BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCE

DEPARTMENT OF ENVIRONMENTAL SCIENCE

OHS TRAINING AND SKILLS IN THE MANUFACTURING INDUSTRY: THE ZIMBABWEAN PERSPECTIVE

SIMBARASHE MAZWI

B241545A

A RESEARCH PROJECT SUBMITTED TO BINDURA UNIVERSITY OF SCIENCE EDUCATION IN PARTIAL FULFILMENT OF THE REQUIREMENT OF THE MSc IN OCCUPATIONAL HEALTH SAFETY AND ENVIRONMENTAL MANAGEMENT.

JUNE 2025

DEDICATION

This research project is dedicated to my family, whose unwavering support and encouragement have been the foundations of my academic journey. To my parents, who instilled in me the values of perseverance and education, thank you for believing in my dreams and for your endless sacrifice.

To my siblings, who have been my constant source of motivation, finance, and joy, your companionship has made this journey enjoyable. This dedication extends to my extended family, whose love and support have been invaluable during the challenges of my studies

ACKNOWLEDGEMENTS

I would like to express my heartfelt gratitude to the individuals and organizations that supported me throughout my research journey.

First, I would like to thank my supervisor, Polite Nhokovedzo, for his invaluable guidance, constructive feedback, and encouragement throughout this project. Your expertise and insights have greatly enriched my understanding of occupational health and safety.

I would also like to extend my appreciation to my colleagues and fellow students in the MSc Occupational Health Safety and Environmental Management programme. Your camaraderie and shared experiences have made this journey memorable and enriching for me.

Special thanks to the staff and administration at Bindura University of Science Education for providing the resources and environment conducive to this research. Their support was instrumental in completing this project.

I am also grateful to the participants of my study, who took the time to share their experiences and insights with me. Your contributions were vital to the success of this study.

Finally, I would like to thank my friends for their encouragement and understanding during the long hours of study. Your belief in me has helped me stay focused and motivated.

Thank you all for being a part of this journey.

ABSTRACT

Occupational health and safety (OHS) is a serious issue worldwide across different industries, with an estimated 400 million employees sustaining occupational injuries annually, whereas approximately 3 million workers worldwide succumb to occupational accidents or work-related ailments annually. As such, competent OHS professionals with expertise are required to supervise OHS issues to avoid or minimize work-related accidents. However, in low- and middle-income countries, little effort is focused on OHS issues, resulting in increased absenteeism, supply chain disruptions, and financial losses. Despite the presence of numerous practicing OHS professionals in Zimbabwe, there is a paucity of information on the OHS knowledge and competencies among OHS professionals, and there is no distinct qualification system for OHS professionals. Therefore, evaluating the effectiveness of OHS training and employee skills in the manufacturing industry in Zimbabwe is crucial for the sector's long-term resilience and sustainability. This study sought to determine the level of OHS knowledge, define the qualities required for OHS professionals in Zimbabwe, identify training gaps on OHS in Zimbabwe, and determine challenges to OHS training and competency in Zimbabwe. The study employed a cross-sectional design with mixed methods by combining both qualitative and quantitative research methods. Data were collected by administering 90 questionnaires and conducting structured interviews with 12 key informants. The major qualities and knowledge required for OHS professionals were knowledge of OHS regulations and laws (61.2 %), incident investigation (51.8 %), and hazard identification and risk assessment (50.6 %). As such, most participants were trained on hazard identification and risk assessment, both attaining values of 19.0 %, whereas OHS training was mostly theoretical, using lectures (21.8 %) and workshops (21.3 %). OHS training was mainly evaluated through incident and accident analyses (22.2 %). The major challenges faced in OHS training were limited resources (14.8 %), lack of standardization (17.7 %), and measuring OHS effectiveness (14.4 %). Educational level ($X2$ = 20.45; p = 0.001), OHS training institution ($X2$ = 36.82; p = 0.012), and work experience ($X2$ = 22.35; p = 0.039) significantly influenced OHS knowledge of OHS professionals. In addition, attaining postgraduate education (OR = 0.467; p = 0.006, 95% CI = 3.626, 13.794) significantly influenced the OHS knowledge and qualities of OHS professionals. Moreover, being trained in OHS at BUSE (OR = 0.311; p = 0.006, 95% CI = 6.512, 18.352) and having more than 10 years of work experience (OR = 0.255; p = 0.0003, 95% CI = 2.895, 9.874) were strongly associated with OHS knowledge and quality. Therefore, it is recommended that OHS training employ more practical methods and a universal OHS training curriculum be formulated.

Key words: challenges, OHS, professionals, skills and training.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ACRONYMS AND ABBREVIATIONS

APA	-	American Psychological Association
BUSE	-	Bindura University of Science Education
EU	-	European Union
GDP	-	Gross Domestic Product
HIRA	-	Hazard Identification and Risk Assessment
ILO	-	International Labour Organization
NSSA	-	National Social Security Authority
OHS	-	Occupational health and Safety
SMEs	-	Small and Medium Enterprises
SPSS	-	Statistical Package for Social Sciences

CHAPTER 1: INTRODUCTION

1.1 Background to the study

Occupational health and safety (OHS) is a critical global concern in various industries (Salaj *et al.,* 2017). According to the International Labour Organisation (ILO), approximately 400 million employees sustain non-fatal work injuries annually (ILO 2023). In addition, an estimated 3 million workers worldwide succumb to occupational accidents or work-related ailments annually (Nastasia and River, 2024). This is attributed to exposure to biological, chemical, adverse ergonomic conditions, and psychosocial factors (Tooma 2019). Therefore, qualified OHS personnel are required to oversee OHS issues to avoid or minimize work-related accidents.

OHS professionals are trained experts responsible for ensuring safe and healthy workplaces. They play a vital role in preventing injuries, illnesses, and fatalities in the workplace (ILO, 2023). In addition, OHS professionals should be highly competent, with knowledge of OHS regulations and strong communication and interpersonal skills. In contrast, OHS professional bodies are organizations that represent and support professionals working in the OHS field. These bodies aim to promote excellence in OHS practice by developing standards, providing training and education, and representing the interests of OHS professionals (INSHPO, 2017).

Before 1978, there were no OHS professional bodies; it was the intervention of Roben's report on self-regulation that advocated for OHS to be considered a profession (Robens, 1972). The 1980s approach focused on improving OHS administration, whereas the 1990s focused on OHS systems. In recent times, several OHS professional bodies have been formed, such as the Institute of Occupational Safety and Health (IOSH) and the National Examination Board in Occupational Safety and Health (NEBOSH); however, developing countries still lag behind (ILO, 2023).

Despite the formation of OHS professional bodies, accidents remain high, although countries with OHS professional bodies have witnessed a decline in the number of occupational accidents and injuries (Nastasia and Rivers, 2024). Sharma and Mishra (2020) opined that poorly trained OHS professionals tend to inadequately implement OHS practices, resulting in adverse OHS consequences within the workplace. As such, competent OHS professionals with relevant skills are required to improve employee competency and promote safe practices (Shea *et al.,* 2016). It was found that the mere presence of SHE personnel in any organization reduces accidents. However, in developing countries, OHS professionals appear to be opportunistic. This is because there are no distinct qualifying criteria or systems for assessing the skills and competencies that OHS professionals should possess.

Globally, the manufacturing industry is risky and susceptible to a high incidence of accidents and fatalities (Arum and Igbavboa, 2018). In the European Union (EU), the manufacturing sector accounts for less than 10% of workplace accidents, whereas the Asia-Pacific region contributes more than 60% of work-related fatalities and injuries (World Economic Forum 2016). In addition, ILO (2017) reported that low- and middle-income countries (in Asia and Africa) focus little effort on OHS issues. This situation is worsened by small and medium enterprises (SMEs) that pay less attention to OHS but dominate the economy of these countries (Moyo *et al.,* 2015). Thus OHS training among these SMEs will reduce occupational incidents, through increasing awareness on OHS issues.

In the Zimbabwean context, the manufacturing industry employs over 150 000 workers, contributes 11.5% to the GDP (NSSA, 2020). However, the manufacturing industry accounts for approximately 25% of work-related injuries reported in the country (ZimStats, 2018) due to falls, exposure to hazardous substances, and machine-related accidents. This has led to increased absenteeism, supply chain disruptions, financial losses, and additional burdens on manufacturing operations and employee well-being.

Zimbabwe's OHS laws and regulations are aligned with international standards (ILO, 2017), such as the Labor Act, Chapter 28.01, and the National Social Security Authority's Accident Prevention Workers Compensation Scheme Notice No. 68 of 1990 (NSSA, 2020). However, recent statistics on workplace accidents and fatalities indicate that OHS procedures in the manufacturing industry have not been effectively implemented. These tragedies can be prevented through effective OHS training and competence development. Therefore, it is fundamental to evaluate the effectiveness of OHS training and employee skills in the manufacturing industry in Zimbabwe, as it is crucial for the long-term resilience and sustainability of the sector.

1.2 Problem statement

Although OHS regulations exist in Zimbabwe, such as Chapter 28.01 of the Labour Act and the Accident Prevention Workers Compensation Scheme Notice No. 68 of 1990 by NSSA, work-related accidents continue to occur. This has led to injuries, illnesses, and fatalities, thereby negatively impacting productivity (ZimStats, 2018). Despite the presence of numerous practicing OHS professionals, the qualities required of these professionals are not defined, and the state of OHS training and skills development is poorly documented (Moyo *et al.,* 2015; Sharma and Mishra, 2020). In addition, ILO (2023) reported that the qualifications required to perform OHS functions within organisations/countries vary considerably, which are influenced by differences in regulation, the role of professional bodies, and the establishment of qualification frameworks. However, Zimbabwe has no distinct qualification system for OHS professionals, and there is a paucity of information on the OHS knowledge and competencies of OHS professionals.

1.3 Main objective

To conduct a comprehensive assessment of the current state of OHS training and competency in Zimbabwe,

1.4 Specific objectives

1. To determine the level of OHS knowledge and define the qualities required for OHS professionals in Zimbabwe.
2. To identify training gaps in OHS in Zimbabwe.
3. To determine the challenges to OHS training and competency in Zimbabwe.

1.5 Research questions

1. What is the level of OHS knowledge among Zimbabwean OHS professionals?
2. What qualities are required of OHS professionals in Zimbabwe?
3. What training gaps exist in the OHS in Zimbabwe?
4. What are the challenges to OHS training and competency in Zimbabwe?

