Evaluation of Occupational Health and Safety Practices and Management in Selected Junior Schools of Gaborone, Botswana

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Promoter: Prof U Useh

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DECLARATION

I, **VIVIAN THUSO MOLAODI**, declare that the thesis titled “Evaluation of Occupational Health and Safety Practices and Management in Selected Junior Schools in Gaborone, Botswana”, submitted for the Degree of Doctor of Philosophy at the North-West University, has not been previously submitted by me for a degree at this or another University, that it is my own work in design and execution and that all material contained herein has been duly acknowledged.

Signature 

Vivian Thuso Molaodi

Date: 3 December 2018

CERTIFICATE OF ACCEPTANCE FOR EXAMINATION

This thesis entitled “Evaluation of Occupational Health and Safety Practices and Management in Selected Junior Schools in Gaborone, Botswana by Vivian Thuso Molaodi (student number 21399328), is hereby recommended for acceptance for examination.

Promoter: Professor U. Useh

DEDICATION

I dedicate this thesis to my late mother, Stella Keogopotse Molaodi, for all her contributions to my life's success stories. I love you, mom!

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ABSTRACT

This study sought to evaluate the Occupational Health and Safety Practices (OHS) and Management of selected junior schools in South East and West of Gaborone and design a model that would help improve the safety conditions of learners and staff members. Concurrent triangulation design was used to evaluate the OHS practices and management amongst staff and learners from 7 selected junior schools in Gaborone. A sample size of 282 was determined for the study. Quantitative data was collected using self-administered questionnaires from 268 participants recruited through stratified random and purposive sampling. Through random sampling, 228 learners and 40 teachers who were purposively selected were involved in gathering quantitative data. For qualitative data, 22 participants were studied, comprising 2 focus group discussions of 8 non-teaching staff, 8 teachers, and 6 school principals who were purposively selected for in-depth interviews. Observation and photography was used to enhance qualitative data gathered.

Quantitative data was analysed using Statistical Package for Social Sciences (SPSS) computer software (version 22.0) and Stata version 12. Data was analysed at univariate, bivariate and multivariate levels. Nvivo (version 9) software was used to analyse qualitative data.

The findings confirmed that junior schools in Gaborone area were not safe due to dilapidated buildings that are rarely inspected and maintained. In addition, Gaborone junior schools were not compliant to Occupational Health and Safety standards because most health and safety measures were not adhered to. The study recommends that staff and learners should be trained on OHS and that regular school inspections should be carried out so that maintenance can be done.

Keywords: Occupational health; safety management; staff members; learners; and physical environment

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LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis Of Variance
BOCODOL	Botswana College of Distance and Open Learning
CSO	Central Statistics Office
HBM	Health Belief Model
HOD	Head of Department
ILO	International Labour Organisation
MOESD	Ministry of Education and Skills Development
NOSA	National Occupational Safety Association
OHSM	Occupation Health and Safety Management
WHO	World Health Organization

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CHAPTER ONE.

OVERVIEW OF THE STUDY

1.1 INTRODUCTION

The International Labour Office (ILO) defines Occupational Health and Safety (OHS) as activities covering the protection of employees from any harm arising from workplace accidents and occupational illnesses, as well as improving working conditions and the work environment (ILO, 2009:1). Occupational Health and Safety Management (OHSM) is meant to protect the safety, health and wellbeing of people at their workplace by ensuring high-quality working conditions, safeguarding against occupational accidents, diseases and injuries as well as identifying occupational hazards and associated risks so that control measures can be put in place (Reason, 2016). Thus, occupational health and safety management systems are implemented in order to reduce work-related risks, to prevent workplace accidents and occupational illnesses, and to increase workplace safety (Karakavuz & Gerede, 2017:3).

OHSM is practised at most workplaces in the world. In most African countries, it is rarely practised in education departments and schools, yet the occupational health and safety of learners is of paramount importance. Schools are responsible for taking care of learners, teachers and other staff members, which constitutes a lawful obligation to offer a rational standard of care to protect them from being injured (Work Safe Victoria, 2008:4). The implication here is that schools should establish means of putting in place procedures and programmes that strive to address health and safety concerns for both staff and learners.

This chapter deals with the background of the study, statement of the problem, research aim and objectives, hypotheses, significance of the study, delimitation and limitation, definition of concepts, and layout of the study.

1.2 BACKGROUND TO THE STUDY

It is an accepted fact that the human, social and economic costs of occupational accidents, injuries and diseases and major industrial disasters have steered concern from individual to national and international levels (Alli, 2008:3). Thus, according to Ibojiemenmen (2007:1), occupational health and safety management has continued to take centre stage in the decision-making process in most organisations. This is because health at work and healthy work environments are among the most valuable assets to individuals, communities and countries (World Health Organization, 1994). It is imperative, therefore, that junior schools as organisations should conduct risk assessment so that they can eliminate potential risks. However, Collins (2000:1) argues that it is impossible to be prepared for all disasters because there is no basic disaster plan to fit all situations in diverse work places.

In a work place such as the school environment, it is noted that Botswana schools lag behind in implementing occupational health and safety, a factor which might result in unnoticed consequences for both the workers and learners in the school environment. Learners are included because schools cannot exist without them, hence due regard needs to be given to their health and safety. Thus, the study evaluates the OHS in selected junior schools in the East and West areas of Gaborone, Botswana, to assess if health and safety requirements are met under such environments.

The International Labour Organisation (2003) maintains that over two million people die every year from work-related accidents and diseases even though the ILO has set forth the principle that workers should be protected from occupational hazards such as sickness, disease and injury (Okuga, Mayega, & Bazeyo, 2012:35). It is therefore, evident that workers' safety and health are critical elements in every work setting (Botswana Federation of Trade Unions, 2007:14; Moeti-Lysson & Boy, 2011:1). This emphasises that health and safety measures and strategies must be designed, developed and applied constantly to keep pace with technological and economic changes, most importantly be monitored frequently. The same applies to schools as organizations of teaching and learning, and other staff members, such health and safety

measures are needed to ensure a conducive learning and working environment. Otherwise, as the International Labour Organization (2013:1) alludes, the poor working conditions would affect the environment that workers live in. This means that school hazards can have harmful effects on teachers, learners, their families and other people in the school community, as well as on the physical environment of the school. This would result in the country failing to realise its development goals because of unhealthy and unproductive workforce which operates in an unsafe and unhealthy environment (Ntebele, 2004:2).

Botswana Federation of Trade Unions (2007:15) argues that employees who contract occupational diseases due to the nature of the work the employee is engaged in should be compensated by the employer as the employer has a common law duty to compensate the employee for damages suffered as a consequence of the disease. This highlights that proper hazard identification and mitigation strategies should be implemented in all Gaborone schools to prevent accidents and diseases that might hamper the effectiveness of teaching and learning and that could cost the employers.

Hazards vary according to the location of such schools. Some of the most prevalent problems in certain schools are poor lighting, inadequate ventilation, excessive heat, poor housekeeping, dilapidated buildings, inadequate working and learning space, poorly designed learning and working tools, lack of suitable and adequate personal protective equipment, exposure to hazardous chemicals and dust in school laboratories, high levels of learners' noise and long hours of work for teachers (Theuri, 2012:31).

In recognition of the above, most countries have enacted the occupational health and safety legislation to protect the health and safety of teachers, learners and other employees in a school. For instance, according to Pisaniello, Stewart, Jahan, Pisaniello and Winefield (2013:55), in Australia there is vast information and resources available on OHS although there is limited evidence on the effectiveness of these resources on educational programmes. In Queensland school communities, practical guidelines were developed to help those with management responsibility for workplace health and safety in schools, among them, principals, assistant principals, teachers and leadership team members responsible for budgets, facilities and purchasing so that they can understand their roles and get started on the challenges to improve the

health and safety performance for their schools (Queensland Government, 2011:3).

South Africa too has the protection of employees at the workplace as a right enshrined in the Occupational Health and Safety Act of 1993 (South Africa, 1993). The principal aim of the Act is to protect the health and safety of employees at the workplace. In South Africa, all employers have an obligation to provide occupational health services for their employees in terms of the country's Occupational Health and Safety Act of 1993 and its various regulations on hazardous chemical substances such as lead, asbestos and biological hazards. The regulations mandate the provision of occupational health services through the requirement for medical surveillance of workers exposed to these hazards in high-risk industries (NOSA, 2012:111).

Zambia also has the Occupational Health and Safety Act of 2010 which provides for the establishment of health and safety committees at the workplace. It further provides for the health, safety and welfare of persons at work; the duties of manufacturers, importers and suppliers of articles, devices, items and substances for use at work; the protection of persons, other than persons at work, against risks to health or safety arising from, or in connection with, the activities of persons at work; and related matters (Mokosiku, 2012:3). Even though Zambia takes issues of Occupational Health and Safety seriously, Mokosiku (2012:13) holds a dissenting view as he observes that in Zambia, approximately 1,200 occupational accidents and diseases are reported from all industries annually while many others go unreported.

