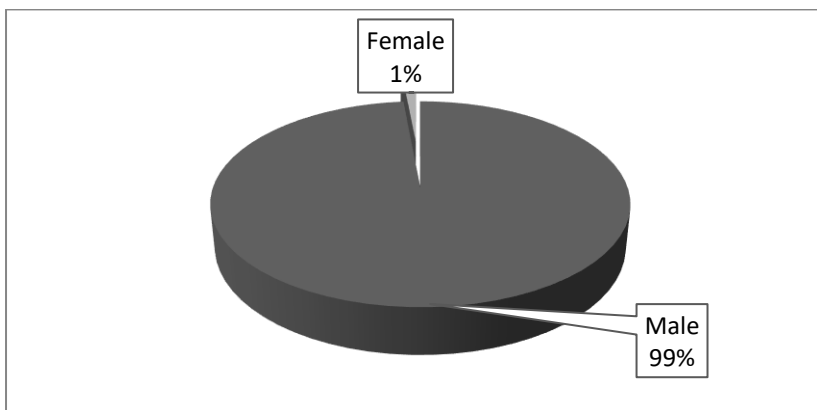


Figure 6. Gender of Participants

Age Group of Participants

In terms of the age group of participants represented in this study, the age group between 19- 30 years were 90%, 10% representing those between 31-50 years. In my perspective the age groups below 50 years of age are the younger generation that is failing to find formal employment. As such, they may start a bakery with family, friends or find employment in the small-scale bakeries where there might not be stiff employment competition.

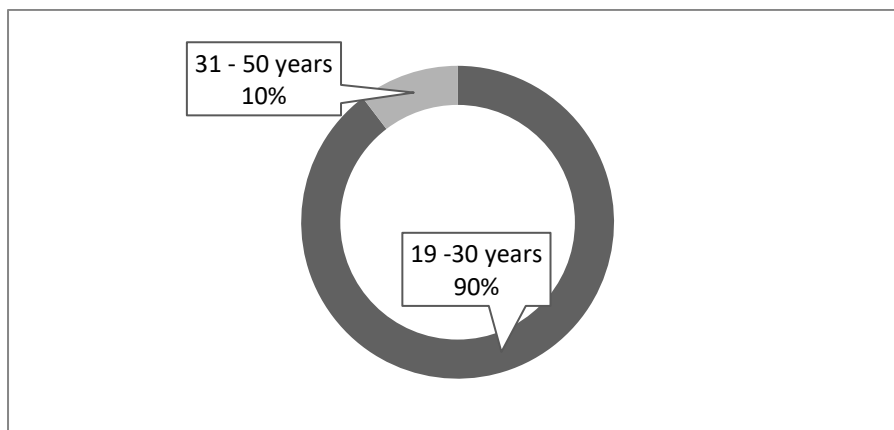


Figure 7. Age of Participants

Level of Education

Pertaining to the educational level of the participants, 90% attained secondary education, 5% primary, while those with a diploma or post-secondary education were 4 % and 1% indicated that they had no education.

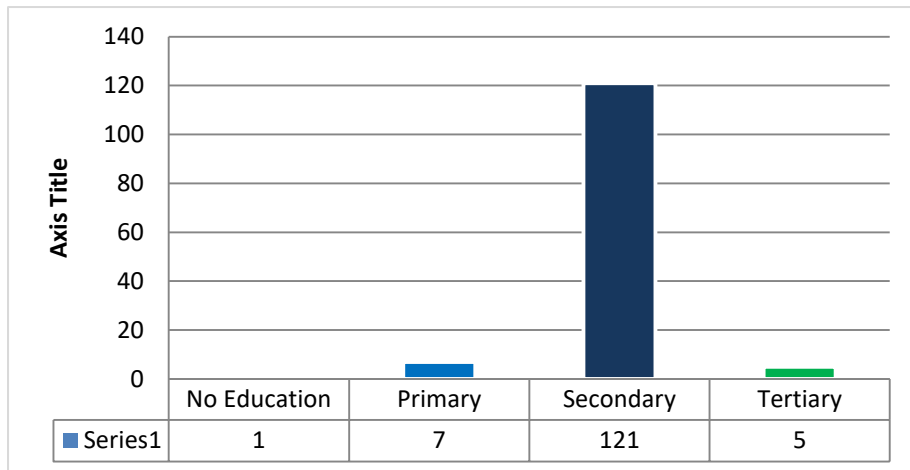


Figure 8. Level of Education

Position in the Organization

Most of the participants in this study were not in managerial positions, 51% were employed as bakers, general workers or those doing all other assigned duties available were 23%, 13% were those whose duties are only confined to slicing the baked bread, 5% kitchen help, serving customers or counter staff were 1% and those in managerial or supervisory position were 7%. This suggests that small-scale bakeries are mostly run by staff while managers or owners of the bakeries are not physically present on site.

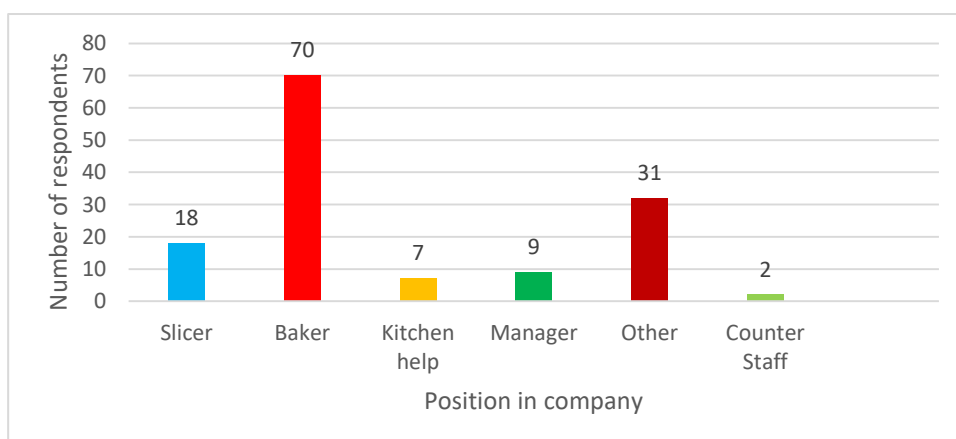


Figure 9. Position in the Organization

Objective 1

The aim of objective 1 was to identify the level of:

- Knowledge of employees and management on OSH standards.
- Attitude of employees and management with regards to OSH standards.
- Practice of the company towards OSH standards.

The charts and tables below show the descriptive statistics of participant's responses on knowledge of employees and management on OSH standards.

In response to the item:

Have you ever heard about OSH?

The response of participants was approximately equal, 52% said yes and those who said never heard about it were 48%.

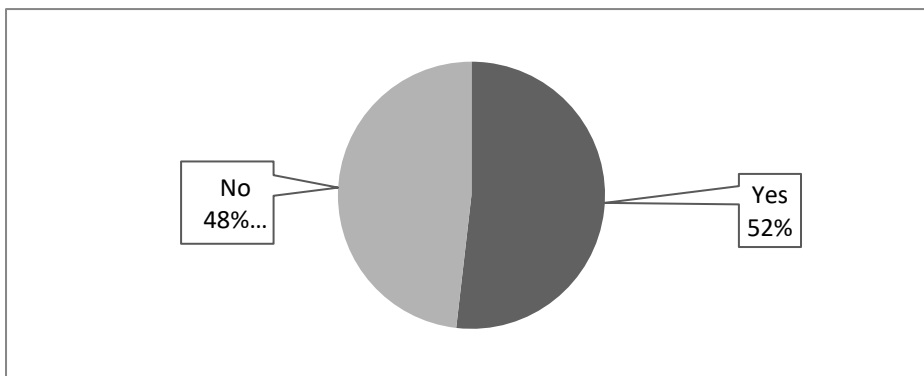


Figure 10. Have You Ever Heard about OSH?

Where did You Hear about OSH?

When asked where the participants heard about OSH, 75% of them indicated they heard about it from their workplace. This showed that the workplace was the most common place for acquiring such information. This was substantiated by the fact that friends constituted 7% on dissemination of OSH information, 6 % from NSSA

another 6% from school, city council, the doctors and the press had each 1% respectively.

Table 2. Where Did You Hear about OSH

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	66	48.2	48.2	48.2
City Council	1	.7	.7	48.9
Doctor	1	.7	.7	49.6
Friends	5	3.6	3.6	53.3
NSSA	4	.7	.7	54.0
Press	1	.7	.7	56.9
School	4	2.9	2.9	59.9
Streets	2	1.5	1.5	61.3
Workplace	53	38.7	38.7	100.0
Total	137	100.0	100.0	

What Do You Understand by Occupational Safety and Health?

Concerning knowledge of what OSH is about, 46% indicated that it is about the safety of people at work, 9% indicated that it is about the health of people while 45% did not know what it is about. In total 55% indicated they knew what occupational safety and health meant.

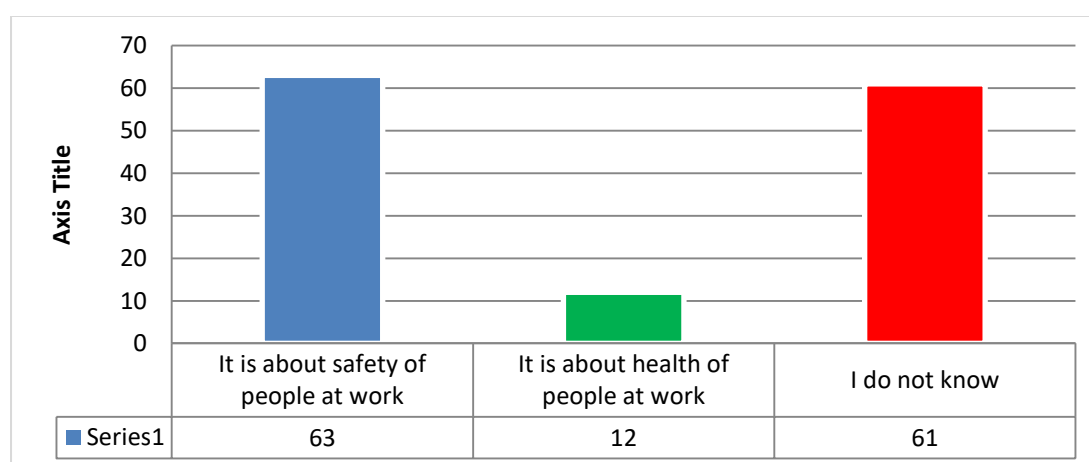


Figure 11. What Do You Understand by Occupational Safety and Health?

Do You Know the Hazards Associated with Your Work?

A hazard is something or a situation that can cause harm. According to the knowledge of hazards associated with bakery work, 76 % of the respondents specified their main hazard to be heat, 24 % did not see heat as a hazard in their work environment. Hot surfaces and hot equipment were another hazard noted by 41 % of the respondents while 59 % did not agree to hot surfaces and hot equipment being hazards prevalent in their work environment. According to the knowledge of the respondents on hazards in their workplace, the following hazards and their respective percentages were indicated as hazards that do not affect small-scale bakery personnel: 90 % indicated noise did not affect them, heavy manual lifting had 84 %, 79 % uneven floors, slippery floors 77 % and flour dust had 71 %. Clearly, only a minority of workers recognized workplace hazards appropriately: 10 % expressed that noise, flour dust 29 %, slippery floors 23 %, uneven floors 21 % and heavy manual lifting 17 % were hazards that affected them.