1.6 Justification

This study seeks to address the knowledge gap and provide evidence-based perceptions of OHS training and skills in Zimbabwe. The study findings will aid in the design and implementation of OHS training curricula. In addition, the qualities and expertise required of OHS professionals should be clearly defined. Ultimately, this will improve employee competency in OHS and safety, reduce work-related illnesses and injuries ((INSHPO, 2017; ILO, 2023), and reduce employee absenteeism (Shea *et al.,* 2016). Companies benefit from reduced compensation costs (Nastasia and Rivers, 2024), reduced LTIs, increased production by competent personnel (Sharma and Mishra, 2020), and enhanced company reputation (Shea *et al.,* 2016). In addition, the roles of the OHS professionals would be clearly addressed thereby enhancing the credibility of the profession.

1.7 Assumptions of the study

Assumptions are factors about the project that are considered true without proof. Identifying assumptions helps the researcher clarify assumptions that not all team members share. This study makes the following assumptions:

- The study participants will not provide biased information.
- This study aims to identify the qualities required of OHS professionals.
- The OHS training programs and curricula that are being implemented are effective.

1.8 Delimitations of the study

This study was:

- confined to the Zimbabwean OHS industry.
- focused on OHS professionals.
- centered on OHS training and skills development.

1.9 Limitations of the study

The study may be limited by confidentiality, as some participants may withhold critical information or some respondents may offer biased information, thus making it difficult to gather data. However, this will be mitigated by ensuring confidentiality, making it clear that the information is only for research purposes, and referring to local authorities.

1.10 Organisation of the study

The research consists of six chapters, organized logically. These chapters include:

- Chapter one – Introduction
- Chapter two – Literature review
- Chapter three – Methodology
- Chapter four – Results
- Chapter five – Discussion
- Chapter six – Conclusion and recommendations

1.11 Chapter summary

This chapter highlights the background information and the statement of the problem. The objectives were expressed, and the study rationale was described; thus, the next chapter reviews the literature.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter reviews the relevant literature associated with this study. It describes and analyses different studies conducted on OHS, challenges faced, and strategies for improving OHS implementation. The theoretical and conceptual frameworks are also described, and the knowledge gap is identified. The study is guided by the OHS model of practice for OHS professionals (Figure 2.1), which describes the key attributes required for an OHS professional as outlined by the Australian BoK (Pryor and Tepe, 2012). The OHS professionals ought to focus on identifying problems, applying corrective action, monitoring implementation, and evaluating change and OHS practice.

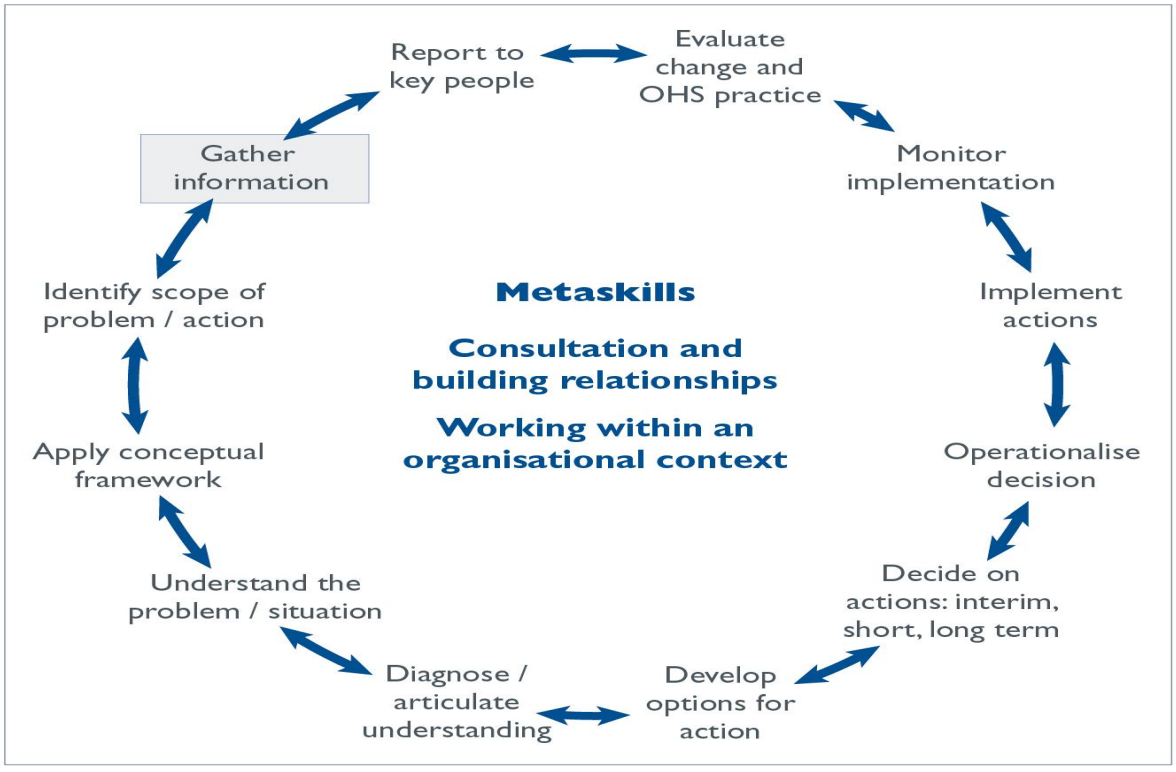


Figure 2.1: The Model of OHS Practice for OHS professionals [adapted from Pryor and Tepe (2012)

2.2 Theoretical framework

The theoretical framework of this study is guided by Kirkpatrick's Model of Training Evaluation (Kirkpatrick and Kirkpatrick, 2010). The theory is based on four different levels of training evaluation: reaction, learning, behavior, and results. These levels are shown in Figure 2.2 and are further explained below.

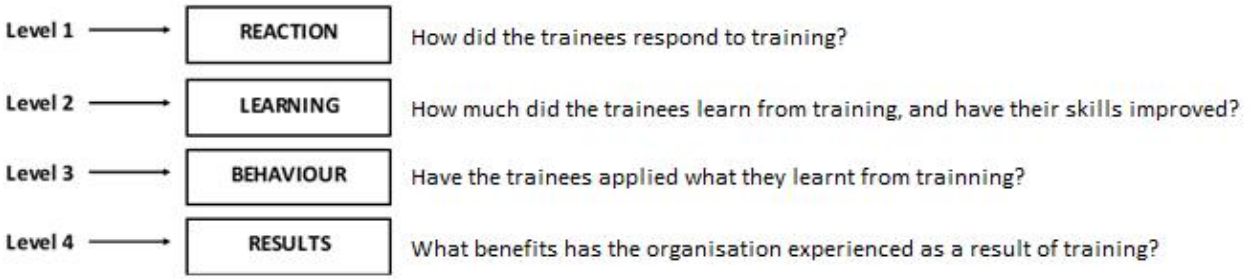


Figure 2.2: The theoretical framework of the study [adapted from Nadli et al. (2022)]

1. Reaction - measures the degree of trainee satisfaction or impressions of the program, with respect to the trainee's positive or negative feedback. Positive feedback signifies the motivation to learn, thus improving knowledge and skills.
2. Learning measures how much trainees gain knowledge, improve skills, and change their attitudes after training. This is reflected in behavioral changes as the trainees later apply the knowledge and skills at their workplaces.
3. Behavior - measures the level to which trainees might employ the knowledge and skills learned in the work settings. In evaluates the job changes that would have occurred as a result of the training.
4. Results were determined by the objectives of the training program and the expectations of the stakeholders responsible for the employees being trained. This is reflected by reduced occupational accidents and LTI, improved productivity, enhanced customer satisfaction, and lower costs.

2.3 Conceptual framework

The conceptual framework of this study consists of input, process, and output factors, which are evaluated using different methods. Figure 2.3 shows the conceptual framework of this study.

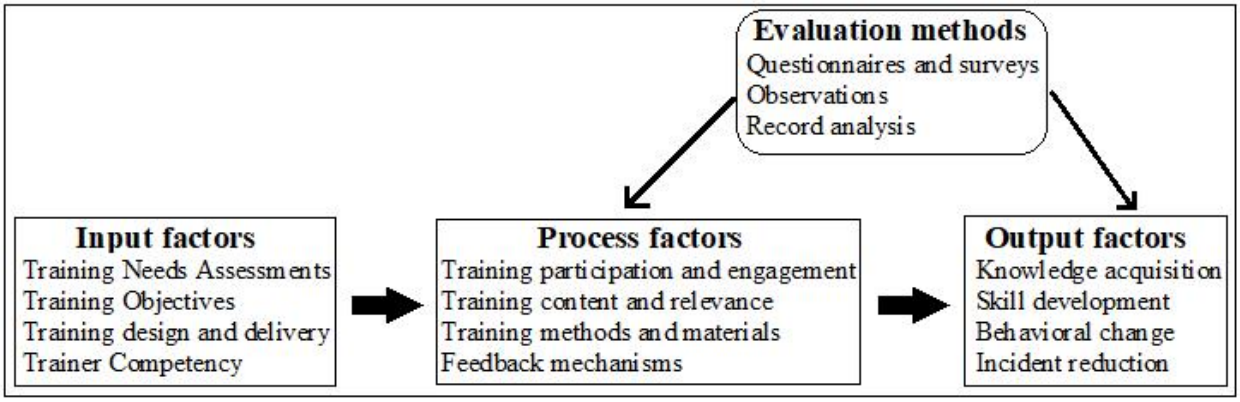


Figure 2.3: The conceptual framework of the study

Based on training needs, objectives are set to conduct the training, whose effectiveness depends on the competency of the trainer and delivery methods. In addition, participation in training relies on the relevance of the training content. At the end of the training, the organization expects its employees to gain knowledge, develop OHS skills, and have positive safety behavior, which will result in reduced incidents and improved production. The effectiveness of the training program was evaluated through interviews, observations, and a review of OHS records.

2.4 Occupational health and safety training and skills

Developing and executing OHS training is fundamental in promoting safe workplaces by increasing workers' knowledge, improving their motivation, adopting safe behaviors, and ultimately preventing occupational accidents and injuries (Garnica and Barriga, 2018; Tong *et al.,* 2023). Therefore, different methods for training personnel on OHS and skills development have been implemented, such as seminars, workshops, mentoring, and on-job training (Bes and Strzałkowski, 2024).

Training is based on the objectives of the organization and can be on emergency response, first aid, equipment maintenance, or HIRA (Kajiki *et al.,* 2020). Regular safety meetings, safety toolbox talks, and post-incident training are other forms of employee training on OHS. As reported by Nawi *et al.* (2016), some companies conduct OHS training to offer employees opportunities to develop their skills in identifying and mitigating hazards. In addition, Bes and Strzałkowski (2024) opined that OHS training is meant to teach employees hazard identification and the effective elimination or control of hazards. This depends on the nature of workplace hazards and the training approach used by the trainer to create a workplace culture of safety.