Botswana has comprehensive, standard and overarching legislation governing occupational health and safety at workplaces in many sectors, including the education sector. Employees in Botswana, as in most countries, spend at least eight hours per day in formal employment. These employees are often exposed to different hazards and working conditions which affect their health and safety. Ntebele (2004:1) observes that some of the workplaces remain hazardous environments that take a heavy toll on the health and economy of the country that includes the education sector.

The researcher is concerned about Botswana, which still relies a great deal on the old Factories Act of 1973 which does not adequately address the contemporary issues of workplace health and safety (Republic of Botswana, 1973). This Act has a limited application in that it can only be enforced in places defined as factories in Section 5

subsection (ii) of the Act. Its application excludes other workplaces and by extension the health and safety of workers in other work environments are compromised, among them, the Botswana education sector. The question, therefore, is whether the Government of Botswana takes the OHS seriously in the school environments as it has not drafted nor enacted anything in place in the form of an Act in order to realise this dire need.

Nonetheless, there are other pieces of legislation spread across different ministries such as Health and Mines that could be invoked to supplement the Factories Act (1973) and these include the following:

- Public Health Act (Republic of Botswana, 1971) Chapter 63:01; The Act implores employers to conduct medical surveillance of its employees, and ensure the protection of public health by protecting the environment;
- Workers Compensation Act (Republic of Botswana, 1998) CAP 47:03. The Act provides for compensation of workers for injuries suffered or occupational diseases contracted during their employment or for death resulting from such injuries or diseases and for matters incidental and connected to foregoing; and
- Smoking Act (Republic of Botswana1992) which prohibits people to smoke in any enclosed indoor designated non-smoking area of any private or public place.

What is lacking therefore is a specific Act that directly provides for the schools' occupational health and safety needs. Educational institutions rely much on teachers to train their learners and prepare them for the world of work. Education plays a very important role in our day-to-day living; in fact, we all need education and security for us to survive the challenges that emerge on a daily basis. According to Seoke (2013:4), an informed nation is a critical element in health promotion since information empowers and enables individuals and communities to take control of their own health and determinants of health. Teaching and learning can only successfully take place in secure schools.

The education system of Botswana finds itself in a period of history when social attitudes and values around the world are changing at an unprecedented rate (Republic of Botswana 1997:1). Thus, the Republic of Botswana (2000:86) has

instituted some initiatives to restructure its education systems in order to focus on the philosophy of education that promotes economic development and prepares learners for the workplace environment. To manage and realise these goals, the country has crafted Vision 2016. Vision 2016 highlights the seven pillars which are imperative to the future development of Botswana. The pillars, as outlined by Republic of Botswana(1997), are as follows:

- an educated and informed nation;
- a prosperous, productive and innovative nation;
- a compassionate, just and caring nation;
- a safe and secure nation;
- an open, democratic and accessible nation;
- a moral and tolerant nation; and
- a united and proud nation.

Schools as learning sites and workplaces confront several variations of hazards. Thus, they are required to implement and maintain health and safety management systems to ensure that people in schools are not harmed. For effective teaching and learning to take place, schools are expected to be secure for learners to feel safe. Jones, Axelrad, and Wattigney (2007:2) argue that poor Indoor Air Quality (IAQ), diesel exhaust emitted from school buses, hazardous materials, pesticides, contaminated drinking water and lead are environmental hazards that are sometimes found in schools and could adversely affect the health, attendance, and academic success of students, as well as the health of teachers and other staff members. Moral obligations would involve the protection of employee's lives and health. The main question that arises is how informed teachers and learners on issues are relative to occupational health and safety.

Teachers in schools have the responsibility of imparting knowledge to learners so that they compete globally with other learners. Therefore, it is the responsibility of the school management to ensure that the knowledge imparted to learners should not necessarily be for examination purposes, but should include life skills subjects such as occupational health and safety (OHS). The assumption is that teachers are well informed in matters of Occupational Health and Safety, hence this study seeks to

evaluate the extent to which teachers and learners know about these issues.

Although the educational setting is rarely regarded as a high-risk environment, the occupational health field recognises the potential for unknown risks in all environments and therefore advocates the promotion of a safety culture that is focused on the prevention of injuries and increasing awareness of risks (Nuwayhid, 2004:2). In Botswana, although the government asserts occupational health and safety more emphatically in several sectors of the economy and this is well-elaborated in the Factories Act (1973), Food Control Act (1993), Waste Management Act (1998) and Radiation Protection Act (2006) in the work place, the aspect of occupational health and safety in the school setting is scantly elaborated. As such, this study evaluates the occupational health and safety in the school environment in Gaborone, Botswana, in order to understand how the practice of OHS affects both learners and teachers in the South-East and Western schools of Gaborone.

1.3 STATEMENT OF THE PROBLEM

Occupational health and safety in schools of Botswana has been a neglected and under-researched area. Previous scholars have pointed out that a number of problems associated with occupational health and safety exist and these problems have serious consequences which affect people's well-being in the country (Moeti-Lysson & Boy, 2011:1). Despite implementation of various projects on health promotion such as wellness programmes in all sectors of the economy including the education sector, the country is still in its infancy in promoting occupational health and safety. For instance, most junior schools in Botswana are currently experiencing classroom overcrowding, a challenge which stretches the already limited basic resources and needs in all institutions (Ketlhoilwe, 2007; Silo, 2011). This consequently results in insufficient infrastructure such as furniture to accommodate admitted learners, resulting in learners sharing chairs and desks during instructional delivery thus challenging their safety and health statuses.

Despite the fact that improving school ergonomics is a major issue in workplaces and a key element of most OHS programmes today (Rostykus, 2012:1), Gaborone schools

in as far as better ergonomic status is concerned have been scantly contested. The researcher observed during teaching practice that the condition of some schools in Gaborone are not compliant to health safety standards for effective teaching and learning, thus confirming the findings by Useh, Kotsokoane, and Masenya (2011:22) that furniture conditions in schools hardly meet expected ergonomic standards aimed at promoting one's sitting posture which result in either temporary subsequent health hazards or permanent deformation in the long term.

Thus, the study on occupational health and safety in South East and West junior schools of Gaborone is a mandate. It is clear from the literature cited above that schools in Botswana are not OHS compliant. Therefore this study set out to propose a model that promotes OHS in Gaborone junior schools.

1.4 RESEARCH AIM AND OBJECTIVES

1.4.1 Aim of the study

The aim of this study was to evaluate the Occupational Health and Safety management practices and to propose a model for the promotion of Occupational Health and Safety management in the South East and West junior schools of Gaborone.

1.4.2 Objectives of the study

The following are the specific objectives of the study, set to:

- Investigate the physical safety conditions of selected schools and their relationship to safety of learning environment in South Eastern and Western junior schools of Gaborone.
- Examine the ergonomic and psychosocial conditions and their impact on the health and safety of the environment in Gaborone junior schools.
- Investigate the Occupational Health conditions and their perceived influence on the learning environment of junior schools in Gaborone.
- Evaluate the level of compliance that the junior secondary schools have regarding occupational health and safety.
- Propose a model for the improvement of Occupational Health and Safety Conditions in junior schools in Gaborone.

1.5 HYPOTHESES

The following hypotheses were tested in this study:

- There is no significant relationship between schools' physical conditions and safety of the learning environment in South East and West of Gaborone Junior schools.
- Ergonomic and psychosocial conditions have no significant relationship to learning environments in South East and West Gaborone junior schools.
- There is no significant relationship between Occupational Health conditions and learning environment in junior schools in the South-East and West areas of Gaborone.

1.6 SIGNIFICANCE OF THE STUDY

The study provides significant insights into ways of managing the neglected health and safety practices in junior schools. It also provides inspiration to scholars to conduct studies of a similar nature paramount to uncover occupational health and safety issues experienced by schools around the country. In addition, the study would be of benefit to:

1.6.1 Ministry of Education Skills and Development

The benefits of OHSM highlighted in the study provides the Ministry of Education Skills and Development with insight to benchmark on standards associated with occupational health and safety and apply the proposed model to the entire secondary school education system in the country. Additionally, such recommendations serve as a learning curve for other ministries that have already launched and implemented Occupational Health and Safety strategies in their ministries to streamline the significant challenges highlighted in this study.

Furthermore, findings drawn from this study serve as a starting point to set up and redirect the education policies not only in secondary schools but also in primary school education as the findings of the study are drawn from the secondary education system which has the same operating environment as that of the primary both in Botswana and beyond.

1.6.2 School Managers and Teachers

The outcome of the study might assist the schools in dealing with pertinent challenges such as absenteeism of both teachers and learners which would have emanated from schools' unhealthy and unsafe environments. In addition, the study will create awareness on the importance of health and safety within the school environment.

1.6.3 Learners

The study also focuses on developing a model to be implemented in junior secondary schools As such the study will be of great benefit to the learners specifically because they will be sensitized on issues of health and safety as well as ways of mitigating risks. The learners will basically apply what they have learnt at school and apply that in their homes and that will benefit other stakeholders such as parents.

1.7 DELIMITATION OF THE STUDY

This study addresses only specific challenges associated with OHS in schools. It did not for example, focus on the occupational violence and risk management. Rather, it focused on the physical safety, occupational health, ergonomics and food safety. The study was confined to seven junior schools in Gaborone due to proximity and convenience. This study took place between 2013 and 2017 to allow the researcher time to familiarise herself with OHS environment and challenges therein.