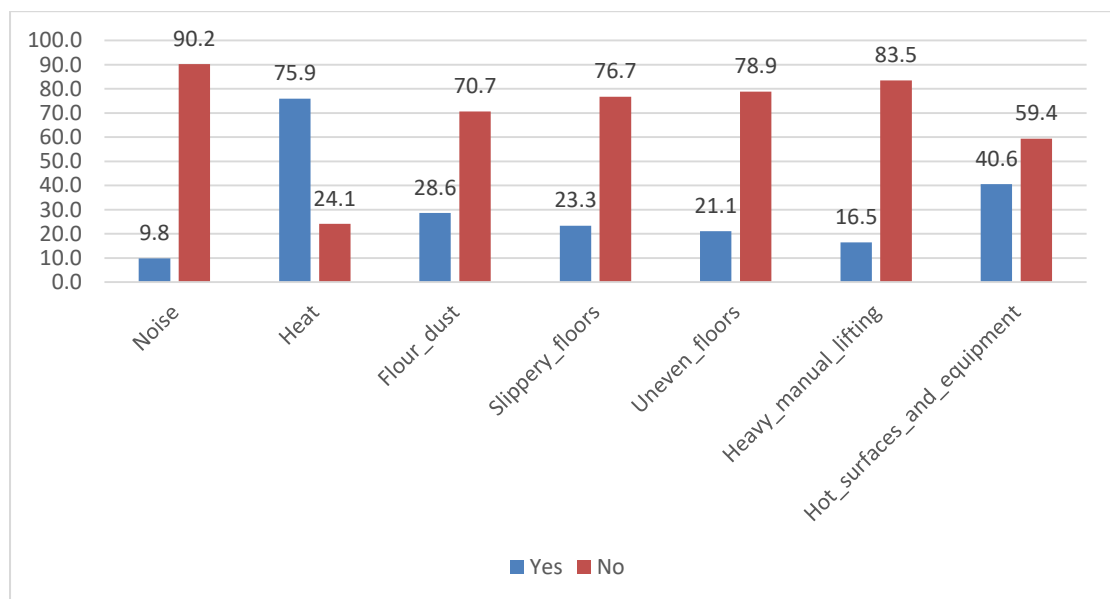


Figure 12. Do You Know The Hazards Associated With Your Work?

Do You Think Poor Safety and Health at Work Can Cause Problems?

Enquiring if participants knew that poor safety and health at work caused problems, 75% indicated that they knew poor safety and health causes problems. 25% indicated that poor safety and health did not cause any problems at work, this meant they were not aware of the impact that their poor safety and health actions had to themselves and their colleagues.

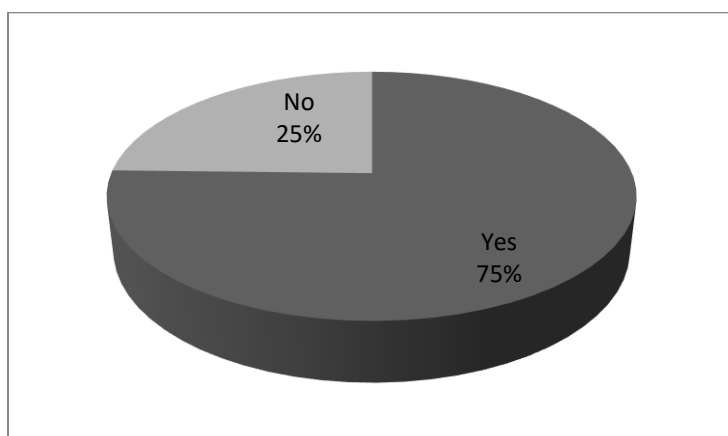


Figure 13. Do You Think Poor Safety and Health at Work Can Cause Problems?

What Problems Can Arise from Poor Safety and Health at Work?

When identifying their knowledge of what problems can arise in the small-scale bakery operations due to poor safety and health, 72 % said burns were a major problem that could arise while 28 % did not seem to know that burns were a result of poor safety and health at the workplace. 53 % highlighted that heat stress was a problem but 47% did not agree. 39 % of the participants indicated that dehydration was a problem while a greater percentage of 61 % did not concur. As much as heat had a significant percentage, the participants did not know that heat could cause dehydration. Hearing loss 96% against 5 % was dismissed as a problem in bakery operations. 87 % of the participants indicated that occupational asthma was not a challenge and 13 % indicated it was a challenge. From the respondents 74 % indicated

there was no risk of falling in their operations while 26 % indicated there could suffer from falls in the bakery. Musculoskeletal disorders were highlighted to be a problem by 79 % while 21 % did not include it to be a problem arising from poor occupational safety and health from the workplace.

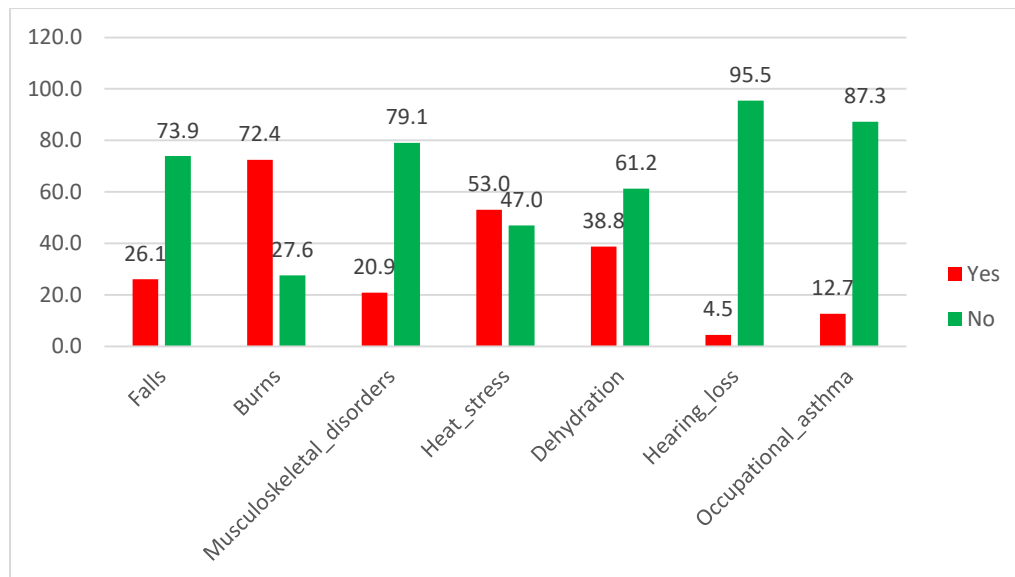


Figure 14. What Problems Can Arise From Poor Safety and Health at Work?

Do You Think OSH Problems Can Be Minimized?

While 50% of the respondents acknowledged that there should be a way of minimizing occupational safety and health problems in the workplace, 49% did not think OSH problems could be minimized. However, 1% thought these problems could be minimized.

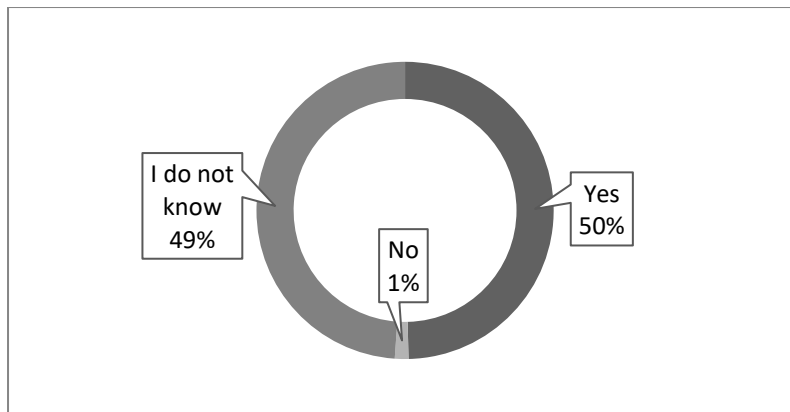


Figure 15. Do You Think OSH Problems Can be Minimized?

Which of the Following are Ways to Minimize (Reduce) and Control Occupational Safety and Health Problems at Work?

Pertaining knowledge on ways of minimizing OSH problems, in order to have summary data the results were grouped into two functional categories: Environmental and Personal. Responses categorized as Environmental included installation of non-slippery floors, posting safety warning signs, providing and use of access ladders to high points, prevention of uncomfortable work postures and installation of ramps. Participants responded that environmental ways to minimize OSH problems would be 71% effective. The Personal category included always cleaning spills, wearing personal protective clothing. Participants responded that these ways would only be 29% effective to minimize OSH problems.

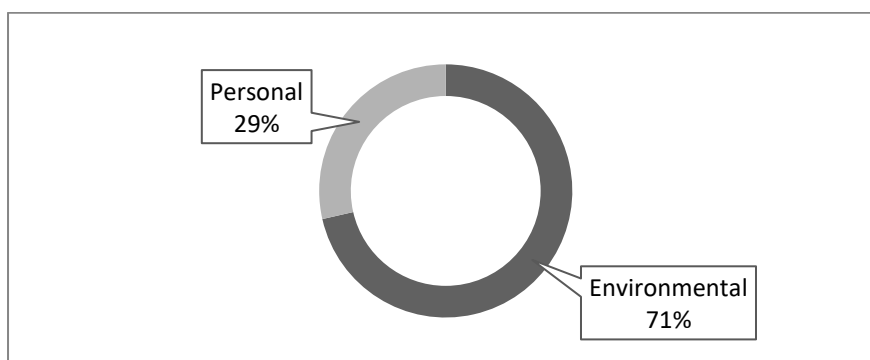


Figure 16. Ways to Minimize (Reduce) and Control Occupational Safety and Health Problems at Work

Who Do You Think is Responsible to Prevent, Minimize and Control Occupational Safety and Health Problems?

77% of the respondents knew that occupational safety and health in the workplace including preventing, minimizing and controlling its problems is the responsibility and duty of the employer. However, they did not know that they also contribute positively or negatively to the OSH problems through their response to the initiatives put in place by the employer. This is evidenced by a response of 8% stating that workers also have a duty, 14% asserting that they don't know whose responsibility it is and 1% saying it is the supervisor's duty to prevent, minimize and control occupational safety and health problems in the workplace.

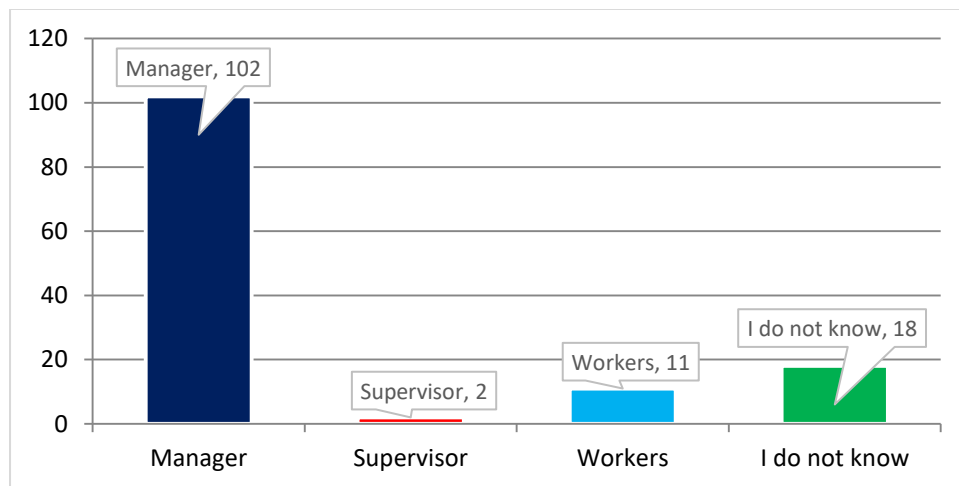


Figure 17. Responsibility to Prevent, Minimize and Control Occupational Safety and Health Problems?

Do You Believe You Comply with OSH?

In relation to compliance with OSH, the respondents did not appreciate what compliance with OSH meant hence 73% stated that they were not sure if they complied, while 22% indicated that they did not comply and only 5% acknowledged that they complied.