2.5 Effectiveness of OHS training and skills development

It is essential to assess the OHS performance of an organization to meet the goals and targets of the OHS policy. Evaluating OHS performance can help identify areas of concern within an organization, where corrective action can be undertaken (Mappangile and Ramdhan, 2022). According to Shea *et al.* (2016) and Mohammadfam *et al.* (2017), the major indicators of effective OHS performance include hazard reporting and control, near-miss reporting, safety behavior, frequency of LTIs, and production.

Through participation in safety training, workers can create safe conditions at work, thus improving decision-making regarding OHS activities (Mohammadfam *et al.*, 2017). Islam *et al.* (2023) deduced that OHS training improved safety and business practices and had a positive impact on productivity in firms in the informal sector of Bangladesh. However, their focus was mainly on training firm managers, not employees. In Bulgaria, Stankova *et al.* (2021) reported that after OHS training, workers became more aware of the risks associated with their work position and identified and controlled risks promptly. However, most employees were unaware of the key OHS legislation. Similarly, Kunodzia *et al.* (2024) found that OHS training improved safety behavior, which in turn positively influenced risk awareness and hazard perception among employees. In addition, Abu-Hamra and Enshassi (2015) reported that weekly work plans foster

communication between employees and management, thereby improving information sharing, OHS planning, and overall safety, productivity, and employee relationships.

2.6 Factors affecting OHS training and skills development

According to Mappangile and Ramdhan (2022), the factors affecting OHS training and skills can be grouped into individual, environmental, technical, and organizational factors (Table 2.1).

Table 2.1: Factors affecting OHS training and skills development

Factor	Description	Reference
1. Individual	Knowledge, safety awareness, competence, workload, fatigue, and work stress directly influence OHS training and are the primary causes of work accidents.	Janackovic Mappangile and Ramdhan (2022)
2. Environmental	Biological, chemical, physical, and ergonomic hazards, lighting ventilation, hygiene, and equipment condition.	Janackovic Tremblay
3. Technical	PPE, working in confined spaces, working at heights, working at high temperatures, manual work procedures, maintenance of work equipment, and supervision.	Setiawan and Astutik (2021) Botti
4. Organisational	Organizational commitment, safety communication, continuous improvement, OHS policy, accident investigation, training methods, frequency and content, safety program, resource procurement, and safety culture.	Mappangile and Ramdhan Setiawan and Astutik (2021)

Bes and Strzałkowski (2024) determined that supervisor commitment, resource availability, and knowledge level were the major factors affecting OHS training. Failure to intervene in subordinate unsafe behavior by supervisors reduces OHS effectiveness, as workers anticipate top management to lead by example (Stankova *et al.,* 2021). In addition, inadequate leadership leads to poor communication, incompetency, and negligence (Mohammadfam *et al.,* 2017), and

ultimately affects the OHS program (Tapurra, 2021). Nawi *et al.* (2016) reported that lack of supervision resulted in inadequate provision of PPE, and absence of safety toolbox talk records, due to negligence. In addition, incidents or accidents were not reported to the supervisors; thus, vital OHS data were missed.

According to Moyo *et al.* (2019), the unavailability of resources and limited time affect the effective implementation of OHS training; that is, some organizations focus on production instead of employee well-being. According to Gopang (2017), resources are often channelled towards production to meet targets; hence, OHS training and skills development are deprived of the necessary resources. The high costs associated with OHS training are a major barrier to its implementation, which is further inhibited by a lack of understanding of the importance of OHS (Kunodzia *et al.,* 2024). Dudarev and Odlaand (2013) opined that OHS implementation is affected by weak legislation that does not protect workers. Employees are obliged to work under unsatisfactory conditions to meet production targets as they are not fully protected (Stankova *et al.,* 2021). Ultimately, employees are pressured to meet targets at the expense of their health and safety.

Sinelnikov *et al.,* (2015) asserted that disseminating OHS information throughout the organisation is fundamental in integrating safety such that without it the OHS system is affected. This was influenced by OHS knowledge and experience prior to training. Mappangile and Ramdhan (2022) deduced that training methods, duration, frequency, and content affect how employees acquire or develop OHS skills.

In Zimbabwe, employees are not required to work more than 12 consecutive hours, as per the requirements of the National Employment Council. However, the majority of workers prefer to work long hours to receive overtime allowances. This, in turn, increases the risk of occupational accidents and injuries owing to fatigue, thus affecting the effectiveness of OHS implementation.

2.7 Strategies for improving OHS skills

If subordinates are assigned roles and responsibilities, their self-esteem is boosted, and their desire to abide by safe practices is enhanced, thereby developing OHS skills (Yiu *et al.,* 2018). Tapurra (2021) concluded that offering incentives and rewards for OHS observations and suggestions, or for well-performing departments in OHS practices, enhances employee safety behavior, thus improving hazard identification and risk analysis. In addition, implementing support programs for unsatisfactory department performance to improve OHS skills is fundamental. In addition, competent personnel should be incorporated into supervisory roles. For example, Nawi *et al.* (2016) reported that appointing competent safety officers improved employee safety performance. The use of safety signage helps employees remember what they learned, such as danger warning signs and the three steps to safety. This corresponds with Muiruri and Mulinge (2014) in Kenya, who reported that the availability of safety signage effectively improved safety communication.

Including OHS in the budget makes company owners understand the existence of OHS costs as part of business costs (Gusti *et al.,* 2019). Therefore, OHS skills can be improved by providing resources such as financing regular OHS workshops and seminars for capacity building and providing adequate protective gear (Koehn, 2015). Moreover, improving the working environment through flexible working hours and developing infrastructure can enhance employee wellness and OHS skills (Bes and Strzałkowski, 2024). Likewise, Gusti *et al.* (2019) advocated for adequate ventilation, humidity, and temperature controls. This guarantees improvedves working environment, thereby enhancing employee productivity and reducing lost time related to incidents.

2.8 OHS training programs in Zimbabwe

The various OHS training programs implemented by different institutions are listed in Table 2.1. An analysis of OHS curricula determined that most institutions distinguished their programs on environmental and occupational bases. In addition, the NSSA curricula focus more on legislation, that is, regulations.

Table 2.2: Various OHS training curricula implemented in Zimbabwe

Bindura University of Science Education	Midlands State University	National Social Security Association
Advanced Risk Management	Advanced Geographic Information Systems and	Accident Prevention & Workers
Air Quality Management	Remote Sensing	Compensation Scheme
Applied Ergonomics	Application of Geographic Information Systems	Accident Reporting, Recording &
Basic physics	and Remote Sensing	Investigation
Citizenship Education and Conflict	Aspects of Human Geography	Agricultural Safety and Health
Transformation	Aspects of Physical Geography	Boilers, Pressure Vessels Safety &
Communication Skills	Aspects of Urban Geography	Regulations
Contaminated Land Remediation	Biogeography and Ecosystems	Building & Construction Safety &
Environmental and Social Impact	Climate Change	Regulations
Assessment	Climate Change, Environmental Impact and	Chemical Safety & Health
Environmental Change and	Mitigation Strategies	Disaster Preparedness & Response
Development	Communication Skills	Planning
Environmental Chemistry	Contemporary Issues in Human Geography	Electrical Safety and Health
Environmental Economics	Development and Trends in Geography and	Regulations
Environmental Law	Environmental Studies	Environmental Management
Environmental Management Systems	Ecosystems and Hydrological Processes	Legislation
Environmental monitoring, evaluation	Elements of Computing	Environmental Monitoring and
and management	Environmental Assessment and Management	Instrumentation
Ergonomics	Environmental Issues: Social and Physical	Factories and Works Act & Regulations

Fire Management	Processes	Fire Prevention and Control
GIS and Remote Sensing	Environmental Planning and Project Appraisal	Hazard Identification & Risk
Health Education	Environmental Pollution and Control	Assessment
Human anatomy and physiology	Epidemiology	Industrial Survey Project Guidelines
Industrial Attachment	Food Safety Management	International Environmental
Industrial Epidemiology	Food Security and the Environment	Conventions
Industrial Epidemiology and	Fundamentals of Geographic Information	Introduction to Chemistry
Biostatistics	Systems and Remote Sensing	Introduction to Microbiology
Industrial Hygiene and Toxicology	Hazard Identification and Risk Assessment	Introduction to Risk Management
Industrial Labour relations	Hydrology and Water Resources Management	Introduction to Total Loss Control
Integrated Management Systems	Hygiene	Machine Guarding Safety & Health
Introduction to Computer Science	Information Technology	Manual Handling & Lifting Techniques
Introduction to Environmental Science	Introduction to Gender Studies	Mining Safety
Introduction to Microbiology	Meteorology and Climatology	National OSH Policy
Introduction to Statistics	Natural Hazards and Human Response	Office Safety
Meat Hygiene and Technology	Natural Resources and Sustainable Development	OSH Conventions & Practices
Occupational Health and Safety	Physical Geography: An Applied Approach	OSH Organization in Zimbabwe
Legislation	Population Studies	Pensions & Other Benefits Scheme
Occupational Health and Safety	Quantitative and Qualitative Techniques	Pneumoconiosis Act
Management	Regional Development	Pollution (Land; Water; Air)
Occupational Health and Toxicology	Regional Geography of Sub-Saharan Africa	Principles of Accident Prevention
Plant Biology	Research Methods	Principles of Communication

Principles of Ecology and Biodiversity Principles of Industrial Processes Research Project Safety, Health and Environmental Auditing Safety, Health and Environmental Law and Compliance Safety, Health and Risk Management Solid and liquid waste Management Statistical Methods and Experimental Designs Waste Water Management Water, Sanitation and Hygiene Promotion	Safety Health and the Environment SHE Law Sustainable Waste Management Techniques for SHE Management Tourism and Recreation Geography Transport Advanced Geography Urban Climatology Urban Development Planning and Management	Public Health Act Role of A Safety and Health Committee Safety & Health Inspections SI 68 of 1990 (Sustainable Development Traffic Safety Use and Maintenance PPC/E Waste Management (Solid and Hazardous) Welding Safety & Health

2.9 Chapter Summary

This chapter presents the theoretical and conceptual frameworks underpinning the study. In addition, this chapter reviews the literature related to OHS training. However, none of the studies focused on evaluating the qualities and expertise required of an OHS professional. knowledge and skills. The next section discusses the methodological aspects of the study.

CHAPTER 3: METHODOLOGY

3. Introduction

This chapter presents the materials and methods used for data collection. The research design, sample size, and research instruments, which include questionnaire surveys, key informant interviews, and observations, are explained. In addition, the data analysis tools are described.