1.8 LIMITATIONS OF THE STUDY

Though the study was conducted in a location where everyone could speak and write English, not all discussions were conducted in English. Some interviews were conducted in Setswana due to some participants' preferences. This required translation of some of the interviews, which might have unintentionally compromised some inferences made of the participants' input.

1.9 DEFINITION OF CONCEPTS

This section defines concepts frequently used in this study.

1.9.1 Occupational health (OH)

Occupational health is a versatile activity concerned with the prevention of ill-health in employment populations. OHS is a cross-disciplinary area concerned with protecting the safety, health and welfare of people engaged in work or employment. Acutt and Hattingh (2011:16) state that the discipline of Occupational Health is concerned with the relationship between work and health. In this study, Occupational Health relates to the ergonomic conditions, physical and psychosocial conditions, cleanliness of the surroundings and toilets and food safety in the selected schools.

According to Wilcock (2000:79), the basic tenet of occupational science, that humans are occupational beings, has the potential to result in a changed view of life and health, and provides the necessary focus for occupational therapy practice, research and education. Wilcock (2000:81), further states that a philosophy based on the notion of people, including learners, as occupational beings is developed in three ways – personal, professional and educational – all of which have the power to transform futures. In view of that, in this study the term occupational health and safety refers to all factors and conditions that affect or could affect health and safety of teachers, non-teaching staff and learners in the school setting.

1.9.2 Risk

As explained by NOSA (2012:4), a risk is a combination of the probability that a particular outcome will occur and the severity of the harm involved. This is the combination of the likelihood and consequences of a specified hazardous event occurring. Hopkin (2012:14) defines risk as the uncertainty of outcome within a range of exposure, arising from a combination of the impact and the probability of a potential event. In this study, risk is the likelihood that an unsafe circumstance with a potential to harm teachers, non-teaching staff and learners is detected.

1.9.3 Ergonomics

Ergonomics is the study of how working conditions, machines and equipment can be arranged to enable people to work with them more efficiently. Jerie (2012:281) defines ergonomics as the study of humans at work, evaluation of the stress that occurs in work and the ability of people to cope with these stresses. Oxford (2010) defines ergonomics as "the study of working conditions, especially the design of equipment and furniture, to help people work more efficiently". Thus, concerning this aspect in relation to OHS, this area of the study focuses on the condition of schools' furniture as well as laboratory machines and equipment.

1.9.4 Hazard

Hazard refers to anything that can cause harm if not controlled. Goertsch (2000:762) defines hazard as a condition with the potential of causing injury to personnel, damage to equipment or structures, loss of material, or lessening of the ability to perform a prescribed function. Piľa, Adamčik, Korba and Antoško (2014:28) further define hazard as a "condition, event, or circumstance that could lead to or contribute to an unplanned or undesirable event." In this study, different hazards such as physical, health and ergonomic hazards in schools are discussed.

1.9.5 Safety

Safety is the condition of being free from danger or injury. Bosworth, Ford, and Hernandaz (2011:195) define a safe school as one lacking direct and indirect violence, fear, and drugs or alcohol, and one where a positive school climate enhances learning and feelings of safety. To ensure the safety and health of workers in a work environment, managers should establish a Safety, Health and Environment Programme (BOCODOL, 2008:5). Safety includes:

- a workplace environment that poses no threat to the safety and health of employees and public;

- a workforce that has been carefully instructed in how to maintain occupational safety in the workplace; and
- a workforce that has a positive attitude about workplace safety.

Safety in this study, therefore, comprises all those techniques used to avert accidents, mitigate personal injury and prevent accidental damage to property.

1.9.6 Learner

The Oxford University Press (2010:257) defines a learner as a person who is learning something, while Ogonyo (2012:39) defines this as a child between 6 and 18 years enrolled in a school. In this study, the terms learner and student were used interchangeably.

1.10 LAYOUT OF THE STUDY

The study consists of eight chapters arranged as follows:

Chapter 1: Overview of the study

This chapter gives an overview of the study. It acquaints the reader with the background to the study, statement of the problem, aim and objectives of the study, hypotheses, significance, delimitation and limitation of the study, as well as definitions of concepts used in the study.

Chapter 2: Literature review

Chapter 2 focuses on the review of literature on evaluating occupational health and safety management in schools. The review covers aspects relevant and related to situations in Botswana schools in comparison with other countries. It covers the theories underpinning the study, occupational health and safety in schools, compliance with legal and general application regulations, and finally, the strategies for improving the management of health and safety conditions in junior schools.

Chapter 3: Research Design and Methodology

Chapter 3 deals with the research design and methods employed in this study. Population and sampling techniques are discussed. The study approach, which is mixed method, is outlined and the research instruments in the form of interviews, focus group, questionnaires, and photographs are also discussed.

Chapter 4: Quantitative Results

Chapter 4 focuses on the results of empirical data collected quantitatively from teachers and learners. The information was useful in evaluating the state of occupational health and safety management in Gaborone junior schools. Descriptive and inferential statistics were generated and the data frequencies were displayed when data was analysed using SPSS version 22 and Stata 12.0.

Chapter 5: Qualitative Results

This chapter deals with the results of empirical data collected qualitatively from school principals, two sets of focus group (one consisting of teaching staff, the other one of non-teaching staff), and photographs of schools OHS features.

Chapter 6: Discussion of Results

Chapter six, presents discussion and interpretation of the integrated research findings from questionnaires, interviews, focus groups and photographs taken during the study.

Chapter 7: Proposed model for improving OHS in schools

This chapter focuses on the development of a model for improving safety performance in junior schools and his model is distilled from the study's findings.

Chapter 8: Conclusions, Limitations and Recommendations

Chapter eight focuses on the summary of the main findings and the implications of these findings on policy and school settings. It consists of study limitations, recommendations for interventions and suggestions for further research.

1.11 SUMMARY

In Chapter One, the researcher provided an overview of the study on the evaluation of OHS practices and management in Botswana junior schools. In addition, the background, research problem, purpose, research design and methods were outlined. The next chapter presents a review of literature that informed the current study pertaining to OHS practices in Botswana junior schools.

CHAPTER TWO.

LITERATURE REVIEW

2.1 INTRODUCTION

Education is the foundation upon which any development in a nation is attached. Good and quality education is achieved when all factors contributing to its success are adhered to (Ng'ang'a, 2013:1). The provision of safe learning environments to the school community is one of the many factors that contributes to any school's success. However, institutions of learning are reportedly experiencing serious cases of insecurity (Omolo & Simatwa, 2010:1). Review of literature indicates serious and widespread security management oversight in educational institutions across the globe (Onderi & Makori, 2013:71). This is highlighted by the fact that all over the world, there has been an upward trend in the number of school children dying or getting injured in school violence, disasters and emergencies that could have been avoided if safety policies were strictly adhered to (Omolo & Simatwa, 2010:2).

The education system in Botswana is undergoing massive transformation due to a changing workforce and emerging technological innovations. As new education reforms are implemented and standards are revised, the demand for continuous quality improvement and management in these settings will also continue to rise. As organisations such as schools are faced with these challenges, understanding the needs of the worker becomes more imperative than ever to promote a healthy and safe work environment. This study, therefore, advocates for occupational health and safety empowerment which necessitates change. Occupational health can be generally conceived as a relationship between work and health and health and work, and attention to this is part of good risk management for any successful work environment. Thus, this study sets to evaluate occupational health and safety practices and management in selected junior schools in Gaborone, Botswana.

Literature in Botswana about occupational health and safety management in schools is limited. As a result, reference is made to what is available in neighbouring countries and internationally. This chapter reviewed literature on OHS in junior schools, focusing on the theory underpinning the study, physical safety conditions of schools and its relationship to safety of the learning environment, ergonomic and psychosocial conditions and their impact on health and safety of the learning environment, occupational health conditions and their perceived influence on learning environment. In the penultimate, this study develops a model for improving occupational health and safe performance amongst learners and teachers in Gaborone junior schools.

2.2 THEORETICAL FRAMEWORK

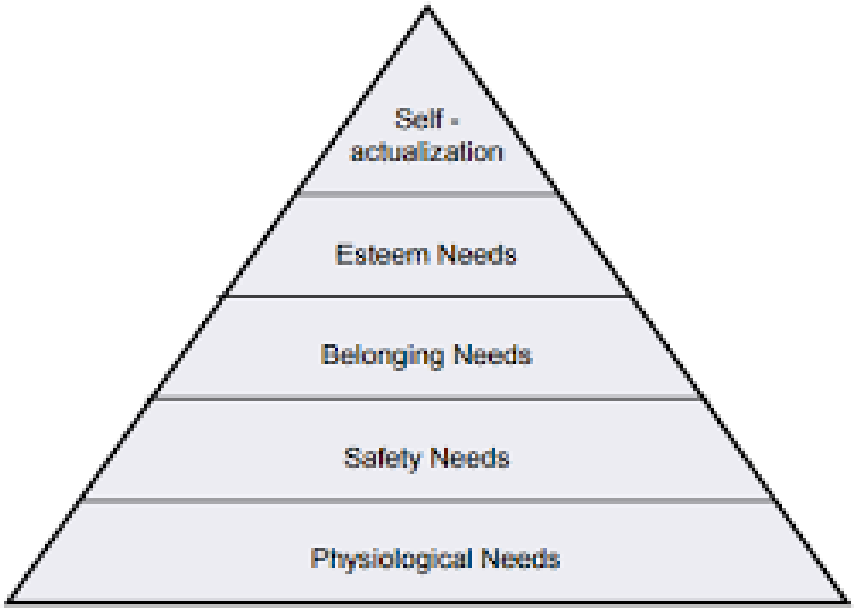
According to Okeke, van Wyk, and Phasha (2014:5), a theoretical framework is an explanatory mechanism that enables one to understand as well as explain the verbal and non-verbal interactional dynamics amongst participants in a particular study. It determines what facets to measure, as well as what statistical relationship one must seek to establish. Thus, theoretical framework underpinning this study provided a basic approach to understanding OHS. It facilitates researchers and managers to see the school organisation through diverse lenses. It also helps the reader make the logical sense of the relationship of the variables of the factors that have been considered pertinent to the problems. In this study, theoretical framework is engaged to explain OHS variables in managing health and safety performance. This study was informed by Maslow's hierarchy of needs and the Health Belief Model.