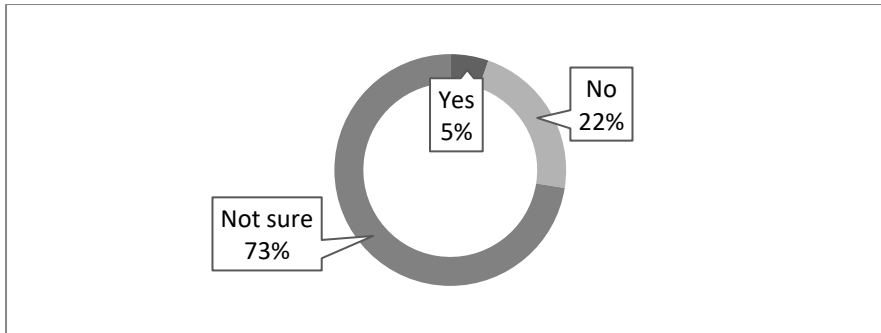


Figure 18. Compliance with OSH?

Have You Heard about the Factories and Works Act Chapter 14:08 of 1996 and its Regulations?

The Factories and Works Act Chapter 14:08 of 1996 is the legislation that controls factories in Zimbabwe in terms of safety and health. It would be assumed that those engaged in activities that are defined as factories would definitely be familiar with the legislation. Of those who took part in this study 83% indicated that they did not know what this legislation is about, only 17% indicated that they knew this legislation.

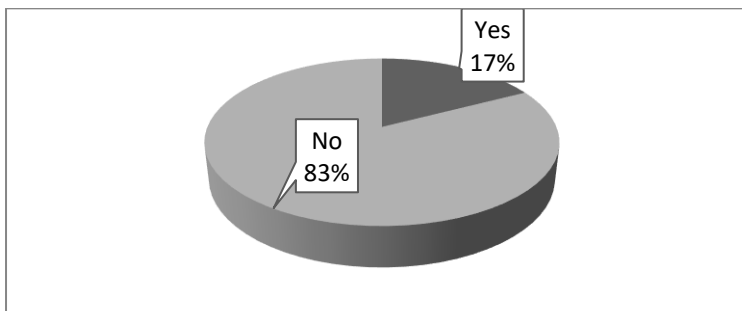


Figure 19. Knowledge on Factories and Works Act Chapter 14:08 of 1996 and its Regulations?

Do You Carry Out OSH Risk Assessment?

From this study, as shown in Figure 17, 80% of the respondents indicated that they did not carry out risk assessment, 17% indicated that risk assessment was not applicable to their job while only 3% stated that they conducted risk assessment.

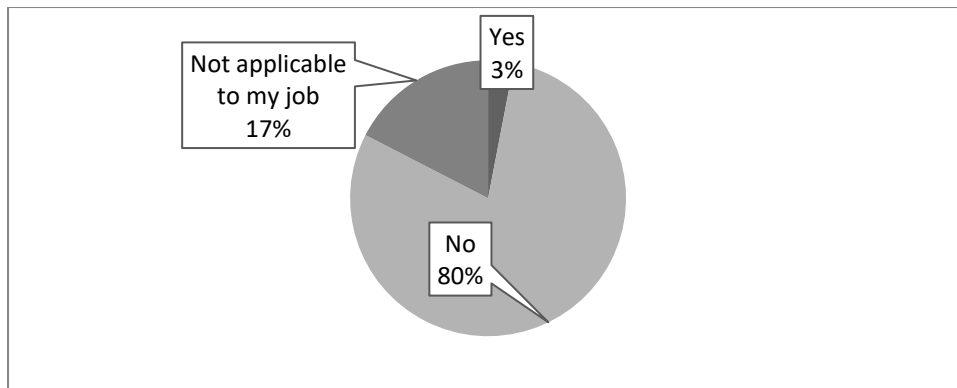


Figure 20. Do You Carry Out OSH Risk Assessment?

Descriptive Statistics

The following tables are descriptive statistics tables which display the mean and standard deviation values according to the responses to the questions regarding knowledge, attitude, practice and the observational check list. The mean values and standard deviation values will be interpreted according to the table below:

Table 3. Mean Value Interpretation Table

	Response Value	Mean value Range	Interpretation
Attitude	1	1.00 – 1.49	Strongly Disagree
	2	1.50 – 2.49	Disagree
	3	2.50 – 3.49	Neutral
	4	3.50 – 4.49	Agree
	5	4.50 – 5.00	Strongly Agree
Practice	1	1.00 – 1.49	Never
	2	1.50 – 2.49	Sometimes
	3	2.50 – 3.00	Always
Knowledge	1	1.00 – 1.49	No
	2	1.50 – 2.00	Yes
Observational Checklist	0	0.00 – 0.49	No
	1	0.50 – 1.00	Yes
Standard Deviation	Homogenous	<1.00	Less deviation
	Heterogenous	>=1.00	Greater deviation

The descriptive statistics of participant's response on knowledge of employees and management with regards to OSH standards. The descriptive statistics table below shows the mean and standard deviation values for questions addressing knowledge. As observed in the table, most of the questions stated with regards to knowledge, the participants scored a mean value within the range of 1.50 – 2.00. This is the 'yes' response range. Suggesting that the participants on average gave a 'yes' response to the questions, have you heard about OSH (mean = 1.52), do you think poor OSH at work can cause problems (mean 1.75) and do you think OSH problems can be minimised '(mean = 1.99). However, for the question that do you know hazards associated with your work the participants scored a relatively lower mean of 1.21 which falls in the 'no' response range of values.

In general, on knowledge the overall average obtained is 1.6 which falls in the yes range. This suggests that in general the participants practice or following OSH standards, they have a general knowledge on OSH standards. For standard deviation the overall average standard deviation value for the participants' knowledge is 0.48. This shows that generally the responses by the participants with regards to knowledge of OSH standards were homogenous in nature, that is they gave similar responses with little deviation.

Table 4. Participant's Response on Knowledge of Employees and Management with Regards to OSH Standards

	N	Mean	Std. Dev.
Have you heard about OSH	137	1.52	.502
Do you know hazards associated with your work	136	1.21	.411
Do you think poor OSH at work can cause problems	134	1.75	.432
Do you think OSH problems can be minimised	135	1.99	.996
Knowledge	131	1.6175	.47731

(Interpretation Key: 1.00-1.49 =No; 1.50-2.0=Yes)

The descriptive statistics of participant's response on Attitude of employees and management with regards to OSH standards. The descriptive statistics table below shows the mean and standard deviation values for questions addressing attitude. However, the researcher carried out a post hoc test of each construct that is; knowledge, attitude and practices. As stated previously, the attitude construct did not yield a positive reliability value in a post-hoc decision during data analysis. As such, the values are not considered reliable. However, these items were reported here as they represent a variable of interest.

As observed in the table, most of the issues highlighted with regards to attitude, the participants scored a mean value within the range of 2.50 – 3.49. This is the neutral response range. Suggesting that the participants gave a neutral response to that OSH is for big companies (mean = 3.20), Government laws on OSH are of no use (mean = 2.70), Training of workers is necessary to reduce OSH problems (mean = 3.34), Poor OSH practices cause injuries (mean = 3.28), I am responsible for taking care of my own safety and health and that of others (mean = 2.87) and to the statement that I am responsible for maintaining good housekeeping (mean = 3.02).

However, for the statements that I am strong, so I don't think I can suffer health impairment due to flour dust and Accidents just occur, you can't control them the participants generally disagreed with these sentiments, shown by the lower mean values 2.03 and 2.47 respectively. Participants had an appreciation that regardless of physical strength one can suffer the effects of hazards they may be exposed to in their work environment. Furthermore, scoring relatively higher means of 3.83 and 3.64 the participants agreed that Workers should know OSH requirements and agreed with that, following stated standard operating procedures helps reduce accidents.

In general, on attitude the overall average obtained is 3.02 which falls in the neutral range. This suggests that in general the participants demonstrated a neutral attitude towards following OSH standards, they have a mixed unclear attitude around adherence to OSH standards. On standard deviation the overall average standard deviation value for the participants' attitude of 0.55. This shows that generally the responses by the participants with regards to attitude towards OSH standards were homogenous in nature, that is they gave similar responses with little deviation.

Table 5. The Descriptive Statistics of Participant's Response on Attitude of Employees and Management with Regards to OSH Standards.

	N	Mean	Std. Dev.
OSH is for big companies	132	3.20	1.669
Government laws on OSH are of no use	132	2.70	1.497
Workers should know OSH requirements	131	3.83	.970
Following stated standard operating procedures helps reduce accidents	132	3.64	2.741
I am strong, so I don't think I can suffer health impairment due to flour dust	132	2.03	1.348
Training of workers is necessary to reduce OSH problems	130	3.34	.945
Poor OSH practices cause injuries	130	3.28	1.027
I am responsible for taking care of my own safety and health and that of others	129	2.87	1.221
Accidents just occur, you can't control them	131	2.47	1.273
I am responsible for maintaining good housekeeping	130	3.02	1.184
Attitude		3.0242	.55427

(Interpretation key: 1.00 – 1.49- Strongly Disagree, 1.50 – 2.49- Disagree, 2.50 – 3.49 – Neutral, 3.50 – 4.49 – Agree, 4.50 – 5.00- Strongly Agree)

The descriptive statistics of participant's response on practices of employees and management with regards to OSH standards. With regards to practice of OSH standards the table below displays the mean values and standard deviation values obtained from the participants' responses. The mean values obtained

for the following practices: When starting work I wear all PPE (mean = 1.83), I clean any spills immediately (mean = 1.96), Are ingredients stored where it is easy to access without straining? (mean = 2.11) and How often do you wear oven gloves when retrieving baked food (mean = 1.82) all fall within the range of 1.50 – 2.49. This is the range for the ‘sometimes’ response. Suggesting that the participants state they do these practices sometimes. This follows the findings of another research which stated that safety practice does not only depend on knowledge and attitude. It is positively associated with being given adequate information about safety precautions that must be followed, being provided with the required safety clothing and appliances coupled with adequate and proper supervision (Wekoye, Moturi and Makindi, 2019)

Is faulty equipment used for production? (mean = 1.21), This question had a lower mean suggesting they never use faulty equipment. This is a positive response as the use of faulty equipment poses high risk of accidents in the workplace.

When the researcher interviewed the senior personnel at the bakeries, it was noted that most of these employees are not provided with PPE and hence they wear them when they bring their own. On the other hand, for practices like Do you carry out safety talks? (mean = 1.37), Are all accidents reported? (mean = 1.42) and that Are accidents investigations carried out (mean = 1.45) these have relatively lower mean values and the mean values obtained fall in the range 1.00 – 1.49 which is the range for the ‘never’ response. This suggests that the participants generally never do those practices.

Safety talks are a way of disseminating safety and health information with the intention of ensuring that employees follow safe work procedures. Halawi & Haydar (2018) explained that, programs to train employees are meant to develop in them the

relevant knowledge and skill which is evidenced in the proper execution of duties and compliance. Hence lack of training as a practice affects compliance to OSH standards.

Failure to investigate and report accidents that occur on the factory premises is against the law which states that Whenever any accident occurs in a factory or on-premises where structural work is being performed or in connection with machinery and such accident causes loss of human life or injury to an employee or building employee which results in his absence from work for three days or more or injury to any person not employed on the premises, the occupier of the factory or the builder or user of the machinery, as the case may be, shall, as soon as possible thereafter in the manner and the form prescribed, notify an inspector in writing of the accident and the prescribed particulars. Factories and Works Act (chapter 14:08) of 1996 Section 13(3).

Hence generally, on practicing OSH standards the overall average obtained is 1.60 which falls in the sometimes range. This suggests that in general the participants sometimes practice and follow the OSH standards. This also means that the participants acknowledge they do adhere to the OSH standards and at other times they do not adhere to the expectations of the OSH standards.