3.1 Description of study area

This study was conducted in the manufacturing industry of the Harare Metropolitan district (17°51'50" S and 31°1'46.99" E) (Figure 1.1). The district covers approximately 982 km2, with an estimated population of 2.5 million residents. The Harare Metropolitan area is home to diverse companies that manufacture building materials, chemicals, food and beverages, furniture, pharmaceuticals, steel, and textiles. This entails the employment of several workers requiring Occupational Health and Safety (OHS) training and skills development from OHS professionals.

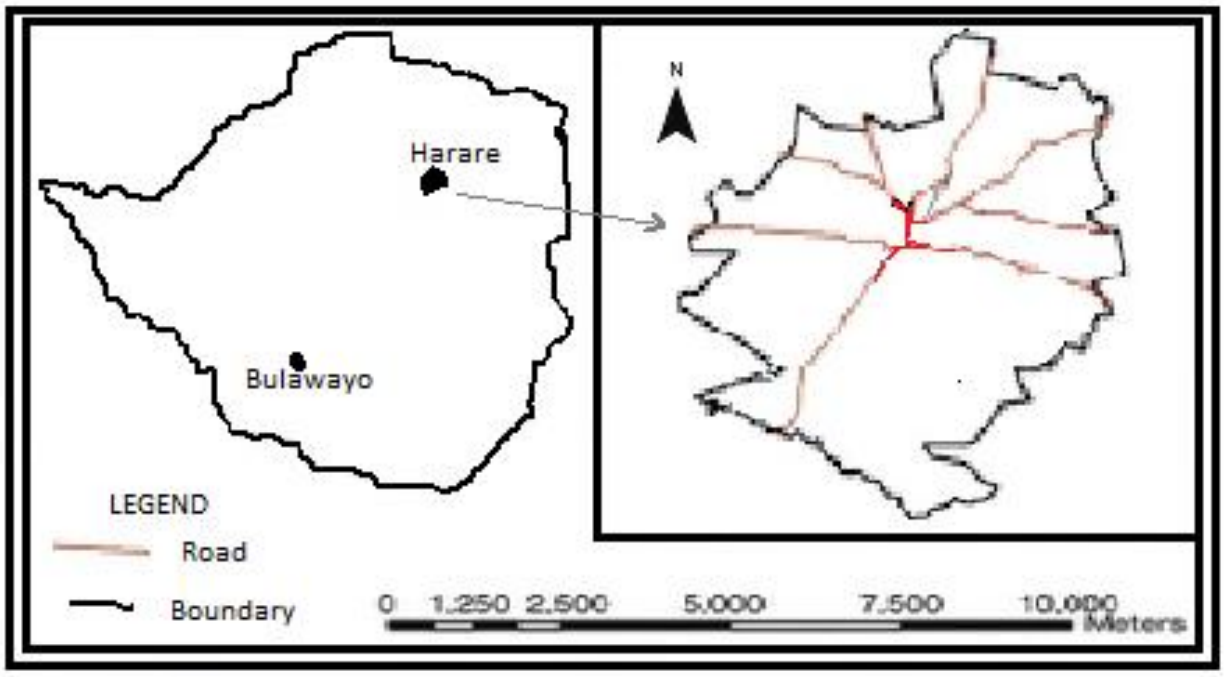


Figure 3.1: Location of study area

3.2 Research Design

A cross-sectional design with mixed methods was used by combining qualitative and quantitative research methods. This aided in reducing the information shortage. In addition, random sampling was performed for the questionnaire surveys, whereas purposive sampling was performed for the interviews by intentionally selecting key informants in the manufacturing industry.

3.3 Target population and sample size

OHS professionals in the Harare Metropolitan Province were targeted. These professionals are engaged in various companies that manufacture automobiles, building materials, chemicals, electricals, food and beverages, furniture, paper and packaging, pharmaceuticals, steel, and textiles (Table 3.1). According to Cresswell and Cresswell (2017), a sample is a minor fraction of a target population that is chosen for examination and evaluation in a logical manner. However, the data saturation technique was employed to achieve the maximum possible sample size (Saunders *et al.,* 2019). This was achieved when no new information or themes were observed in the collected data, and the responses became consistent. Hence, the sample size was unbiased and represented the target population.

Table 3.1: Distribution of the sample size for questionnaire survey

Product	Companies	Number
1. Automotives	Exide batteries	5
2. Building materials	PPC Zimbabwe	10
3. Chemicals	Windmill	8
	Zimchem Refiners	7
4. Electricals	Capri	5
5. Food and beverages	Delta Beverages	10
	National Foods	10
6. Furniture	Ruwa Export (Pvt) Ltd	5
7. Paper and packaging	Zim Packaging	10
8. Pharmaceuticals	Caps Holdings Limited	5
9. Steel	BSI Steel	10
10. Textiles	Jacaranda Textiles	5
Total	12	90

The structured interviews were conducted with individuals with knowledge of OHS and stakeholders in the manufacturing industry. These key personnel included managers, supervisors, consultants, and lecturers, making a total sample size of 12, as listed in Table 3.2.

Table 3.2: List of key informants engaged for structured interviews

Key informant	Number selected
1. OHS Managers	2
2. Supervisors	2
3. SHE Officers	3
4. OHS Consultants	3
5. University Lecturers	2
Total	12

3.4 Research Instruments

3.4.1 Study questionnaire

A questionnaire is an instrument that measures the particular attributes of the study objectives using prearranged questions in a predetermined order (Cooper and Schindler, 2019; Ko and Chou, 2020). The structured questionnaire (Appendix I) captured qualitative and quantitative data using open- and closed-ended questions. A pilot study was conducted to pre-test the questionnaire, allowing for adjustments to the questionnaire inquiries (Perneger *et al.* 2015). This aided in avoiding ambiguity and biases.

The questionnaire was disseminated online to OHS professionals in the manufacturing industry, and respondents returned their responses from March to April 2025. The questionnaire was designed to gather quantitative data on OHS training and practices. The questionnaire was divided into sections to capture information on socio-demography, knowledge, training, and skills in OHS.

3.4.2 Semi-structured interviews

Structured interactive interviews are a qualitative approach that involves conducting one-on-one interviews with key informants using semi-structured questions to acquire detailed information (Cooper and Schindler, 2019). They provided in-depth information that could have been missed by the questionnaire. As such, a key informant guide (Appendix II) was used to conduct a total of one semi-structured interview with key informants on OHS. The key informants included OHS managers, training managers/instructors, OHS consultants, regulatory bodies (for example, NSSA), and industry experts. The interviews were conducted face-to-face or via telephone based on the interviewee's preference.

3.5 Statistical analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 25.0. Initially, data were tested for normality using the Smirnov-Kolmogorov test to determine the appropriate statistical tests to ensure accurate and reliable results. Descriptive statistics were used to analyze the frequency of questionnaire responses, and the results were presented as percentages. If the data were found to be normal, the chi-square test and multinomial logistic regression were used to test the association between sociodemographic characteristics (age, gender, marital status, educational level, and work experience) of respondents and OHS knowledge and skills. A 95% confidence level was adopted, and $p < 0.05$ was considered statistically significant. If the data were not normally distributed, they were analyzed using appropriate non-parametric tests.

3.6 Reliability and validity

A reliability check of the questionnaire was carried out to reduce bias, which was achieved through independent reviewing of the questionnaire transcripts by Lecturers from Bindura University of Science Education. The reviewers paraphrased the questionnaire inquiries and

removed unnecessary questions. In addition, they assisted in data analysis, thus eliminating potential bias from a lone researcher (Creswell and Creswell, 2017).

Validity is the extent to which an instrument measures what it is claimed to measure (Saunders *et al.,* 2019), and based on the test results, appropriate interpretations can be made. Therefore, the questionnaire was pre-tested on ten individuals not included in the study to determine the suitability of the questions, as well as to rephrase and adjust some questions to remain appropriate for the study. This corresponds with Creswell and Creswell (2017), who opined that pilot tests should be conducted to ensure the precision, relevance, and suitability of the questionnaire.

3.7 Ethical considerations

Research ethics refer to the morally acceptable and suitable behavior and inquiries presented by the researcher when collecting data from the study participants (Blumberg *et al*., 2005). This is appropriate to avoid embarrassment or societal taboos. The American Psychological Association (APA) code of ethics was used to guide ethical issues in this study (APA, 2017). Permission to conduct the study was authorized by the Bindura University of Science Education (BUSE) and the manufacturing organizations that were assessed. Respondents were first informed about the study purpose, thereby promoting voluntary participation. Personal identifiers were not recorded to ensure confidentiality, the views and opinions of the participants were respected, and respondents had the right to stop the interview whenever they felt like it.

3.8 Chapter conclusion

This chapter highlights the research methodology. The research instruments, methods of data collection, and statistical analysis are explained. Therefore, the following chapter will dwell on presents the study findings.

CHAPTER 4: PRESENTATION OF RESULTS

4. Results

4.1 Questionnaire and interview response rate

4.1.1 Questionnaire response rate

A total of 90 questionnaires were administered, and 85 were returned, yielding a response rate of 94.4 % (Table 4.1). According to Saunders *et al.* (2019), the questionnaire response rate should be more than 70%. Thus, the response rate observed in this study was adequate.

Table 4.1: Response rate of the questionnaire (where n=90)

Administered Questionnaires	Responded	Response Rate (%)
90	85	94.4

4.1.2 Interview response rate

Twelve structured interviews were scheduled with key informants. However, a total of eleven were conducted, resulting in an interview response rate of 91.7 %. According to Saunders et al., this was a satisfactory response rate. (2019). Table 4.2 presents the inventory of participants for the structured interviews.