2.3 MASLOW'S HIERARCHY OF NEEDS AND SAFETY IN SCHOOLS

According to Maslow and Lewis (1987) hierarchy of needs, safety is a basic need that must be met in order for learners to achieve the cognitive outcomes that are intended as a result of schooling. If schools do not fulfil those needs, learners' education gets negatively affected. Schools are required to provide safe environment to prevent accidents. As depicted in Figure 2.1, Ogonyo (2012:33) opines that Maslow's theory

identifies safety needs as being important to the well-being of people. The Queensland Government (2011) states that good OHS performance in schools generally results in fewer injuries, greater job satisfaction, increased motivation, better industrial relations, improved retention of staff and better student performance. For learners to be safe and secure in schools, it is imperative that educational stakeholders foster safe and secure environments to facilitate increased learners' enrolment, retention, completion and hence attainment of quality education (Ogonyo, 2012:34).

Figure 2-1: Maslow's hierarchy of needs and schools



Source: Adapted from Ogonyo (2012)

The figure above displays the five levels of needs as outlined in Maslow's hierarchy, but the researcher focused on the two basic levels as they are the most foundational of the hierarchy. The highest needs, self-esteem and self-actualisation, cannot be attained if the foundational ones identified have not been fulfilled.

2.3.1 Safety Needs

A safe and secure working environment reduces the threat of physical injury. When learners and staff members believe that their level of risks has been minimised and that good health and safety practices are judiciously enforced and monitored by school

management, they feel more comfortable and active in performing their tasks and interacting with others. Conscientious safety practices reduce absenteeism as well, which can impact on productivity and morale. Security also extends to emotional well-being in the workplace. The Ministry of Education and Skills Development can account for the safety needs of teachers, learners and non-teaching staff by providing safe working and learning conditions, secure compensation and job security.

2.3.2 Physiological Needs

Maslow and Lewis (1987) identified the core physiological needs that sustain human life as air, water, food and sleep. To perform their jobs, school communities require healthy air to breathe, clean water to keep their systems hydrated, sustenance to fuel their bodies and adequate time to rest and recuperate between shifts, including scheduled breaks. A school principal can account for the physiological needs of the staff members and learners by providing comfortable working and learning conditions, reasonable working hours and the necessary breaks to use the bathrooms and eat or drink.

Armstrong (2006:830) suggests that it is very important for employers and employees to have healthy and safe conditions and to engage in Health and Safety programmes to ensure that they are socially, mentally and physically fit. This theory fits into this study in that safety is one of the basic needs, after physiological ones, as pointed out by Maslow. Insecure learners are not likely to benefit much from the education being offered. School safety is a necessary element for a conducive learning environment. There is a need for security, safety and protection of learners and staff members in schools. As such threats to learner's safety must be dealt with through careful measures and strategies.

2.4 HEALTH BELIEF MODEL

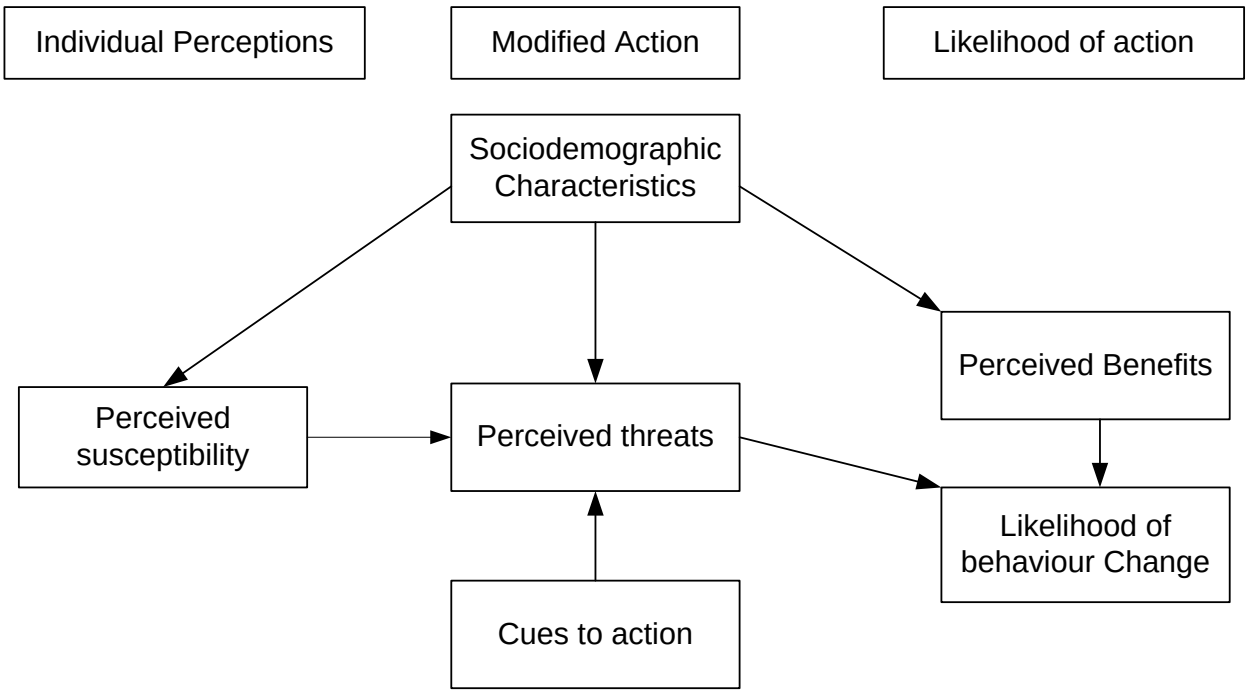
According to the social cognitive evaluation, the Health Belief Model by Rosenstock (1974) is paramount to implement both in forecasting and intervening of food management in public places if the health well-being of people is to be improved in the

long term. The Health Belief Model (HBM) has been widely used and applied to explaining health behaviours as well as using interventions influenced by a person's desire to avoid illness or to get well (Janz & Becker, 1984:2). The model is used in explaining and predicting preventative health behaviour. The HBM breaks down health decisions into a series of stages and offers a catalogue of variables that influence health action. According to Janz and Becker (1984), a person's motivation to undertake health behaviour can be divided into three main categories, which are individual perception, modifying behaviour and the likelihood of action:

- Individual perception deals with the importance of health to individual perceived susceptibility and perceived severity;
- Modifying factors include demographic variables, perceived threat into action and cues of action; and
- The likelihood of action discusses factors in probability and appropriate health behaviour. It is the likelihood of taking the recommended health preventative action.

A combination of the above-mentioned factors causes a response that often manifests in action. Perceived susceptibility relates to the likelihood of the occurrence of the threat posed by illness. Perceived threats or severity have potential for causing physical harm. Cues to action relate to action being taken to address the potential threats. The actions may include awareness or provision of soap in toilets or provision of health facilities such as ramps in the school buildings to cater for disabled learners. Perceived benefits relate to assurance in the efficiency or value of behaviour in reducing threats.

Figure 2-2: Health Belief Model



Source: Adapted from Rosenstock (1974:334)

Becker, Maiman, Kirscht, Haefner, and Drachman (1977:3) argue that health behaviour may be postulated by motivation to avoid illness, amount of desire for a level of health and the belief that a specific health action will prevent or ameliorate illness. The model was applied to understand different perspectives of learners and staff members in the South East and West junior schools of Gaborone regarding health and safety on food preparation and general behaviour on cleanliness of the school environment to ensure a healthy and safe environment in these schools. The model postulates that a relevant external or internal stimulus or cue action must occur to trigger the appropriate behaviour. In relating it to the school situation, one can assume that if management provides soap in learners' toilets most learners will wash their hands after using toilets.

2.5 MODEL GENERATION PROCESS

One of the objectives of this research was to propose a model for the promotion of Occupational Health and Safety Conditions in junior secondary schools in Gaborone. The foregoing research objective was achieved through theory generation and following the subsequent steps: concept analysis, relationship statements, description of the model and the strategies for implementation of the model (Chinn & Kramer, 2008).