On standard deviation the overall average standard deviation value for the practice of the OSH standards by the participants is 0.42. This shows that generally the responses by the participants with regards to practice of OSH standards were homogenous in nature, that is they gave similar responses with little deviation.

Table 6. The Descriptive Statistics of Participant's Response on Practices of Employees and Management with Regards to OSH Standards.

	N	Mean	Std. Dev.
When starting work I wear all PPE	132	1.83	.746
I clean any spills immediately	131	1.96	.661
Are ingredients stored where it is easy to access without straining?	132	2.11	.650
How often do you wear oven gloves when retrieving baked food	130	1.82	.676
Do you carry out safety talks?	125	1.37	.589
Is faulty equipment used for production?	128	1.21	.428
Are all accidents reported?	120	1.42	.751
Are accidents investigations carried out	119	1.45	.810
Practice		1.6000	.42380
(Interpretation key: 1.00 – 1.49—Never, 1.50 – 2.49—Sometimes, 2.50 – 3.00—Always)			

Objective 2

Observational Checklist as a Measure for the Level of Compliance

The researcher used an observational checklist which they adapted from the factory inspection checklist that they currently use as they conduct their mandatory factory inspections in compliance with the Factories and Works Act Chapter 14:08. This checklist was used to provide an objective measure of how participating bakeries comply with OSH regulations in their daily activities.

None of the bakeries had copies of the Factories and Works Act and regulations on display available for employees' perusal. This is the primary legislation dealing with occupational safety and health in Zimbabwe and as such expected to be available on all premises defined as a factory. The Factories and Works (General) regulations (1976) states that every occupier, builder and user shall have in his possession a copy of the Act and the regulations made thereunder and shall at all times keep a copy on his premises, available for perusal by persons working thereon.

From the twelve bakeries visited 17% had their factory registration certificates displayed. 33% had cleaned their premises on the day of the researchers visit, connecting of electrical wires direct into wall sockets appeared to be a common feature. The poor electrical connection is against the law which requires that all electrical machinery, apparatus and conductors shall be worked, maintained and identified as to prevent danger to persons and to be protected in such a manner that no injuries can be caused to any person by inadvertent contact with any portion thereof Factories and Works (Electrical) Regulations, 1976.

Now we will examine the areas that had minimal or no compliance. None of the bakeries carried out medical examinations to ascertain fitness of the employees to handle food products—in particular, food handler’s medical examinations. None had trained first aiders and furnished first aid boxes. This was an indication that if there was going to be a health emergency situation there would not be any first or immediate informed help that could be given. General demarcation of walk ways, workstations, storage area was not well spelt out resulting in poor housekeeping. Drinking water was generally not provided for in the factory premises. Considering there are small cubicles being rented out, drinking water facilities such as dispensers were expected to be provided. In the toilets water was stored in huge bins but the small buckets to use for flushing were not there. Some indicated that they carry a small bucket to the toilet to use for flushing. About 83% of these bakeries were on complexes with shared ablution facilities. This means there will be a block of toilets shared by all persons from the different companies on the complex. No individual company takes ownership of the toilet facilities. In some complexes there will be caretakers who keep cleaning the toilets regularly but on the visited ones, there didn’t seem to have regular cleaning routine and no portable water for use.

Observational Checklist

On measuring compliance, the descriptive statistics below highlight the results obtained from the assessment carried out through an observational checklist. The above listed entities were observed in each of the twelve (12) facilities and the average mean values calculated. The 12 facilities being the (n). As shown below, a good number of the factors on the checklist were not being followed while some were being followed. As shown by the mean values in the range 0 – 0.49, there is generally little or no compliance to OSH legislation, change rooms, cleanliness, meal facilities, building structure, ventilation (cross or through ventilation), medical examinations, first aid aiders/box, accident register, displayed factory registration certificate, protective clothing, emergency exit, notices, SHE personnel, responsible person, electricity connections and heat.

The actual practices that employees can control include items such as participating in training (if such training is offered), wearing of personal protective clothing and housekeeping among others. The observational checklist had measures which workers cannot incorporate into practices such as the heat and light measures. The aim of indicating such parameters into the checklist is to give a general assessment or a first impression assessment of how such parameters fare in terms of adequacy before quantifying them through actual measurements.

However, there is compliance to some of the entities such as provision of separate toilets for both sexes, wash basins, water supply, floors, overcrowding, lighting, other certificates/licenses e.g. City council operating license, dangerous substances, fire equipment/service, noise, dust/fumes, stacking, ergonomics, lifting equipment, machine safety and housekeeping as shown by the relatively higher mean

values in the range 0.50 – 1.00. Thus, the average mean for compliance obtained is 0.47. This falls in the non-compliance range.

Table 7. Observational Checklist

Descriptive Statistics	n = 12	Mean	Compliance
OSH legislation		.00	No
Change rooms		.17	No
Toilets separate for both sexes		1.00	Yes
Wash basins		1.00	Yes
Cleanliness		.34	No
Meal facilities		.18	No
Water supply		.75	Yes
Building structure		.26	No
Floors		.68	Yes
Overcrowding		.51	Yes
Lighting		.59	Yes
Ventilation (cross or through ventilation)		.34	No
Medical examinations		.09	No
First aid aiders/box		.35	No
Accident register		.09	No
Other certificates/licenses e.g. City council operating license		1.00	Yes
Displayed Factory registration certificate		.18	No
Dangerous substances		.83	Yes
Protective clothing		.34	No
Fire equipment/service		.60	Yes
emergency exit		.18	No
Notices		.09	No
Noise		.92	Yes
Dust/fumes		.58	Yes
Stacking		1.00	Yes
SHE personnel		.09	No
Responsible person		.00	No
Ergonomics		.50	Yes
Lifting equipment		1.00	Yes
Electricity connections		.34	No
Machine safety		.84	Yes
Heat		.26	No
Housekeeping		.50	Yes
General Compliance		.4718	No

(Interpretation key: 0.00-0.49= No; 0.50-1.00= Yes)

Interview Checklist

The researcher interviewed the senior company representatives in each of the twelve (12) bakeries. The seniors were not all necessarily management, some were supervisors or foreman. None of the company representatives interviewed indicated that they had the following: occupational safety and health management systems, safety and health training programs, emergency preparedness and response plan, legislation (in this case the Factories and Works Act Chapter 14:08), safety and health committee, and safety and health policy. Only 17% of the bakeries had registered their operations as a factory as evidenced by the displayed certificates. Those with accident registers were 17% and 8% carried out accident investigations. From those interviewed, 8% of the bakeries carried out hazard identification and risk assessment. 7% did planned internal audits to ensure the workplace was safe, 25% posted safety posters on the walls as a way of campaigning for safety and health. Out of all these establishments 17% had inspection reports from the factory's inspectorate department.

Table 8. Interview Checklist

[illegible]

The Zimbabwe legislation states that, no occupier shall require or permit any person to work in any room in his factory unless the means of ventilation are satisfactory, and effective provision is made for securing and maintaining such air movement by cross or through ventilation as will ensure comfortable atmospheric conditions, as required by the inspector. Factories and Works (Registration and Control of Factories) RGN 262 of 1976 Section 4(1.c).

This legislation does not give specific threshold limits values but gives a generalized requirement of ensuring through or cross ventilation. As such Zimbabwe follows the American Conference of Governmental Industrial Hygienists ACGIH (1996) for heat stress monitoring. The assumption on the threshold limit values is that nearly all acclimatized, fully clothed employees with adequate water and salt intake should be able to function effectively under the given conditions without exceeding a deep body temperature of 38°C (American Conference of Governmental Industrial Hygienists, 1996).

Acclimatization is the process of adapting to new conditions or environmental stressors. In this study acclimatization refers to adapting to heat in the work environment. Being able to acclimatize efficiently improves the worker's fitness to adapt to the new (hot) or variable work environment (Collier, Baumgard, Zimbelman and Xiao, 2018).

Fully clothed employees are those wearing clothing that gives good thermal comfort when exposed to heat levels above the acceptable threshold limit values. A fully clothed employee should be able to maintain a balance between heat loss and heat gain as they carry out their normal duties in hot working environment, the clothing must be able to allow the release of body metabolic heat (Uwe, 2018).

These concepts are being discussed to give the reader better appreciation of the many aspects of worker safety, but the scope of this study did not include acclimatization and fully clothing factors.

Small-scale bakeries fall under 50% work + 50% rest each hour; this is because employees do not work all day. Baking is done until they meet their daily supply then they close for selling. The work involves kneading of dough, proving, baking, cooling and packing in the same space. In other bakeries there is frying if they do doughnuts too. With this kind of work, employees are placed under moderate work range which allows a threshold limit value of 29.4 °C. The mean at the ovens section 30.45 °C exceeds the permissible limits and proving and packing has a mean of 29 °C which places it right on the line and does not make it a comfortable working area. The heat levels in these small-scale bakeries do not seem to provide comfortable thermal comfort for employees, according to the threshold limit levels. This is a combination of the ovens, poor ventilation resulting from absence of windows in some bakeries and small non-openable windows in others. The employees may suffer from heat strain due to excessive heat exposure among other heat related ailments (Afshari, Moradi, Angali and Shirali (2019).

Table 9. Results of Heat Stress Parameters in Small-Scale Bakeries

Bakery numbers	Ovens	Cooling and Packaging
1	28.4	29
2	29	27.4
3	28.2	25.5
4	31.4	30.4
5	31.5	29.3
6	30.2	29.1
7	31.6	30.2
8	32.1	30.1
9	30.2	30.3
10	29.7	28.4
11	32.6	28.4
12	30.5	30.4
Standard deviation	1.437485	1.473066
Mean	30.45	29.04167

The lighting in the bakeries visited fell below the acceptable threshold limit values of three hundred lux and 500-1000lux. The mean for the ovens was 90.7 lux while for the prover it was 46.1 lux and 163.6 lux for packaging respectively. These illumination conditions do not provide adequate lighting for employees to carry out their bakery duties comfortably, as measured by the illumination standards. The employees may suffer fatigue, eye pain, headaches and poor visual perception, their mood, alertness and performance are also affected due to poor lighting (Katabaro &Yan 2019).

The Factories and Works R.G.N No 262 of 1976 Section 5 (4.5) states that: No occupier shall allow or permit any persons to work either by day or by night unless adequate lighting for the work being done is provided. It goes further to say such intensity shall not be less than three hundred lux at the point of operation of any process unless an inspector allows lesser value according to the nature of the work undertaken. Tasks with normal visual requirements (medium weight machinery,

office space) require lighting ranging from 500-1000 lux (International Labour Organization, 1998).

Table 10. Small-Scale Bakeries Illumination Results (Lux)

Bakery number	Ovens	Prover	Packaging
1	204.4	129.1	182.9
2	193.7	107.6	161.4
3	32.3	21.5	37.7
4	118.4	53.8	365.8
5	53.8	32.3	39.8
6	107.6	43	333.6
7	19.4	3.2	156
8	21.52	9.7	4.3
9	37.7	20.4	32.3
10	182.9	96.8	172.2
11	19.4	3.2	153.9
12	96.8	32.3	322.8
Standard Deviation	71.13498	42.60062	124.1428902
Mean	90.66	46.075	163.5583333

Objective 3

Objective 3 was to: Assess whether there is a significant relationship between knowledge of, attitudes toward, and practices of OSH and compliance with OSH standards.

Analysis of the Relationship between Knowledge, Attitudes, and Practices toward OSH and Compliance with OSH Standards

Negative Binomial Regression analysis was adopted to measure the above-mentioned relationship. For the regression, the Compliance to OSH standards is specified as the dependent variable while knowledge, attitude and practice are the independent variables. The **IRR** option calls for incidence rate ratios. The confidence intervals (CI at 95%) are also captured as too are the significance P values.