Table 4.2: Interview response rate (where n=12)

Key Informant	Tally	Successful (Yes / No)	Success Rate
1. OHS Managers	2	2	100 %
2. Supervisors	2	2	100 %
3. OHS Officers	3	3	100 %
4. OHS Consultants	3	3	100 %
5. Academics	2	1	50 %
Total	12	11	91.7 %

4.2 Sociodemographic characteristics of the respondents

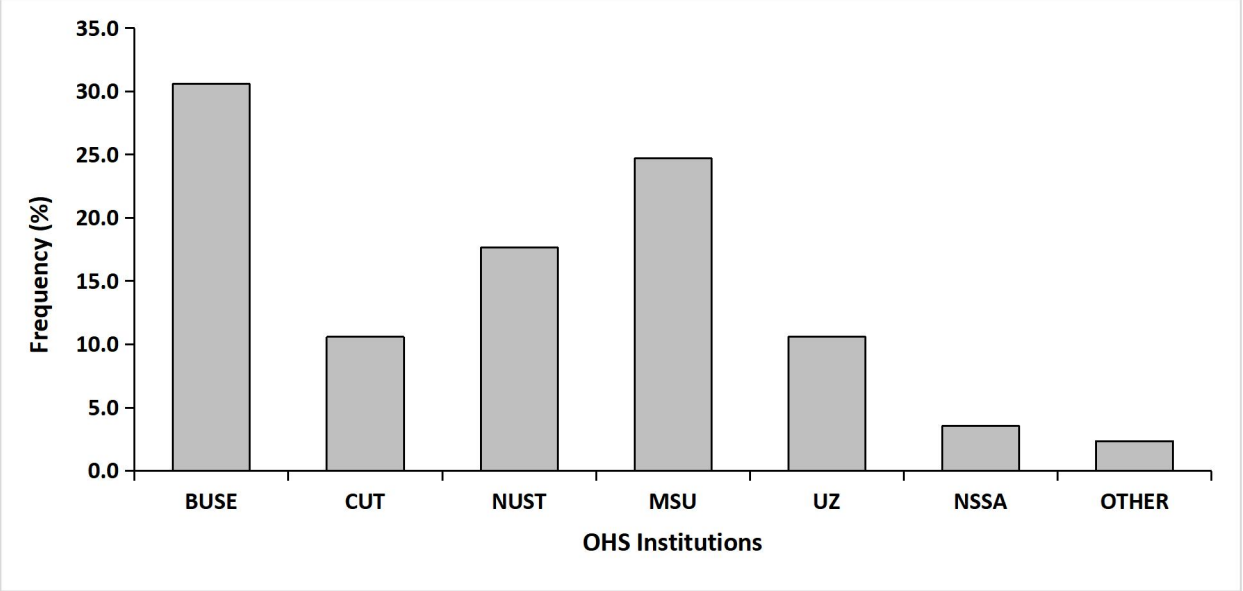
The sociodemographic characteristics of the study participants are shown in Table 4.3. The majority of the respondents were male (50.6 %), married (67.1 %), and aged between 26 and 40 years (48.2 %). Most participants had attained an undergraduate level of education (61.2 %), with 57.6 % of the respondents having 6–10 years of working experience in the OHS sector.

Table 4.3: Sociodemographic attributes of the questionnaire respondents (n=85)

Characteristic	Category	Frequency (n)	Frequency (%)
1. Gender	Male	43	50.6
	Female	42	49.4
2. Marital status	Married	57	67.1
	Divorced	4	4.7
	Single	13	15.3
	Widowed	11	12.9
3. Age class	< 25 years	5	5
	26 - 40 years	41	48.2
	41 - 60 years	30	35.3
	> 60 years	9	10.6
4. Highest level of education attained	Certificate	3	3.5
	Diploma	2	2.4
	Undergraduate	52	61.2
	Post graduate	28	32.9
5. Working experience	< 1 year	5	5.9
	1 - 5 years	14	16.5
	6 - 10 years	49	57.6
	> 10 years	17	20

Figure 4.1 shows the institutions that offered OHS training to the participants of this study. The majority of the participants were trained at three institutions: Bindura University of Science

Education (30.6 %), Midlands State University (24.7 %), and the National University of Science and Technology (17.6 %).



BUSE: Bindura University of Science Education; CUT: Chinhoyi University of Technology; MSU: Midlands State University; NSSA: National Social Security Association; NUST: National University of Science and Technology; UZ: University of Zimbabwe.

Figure 4.1: Institutions where participants were trained on OHS

4.3 Level of OHS knowledge, and the qualities required for OHS professionals in Zimbabwe

The questionnaire respondents were queried about their OHS knowledge and the qualities that should be possessed by OHS professionals. The majority of respondents strongly agreed that OHS professionals should have knowledge of OHS regulations and laws (61.2 %), incident investigation (51.8 %), and hazard identification and risk assessment (50.6 %). However, most respondents were neutral on the issue of OHS professionals possessing technological skills (8.2 %). Most respondents strongly disagreed that OHS professionals should have emotional intelligence (36.5 %), business acumen (35.3 %), and cultural competence (32.9 %). The key informants also mentioned the following:

"OHS professionals must have basic knowledge of OHS legal requirements, such as laws and policies. They should be able to identify hazards and mitigate them, as well as have good communication skills." [Interviewee 1].

"OHS professionals should also have knowledge of the environment, possess good communication skills, and be critical thinkers" [Interviewee 6].

The participants' responses are presented in Table 4.4.

Table 4.4: Perceptions of the OHS knowledge and skills that should be possessed by OHS professionals (n=85)

OHS knowledge and skill	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1. Business acumen	30 (35.3)	34 (40.0)	3 (3.5)	12 (14.1)	6 (7.1)
2. Communication skills	9 (10.6)	15 (17.6)	4 (4.7)	24 (28.2)	33 (38.8)
3. Critical thinking and problem solving	14 (16.5)	23 (27.1)	3 (3.5)	17 (20.0)	28 (32.9)
4. Cultural competence	28 (32.9)	25 (29.4)	5 (5.9)	17 (20.0)	10 (11.8)
5. Data analysis	20 (23.5)	28 (32.9)	2 (2.4)	20 (23.5)	15 (17.6)
6. Emotional intelligence	31 (36.5)	30 (35.3)	3 (3.5)	8 (9.4)	13 (15.3)
7. Environmental health	9 (10.6)	20 (23.5)	2 (2.4)	25 (29.4)	29 (34.1)
8. Ergonomics and human factors	10 (11.8)	24 (28.2)	3 (3.5)	22 (25.9)	26 (30.6)
9. Hazard identification and risk assessment	0 (0.0)	2 (2.4)	3 (3.5)	37 (43.5)	43 (50.6)
10. Incident investigation	3 (3.5)	7 (8.2)	2 (2.4)	29 (34.1)	44 (51.8)
11. Industrial hygiene	11 (12.9)	19 (22.4)	27 (31.8)	16 (18.8)	12 (14.1)
12. Knowledge on OHS regulation and laws	0 (0.0)	0 0.0)	1 (1.2)	32 (37.6)	52 (61.2)
13. Leadership	14 (16.5)	24 (28.2)	3 (3.5)	19 (22.4)	25 (29.4)
14. OHS management systems	8 (9.4)	11 (12.9)	15 (17.6)	38 (44.8)	13 (15.3)
15. Program development and training delivery	19 (22.4)	30 (35.3)	5 (5.9)	17 (20.0)	14 (16.5)
16. Technology skills	26 (30.6)	22 (25.8)	7 (8.2)	25 (29.4)	5 (5.9)
17. Time management and organisation	17 (20.0)	28 (32.9)	2 (2.4)	22 (25.9)	16 (18.8)

4.4 Training gaps on OHS in Zimbabwe

The respondents were asked about the OHS training they received. The majority of participants were trained in hazard identification and risk assessment, both attaining values of 19.0 %, and first aid (12.6 %). In addition, the key informants proposed the following:

"OHS professionals are usually trained on HIRA (hazard identification and risk assessment, OHS regulations, and how to prepare and respond to emergencies" [Interviewee 3].

Figure 4.2 depicts the types of OHS training that the study participants received.

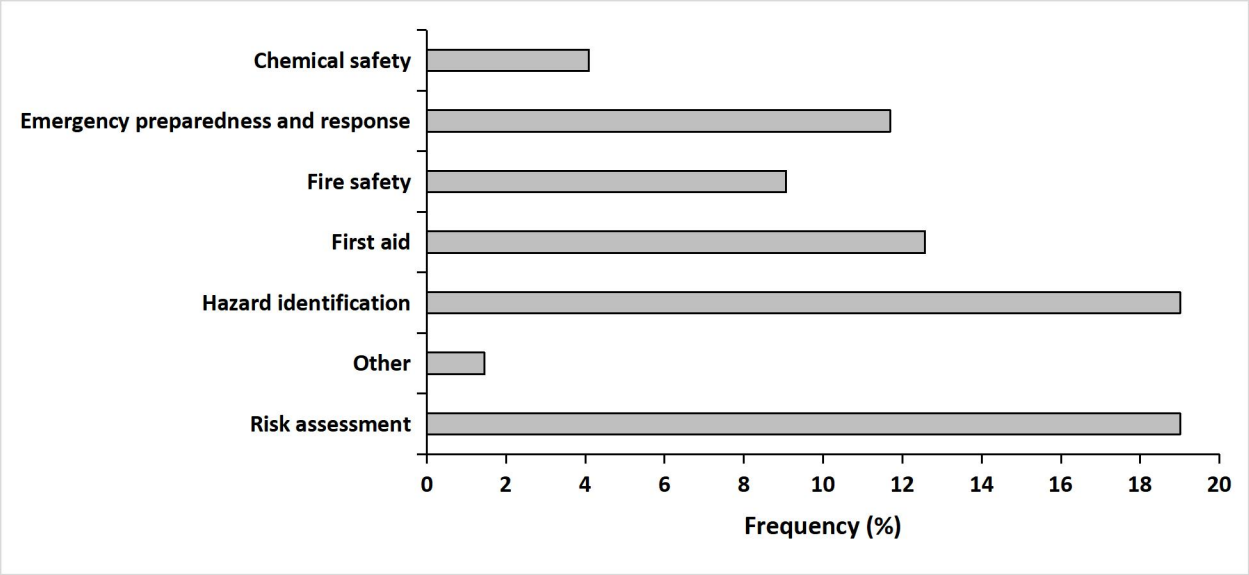


Figure 4.2: The types of OHS training which the participants received

The respondents to the questionnaire were asked about the methods used to conduct OHS training for OHS professionals. The majority of participants acknowledged that OHS training is mostly undertaken through lectures (21.8 %), workshops (21.3 %), and on-the-job training (18.3 %). In addition, the key informants proposed the following:

"OHS training is mostly conducted at various academic institutions in the form of lectures, but for OHS personnel at different organizations, workshops are conducted. In some organizations, on-job training is done for trainee professionals to acquire practical experience" [Interviewee 5].