Step 1: Concept analysis

Concept analysis is done in two parts, namely identification of the main concepts by exploring the views of staff members and leaners in Gaborone schools in relation to the OHS conditions in those schools and then the definition and classification of the concepts.

a) Identification of main concepts

The identification of main concepts was done through a qualitative research method in order to explore and describe the lived experiences of OHS by staff members and learners in Gaborone Junior schools. A literature review was done to identify literature that relates OHS in these schools.

b): Concept definition and classification

After the concept analysis and contextualisation into the literature, the central narrative and theme was identified. The next step in theory generation was to define the central and related concepts. Chinn and Kramer (2008) state that central concepts need to be defined by existing theories, dictionary definitions, subject definitions and synonyms. The survey list of Dickoff, James and Wiedenbatch (1968) and Chabeli (2004) was used to determine the agent, recipient, context, terminus, procedure and dynamics of the model.

Step 2: Relationship statements

Relationship statement is the investigation of the nature of relationships between concepts and the identification, if any, of links between the concepts (Chinn & Kramer, 2008). The context within which these relationships of concepts are described is the experience of learners and staff members on OHS in Gaborone Junior Schools.

Step 3: Description of the model

A clear, detailed and complete description of the model for the promotion of the occupational health in Gaborone junior schools is provided and evaluated according to the criteria as suggested by Chinn and Kramer (2011).

Step 4: Description of strategies for implementation of the model

The implementation of the model is done by describing strategies as outlined in 7.3.6 of this thesis.

2.6 METHODS OF REVIEWING LITERATURE FOR THIS STUDY

The literature review in this study adopted the scoping review method. The scoping review normally reviews and assesses many studies, selects relevant quality studies and analyses results. The aim of the scoping review in this study is to search for pertinent studies pertaining to Occupational Health and Safety practices in schools. This review provides an overview of the literature and serves to inform the planning of future studies. Following an initial scan of the literature and consultation with experts in the field, the initial broad research was defined as the following: *What are the health and safety conditions of Gaborone junior schools?*

A scoping review was undertaken using the methodological framework originally outlined by Arksey and O'Malley (2005) from York University in the United Kingdom. The “York framework” suggests five stages in performing this type of review. The five stages are: *Identification of the research questions to be addressed; identification of the relevant studies to the research questions; selection of studies to be included in*

the review; charting of the information and data within the included studies and collating, summarizing and reporting on the results of the review. An optional sixth phase of this methodology type, *consultation with stakeholders,* was not undertaken in this review.

2.6.1 Search strategy

A comprehensive text search of journal articles from the PubMed, Cochrane Library, Cinah, Web of Science, Google Scholar and Scopus was conducted using the following keywords: safety management, occupational health, school safety, and ergonomics. Articles were restricted to those published in English and their recent publication dates.

2.6.2 Article selection

To identify relevant articles, three major domains of Occupational Health and Safety Management (OHSM) were found based on citation, network analysis, an objective approach to identify clusters in the OHSM literature which are safety management, and Occupational Health. Cost-analysis studies, case reports and letters to the editor were amongst the articles which were excluded from this review. The researcher assessed the titles and abstracts of the articles. When the titles or abstracts did not clearly indicate whether an article should be included or excluded, the full text was assessed and a second reviewer was consulted for opinion on whether the article should be included in this review.

2.6.3 Charting Process

Descriptive data including general citation information, country of origin, type of study, school setting, primary objective, results of study and author's conclusion were extracted from the included articles and charted in a MS Excel spreadsheet to create a data base. Information gathered from the articles was evaluated. Narrative and data are summarised in tables and figures where applicable.

2.6.4 Results

The comprehensive broad search yielded a total of thirty six (36) articles divided across the three subsections and these were included in the review.

2.7 OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT IN SCHOOLS

Occupational Health and Safety Management is a broad concept covering a range of topics. Mostly, occupational health and safety cover wide-ranging and varied areas in schools, which may include issues such as water and sanitation, ergonomics, infrastructure, food hygiene practices, establishing and managing occupational health services in schools, teaching and promotion programmes. The workers' safety and health rests with the employer but the state has the responsibility to legislate on OHS for employers to be legally obliged to carry out essential preventive functions.

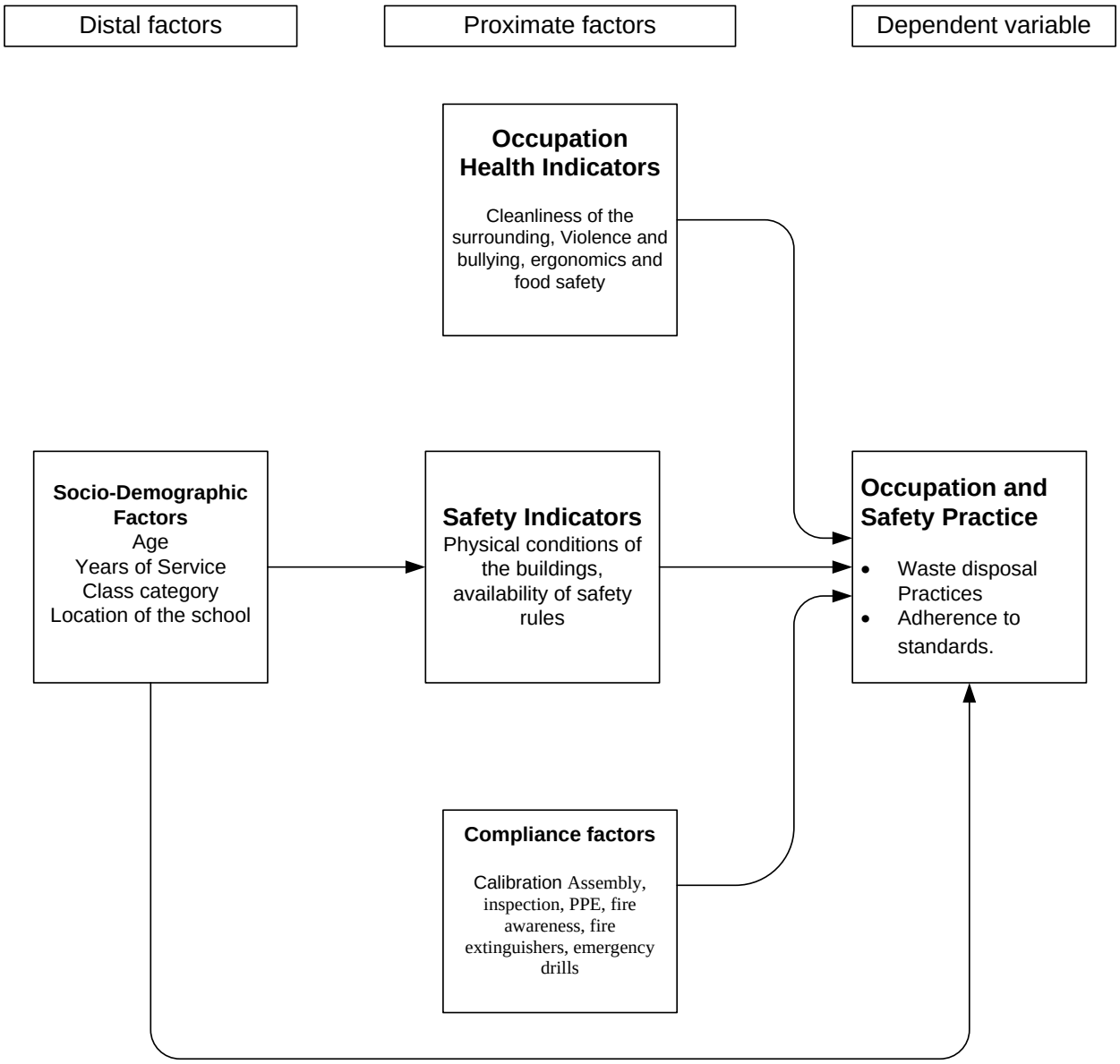
This section discusses the occupational health and safety management in schools. Occupational Health and safety management is a broad concept covering a range of topics as shown in Figure 2.3.

The conceptual framework assisted the researcher to identify the relevant variables that had to be included in this study. The conceptual framework demonstrates the dependent and independent variables of the study. Occupational Health and safety in schools is determined by multiple variables. In this study, the independent variables for occupational health and safety management are safety indicators, occupational indicators and demographic factors.

The safety indicator variables include the infrastructure, furniture, availability of running water and safety audits. The occupational health independent variables indicators comprise cleanliness of the surroundings, violence and bullying, sanitation, ergonomics and food safety. Safety independent variables comprise the physical buildings and availability of rules. The other variable concerns compliance which entails emergency preparedness, inspection, use of personal protective equipment, fire awareness and fire extinguishers in schools. The last independent variable

included in the framework is the demographic variable which constitutes gender, age, form and teaching experience.