The results obtained are not statistically significant. This is shown by the P values ($P > |z|$) obtained which are all greater than 0.05. For knowledge, participants who had high level of knowledge (IRR 1.20, CI 0.53 – 2.73) had a higher rate of compliance to OSH standards by 20% than those with low Knowledge. However, those with intermediate level of knowledge (IRR 1.34, CI 0.64 – 2.82) had the highest rate of Compliance to OSH standards of 34% than those who had low knowledge levels.

For practice, those who indicated that they always practice OSH standards (IRR 0.96, CI 0.28 – 3.34) had lower rates of compliance to OSH standards compared to those who indicated they never practice OSH standards. Similarly, those who sometimes practice OSH standards (IRR 0.79, 0.30 – 2.09) had lower rates of compliance to OSH standards compared to those who indicated they never practice OSH standards. Moreover, the respondents with a negative attitude were more likely to comply to OSH standards than those with a positive attitude (IRR 0.99, CI 0.52 – 1.88) although the difference is not statistically significant.

Table 11. Negative Binomial Regression of Compliance to OSH Standards among Small Scale Bakeries in Harare

	Compliance with OSH Standards			
	IRR	$P > z $	95% Conf. Interval	
Knowledge				
Low	1			
Intermediate	1.34	0.433	0.64	2.82
High	1.20	0.666	0.53	2.73
Practice				
Never	1			
Sometimes	0.79	0.638	0.30	2.09
Always	0.96	0.948	0.28	3.34
Attitude				
Negative	1			
Positive	0.99	0.964	0.52	1.88

CHAPTER 5

SUMMARY, CONCLUSION AND RECOMMENDATIONS

A summary of findings is presented in this Chapter. Conclusions were drawn from the study and recommendations made. The conclusion and recommendations made address the knowledge, attitudes and practices on occupational safety and health compliance among small-scale bakeries in the Willowvale Industrial area in Harare, Zimbabwe.

Summary

The aim of the study was to conduct an analysis of the impact of knowledge, attitudes, and practices on occupational safety and health compliance among small-scale bakeries in Willowvale industrial area, Harare, Zimbabwe. The study was a descriptive cross-sectional study where from a sample of 145, one hundred and thirty-seven (137) participants responded from twelve (12) small-scale bakeries within the area. Tables and graphs were plotted for summary data presentation. Negative Binomial Regression was used to establish the strength of the relationship between variables and know which independent variable(s) proved significant predictor(s) of compliance with OSH standards.

The study revealed that participants had knowledge of OSH and had heard about it from the workplace (75%). Since these small-scale bakeries did not carry out OSH training and did not have OSH experts, it is assumed that knowledge was shared as workers interacted with each other. They knew OSH is about the safety and health

of people at work. The main prevalent hazard in the small-scale bakeries was known as heat, though on average they did not know other hazards that could be associated with their work. This was evidenced by a mean value of 1.21 which falls in the range (no).

The fact that poor safety and health at work could cause problems was known and workers had a fair understanding of what these problems could be with 72% stating burns, heat stress and musculoskeletal disorders as the biggest problems. Although they knew heat was a big problem and that they could suffer from heat stress, they indicated that they did not know heat exposure could cause dehydration. This knowledge on the major OSH problems could have been acquired through work experience in the bakery industry since most of them had more than (5) years working in the bakery industry. These findings were different from one study that was conducted in bakeries in developing countries such as Zimbabwe which stated that the prevalent occupational hazards include, musculoskeletal disorders due to poor working postures as they handle bread dough (excessive bending, twisting, turning and strenuous reaching out), skin irritation, hearing loss, accidents mainly caused by slips, trips and falls because of wet floors and respiratory problems (Aguwa & Arinze-Onyiwa, 2014).

From the study findings, workers in small-scale bakeries might not have suffered any musculoskeletal disorders since they did not operate full day, this agrees with one study that stated that the risk of developing musculoskeletal disorders increases with increased length of working time (Bonsu, Adei and Agyemang-Duah, 2020). It could also be that they did not relate any musculoskeletal disorders they had to their occupation. Musculoskeletal disorders were discussed and reported but did not show up in the analysis of this study since they did not form part of the scope.

The participants from this study acknowledged there should be a way of minimizing OSH hazards and that it is the employer's duty to put in place measures to prevent, minimize and control these problems. However, they did not know that they also contributed to the control of these problems through responding positively to the initiatives suggested by the employer. The methods of controlling these problems were grouped into two categories, namely environmental and personal.

According to the participants, if the work design and appliances are catered for, then OSH problems can be resolved. These environmental factors included installation of non-slippery floors to prevent slips and falls, posting safety warning signs on the factory walls to give a constant reminder of safety procedures to be followed and what to avoid could result in minimizing or controlling safety and health problems at work. Other methods that were highlighted as environmental measures included provision of access ladders, installation of ramps and designing the work in a way that reduces uncomfortable work posture. For this study access ladders were not necessary since they only stocked ingredients for the day and did not need to stack large quantities. Personal factors for controlling safety and health problems at work included wearing personal protective clothing and cleaning of spillages on the floors.

Regarding knowledge about what compliance to OSH meant and whether small-scale bakeries complied with OSH standards or not, the participants did not seem to be familiar with this. This was demonstrated by a percentage of 73% stating they did not know what OSH compliance was. The Factories and Works Act which is the principal safety and health legislation in Zimbabwe was not known, and risk assessments to determine the prevalent risks and put in place control measures were not familiar and were not done by the majority. This agrees with researchers who posit that if an organization does not have safety management programs, no standard

operating procedures and there is no awareness and provision of the regulations the OSH knowledge of employees will be minimum (Singh and Misra, 2020).

The study revealed a neutral attitude on compliance with occupational safety and health standards. The participants were neutral in their responses to questions such as if they thought OSH was for big companies, and if government laws on OSH were not necessary. They did not give clear thoughts or belief if training of workers was necessary to reduce OSH problems, poor OSH practices cause injuries, and that one is responsible for taking care of their own safety and health and that of others. This was indicated by a low mean of 2.87. This attitude is consistent with their knowledge that it was only the employer who had the duty to ensure safety and health provisions are in place. On the question that asked whether the workers were responsible for maintaining good housekeeping, they still gave a neutral response. One scholar mentioned in their study that an improper attitude towards safety and health contributes to accidents and affects compliance with safety regulations (Tobór-Osadnik, Wyganowska, and Manowska, 2017).

The structure of the buildings could have contributed to the neutral attitude. The small-scale bakeries were characterized by small buildings which may not have offered the required space per individual of 4m² (Factories and Works Act, R.G.N No. 262 of 1976 Section 4. 1(a)), inadequate lighting which fell below the acceptable threshold limit values of three hundred lux and 500-1000lux, and heat levels exceeded the acceptable threshold limit value of 29.4 °C These can negatively affect the attitudes of those working in the bakeries (Edem & Pepple (2017). If attitude is affected negatively it also translates to poor compliance with OSH standards.

Pertaining to OSH practices, there are factors that could have caused small-scale bakeries to occasionally comply with OSH standards in their operations and not

regularly. The absence of enabling working tools and adequate OSH knowledge and expertise contributed to this. Most of these bakeries did not carry out inspections of their premises. Safety and health inspections assist the organization in identifying problematic areas that require interventions. Safety talks were not done which is an important tool for disseminating safety information to employees on a regular basis and also gives a platform to the employees to speak out their safety and health concerns. Personal protective clothing and appliances such as gloves to retrieve hot baked foods from the ovens were not provided. It was then not practical to expect employees to always wear what was not available to them. Mostafa and Momem (2014) stated that practices are affected by the type of equipment that has been provided including the personal protective clothing and equipment provided.

Accident investigations were not carried out at most of the facilities with only 17% carrying out accident investigations. Upon enquiry the participants said they rarely had accidents on their premises and if they did, they were very minor although the level of being minor could not be established without a written record in an accident register describing the nature of the injury. This study could not establish how minor the accidents were since there were no accident registers on the premises. Keeping these records could have helped to establish the nature of accidents that were common, their frequency, who gets injured frequently just in case there is a common person who gets injured, when the accidents usually happen like time of day and time of the month. All the above information could have assisted in making an informed determination of whether it was because of poor knowledge or attitude that they did not report to the inspectorate department.

A disabling environment results in practices at the workplace that do not conform to OSH standards. These include failure to have standard operating

procedures. If there is no standardized and documented way of doing things employees tend to resort to ways they feel will give quick results but which may not be the safest. Having job instructions written down and posted on the machines or around the factory and ensuring the employees are trained and regularly given refreshers through safety talks aids in safe work and better compliance to OSH standards. The absence of OSH experts such as safety officers at the workplace and unavailability of safety and health training programs promote a disabling working environment.

The employees in small-scale bakeries followed the following practices not on a regular basis but sometimes. Wearing personal protective clothing and appliances and cleaning of spillages which can result in the falls of persons was done sometimes. They did not have much control over personal protective clothing since the employer did not provide them with the required personal protective clothing. Sometimes the employees considered the accessibility of ingredients when storing them.

Faulty equipment was never used in these bakeries according to the responses given. This could have contributed positively to reducing the frequency and severity of accidents within the bakeries. The use of faulty machinery raises the chances of having serious accidents as well as fatalities.

Compliance with OSH standards were generally low. The observations made through the use of the checklist showed an average mean which fell in the noncompliance range (0.47). Further, the interviews conducted with the management showed that compliance levels were low. The low level of compliance could have been influenced by lack of appreciation of the need to invest in OSH and not being familiar with the Factories and Works Act which is the principal occupational safety and health legislation in Zimbabwe as evidenced by 83% of the participants stating

they did not know what this legislation is about. The absence of a proper safety management program may have contributed to poor compliance levels (Singh and Misra, 2020). A safety management program involves identifying all legal requirements that apply to the organizations operations and putting in place measures to ensure they are complied with.

The Factories and Works Act stipulates what is required and expected to be on the factory premises. Failure of the factories to possess the Act and lack of consultation and interaction with the OSH personnel will result in lack of information on expectations and hence noncompliance. Only 17% of the bakeries were registered as factories and registering meant that their factory registration certificates were displayed on the factory premises as required by Chapter 7 of the Factories and Works Act Chapter 14:08. The study revealed that most of the bakeries never had an encounter with the Factories and Works Inspectors. Employees stated that the moment they saw branded Inspectors cars they would shut their doors and pretend as if there were no operations. The general sentiments presented were that law enforcers are there to prosecute, make them pay very stiff penalties and suspend operations. Since their main interest is to make money for survival and income generated is directly depended on how much sales they make from the produce, they would rather avoid law enforcers. Yet interaction with the inspectors could result in better appreciation of OSH and improved compliance.

The building structures in use were generally not good for bakery operations. They were small, characterized by poor lighting from equipment congestion, with not many windows to bring in natural lighting. The available light bulbs and some windows were clogged with dirt from oils and smoke. There was poor ventilation as some bakeries had only one openable door without windows while others had one

window that was either small and very high, not openable, or was blocked by equipment in the bakery due to lack of space. The researcher was prompted to ask the respondents why their windows were blocked. The response given for blocking them with equipment was to prevent unwanted access from thieves. They also stated that they had no control over the state of the building, poor ventilation, poor lighting, size of the building, broken floors among others. The argument was they were at the mercy of the owner of the complex or building since these premises are affordable. The bakeries do not afford rental for the factory premises with required good facilities.

The results also revealed that the bakeries did not have safety and health experts but did not seem to have the capacity to employ such required expertise. This was evidenced by the fact that in some bakeries, employees were trained on the job to do all-rounder work activities. OSH experts would help in setting up safety and health systems, which includes hazard identification and risk assessment, coming up with standard operating procedures, legal compliance registers, carry out routine inspections, come up with planned maintenance schedules for their machinery, OSH training programs, acquisition and provision of appropriate and adequate personal protective clothing, equipment and measures and general OSH management.