Figure 4.3 below shows the methods employed in undertaking OHS training

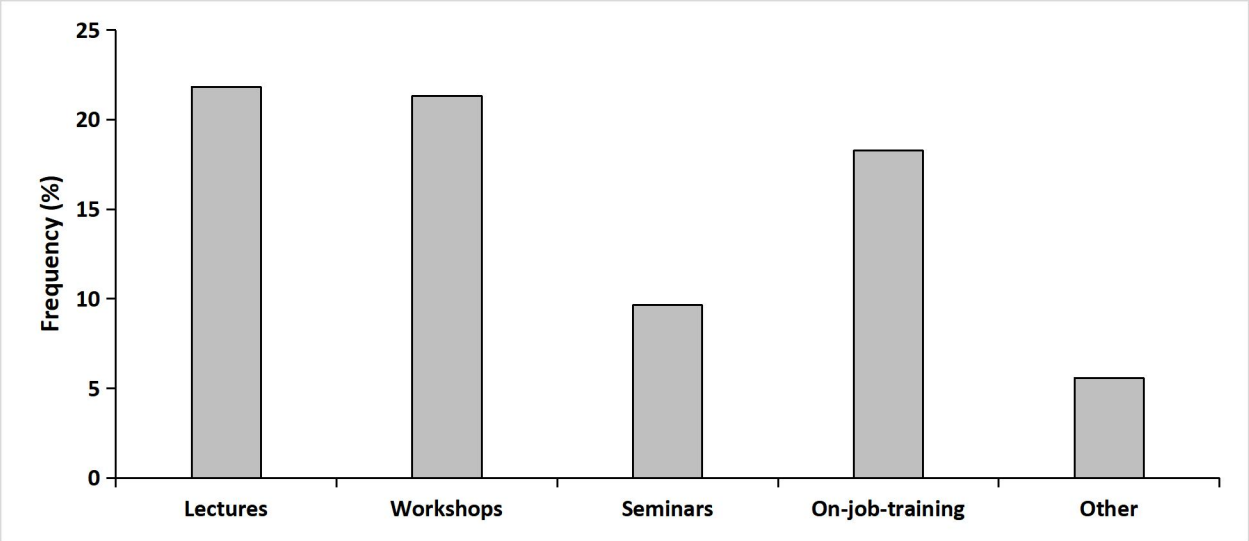


Figure 4.3: Methods used to conduct OHS training

Questionnaire participants were probed on how OHS training is evaluated to ensure its effectiveness. Most respondents stated that the effectiveness of OHS training was assessed through incident and accident analysis (22.2 %), observations (16.1 %), and audits (14.8 %) (Figure 4.5). This was confirmed by key informants who mentioned the following:

"To assess the effectiveness of the OHS training programs, many organizations conduct OHS audits or analyze the frequency of accidents and incidents before and after the training. In addition, observations of employee behavior on OHS are undertaken to assess if they are applying what they learnt during training" [Interviewee 10].

"Assessing worker behaviour to note the positive change in attitude towards OHS is done, or conducting questionnaire surveys on the workers to assess their OHS knowledge after an OHS training program" [Interviewee 6].

Figure 4.4 shows the methods used to evaluate OHS training.

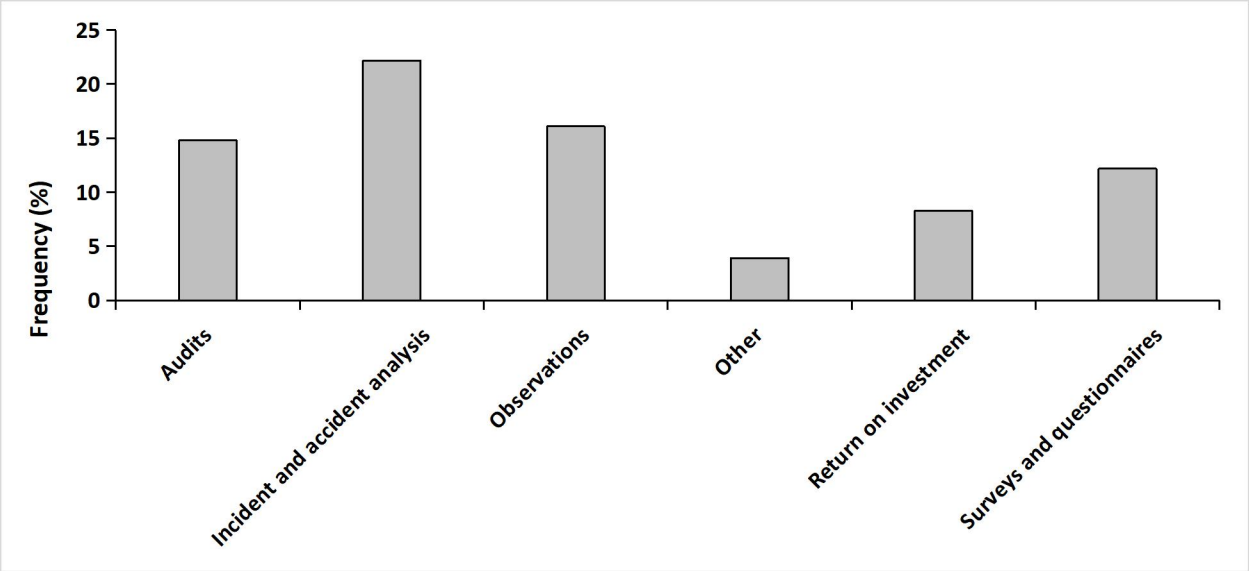


Figure 4.4: Methods used to evaluate the effectiveness of OHS training

4.5 Challenges to OHS training and competency in Zimbabwe

Figure 4.5 shows the challenges faced in OHS training and competency. The major challenges were limited resources (14.8 %), lack of standardization (17.7 %), and measuring effectiveness (14.4 %). The ever-changing OHS regulations (5.8 %) were the least challenging. In addition, key informants mentioned the following with respect to the challenges faced in OHS training:

"In Zimbabwe, OHS training is mainly affected by lack of resources, such as finance, venues, training materials, and experienced trainers" [Interviewee 2].

"There is a lack of a proper standard that should be used to train OHS personnel, of which, without it, measuring the effectiveness of the training becomes difficult" [Interviewee 5].

The challenges faced in OHS training and skills development in Zimbabwe are shown in Figure 4.5.

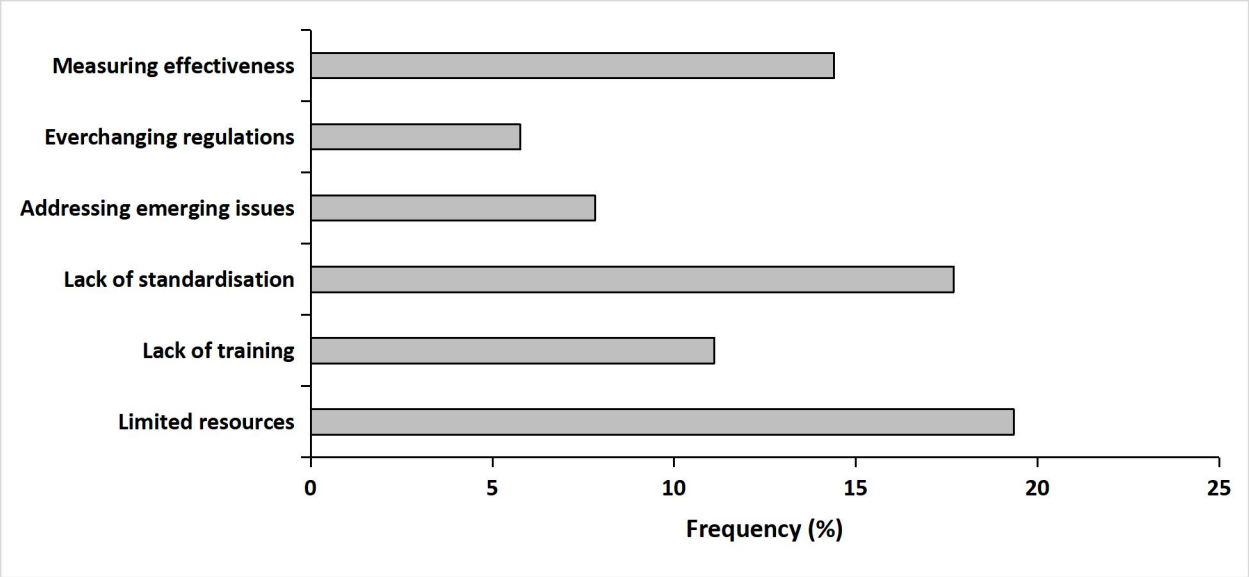


Figure 4.5: The challenges to OHS training and skills development

4.6 Factors influencing OHS knowledge and qualities of OHS professionals

The influencers of OHS knowledge and the qualities of OHS professionals are presented in Table 4.5. Educational level (X^2 = 20.45; p = 0.001), OHS training institution (X^2 = 36.82; p = 0.012), and work experience (X^2 = 22.35; p = 0.039), significantly influenced OHS knowledge of OHS professionals. On the other hand, age, gender and marital status were not significantly associated with OHS knowledge and the qualities of OHS professionals (p > 0.05).

Table 4.5: Socio-demographic factors influencing OHS knowledge and, qualities of OHS professionals (Chi-square test)

Variable	*Chi*-square test value	*p – Value*
1. Highest level of education attained	20.446	**0.001***
2. Institution where you were trained on OHS	36.815	**0.012***
3. Work experience	22.349	**0.039***

***Bold figures** under the *p*-value column denote significant differences ($p < 0.05$).

Table 4.6 shows the predictor variables associated with OHS knowledge and the qualities of OHS professionals. Attaining postgraduate education (OR = 0.467; p = 0.006, 95% CI = 3.626, 13.794) significantly influenced the OHS knowledge and qualities of OHS professionals. Also, being trained in OHS at BUSE (OR = 0.311; p = 0.006, 95% CI = 6.512, 18.352) and having more than 10 years of work experience (OR = 0.255; p = 0.0003, 95% CI = 2.895, 9.874) significantly influenced OHS knowledge and qualities of OHS professionals

Table 4.6: Sociodemographic predictors of OHS knowledge and, qualities of OHS professionals (multinomial logistic regression)

Predictor variable	Category	Wald	Sig.	Odds Ratio	95% CI	
					Lower	Upper
Highest level of education attained	Undergraduate	0.016	0.0483*	0.381	5.781	12.993
	Post graduate	0.593	0.0061**	0.467	3.626	13.794
Institution where you were trained on OHS	BUSE	6.512	0.0002***	0.311	6.512	18.352
	MSU	3.202	0.0378*	0.208	4.802	12.827
	NSSA	3.127	0.0057**	0.826	3.127	9.955
Work experience	6 - 10 years	2.352	0.0389*	0.561	1.087	7.083
	> 10 years	1.562	0.0003***	0.255	2.895	9.874

Significantly different, * = $p < 0.05$; ** = $p < 0.01$; *** = $p < 0.0001$, Chi-square.

CHAPTER 5: DISCUSSION

5. Discussion

5.1 Level of OHS knowledge, and the qualities required for OHS professionals in Zimbabwe

The top recommended knowledge and qualities for OHS professionals were knowledge of OHS regulations and laws, incident investigation, hazard identification and risk assessment, ergonomics and human factors, environmental health, and communication skills. This is supported by the ILO (2023), who reported that OHS professionals must be able to interpret and comply with laws, legislation, regulations, and standards that govern their organizations' operations. This enables OHS professionals to identify hazards and risks within the confines of governing legislation. In addition, good communication skills necessitate the effective conveyance of vital OHS information in ways that can be understood by every employee. Understanding ergonomics and human factors helps improve productivity through well-designed workspaces. It also promotes employee happiness and job satisfaction, resulting in reduced errors and accidents.