Figure 2-3: Framework for OHS management



Source: Author (2017)

2.7.1 Occupational health

Occupational health is a multifaceted and multidisciplinary activity concerned with the prevention of ill-health of workers, but for the purposes of this study it has been applied to junior school's learners in Gaborone with the aim of showing how it affects learners

and staff members as they are also stakeholders within the school environment. Considering the fact that lack of OHS affects learners, the study perceives learners as part and parcel of the workers albeit under different names. Occupational health plays an important role in helping create a safe and healthy working and learning environment but it is rarely observed in selected Gaborone junior schools. The best practices in OHS practices contribute to both a reduction of workplace accidents and a negative impact on occupational illnesses, as well as an improvement in general safety (Karakavuz & Gerede, 2017:3).. Therefore, prevention and minimising hazards at work is pertinent but it involves management's efforts to influence the behaviour of staff members.

Although the educational setting is rarely regarded as a high risk environment, the occupational health field recognises the potential for unknown risks in all environments and therefore advocates the promotion of a safety culture that is focused on the prevention of injuries and increasing awareness of risks (Nuwayhid, 2004:3). Unsafe work environments as well as workplace violence and insecurity are a cause of concern in the schools (Deussom, Jaskiewicz, Adams, & Tulenko, 2012:3). Hence the general consensus among scholars is that hazardous environments increase workers' absenteeism, risk of abandoning the profession, short-term sick leave, longer-term disability, and even death (Deussom *et al.,* 2012:3).

According to the Department of Secondary Education (2007:4), the school environment should be clean and aesthetical. Current practices of sanitation management in schools in Botswana involve routine activities that are tailored towards meeting these requirements through cleaning classrooms and school grounds, community litter campaigns, as well as collection of cans and bottles for recycling (Ketlhoilwe, 2007:15). However, most schools experience hazardous conditions which at times do not only affect the health and safety of workers and learners but also of their families, the physical environment as well as the community (Acutt & Hattingh, 2011:1; International Labour Organization, 2010:3).

2.7.2 Drainage and sanitation

Sanitation facilities are very important for the safety and healthy school environment. According to Florida (1993:48), research indicates that toilet rooms are the fourth highest location for criminal activities on school campus. Furthermore, Nhlapo (2006:22) claims that safe water and environmental sanitation services, that is waste facilities, are vital for people's dignity and health, and are especially important in ensuring the healthy development of children. Silo (2011:2) also observes that due to overcrowding, the cleaning and maintenance of latrines in low-income areas is so poor that the facilities have become a major health hazard which people avoid getting close to. In relation to the sanitation facilities, Morebodi (2006:35) confirms that some schools in their study had toilets which were unsafe but were still being used by learners. Dirty and unsafe toilets are not only a danger physically, but can also pose health hazards to all people who use them at schools (Morebodi, 2006:86).

Most junior schools in Gaborone use flushing toilets and those toilets can create health hazards if not taken care of. This study found that some schools' enrolment in Gaborone does not correlate with the number of toilets and this obviously implies that the toilets are not enough to accommodate all learners in those schools. This problem is prevalent in African countries as demonstrated by Omolo and Simatwa (2010:641) in their study where they observed that in Kenyan schools only 2 schools (6.67%) complied with the requirement that one toilet be made available for the use of 30 or a fewer number of students.

Another concern about sanitation is that school toilets are not cleaned for use by learners. Elsewhere, a study conducted by Morebodi (2006:102) reveals that the toilet facilities of one school in a rural area were in a poor state. Silo (2013:5) confirms this problem by revealing that teachers and learners in Botswana schools were concerned about the environmental health status of their schools with emphasis on toilet sanitation. The problems were specifically compounded by poorly maintained and inadequate toilets, poor utilisation of toilets and the shortage of facilities such as girls' sanitary bins, toilet paper and gloves for picking up litter around the toilet area, a practice they felt was highly unsanitary. A gross situation like that can impact on waste management negatively.

According to World Health Organization (2010:32) success in eliminating faecal material from the school environment is dependent on informed and responsible students; supervision of young students; a fence or structure to stop animals from defecating in areas where children play; toilets conveniently located, reliable, clean, odour-free, private, and well-maintained. Being alive to that fact, learners have to be taught and encouraged to practice good hygiene such as washing hands after use of toilets. Schools should provide hand-washing soap in the toilets.

In relation to the latter, it is apparent that waste and sanitation management is a challenge in Botswana schools. On sanitation facilities, it is clear from this exposition that the safety of the school's sanitation and drainage relates to ensuring that there is proper water supply and usage, proper waste and garbage disposal and proper practice of hygiene, something that is still a challenge in Gaborone junior schools. Soares, Almeida, Cerqueira, Carvalho, and Nunes (2012:1), opine that good personal hygiene and sanitary practices at work are an essential part of any programme for food safety.

The study by Omolo and Simatwa (2010) conducted in Kisumu East and West of Kenya involved a sample of 54 secondary school Head Teachers. The study employed both qualitative and quantitative design where qualitative data was analysed on an ongoing process as subtheme and themes emerged. The fact that only principals were included in the sample dictates that the findings cannot be generalised to a wider population.

The study by Silo (2013) was conducted from a sample drawn from 3 primary schools in Botswana. The participants included pupils, teachers and cleaners. The results of the study may not be a true record of Botswana schools as the study was conducted in three primary schools of Botswana but the fact that the data was largely generated from Focus Group Discussions, observation and semi structured interviews might also have influenced the results. A mixed method approach might have yielded convincing results. Since Silo’s study only deals with three primary schools and there is high propensity that his work is biased, it is necessary to undertake this study on Occupational Health and Safety practices and management in junior secondary schools.

2.7.3 Food safety in schools

Food safety is an issue that draws the attention of Education departments in most parts of the world. As a matter of fact, meals prepared in schools should be healthy to avoid risks related to food-borne disease. Food safety is a critical component of sustainable development (Zanin, Cunha, Rosso, Capriles & Stedefeld, 2017: 53). However, if food is not handled hygienically, it could be a medium for disease transmission (Mensah, Mwamakamba, Mohamed, & Nsue-Milang, 2012: 6319). Cognisant of this fact, Baş, Ersun, and Kıvanç (2006:317) observe that the increasing number of food poisoning outbreaks and food related scares has led to calls for better hygiene. Current evidence on the effectiveness of food hygiene training is limited.

One good practice according to Soares *et al.* (2012:211) is the availability of wash bins as a way of ensuring good hygiene since failures in hygienic procedures have been associated with food-borne disease outbreak. The hands of food service employees can be vectors in the spread of food-borne diseases because of poor personal hygiene or cross contamination. This suggests that the school community should be made aware of those practices if schools are to maintain good safety practices.

In addition, researchers have related unhygienic behaviour to lack of training. The findings of the study by Baş *et al.* (2006:321) demonstrates that food handlers in food businesses lack food safety training. The findings further reveal that a general negative attitude towards correct handling of food, safe storage practices and cross-contamination control were found among food handlers.

A study conducted by Soares *et al.* (2012:211) indicates that almost all respondents claim they wash their hands before using gloves and answered correctly that washing hands before work reduces the risk of contamination. The study further highlighted practices that may negatively impact food safety, such as absence of disposable soap, towels and lack of exclusive wash areas for hand hygiene. This study also recorded awareness and hygiene practices among the selected school's cooks. In addition, Sani and Siow (2014:212) report that the majority (98.2%) of respondents knew that it was necessary to always wash their hands when handling foods and avoid touching

their body parts after washing their hands (92.9%). About 97.3% stated that they knew washing hands properly reduces the risk of contamination.

Baş *et al.* (2006) conducted their study in different organisations such as hospital food services, catering establishments and school food services. It employed questionnaires and interviews. On the other hand, the study by Soares et al. (2012) was a descriptive cross-sectional study in 90 public schools in north east Brazil. Sani et al (2014) study was a mixed method study with questionnaire as the main tool collection which was conducted at the university. The study was conducted in a university and cannot be generalized to a wider population.

Table 2-1: Summary of Journal articles on Occupational Health

Authors and dates	Key aims and objectives	Main findings	Review
Morebodi, 2006, South Africa	Sanitation conditions in Taung primary schools	Dirty and unsafe toilets pose physical, and health hazards to all people who use them at schools	Qualitative design only
Silo, N. (2013). Botswana.	Sanitation Management in Botswana schools.	Toilet sanitation is neglected in Botswana schools.	Nothing was mentioned regarding analysis
Omolo and Simatwa (2010). Kenya	Strategies of enhancing safety policies in Kenya	Toilet facilities not enough for the number of learners	Small sample size and only principals included in the population. Qualitative design employed
Soares, Almeda, Cerquera and Canvalho, 2012. Brazil	The aim of this study was to evaluate the level of knowledge, attitudes and practices in food safety and the presence of coagulase-positive staphylococci species on the hands of food handlers in the municipal schools of Camaçari, Bahia in northeast Brazil.	Almost all respondents claimed that they washed their hands before using gloves.	
Sani and Siow 2014. Malaysia.	The study was conducted to determine the level of knowledge, attitudes and practices of food handlers in food service operation at the main campus of Universiti Kebangsaan Malaysia (UKM) regarding food safety.	Personal hygienic practice is extremely vital to ensure production of safe food to consumers.	Mixed method conducted in the main campus of the university. Therefore, the results cannot be generalized to a wider population.

2.7.4 Ergonomic and psychosocial conditions and their impact on health and safety of the environment

This section deals with the ergonomic and psychosocial conditions in Botswana schools.