Pressure to make profits was another challenge that could have resulted in non-compliance. While the researcher was conducting interviews during checklist aspect of the study, they mentioned that they concentrate on baking their products and as soon as they finish, they close the bakery and go to sale since they have no one to depend on for funding. Spending the day at the bakeries was also considered as contributing to the electricity bill.

Planned and consistent training of employees is an aspect that the researcher believes helps improve compliance. However, there were no trainings done in the small-scale bakeries, yet different studies reveal that training positively affects knowledge, attitude, practices of employees and ultimately compliance with OSH standards. Considering the young age of most of the employees, training of such young workers enhances their OSH compliance (Dragano, 2018).

Safety training in recent studies continues to be cited as a predictor of knowledge on safety, compliance with safety standards and motivation to improve on safety which is ultimately evidenced in the adoption of safe practice. This school of thought comes from a study conducted by Liu, Nkrumah, Akoto, Gyabeng, and Nkrumah (2020). If workers receive the appropriate training they need, their knowledge will be improved, and the acquired knowledge coupled with the right attitude will produce the desired practices and compliance.

This research discovered that small-scale bakeries did not have standard operating procedures. Employees carried out their tasks following procedures they deemed suitable and ways that they observed others practicing. Standard operating procedures state how operations must be undertaken in the safest way possible, they assist in preventing avoidable accidents as well as preventing occupational fatalities (Singh and Misra, 2020).

The importance of worker training and having standard operating procedures and the influence these two organizational characteristics could have on improving occupational knowledge, developing better attitudes, undertaking safety practices and compliance with OSH standards were realized and reported in this study. However, analysis of these two characteristics was not done as this was outside the scope of this study.

The statistical significance of the relationship between the dependent variable (Compliance with OSH Standards) and the independent variables (knowledge, attitudes and practices) was not established by the findings in this study. It may be that the small size of the sample affected the statistical power to detect significant differences. Subsequent studies with larger sample sizes may be necessary to determine whether KAP relationships exist and under what conditions among small scale bakeries in Harare, Zimbabwe.

The study conducted presented statistically insignificant relationship between the dependent variable (compliance) and the three independent variables which are knowledge, attitude and practices. This is shown by the P values ($P > |z|$) obtained which were all greater than 0.05. The inconsistency is evidenced by those with intermediate (IRR 1.34) knowledge having a higher likelihood to comply with OSH standards as opposed to those with higher level knowledge who had (IRR 1.20). Ordinarily the assumption would be for those with higher level of knowledge having a higher level of compliance.

For practice, those who indicated that they always practice OSH standards (IRR 0.96, CI 0.28 – 3.34) had lower rates of compliance to OSH standards compared to those who indicated they never practice OSH standards. Similarly, those who sometimes practice OSH standards (IRR 0.79, 0.30 – 2.09) had lower rates of compliance to OSH standards compared to those who indicated they never practice OSH standards. This does not follow logic as it is expected that those who always consider OSH in their practices would have better compliance than those who never consider OSH in their practices.

Moreover, the respondents with a negative attitude were more likely to comply to OSH standards than those with a positive attitude (IRR 0.99, CI 0.52 –

1.88) although the difference was not statistically significant. This does not agree with a study that concluded that a wrong attitude towards safety and health contributes towards accidents and affects compliance with safety regulations (Tobór-Osadnik, Wyganowska, and Manowska, 2017).

This study revealed that the current level of knowledge requires improvement for improved OSH compliance. This can be achieved by ensuring that the small-scale bakeries have access to OSH information. From the interviews conducted, the management were informed that OSH experts are there to ensure their work environment is safe to work in and can assist them in achieving the desired outcome. This interaction will help cater for the OSH knowledge gap.

Compliance with OSH standards were also being negatively affected by the current practice levels where safety adherence was done sometimes and not consistently. There was no safety culture and enabling safety environment to ensure OSH standards are followed consistently. Therefore, for small-scale bakeries to improve on OSH compliance there should be an improvement in the current practice levels of the small-scale bakeries towards implementing the OSH standards. Practices can be improved through the organization adopting a safety culture, coming up with OSH programs and auditing its own operations to assess level of compliance and enforcing adherence to all stipulated standards and procedures by all employees.

Conclusion

The main objective of the study was to evaluate the impact of knowledge, attitudes, and practices on occupational safety and health compliance among small-scale bakeries in Willowvale industrial area, Harare, Zimbabwe.

Based on this sample population, there is an overall poor compliance on occupational safety and health standards by the small-scale bakeries. The study did

not indicate correlation between knowledge, attitudes and practices and compliance to OHS standards. However, results indicated that employees and management did not have adequate knowledge on OSH to empower them to implement and follow a safety culture that would see them complying with OSH standards. The inconsistent practices with regards to procedures and use of safety equipment and protection contributed to poor compliance with OSH standards. The employees are therefore at high risk from the major occupational hazards of heat exposure, poor lighting and possible falls from slippery uneven floors in small-scale bakeries in Willowvale, Harare.

Recommendations

From the findings of this study, the researcher recommends the following to the various stake holders:

The Employer

A sense of social and moral responsibility needs to be developed by small-scale bakery enterprises in Willowvale on issues relating to safety, health and general wellbeing of employees. Human beings have a moral obligation to take care of each other and not cause harm unnecessarily.

The employer needs to realize that the greatest asset is the employee and taking care of their safety, health and well-being will benefit the organization. Having employees who feel safe benefits the organization through having a motivated workforce and keeping the same experienced workers for a long time which keeps the good quality of the product.

The employer has the policy making powers as well as resources for implementation of the policy and programs. A demonstration that they have care for

the safety and health of their employees will create a culture that cascades throughout the whole organization.

The employer should design work procedures and programs that factor in safety and health of employees and effectively communicate these with the employees. This will be aided by clearly defining and assigning roles and responsibilities to all the employees within the organization as well as documenting all work procedures.

The employer should identify and comply with all the minimum OSH requirements that affect or are relevant to their operations. The employer should not wait for law enforcement agencies to police them.

Bakeries should outsource/engage safety and health experts to ensure they are equipped with relevant knowledge and provide safe working environment for their employees. The employer is at liberty to engage safety and health inspectors, health and safety promotions officers, occupational health services officers, occupational hygiene and ergonomics inspectors among others safety and health professionals that can be of assistance to them.

The Employee

Employees need to develop a positive attitude towards OSH and implement daily safety practices. A positive attitude can be achieved by developing a keen interest in the work that one does and find out the safe way of doing the job.

Employees should avail themselves for safety and health training programs planned for them within the organization. Training will aid in developing a positive attitude towards safety, proper execution of duties and compliance as supported by (Halawi & Haydar, 2018)

Employees should prioritize their own safety and health and that of others who may be affected by one's actions. Protection of own safety is done through following the standard operating procedures, exercising due care in carrying out work to avoid placing oneself and others at risk by what you do or fail to do as you carry out your work. Failing to clean up spillages, not keeping ingredients where they are supposed to be and leaving them blocking walkways may place others at risk of falling who may not be aware of such acts of carelessness.

Employees should communicate to the employer any situations that seem to pose danger to themselves and others, refuse to work where the work may expose them to danger and help in coming up with corrective measures. Employees are familiar with their work environment and their daily duties and may have less expensive and practical ways to ensure the work environment is safe.

The employee should use all the protective materials, equipment, devices and clothing that the employer provides as stated in Section 8 of the Factories and Works Act RGN (263) of 1976 Section 1(b.3)

The employees should report any accidents or illnesses experienced because of the work being done. This will help the employer and the employees to explore other safe ways of doing the work. Not reporting any accidents and injuries may give false satisfaction that the work environment and the operations are safe.

It is the duty and right of the employee to look out for safety and health experts such as the factory inspectors and safety and health promotion officers and make enquiries of what they should know about their safety and health at work. They have the right to be safe while carrying out their work operations.

Legislators

There is need to formulate national policies targeted at improving occupational safety and health in small-scale enterprises including bakeries. The greater emphasis should be placed on training of employers, managers and general employees on sustainable mechanisms of occupational safety and health at enterprise level. Raising awareness is more critical in small-scale bakery operations as opposed to enforcement.

The legislators may provide free safety and health training programs through departments such as the NSSA occupational safety and health promotions. These programs should be tailor made to address the nature of hazards peculiar to small-scale bakery operations.

Systematic, sustainable and increased interaction between OSH experts which includes (Occupational Hygienists, Ergonomists, Factories and Works Inspectors, OSH Promotions Officers and Medical Services personnel) and the small-scale bakeries should be developed. These officers are available to assist employers whenever there is need. Interactions will help empower small-scale bakeries with the knowledge they need, equip them with the necessary OSH skills which will bring change in the knowledge levels, attitudes, practices and ultimately compliance with OSH standards.

Awareness campaigns and programs should be done targeting SMEs including bakeries to enhance their OSH knowledge. Awareness campaigns are done in various ways including but not limited to, show conferences, road show campaigns, free teach-ins, giving OSH pamphlets among others.

Suggestions for Future Research

The researcher makes these suggestions for areas of future research in this important aspect of Occupational Safety and Health. There is need for study that includes an instrument that has reliability to measure the relationship between OSH compliance and attitudes. This will assist in establishing whether there is a relationship between attitudes and compliance with safety standards in Zimbabwe.

A study on the effects of heat exposure on the health and safety of employees could contribute valuable actionable data. This study identified that the owners and workers of small-scale bakeries are low-wage and therefore have limited resources. This results in them experiencing difficulty investing in good infrastructure that can provide safe and healthy work environments, including providing good thermal comfort. The poor infrastructure exposes employees to elevated heat radiating from the bakery ovens.

Heat exposure in the poorly ventilated hot bakeries coupled with climate change has been linked to many health-related problems. These problems include cardiovascular disease, chronic kidney injury, which is of great concern recently, mental problems, and an increase in accidents and injuries. (Xiang, Bi, Pisaniello and Hansen, 2014).

Another school of thought alludes to the same fact that excessive heat exposure in poorly ventilated bakeries can result in heart diseases and chronic kidney disease. This study could not explore this important topic and hence further studies could give guidance to practitioners in the occupational health field as well as policy-makers to come up with sustainable intervention measures focusing on heat stress in the understudied small-scale bakeries in Zimbabwe. (Habib, El-Haddad, Halwani, Elzein and Hojeij, 2021).

The impact of financial constraints on OSH compliance is a major factor. Small- scale bakeries do not have financial resources to invest in OSH systems, employing the relevant expertise, or resources to carry out OSH programs such as employee training. A study should be done to quantify the impact of financial constraints and explore avenues that may capacitate Zimbabwe small-scale bakeries financially for improved OSH compliance.

Evaluating the effect of Occupational Safety and Health education on worker's knowledge, attitude and practices in small-scale bakeries is research that should be expanded. Several studies referenced in this study continued to raise safety and health training and education as a main predictor of increased knowledge, improved attitudes, desirable practices and compliance with OSH standards (Liu, Nkrumah, Akoto, Gyabeng, and Nkrumah, 2020). A study focusing on the effect of education and training on Zimbabwe small-scale bakeries could contribute significantly to the body of literature.