Similarly, Wright *et al.* (2019) and Swuste *et al.* (2021) concurred with this study's outcomes, asserting that OHS professionals ought to have expertise in OHS regulations and legislation, effectively communicate OHS principles with subordinates, provide recommendations for corrective actions or controls, and conduct OHS compliance audits. This is because, for an OHS professional to be considered competent, they must be qualified through knowledge, training, and experience, and, where applicable, a formal qualification to do the assigned work or tasks (MSA, 2021). Hence, they should understand the hazards and risks associated with the work or tasks to be performed, evaluate and control these hazards and risks, and have knowledge of the laws and regulations that apply to the tasks.

Business acumen, cultural competence, and technology were not recognized as key OHS skills. In contrast, ILO (2021) opined that proficiency in and understanding ethical dilemmas is a key skill for OHS professionals. This enables problem solving in a civil and traditional manner. In addition, failure to comprehend business ethics will result in poor decision-making, non-compliance (Tapura, 2021), and consequentially increased liability and reputational damage for the organization. In addition, acquiring technology skills helps in understanding the use of digital systems and processing digital information. This is vital in the ever-changing world, where most systems are shifting from analog to digital. Likewise, IWH (2022) listed digital technology as a key skill that OHS professionals should possess.

5.2 Training gaps on OHS in Zimbabwe

Most participants were trained in hazard identification, risk assessment, and first aid, which are key variables required to reduce workplace incidents and accidents. By assessing risks and identifying hazards, appropriate measures can be implemented to ensure employee safety. In addition, being trained in first aid helps OHS professionals attend to casualties in the event of an emergency, thus reducing the severity of injuries or even saving lives. The study findings correspond with those of Stankova *et al.* (2021), who reported that most OHS professionals were trained on disaster and accident actions and first aid, thus enabling them to capacitate them on emergency preparedness and response.

In contrast, Zimbabwe's OHS curricula do not include psychosocial hazard identification and management. Therefore, it is fundamental to incorporate it and broaden OHS professionals' skill sets, especially because of the various psychosocial stressors employees face daily. As reported by Wright *et al.* (2019), OHS professionals find it difficult to balance their commitment to business goals and employee safety. Thus, to mitigate this form of stress, continual professional support and development are needed to maintain and improve the OHS environment (MSA, 2021). Therefore, incorporating psychosocial hazard identification and management among OHS

professionals is imperative, as it will add value to previously unexplored areas of OHS practice and further steer OHS in new directions.

Most OHS training was undertaken through lectures at academic institutions; When the OHS professionals graduate from these institutions, training is conducted through workshops or seminars with other employees. However, this mainly involves theoretical experience; hence, it is fundamental to undergo on-job training, which is more suitable as it offers a more practical experience. IWH (2018) also suggests that on-job training is crucial as it provides the much-needed practical experience enabling trainees to apply theoretical knowledge into everyday situations, develop their skills and competencies, and boost confidence. This is because some skills are gained through experience and practice, unlike through informal and formal education and training.

According to Bes and Strzałkowski (2024), the effectiveness of OHS training should be measured by the ability of the trainees to employ the knowledge and skills learned during training. However, in this study, the effectiveness of OHS training was mostly assessed by analyzing the frequency of incidents and accidents before and after the training, which concurs with O'Connor *et al.* (2014). It is also important to carry out observations, as they provide a clear picture of the trainee's behavior (Kirkpatrick and Kirkpatrick, 2010; Nadian *et al.,* 2022). This behavior will develop into good OHS habits, leading to a positive attitude towards OHS and contributing significantly to complying with OHS requirements.

5.3 Challenges to OHS training and competency in Zimbabwe

OHS training and competency in Zimbabwe are mostly challenged by limited resources and a lack of standardization. Most organizations do not have the resources to undertake an OHS training programme, including finance, training venues, training materials, and expertise. Without these key elements, OHS training is impossible. In addition, some organizations

consider OHS training less important and focus more on production; thus, channelling resources towards OHS training is regarded as an expense. They only realize the significance of training after an accident occurs.

There is a lack of a common standard that governs the training of OHS professionals. As such, OHS training is fragmented and varies from institution to institution. Therefore, OHS institutions, together with relevant stakeholders, should formulate a universal training curriculum that can be used nationally. The universal training curriculum will also make it easy to assess the effectiveness of OHS training programs, as it facilitates the formulation of similar training content, training methods, and evaluation for every institution. Furthermore, a standard for OHS training enhances compliance among professionals and organizations.

The findings of this study concur with those of Tshewang and Wangmo (2024), who reported that the challenges faced in OHS training include a lack of funds, limited training expertise, and a lack of standard OHS policy and guidelines. On the other hand, ILO (2023) reported that the core challenges to the OHS profession were the ever-changing world of work and job design, including emerging technologies and diseases with unknown or unclear risks. For example, the Covid-19 pandemic was associated with isolation and social distancing, which necessitated OHS professionals to improve their skills to safeguard employees (Schall and Chen, 2022). In addition, it brought the need for conducting OHS training remotely, that is, via Zoom or other social media platforms thus, without the necessary resources, OHS training was hampered. However, Tshewang and Wangmo (2024) argue that virtual training is not practical or efficient.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6. Conclusion and recommendations

6.1 Conclusion

Knowledge of OHS regulations and laws, incident investigation, hazard identification, and risk assessment were the most recommended qualities for OHS professionals. Hence, most OHS professionals were trained in hazard identification, risk assessment, and first aid, which are key variables required to reduce workplace incidents and accidents. OHS training was mainly theoretical; hence, practical experience was limited, whereas the reduction in accidents was the main method of evaluating the effectiveness of OHS training. Limited resources and fragmented OHS curricula were the major challenges to OHS training and competency among OHS professionals.

6.2 Recommendations

This study makes the following recommendations:

- Inclusion of psychosocial hazard identification and management as a key requirement for OHS professionals.
- Employing practical methods in OHS training and using observations to evaluate the effectiveness of OHS training by noticing a change in trainees' OHS behavior.
- Formulation of a universal OHS training curriculum that can be used nationally.

REFERENCES

Annan, J.-S., Addai, E. K., and Tulashie, S. K. 2015. A Call for Action to Improve Occupational Health and Safety in Ghana and a Critical Look at the Existing Legal Requirement and Legislation. *Safety and Health at Work* 6(2) :146-150.

Bes, P. and Strzałkowski, P. (2024). Analysis of the Effectiveness of Safety Training Methods. *Sustainability,* 16 (2732), 1-21.

Botti, L., Melloni, R. and Oliva, M. 2022. Learn from the past and act for the future: A holistic and participative approach for improving occupational health and safety in industry. *Safety Science* 145(1):105475.

Coupad, M. 2017. Determinants of health at work in the EU15: Elaboration of synthetic indicators of working conditions and their impacts on the physical and mental health of workers. *International Journal of Manpower*, 38(1):93-126.

da Silva, S. L. C., and Amaral, F. G. 2019. Critical factors of success and barriers to the implementation of occupational health and safety management systems: A systematic review of literature. *Safety Science* 117:123-132.

Dudarev, A. A. and Odlaand, J. O. 2013. Occupational health and health care in Russia and Russian Arctic: 1980–2010. *International Journal of Circumpolar Health* 13:72:1-12

Garnica, G. B. and Barriga, G. D. C. 2018. Barriers to occupational health and safety management in small Brazilian enterprises. *Production* 28: e20170046.

Gopang, M. A., Nebhwani, M., Khatri, A. and Marri, H. B. 2017. An assessment of occupational health and safety measures and performance of SMEs: An empirical investigation. *Safety Science* 93:127-33.

International Labour Organisation. 2017. General Survey on the Occupational Safety and Health Instruments Concerning the Promotional Framework, Construction, Mines and Agriculture. In: 106th Session International Labour Conference, International Labour Office, Geneva, Report III (Part 1B).

International Labour Organization (ILO). (2023). Occupational Safety and Health: Professionals at the Workplace Level. ISBN 9789220391068 (print); ISBN 9789220391075 (web PDF)

International Labour Organization (ILO). 2023. A call for safer and healthier working environments. Geneva.

International Network of Safety and Health Practitioner Organisations (INSHPO). 2017. The Occupational Health and Safety Professional Capability Framework: A global framework for practice. International Network of Safety and Health Practitioner Organisations (INSHPO). Park Ridge, IL, USA.

Islam, A., Lee, W. S., Triyana, M. and Xia, X. 2023. Improving Health and Safety in the Informal Sector: Evidence from a Randomized Trial in Bangladesh. Monash CDES Working Paper.

Janackovic, G., Stojiljkovic, E. and Grozdanovic, M. 2017. Selection of key indicators for the improvement of occupational safety system in electricity distribution companies. *Safety Science* 125:1-9.

Kajiki, S., Mori, K., Kobayashi, Y., Hiraoka, K., Fukai, N., Uehara, M., Adi, N. P. and Nakanishi, S. 2020. Developing a global occupational health and safety management system model for Japanese companies. *Journal of Occupational Health* 62: e12081.

Kim, Y., Park, J., and Park, M. 2016. Creating a Culture of Prevention in Occupational Safety and Health Practice. *Safety and Health at Work* 7(2):89-96.

Kirkpatrick, D. L. and Kirkpatrick, J. D. (2010). Evaluating training programs: The four levels (3rd Edition). USA: Berrett-Koehler Publishers.

Kirkpatrick, D. L. and Kirkpatrick, J. D. 2006. Evaluating training programs: The four levels (3rd Edition). Berrett-Koehler Publishers.

Kunodzia, R., Bikitsha, L.S. and Haldenwang, R. 2024. Perceived Factors Affecting the Implementation of Occupational Health and Safety Management Systems in the South African Construction Industry. *Safety* 10(5):1-22.

Manufacturing Safety Alliance (MSA) of British Columbia. (2021). OHS Occupational Health and Safety Competency Framework: Defining competency standards for OHS Professionals in BC's Manufacturing Sector.

Mappangile, A. S. and Ramdhan, D. H. 2022. Literature Review: Relating Factors to the Effectiveness of Occupational Health and Safety Program Performance. *Open Access Macedonian Journal of Medical Sciences* 26(10F):420-426.

Mohammadfam, I., Kamalinia, M., Momeni, M., Golmohammadi, R., Hamidi, Y., and Soltanian, A. 2017. Evaluation of the Quality of Occupational Health and Safety Management Systems Based on Key Performance Indicators in Certified Organizations. *Safety and Health at Work* 8(2):156-161.