2.7.4.1 Ergonomic situations in Botswana junior schools

The practical aims of ergonomics are the efficiency and safety of man-machine and man-environment combinations, together with the welfare and satisfaction of the people involved (Jerie, 2012:282). However, there are dissenting views on the definitions of safety and efficiency. Bradley (2001:275) argues that the widespread use of computers, for all its benefit, has one major drawback which is repeated strain injuries that cause pain and nerve damage to the upper limbs, resulting from repeated stress (such as typing) that are unable to heal properly before re-aggravation occurs. On the same note, Sawyer and Penman (2011:1) acknowledge that prolonged periods of computer use can result in visual, musculoskeletal and psychological problems while the application of ergonomics to computer use can reduce health risks and increase comfort and efficiency.

The maxim “technology has brought more harm than good to human life” is proving to be true in the school environments. This general view is buttressed by Matuku in Jerie (2012:282), where they argue that while industrialisation and innovative technology have their advantages, the other side of the coin is that they bring inherent ergonomic hazards at workplaces. Although they increase efficiency, they equally have the potential to cause painful and sometimes debilitating injuries known as Work Related Musculoskeletal Syndrome Disorders (WRMSSDs). Furthermore, Sawyer and Penman (2011:1) observe that though society is becoming increasingly computerised and learners are pressured to become more computer literate and take up the benefits that technology offers, it is generally acknowledged that prolonged periods of computer use can result in visual, musculoskeletal and psychological problems. One wonders if the school community is aware of such issues. Thus, scholars agree that though computers have been the best tech innovation that has happened to human life, it has also brought more harm than good.

This study has documented the effects of poor ergonomic practices in Gaborone selected junior schools. The Botswana Secondary Department, through the Ministry of Education Skills and Development, has introduced Computer Awareness for staff and learners which campaign has really benefited most junior schools in the country as learners and teachers who are computer illiterate can learn how to use computers. The innovation is of great benefit as almost every member of the school community can type their work. This is costly though as some of the students and teachers have endured the consequences of prolonged use of computers in Botswana Junior schools and elsewhere.

Another aspect of ergonomics in this study relates to school furniture. The problems of inappropriate school furniture are general but probably still poorly recognised in schools and among politicians who should allocate resources for new school furniture (Saarni, Nygård, Kaukiainen, & Rimpelä, 2007:9). An observation has been made that most of the classroom furniture in Gaborone Junior schools does not promote good sitting posture. The population in Gaborone is rapidly increasing because of urban migration and this has generated overcrowded classrooms with limited furniture which forces learners to share chairs and desks. Sitting in awkward postures may lead to the risk of having Cumulative Trauma Disorder (NOSA, 2012:102). In that regard, the researcher strongly believes that school principals, as managers of schools can provide professional advice intended to improve the conditions of the classroom furniture.

Risks of back pains due to prolonged sitting have been documented (Useh *et al.* 2011:20). Similarly, Ismaila, Akanbi, and Oderinu (2015:2) noted that children spent most of their time in classrooms and yet the effect of the design of school furniture and their behaviour and health received comparatively little attention.

Empirical and well-designed studies have associated inappropriate posture with the necks, upper backs and lower backs getting prone to immediate risk of back injury (Ismaila *et al.*, 2015:2). Similarly, Saarni *et al.* (2007:2) agree that the appropriateness of school furniture showed an increase in neck-shoulder pain (NSP) and low back pain (LBP) among teenagers. A possible factor behind the increased discomfort could be sitting for extended periods in stooped, static or otherwise awkward postures at school (Saarni *et al.*, 2007:3).

The findings of the study conducted by Useh *et al.* (2011:22) reveal that the prevalence of back pain is higher for the neck area (35%) among the studied high school learners from Grade 8-12. The results also indicate that learners of that high school are working in their worst postures for their necks, upper and lower backs therefore placing them at the immediate risk of back injury which might be directly related to the design of school furniture. However, Saarni *et al.* (2007:5) attribute this phenomenon to the sitting posture of the participants as it differs less between genders than height and weight.

Most countries have not considered the ergonomic principles when designing school or office furniture. Ashiedu and Amiebenomo (2013:1) noted that the design and development of carpentry products in Nigeria appears to have been made without due considerations to ergonomic principles which made it quite difficult for efficient, convenient and comfortable use of furniture products without epidemiological disorders. It is evident that the design of school furniture can have negative effects on the health of learners and staff members who use that furniture daily. The resultant effect of using these products for a prolonged period of time includes the development of muscular skeletal disorders, rheumatic pains and back injuries among others (Useh *et al.*, 2011:22).

Thus, in Benin, Nigeria, an analysis was done through Kruskal Wallis Statistics test and basically, the study suggests that furniture products in Benin City (Nigeria) do not use ergonomic principles in the design and development of furniture products. Another study conducted by Ismaila *et al.* (2015:34) also shows that the anthropometric data of pupils in primary schools were probably not used when designing the furniture currently in use. The study further suggests that it is important that if products are to

be designed, they should be based on the anthropometric dimensions of the user population to reduce negative effects on the muscle due to poor sitting postures and reduce neck, shoulder and back pain that may occur.

Apart from sitting in correct posture at school for prolonged periods of time, school children continue to sit during their free time without taking part in any physical activities, therefore leading sedentary, inactive lifestyle that can predispose learners to back and occasional neck pain (Useh *et al.*, 2011:19). A remedy to that is to adapt a school curriculum that encourages physical activity and to encourage schools to pay attention to the design of school furniture.

The findings of Ashiedu and Amiebenomo (2013:3) show that epidemiological conditions suffered by school learners and teachers who make use of furniture products designed without using ergonomic standards for a prolonged period of time had been traced to systems user-unfriendliness. Those researchers further observed that users were forced to use furniture products available to them which amounted to fitting job to man (FJM) which is the Rosicrucian approach as against the recommended norm of fitting man to job (FMJ). It is a humble submission that the furniture in classroom and staffrooms should promote good sitting posture and workers are not supposed to work long hours in the hope of getting overtime allowance as this can impact negatively on their ergonomic status. On that note, Monyatsi and Monyatsi (2007:6) maintain that learners should be provided with desks where they can sit comfortably without being crowded on one desk.

Table 2-2: Summary of Journal Articles on Ergonomics

Authors and dates	Key aims and objectives	Main findings	Review
Useh, Kotsokoane and Masenya, (2011). South Africa.	Investigating the risk of developing back and neck pain	Prevalence of back pain is higher for the neck pain amongst the studied learners.	The study was a quantitative design and the sample size was small/
Ashiedu, and Amiebenomo, (2013). Nigeria.	Creating awareness in the use of ergonomic principle in furniture design.	Furniture products in Benin City (Nigeria) do not use ergonomic principles in designing school furniture.	Study conducted in Benin City therefore the findings cannot be generalised to all parts of Nigeria,
Ismaila, Akanbi and Oderinu. (2015) Nigeria.	To obtain some anthropometric dimensions of pupils in primary schools and examine the likelihood of mismatch between the relevant body dimensions of the pupils with the furniture.	The results of this study show that the anthropometric data of pupils in primary schools were probably not used when designing the furniture currently in use.	The study was conducted in primary schools.
Sawyer and Penman, (2011). Australia	To provide guidelines for healthy computing in an effort to improve comfort and efficiency	Ongoing short educational session's programmes can be valuable in providing information to students about computer related health problems.	The sample size is small
Saarmi et al, 2007	How school children sit during lesson in classroom	There is a mismatch between school furniture and anthropometrics of school children	Small sample size and the use only quantitative design.

2.7.4.2 Psychosocial Safety Conditions in junior schools

Psychosocial conditions refer to learner behaviour towards other learners that can cause physical or psychological hurt or harm to others to the extent that to its victim, schooling ceases to be safe and interesting (Moswela, 2005:29). In this study, the psychosocial safety conditions refer to substance abuse, bullying and other acts of violence that can affect learner's learning ability. Verbal and physical violence at school affect the individuals directly involved, members of the school community who observe the event and others within the larger community. According to Work Safe Victoria (2008:15), risks to psychological and physical health arise from work-related stress, violence, harassment and bullying. Some of the risk factors in the school environment that may lead to psychological harm as highlighted by Work Safe Victoria (2008:15) are:

- lack of control over workload and work demands (such as pressure to work long hours and timetabling issues);
- challenging behaviour of students, parents or colleagues;
- bullying and workplace violence;
- poor leadership skills;
- poor communication;
- lack of clarity around roles, processes and procedures;
- perceptions that processes, such as promotion processes, are not procedurally fair;
- concerns about career development, social status and pay; and
- conflicting demands of home and school.

Safe schools are those in which learners and educators are not subject to physical or psychological abuse, and where they feel secure and peaceful (Neser, 2005:6). This view is shared by Steinberg, Allensworth, and Johnson (2011:1), who believe that quality of relationships between staff and students and between staff and parents strongly define safe schools. Basically, the state of schools should promote a culture and an environment where learning will run smoothly without any disturbances and threats from external forces. For that to happen, literature reveals that proper school management and accountability are key elements to improving school safety.