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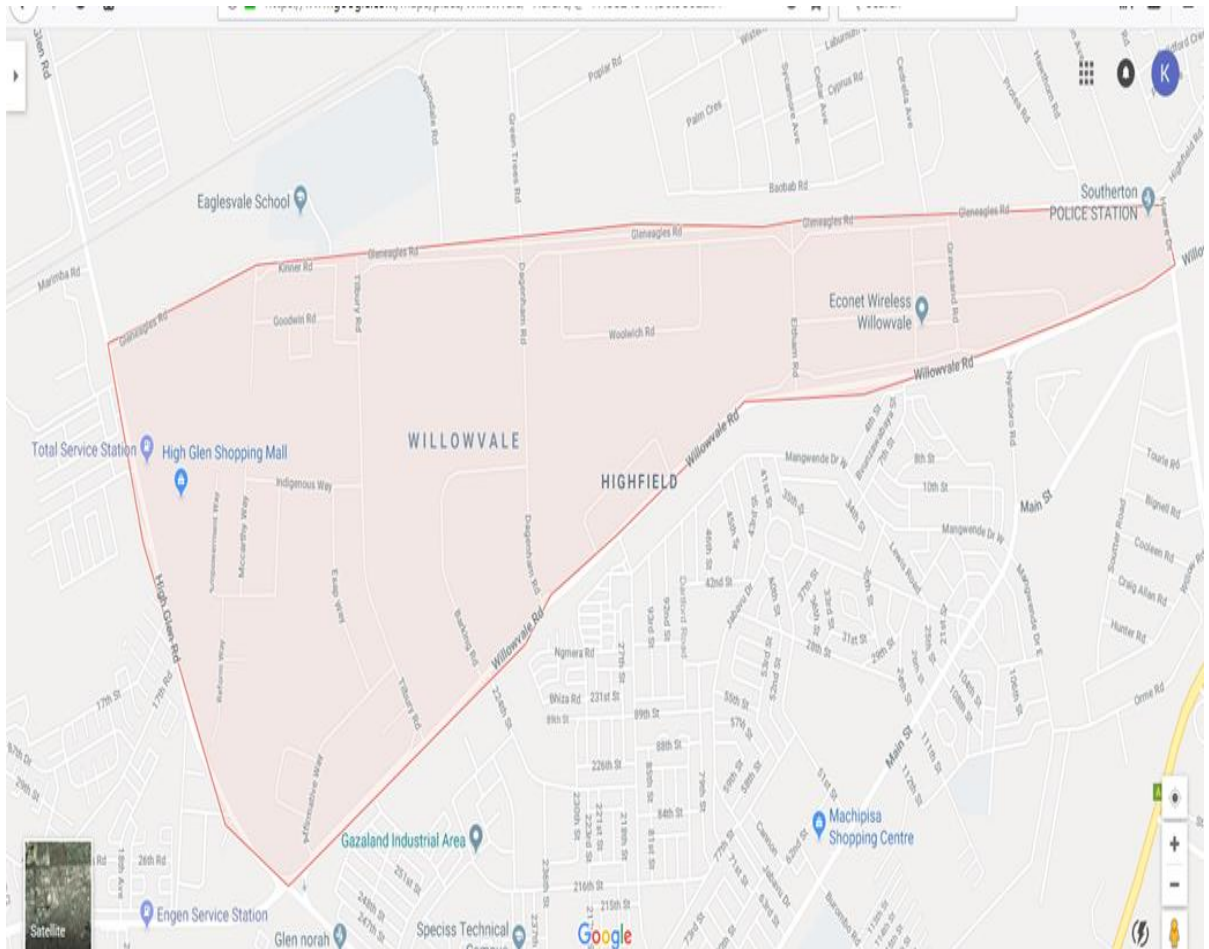
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APPENDICES

APPENDIX A

WILLOWVALE INDUSTRIAL AREA MAP



Willowvale Industrial Area (Harare) – Google Maps

APPENDIX B

LUX METER CALIBRATION CERTIFICATE



SCIENTIFIC & INDUSTRIAL RESEARCH & DEVELOPMENT CENTRE
NATIONAL METROLOGY INSTITUTE
 1574 Alps Road, Hatcliffe, Harare, Tel +263-4-888321-23, Fax +263-4-888350, www.sirdc.co.zw

CALIBRATION CERTIFICATE

CALIBRATION OF FOOT CANDLE LIGHT METER

MANUFACTURER : EXTECH
SERIAL / ASSET NUMBER : Q698136 / WF7874
CERTIFICATE NUMBER : E-136-09-21
MODEL NUMBER : 401027
CALIBRATED FOR : NATIONAL SOCIAL SECURITY AUTHORITY
PLACE OF CALIBRATION : OFFICE NUMBER 2
LOCATION : NATIONAL SOCIAL SECURITY AUTHORITY
 52 GLEN EAGLES ROAD, WILLOWVALE, HARARE
DATE OF CALIBRATION : 01-09-2021
CALIBRATION DUE DATE : 01-09-2022
CALIBRATION CONDITIONS:
TEMPERATURE : (24 ± 3) °C
HUMIDITY : (23 ± 10) %RH

STANDARDS AND EQUIPMENT USED:

DESCRIPTION	SERIAL NO.	CERTIFICATE NO.
HEAVY DUTY LIGHT METER	Z188404	58889
Noise Dosimeter Kit	Z193495	59265



Calibrated by: J. Madziva
(Metrologist)

Checked by: M. Mubvumba
(Metrologist)

Approved
(for Director)





1 of 2

1. PROCEDURE

The calibration was performed by comparison with a standard heavy duty light meter (serial number Z188404).

2. RESULTS

Luminance Measurement

Standard: Luminance (Lux)	UUT: Luminance (Lux)	CORRECTION (Lux)
0.0	0.0	0.0
50.0	50.1	-0.1
231.0	232.0	-1.0
500.0	500.0	0.0

The uncertainty of measurement was estimated to be ± 0.5 Lux

3. TRACEABILITY STATEMENT

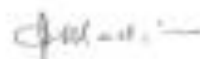
The calibrator used is traceable to NIST through Certificate number 58889.

4.0 REMARKS

- 4.1 The reported uncertainties of measurement were calculated and expressed in accordance with the BIPM, IEC, ISO, IUPAP, OIML document entitled "A Guide to the Expression of Uncertainty in Measurement" (International Organisation for Standardisation, Geneva, Switzerland, 1993).
- 4.2 The reported uncertainties of measurement are based on a standard uncertainty multiplied by a coverage factor of $k=2$, which, unless specifically stated otherwise, provides a level of confidence of approximately 95 %.
- 4.3 The actual reading is obtained by adding the correction to the reading indicated by the unit under test (UUT).
- 4.4 The calibration results are as obtained at the time of calibration. The subsequent accuracy will depend on factors such as care, handling and frequency of use. It is recommended that recalibration be undertaken at an interval that will ensure that the instrument remains within the desired limits.
- 4.5 The measurement results relate only to the item(s) calibrated.
- 4.6 The calibration certificate or report may not be reproduced except in full, without the written approval of the laboratory.

xxxxxxEND OF DOCUMENTxxxxxx

Date of Calibration : 01-09-2021
Calibration Due Date : 01-09-2022
Certificate Number : E-136-09-21
Calibrated by : J. Madziva
(Metrologist)
Checked by : M. Mubarek
(Metrologist)
Approved




(for Director)



SCIENTIFIC & INDUSTRIAL RESEARCH & DEVELOPMENT CENTRE
NATIONAL METROLOGY INSTITUTE

1574 Alpen Road, Hatcliffe, Harare. Tel +263-4-000321-55. Fax +263-4-000350. www.sirdc.ac.zw

CALIBRATION CERTIFICATE

CALIBRATION OF HEAT STRESS MONITOR

MANUFACTURER : QUEST TECHNOLOGIES
SERIAL / ASSET NUMBER : TPK090005 / WF5611
CERTIFICATE NUMBER : T-005-09-21
MODEL NUMBER : QUEST TEMP 32
CALIBRATED FOR : NATIONAL SOCIAL SECURITY AUTHORITY
56 GLEN EAGLES ROAD, HARARE
PLACE OF CALIBRATION : NATIONAL SOCIAL SECURITY AUTHORITY
LOCATION : OFFICE 2
DATE OF CALIBRATION : 01-09-2021
CALIBRATION DUE DATE : 01-09-2022
CALIBRATION CONDITIONS:
TEMPERATURE : $(242 \pm 3) ^\circ\text{C}$
HUMIDITY : $(22 \pm 10) \% \text{RH}$

STANDARDS AND EQUIPMENT USED:

DESCRIPTION	SERIAL NO.	CERTIFICATE NO.
Fluke 744	1798021	86359
Electronic Thermohygrometer 1620A(DewK) & 2626-S Probes	B08808 (Readout), B0A142 & B0A141 (Probes)	HMiGC-2773



Calibrated by: J. Madziva
(Metrologist)

Checked by: B Chibaya
(Metrologist)

Approved

(for Director)

1 of 3

1. PROCEDURE

The HEAT STRESS MONITOR by Comparison in accordance with procedure THP03.

2. RESULTS

Dry Bulb Temperature

STD: Temperature (ITS90) (°C)	UUT: Indicated Temperature (°C)	CORRECTION (°C)	UNCERTAINTY (±°C)
30.1	30.3	-0.2	2.0

Wet Bulb Temperature

STD: Temperature (ITS90) (°C)	UUT: Indicated Temperature (°C)	CORRECTION (°C)	UNCERTAINTY (±°C)
30.2	30.2	0.0	2.0

Humidity Measurement

STD: Humidity (%RH)	UUT: Humidity (%RH)	CORRECTION (%RH)	UNCERTAINTY (±%RH)
37.9	40	-2	5

Globe Temperature

STD: Temperature (ITS90) (°C)	UUT: Indicated Temperature (°C)	CORRECTION (°C)	UNCERTAINTY (±°C)
30.3	30.3	0.0	2.0

3. TRACEABILITY STATEMENT

The calibrator used is traceable to the National Measurement Standard of Temperature and Humidity for South Africa through certificate numbers 86359 and HMIGC-2773.

4.0 REMARKS

- 4.1 The reported uncertainties of measurement were calculated and expressed in accordance with the BIPM, IEC, ISO, IUPAP, OIML document entitled "A

Date of Calibration : 01-09-2021
Calibration Due Date : 01-09-2022
Certificate Number : T-005-09-21

Calibrated by : J. Madzwa
(Metrologist)

Checked by : B. Chibaya
(Metrologist)

Approved

(for Director)



- Guide to the Expression of Uncertainty in Measurement" (International Organisation for Standardisation, Geneva, Switzerland, 1993).
- 4.2 The reported uncertainties of measurement are based on a standard uncertainty multiplied by a coverage factor of $k=2$, which, unless specifically stated otherwise, provides a level of confidence of approximately 95 %.
- 4.3 **The actual reading is obtained by adding the correction to the reading indicated by the Unit Under Test (UUT).**
- 4.4 The calibration results are as obtained at the time of calibration. The subsequent accuracy will depend on factors such as care, handling and frequency of use. It is recommended that recalibration be undertaken at an interval that will ensure that the instrument remains within the desired limits.
- 4.5 The measurement results relate only to the item(s) calibrated.
- 4.6 The calibration certificate or report may not be reproduced except in full, without the written approval of the laboratory.
- xxxxxxxxxx END OF DOCUMENT xxxxxxxxxxxxxx

Date of Calibration : 01-09-2021
Calibration Due Date : 01-09-2022
Certificate Number : T-005-09-21

Calibrated by : J. Madziva
(Metrologist)

Checked by : B. Chibaya
(Metrologist)

Approved




(for Director)

APPENDIX C

LETTER REQUESTING PERMISSION TO CONDUCT OCCUPATIONAL
SAFETY AND HEALTH STUDY

24/01/2020

The Chief Inspector of Factories
OSH Division
NSSA

Dear Sir

RE: REQUEST TO CONDUCT OSH STUDY

My name is Gelien Busangavanye, a Master of Public Health student at the Adventist University of Africa. I am conducting a research, A ***COMPARATIVE ANALYSIS OF THE IMPACT OF KNOWLEDGE, ATTITUDES AND PRACTICES ON OCCUPATIONAL SAFETY AND HEALTH COMPLIANCE IN SMALL-SCALE BAKERIES IN WILLOWVALE INDUSTRIAL AREA, HARARE.***

I request your permission to carry out my research in the Willowvale industrial area. Please be advised that the information collected will be solely used for academic purposes.