Moyo, D., Zungu, M., Kgalamono, S., and Mwila, C. D. 2015. Review of Occupational Health and Safety Organization in Expanding Economies: The Case of Southern Africa. *Annals of Global Health* 81(4):495-502.

Nik Nadian Nisa Nik Nazli, N. N. N. N., Khairuddin, S. M. H. S., Hasan, N. N. A. and Abdullah, A. S. (2022). Theory of Training Effectiveness Evaluation by Kirkpatrick: Background of Theory, 1-8.

NSSA. 2020. On Guard: An Aid to Occupational Safety and Health. Volume 26 No. 1: June 2020 Edition. Retrieved from https://www.nssa.org.zw/occupational-safety-health/research-development/research-reports/ on 14/1/2025

O'connor, T., Flynn, M., Weinstock, D. and Zanoni, J. (2014). Occupational Safety and Health Education and Training for Underserved Populations. *New Solutions,* 24(1), 83-106.

Pryor, P. and Tepe, S. (2012). Model of OHS Practice: Core body of knowledge for the generalist OHS professional. Safety Institute of Australia Ltd. OHS Body of Knowledge.

Robens, L., Beeby, G. H., Pike, M., Robinson, S. A., Shaw, A., Wlndeyer, B. and Wood, J. C. 1972. Safety and health at work. Report of the committee 1970-72. Presented to Parliament by the Secretary of State for Employment. House of Commons, London.

Salaj, A.T., Baricic, A. and Maamari, B. 2017. How economic crisis affects workplace conditions and occupational health. In: Emuze, F.A. and Behm, M. (Eds.). Proceedings of the Joint CIB W099 and TG59 International Safety, Health and People in Construction Conference, 11-13 June 2017, Cape Town, South Africa, pp. 510-523.

Schall, M. C. and Chen, P. (2022). Evidence-based Strategies for Improving Occupational Safety and Health Among Teleworkers During and After the Coronavirus Pandemic. *Human Factors,* 64(8), 1404-1411.

Setiawan, F. and Astutik, M. 2021. Effect of training, supervision and culture of occupational safety and health on employee Performance. *Indonesia Journal of cultural and community development* 11(3):1-13.

Sharma, R. and Mishra, D. K. 2020. The Role of Safety Training in Original Equipment Manufacturing Companies on Employee Perception of Knowledge, Behavior Towards Safety and Safe Work Environment. *International Journal of Safety and Security Engineering* 10(5):689-698.

Shea, T., De Cieri, H., Donohue, R., Cooper, B., and Sheehan, C. 2016. Leading indicators of occupational health and safety: An employee and workplace level validation study. *Safety Science* 85:293-304.

Sinelnikov, S., Inouye, J., and Kerper, S. 2015. Using leading indicators to measure occupational health and safety performance. *Safety Science* 72:240-248.

Stankova, G., Tzacheva, N. and Hristova, L. (2021). Occupational Health and Safety Training - a Snapshot of Employees' Level of Knowledge. *Journal of IMAB - Annual Proceeding (Scientific Papers),* 27(3), 3905-3910.

Swuste, P., Galera, A., van Wassenhove, W. Carretero-Gómez, J. and Arezes, P. (2021). Quality assessment of postgraduate safety education programs, current developments with examples of ten (post) graduate safety courses in Europe. *Safety Science,* 141, 105338.

Tapurra, S. (2021). OHS Management Skill Development and Continuing Learning. *Applied Human Factors and Ergonomics International,* 1-9.

Tong, R., Wang, B., Yan, B., Zhang, B., Zhang, L., Wang, Q. and Ding, J. 2023. Method for Safety Training: An Approach to Improve On-site Safety Performance. *Journal of Loss Prevention and Processes in Industry* 83:105013.

Tooma, M. 2019. The case for global regulation of industrial safety. International Conference on Ensuring Industrial Safety: The role of government, regulations, standards and new technologies, Vienna, 30-31 May 2019.

Tremblay, A. and Badri, A. 2018. A novel tool for evaluating occupational health and safety performance in small and medium-sized enterprises: The case of the Quebec forestry/pulp and paper industry. *Safety Science* 101(5):282-94.

Tshewang, S. and Wangmo, S. (2024). The Effectiveness of Occupational Health and Safety Practices in Public Technical Training Institutes. *Journal of Innovation in Polytechnic Education*, 6 (1), 73-88.

Wright, N., Hollohan, J., Pozniak, E. and Ruehlen, P. (2019). The development of the occupational health and safety profession in Canada. *Safety Science,* 117, 133-137.

ZimStats. 2018. National Health Profile Report of 2018, Government of Zimbabwe, Harare.

APPENDICES

Appendix I: Questionnaire for OHS Professionals

My name is SIMBARASHE MAZWI, Reg. no. B241545A, and am a Master of Science student in Occupational Health Safety and Environmental Management at Bindura University of Science Education. I am conducting research on "OHS TRAINING AND SKILLS IN THE MANUFACTURING INDUSTRY: THE ZIMBABWEAN PERSPECTIVE". The information you will provide will be used ONLY for academic purposes, and may aid in improving OHS skills in Zimbabwe's manufacturing industry. Please feel free to ask questions related to the study.

*Write or tick in the spaces provided **NO NAMES** to be written so as to avoid victimization.*

SECTION A: DEMOGRAPHIC INFORMATION

1. How old are you? Less than 25 years ☐ 26-40 years ☐ 41-60 years ☐ above 60 years ☐
2. Gender: Male ☐ Female ☐
3. Marital status: Married ☐ Divorced ☐ Widow/er ☐ Single ☐
4. Level of education: Certificate ☐ Diploma ☐ Undergraduate ☐ Post graduate ☐
5. Which institution/(s) were you trained on OHS? ……..
   ……..
6. Work experience: Less than 1 year ☐ 1-5 years ☐ 6-10 years ☐ above 10 years ☐

SECTION B: OHS KNOWLEDGE AND QUALITIES OF OHS PROFESSIONALS

7. OHS professionals must possess certain knowledge and skills. Do you agree? Please indicate your response against each of the following inquiries on a scale of 1-5 as highlighted below.

   1= Strongly disagree; 2= Disagree; 3=Neither agree nor disagree; 4=Agree; 5= Strongly Agree

The following OHS skills and competencies should be possessed by OHS professionals.	**OHS Skills Level**				
	Strongly disagree	**Disagree**	**Neither Agree nor Disagree**	**Agree**	**Strongly agree**
a) Business acumen					
b) Communication skills					
c) Critical thinking and problem solving					
d) Cultural competence					
e) Data analysis					
f) Emotional intelligence					
g) Environmental health					
h) Ergonomics and human factors					
i) Hazard identification and risk assessment					
j) Incident investigation					
k) Industrial hygiene					
l) Knowledge on OHS regulation and laws					
m) Leadership					
n) OHS management systems					
o) Program development and training delivery					
p) Technology skills					

q) Time management and organisation					

SECTION C: OHS TRAINING AND SKILLS DEVELOPMENT

8. What OHS training programs are currently in place for OHS professionals? ……...

……..……..…

……..……..……

……..……..……

……..……..……

……..……..……

……..……..……

……..……..……

……..…

9. Which training method/s were employed? Lectures ☐ Workshops ☐ Seminars ☐ On-job-training ☐ If other, *please specify* ……

10. Was the OHS training effective in OHS skills development? Yes ☐ No ☐

11. How often are OHS training programs offered? Every month ☐ Every 3 months ☐ Every 6 months ☐ Every 12 months ☐ Over 12 months ☐

12. Who is responsible for conducting the OHS training? …….

……..

13. What methods are used to evaluate the effectiveness of the OHS training programs? Observations ☐ Surveys and questionnaires ☐ Audits ☐ Incident and accident analysis ☐ Return on investment ☐ If other, *please specify* ……...……...

……..……

……..……

SECTION D: CHALLENGES TO OHS TRAINING AND COMPETENCY (*Please select all that apply***)**

14. What challenges are faced in terms of OHS training and skills development among OHS professionals? Limited resources ☐ Lack of standardisation ☐ Changes in OHS regulations ☐ Insufficient practical experience ☐ Addressing emerging issues ☐ If other *please specify below.*

……

……

……

15. What strategies do you suggest to overcome the challenges faced in OHS training and skills development? Providing resources ☐ Standardised training ☐ Continuous education ☐ Mentorship programs ☐ Collaboration and networking ☐ Online training platforms ☐ If other, *please specify below.*

……

……

……

16. Any additional remarks that you may wish to make related to this study.

……...…

……...

……...

……...

……...

…

END OF THE QUESTIONNAIRE

THANK YOU FOR YOUR PARTICIPATION

Appendix II: Key informant interview guide

My name is SIMBARASHE MAZWI, Reg. no. B241545A, and am a Master of Science student in Occupational Health Safety and Environmental Management at Bindura University of Science Education. I am conducting research on "OHS TRAINING AND SKILLS IN THE MANUFACTURING INDUSTRY: THE ZIMBABWEAN PERSPECTIVE". The information you will provide will be used ONLY for academic purposes, and may aid in improving OHS skills in Zimbabwe's manufacturing industry. Please feel free to ask questions related to the study.

SECTION A: DEMOGRAPHIC INFORMATION

1. How old are you? ≤20 years ☐ 21-40 years ☐ 41-60 years ☐ >60 years ☐
2. Gender: Male ☐ Female ☐
3. Level of education: Ordinary level ☐ Advanced level ☐ Tertiary level ☐
4. Work experience: < 1 year ☐ 1-5 years ☐ 6-10 years ☐ > 10 years ☐

SECTION B: OHS Training Programs

5. What OHS training programs are currently in place for OHS professionals? ……...
   ……..……..
   ……..……..
   ……..……..
   ……
6. How often are OHS training programs offered? ……
7. Who is responsible for conducting the OHS training? …….....
   ……
8. Which training method/s are used? ……..
   ……..
9. What methods are used to evaluate the effectiveness of the OHS training programs? ……..
   ……..……...
   ……...
   ……

SECTION C: OHS Skills and Competencies

10. Is there a standard guideline/ requirement for OHS professionals? If yes, please explain. …..……
    ……..…….
    ……..…….
    ……..…….
11. What OHS skills and competencies should be possessed by OHS professionals? ……..…
    ……..…
    ……..…
    ……..…
    ……

12. How are these OHS skills and competencies evaluated/assessed? ……
…..……
…..……
…..……

SECTION D: Challenges and Opportunities

13. What challenges are faced in terms of OHS training and skills development among OHS professionals? ……
……
……
……
……

14. Are there any additional resources or support needed to enhance OHS training and skills? Please explain.
……
……
……
……

15. Any additional comments that you may wish to make related to this study.
……..…
……..…
……