Thanking you in anticipation of your favorable support.

Yours faithfully

Gelien Busangavanye

APPENDIX D

APPROVAL TO CONDUCT OCCUPATIONAL SAFETY AND HEALTH STUDY



NSSA WILLOWVALE
56 Gleneagles Road
Willowvale
HARARE

ZIMBABWE

FACTORIES AND WORKS DEPARTMENT
P O Box CY 56
Causeway, Harare
Telephone: +263 8677 000455

24/01/2020

To: Gelien Busangavanye
Department of Public Health
Adventist University of Africa
Dear Gelien,

RE: A COMPARATIVE ANALYSIS OF KNOWLEDGE, ATTITUDES AND PRACTICES ON OCCUPATIONAL SAFETY AND HEALTH COMPLIANCE AMONG SMALL-SCALE BAKERIES IN HARARE, ZIMBABWE

This is to inform you that you have been given permission to go ahead with the above research. This is due to the benefits that the OSH Factories Inspectorate department will realize from the results of this research. This includes informing why small-scale bakeries do not comply and approaches that can be used to improve compliance with OSH legislation. The approval is subject to compliance with the following.

1. Only approved documents will be used (including inspectorate records)
2. The researcher will not abuse their powers as the Inspector to coerce respondents to participate in the study.

Yours Sincerely

SP Marunza

CHIEF INSPECTOR OF FACTORIES



APPENDIX E
QUESTIONNAIRE

Dear Respondent,

You are being asked to participate in a research study entitled: ***A COMPARATIVE ANALYSIS OF THE IMPACT OF KNOWLEDGE, ATTITUDES AND PRACTICES ON OCCUPATIONAL SAFETY AND HEALTH COMPLIANCE IN SMALL-SCALE BAKERIES IN WILLOWVALE INDUSTRIAL AREA, HARARE.***

The purpose of this study is to assess the impact of knowledge, attitude, and practices on Occupational Safety and Health (OSH) compliance with OSH standards.

In order to participate in the study, you will be asked to fill out this questionnaire that has 35 items and takes approximately 10-15 minutes to complete.

Participation in this study is voluntary and signing at the bottom of this **Form** means that you are giving your consent to be in the study. Please do **NOT** write your name on the questionnaire and this Form is separate from the questionnaire to ensure that your identity will not be revealed. Only the researcher and advisors will have access to the data. Withdrawal from participating is also voluntary at any stage of participation.

There are no direct benefits and no penalties for participating in this study.

You are therefore requested to respond suitably to the questions given and freely express your views. Please note the information will be used for academic purposes only and will strictly remain confidential. The researcher will answer any questions that you have about the study and you should ask them now.

In case you need any clarification on the study or have any comments or complaints about the study, please contact the research supervisor: Professor Susan Baker at, bakers@aua.ac.ke.

Thank you.

I agree to participate in this research.

Signature _____ Date _____

SECTION A: GENERAL INFORMATION

Please tick the appropriate box:

Demographic Characteristics

Gender: ☐ Male ☐ Female

1. Age (years) ☐ Below 18 ☐ 19-30 ☐ 31- 50 ☐ 51-60 ☐ Above 60
2. Position in the company? ☐ Counter staff ☐ Baker
☐ Kitchen help/cleaner Other (Specify) _____
3. What is your educational level?
☐ No education ☐ Primary ☐ Secondary ☐ Tertiary (College/university)

WORK RELATED INFORMATION

4. How long have you worked in the bakery industry? _____
5. What is your work shift time? ☐ Day-time ☐ Night-time ☐ Day and night
6. How many days do you work in the week? _____
7. For how long has the bakery been in operation? _____
8. How would you rate your health? ☐ Excellent ☐ Good ☐ Fair
☐ Poor

SECTION B: OSH KNOWLEDGE

9. Have you ever heard about Occupational Safety and Health?
☐ Yes ☐ No
10. If yes to question 9, where did you hear about occupational safety and health?
☐ Workplace Other (specify) _____
11. What do you understand by occupational safety and health?
☐ It is about the safety of people at work
☐ It is about the health of people at work
☐ It is about the welfare of people at work
☐ I do not know
12. Do you know the hazards associated with your work? (A hazard is something or a situation that can cause harm) ☐ Yes ☐ No
13. If yes, which of the following hazards affect you? ☐ Noise ☐ Heat
☐ Flour dust ☐ Slippery floors ☐ Uneven floors
☐ Heavy manual lifting ☐ Hot surfaces and equipment

14. Do you think poor safety and health at work can cause problems?
☐ Yes ☐ No
15. If yes to number 14, What problems can arise from poor safety and health at work?
☐ Falls ☐ Burns ☐ Musculoskeletal disorders (Body aches)
☐ Heat stress ☐ Dehydration ☐ Hearing loss (Ear problems)
☐ Occupational asthma
16. Do you think Occupational safety and health problems can be minimized?
☐ Yes ☐ No ☐ I do not know
17. Which of the following are ways to minimize (reduce) and control occupational safety and health problems at work?
☐ Always clean spills, drips on the floors as soon as possible
☐ Install non-slippery floor surfaces
☐ Install small ramps where there is change in level of ground
☐ Use access ladders to access high points
☐ Prevent uncomfortable work positions by providing stools and adjust work platforms
☐ Always wear protective equipment, like earplugs
☐ Post safety warning signs on the walls ☐ I don't know
18. Who do you think is responsible to prevent, minimize and control occupational safety and health problems?
☐ Manager ☐ Supervisor ☐ Employees ☐ I do not know
19. What are the two main Occupational Safety and Health hazards in your workplace? (*write them down*)
a. _____ b. _____
20. Suggest how these can be solved.

21. What other issues affect your safety and health?

22. How do you think these Safety and Health issues can be resolved?

23. Do you believe you comply with OSH? ☐ Yes ☐ No ☐ Not sure

24. What is your perception of OSH compliance?

25. Have you heard about the Factories and Works Act chapter 14:08 of 1996 and its regulations? ☐ No ☐ Yes

26. Do you carry out OSH risk assessments? ☐ Yes ☐ No ☐ Not applicable to my job

SECTION C: ATTITUDES ON OCCUPATIONAL SAFETY AND HEALTH
For each statement indicate how much you agree.

Key: 1 - Strongly Disagree; 2 - Disagree; 3 - Neutral; 4 - Agree; 5 - Strongly Agree

		1	2	3	4	5
1.	Occupational safety and health is for big companies who have the money, bigger space and equipment.					
2.	The government's laws on Occupational safety and health are of no use, they just want their power to be felt.					
3.	Employees should know the Safety and Health requirements.					
4.	Following stated standard operating procedures helps reduce accidents, injuries and death at work.					
5.	I am strong, I do not think I can suffer health impairment due to flour dust exposure.					
6.	Training of employees is necessary to reduce safety and health problems.					
7.	Poor Occupational safety and health practice causes injuries, diseases, loss of property and death.					
8.	I am responsible for taking care of my own safety and health and that of others.					
9.	Accidents at work and sickness just occur, you can't control or minimize them.					
10.	I am responsible for maintaining good housekeeping in the factory.					

Evaluation of exposure to heat and other related factors in tobacco curing tunnel facilities in Zimbabwe: Questionnaire, adapted by the researcher.

SECTION D: OSH PRACTICES

Please, tick the appropriate column

No	Questions	Never	Sometimes	Always
1.	When starting work, I put on all appropriate protective clothing.			
2.	I clean up any spills immediately.			
3.	Are ingredients stored where it is easy to access without straining?			
4.	How often do you wear oven gloves when retrieving baked food from the oven?			
5.	Do you carry out safety talks?			
6.	Is faulty equipment or machinery used for production?			
7.	Are all accidents that occur at the factory reported?			
8.	Are accident investigations carried out for corrective action?			

9. Do you have job aids or instructions stating procedures and safety precautions that you need to take when carrying out your job? ☐ Yes ☐ No ☐ I do not know

10. Have you ever been trained on hazards and risks associated with your work and preventative strategies? ☐ Yes ☐ No

11. Is there an appointed person to deal with employees' occupational safety and health in general at your workplace? ☐ Yes ☐ No ☐ I do not know

12. During the past year did you suffer from any of the following?

☐ Burns ☐ Severe headaches

☐ Upper and lower backache

☐ Shoulder pain ☐ Arm pain

☐ Shortness of breath, cough, chest tightness, or wheeze.

Questionnaire developed by practice.

APPENDIX F

OSH PRACTICES OBSERVATIONAL CHECKLIST

Check issues on	Tick/X	Comments /Notes	Issues	Tick/X	Comments/ Notes
OSH legislation			Displayed Factory registration certificate		
FACILITIES			Dangerous substances		
Change rooms			Protective clothing		
Toilets separate for both sexes			Fire equipment/ service		
Wash basins			emergency exit		
Cleanliness			Notices		
Meal facilities			Noise		
water supply			Dust/fumes		
Building structure			Stacking		
Floors			SHE personnel		
Overcrowding			Responsible person		
Lighting			Ergonomics		
Ventilation (cross or through ventilation)			Lifting equipment		
Health			Electricity connections		
Medical examinations			Machine safety		
First aid aiders/box			Heat		
Accident register			Housekeeping		
Other certificates/licenses e.g. City council operating license					

Factory inspection checklist, adapted by the researcher

APPENDIX G

INTERVIEW CHECKLIST

		Yes	No
1.	Is the organization certified to a recognized OSHMS?		
2.	Is the factory registration certificate displayed?		
3.	Does the establishment have accident registers?		
4.	OSH Management systems /programs available?		
5.	Is Hazard Identification and Risk Assessment (HIRA) being done?		
6.	Does the establishment have a safety and Health Training Program?		
7.	Is there a Safety, Health and Environment Committee?		
8.	Are OSH Planned internal Audits conducted?		
9.	Is there a planned maintenance program?		
10.	Are Safety Campaigns programs being done (teach-ins, posters, awards, magazine?).		
11.	Is there OSH Services at the establishment?		
12.	Is there Emergency Preparedness and response planning?		
13.	Are incidents and accidents investigated?		
14.	Does the establishment keep all relevant legislation?		
15.	Is personal protective clothing and equipment provided?		
16.	Is there Occupational Safety and Health Policy?		
17.	Are there Factory inspection reports from the NSSA Factories Inspectorate department?		

CURRICULUM VITAE

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PERSONAL DETAILS

Date of birth	14 October 1982
Marital status	Married
Sex	Female
Nationality	Zimbabwean
Languages	Shona, English

EDUCATION & PROFESSIONAL QUALIFICATIONS / SPECIALISED TRAINING / PROFESSIONAL AFFILIATIONS / COMPUTER SKILLS

- Master of Public Health-Environmental Health (Adventist University in Africa-Kenya) (Candidate).
- BSc Environmental Health – Solusi University (2005).
- Safety and Health Advisors Course Certificate (SHATCO 2006)
- OHSAS 18001 Auditor training Course (AFROCARE 2008)
- EMS Environmental Management Systems ISO 14001 (AFROCARE 2007)
- ISO 22000 Food Safety Management Systems Development and Implementation (Standards Association of Zimbabwe 2011)
- ISO 4500 Occupational Safety and Health Management System (2019)
- International Computer Driving Licence (ICDL)
- Customer Service Training (Zimhost 2012)

PROFESSIONAL MEMBERSHIP

- Environmental Health Practitioners Zimbabwe

PROFESSIONAL EXPERIENCE

National Social Security Authority

Position: Occupational Safety and Health Factory Inspector Hygiene – March 2006 to date.

KEY SKILLS AND ATTITUDES

- Good analytical & communication skills.
- Experience in Safety and Health management systems, emergency preparedness.
- Exposure to computerization & general administration.
- Wide experience on prioritizing workloads to meet set deadlines
- High-level teamwork spirit and ability to work collectively with any task-group.