According to Matsoga (2003:145), for the school to attain its goal of bringing up and equipping learners with necessary life skills all activities have to be guided by clean, transparent leadership style in the school. Mayfield-Harris (2008: 19) states that it has been found that a positive school climate can yield positive educational and psychological outcomes for students and school personnel. Similarly, a negative climate can prevent optimal learning and development. Schools are not immune to acts of violent behaviour. The protection of staff members and learners therefore depends on assessing the potential for dangerous situations and taking steps to counteract them.

Researchers have confirmed an increase in unsafe practices in schools, thus inspiring debates on the role that the school physical conditions have on the psychosocial health and security of learners and teachers in schools. Conversely, Steinberg *et al.* (2011:13) reveal that teachers report problems with violent threats in the school buildings and many report problems associated with gang activity and fights. 60% of teachers further report problems associated with disorder and disrespect. The study further reveals that despite a physical environment that is neat and orderly, students and teachers in many high schools and elementary schools face intermittent threats, and classes are often not conducive to purposeful and productive learning (Steinberg *et al.*, 2011:9).

A study conducted by Nhlapo (2006:9) reveals that safety-threatening situations are becoming a regular occurrence in South African schools, among others, injuries; crime, violence, burglaries and damage to school property are beginning to be reported in both the print and electronic media. Similarly, Netshitahame and Van Vollenhoven (2002:303) reveal other safety threats that were discovered, but not arranged in order of frequency, these included range from continued fights on the school property during class hours and on playgrounds; sniffing of fumes such as glue and benzene; unruly behaviour; weapons such as knives; alcohol abuse; and culminate in learners' belief in witchcraft.

Bullying is a safety threat common in Botswana schools. Physical bullying is common among boys while verbal bullying is common among girls (Mangope, Dinama, & Kefhilwe, 2012:72). Mangope *et al.* (2012:72) confirm that physical and psychological bullying exists in Botswana junior schools and that victims are both boys and girls. Malete (2007:91) reveals that in the context of Botswana, media and police reports as well as reported violence and anti-social behaviours from school system suggest that acts of violence and aggression committed by youth are increasing at an alarming rate. According to Malete (2007:92), there are high rates of serious youth aggression and violence in Botswana and there is need for gathering empirical evidence on the prevalence of violence, aggression and related antisocial behaviour in the country.

Mayfield-Harris (2008:3), on the other hand, notes that schools are confronted with problems of students possessing weapons, involved in gang recruitment and engaged in drug trafficking both as sellers and buyers. Such problems lead to violent acts in schools which might physically or psychologically affect learners or staff members. The same study by Mayfield-Harris (2008:63) revealed that students reporting in the school safety revealed that on average, 59% of the students were subjected to being pushed around, having witnessed thefts or vandalism of property, and being verbally or physically threatened. Moswela (2005:32) confirms that victimization is present in most Botswana schools. While the findings revealed that 56% of the respondents do not regard it as a problem, 44% of the respondents who think it is a concern were supported by media reports on unruly student behaviour.

Table 2-3: Summary of journal articles on Psycho-social conditions

Authors and dates	Key aims and objectives	Main findings	Review
Steinberg, Allensworth and Johnson. (2011). Chicago.	The relationships that teachers and school personnel foster with students,	Students and teachers in many high schools and elementary schools face intermittent threats, and classes often are not conducive to learning.	The study conducted in Chicago
Malete, (2007). Botswana.	Investigate factors that impinge upon aggressive behaviours among Botswana youths	Act of violence and aggression committed by youth are increasing at an alarming rate.	Quantitative design only and exclusion of schools in the village.
Mayfield-Harris, (2008). USA.	To find the perceptions of stakeholders concerning school safety in northern Mississippi middle school.	The violence acts in schools affect learners psychologically and physically	The study employed qualitative design, A mixed method design would have been ideal
Liang, Flisher and Lombard, (2007). South Africa	To examine the prevalence of bullying behavior in adolescents in SA schools	The results of this study confirm that bullying is a serious problem in South African schools.	Quantitative design only. The study was conducted in Cape Town and Durban schools only.
Nhlapo, (2006)	Managing school safety in primary schools	safety-threatening situations are becoming a regular occurrence in South African schools,	Small sample size of primary school teachers and the use of quantitative design only.
Mangope, Dinama and Kefhilwe, (2012).	study sought to establish the intensity of bullying and its consequences on students at junior secondary school	Physical and psychological bullying exists in Botswana schools.	Qualitative design and small sample size. .Mixed methods design recommended.

2.8 SAFETY MANAGEMENT

According to Harms-Ringdahl, cited in Ferreira and Van Loggerenberg (2011:26), safety management is the way in which procedures and policies are used in order to control risks. Managing is generally defined in terms of the management tasks and areas, that is, executing such tasks as planning, organising, leading and controlling in such areas as staff affairs, learner affairs, curriculum and teaching affairs, physical facilities, financial affairs and school community affairs (Nhlapo, 2006:41). Thus managing school safety entails executing all the management tasks in so far as ensuring the safety of the school environment by using all resources available to the school (Nhlapo, 2006:41).

Researchers have different perceptions about school safety. A safe school is one that is free from danger and where there is an absence of possible harm, a place where educators and learners may work, teach and learn without fear of harassment, humiliation or violence (Mathe, 2008:22). By extension, schools should be conducive for teaching and learning. According to Srichai, Yodmongkol, Sureephong, and Meksamoot (2013:2), a safe school provides a positive environment, allowing students, teachers, staff and visitors to interact without fear or threats, and in a supportive way to achieve the educational mission of the school while fostering and nurturing personal growth.

Concerning school safety in relation to a healthy environment, McKenzie and Richmond in Morebodi (2006:8) defines it as the physical, emotional and social climate of the school designed to provide a safe physical plant as well as a healthy and supportive environment that fosters learning. Nhlapo (2006:1) believes that a safe school is one that is also free from violence and crime, free from hazards or danger within the school; for instance, secure parameter fencing, safety policies and their enforcement.

Safety in schools should be given priority for effective teaching and learning to take place. Given the substantial challenges of crime and disorder faced by many secondary school teachers, it is not surprising that school safety is a priority for many countries. Children are the most precious resources as they are the future of the state and nation. This is the compelling reason why school safety should be everyone's concern and responsibility (Nhlapo, 2006:40). On the same note, Srichai *et al.* (2013:1) suggest that the school, as one of the principal environments where children spend extensive time during formative years, should be effectively managed.

However, it is shocking to discover that the school environment is not safe. This is evidenced by horrific incidents that are happening to school children lately. For instance, in India, Kumar and Kumar (2004) report in Southern India an incident in which 90 children were charred to death when fire broke out in a kitchen on the premises at a private school and spread to other parts of the school rooms. Furlong and Morrison (2000) in Dunne, Sabates, Bosumtwi-Sam, and Owusu (2010) also reports about the Atkansas (in the USA) incident where eleven and thirteen years old learners opened fire on their classmates at the playground, shot and killed four girls who declined their love proposals (Onderi & Makori, 2013:71)

In Kenya, the study conducted by Ruto (2009:177) on sexual abuse reports on the infamous St. Kizito incident where 70 girls were raped while 19 others lost their lives when their male peers descended on them during what was supposed to be a school strike. Several other group sexual violations have occurred. In addition, Matsoga (2003:167) notes that violence is now prevalent in Botswana schools and that means schools are no longer safe and the culture of learning has deteriorated.

Botswana is not an exception regarding school safety. Several unsafe conditions have been highlighted and documented. A shocking incident was that of the death of nine learners after they drank a poisonous chemical called methanol (Moswela, 2005). Another incident reported by the Midweek Sun Online on the 7th of August 2014 was that of a student at Nata Senior Secondary School who died following a fist fight with a school mate within the school premises. Matsoga (2003:142) reports on incidents where boys in secondary schools sustain injuries because of serious fights.

To fulfill the mission of public schools, Edmondson, Fetro, Drolet, and Ritzel (2007:18) emphasise that schools need to provide an environment that is physically and emotionally safe for all children. However, apart from serious problems faced by selected Gaborone Junior schools, it is observed that most learners in public schools are exposed to dangers such as bullying and verbal abuse which disrupt their learning process. The study conducted by Liang, Flisher, and Lombard (2007:9) confirmed that bullying is a serious problem in South African schools with involvement of 36% of all students. Although, this might be true, it might be a speculation in the sense that the study relied exclusively on self-report measures, which can be subject to deliberate distortion, inattention and faulty recall. Bullying in selected Gaborone Junior schools is just but the tip of an iceberg when looking at other OHS related problem although it compounds safety problems.

Despite efforts made by researchers to sensitise communities about the importance of school safety, some countries still take pride in achieving high academic results as opposed to making efforts to improve school safety. For example, in Thailand, school safety is generally considered a low priority compared to other educational issues. As a result, child injury is common in Thailand, and according to Sitthi-Amorn, Chaipayom, Udomprasertgul, Linnan, Dunn, Beck, and Cox (2006), approximately 6,000 children die from preventable injuries each year (Srichai *et al.*, 2013:1).

In Botswana, Performance Management System (PMS) is used to measure academic performance. Although there are many objectives that should be achieved in the PMS charter, safety management inclusive, more emphasis is put on the academic objective and this puts every school principal under pressure as they must account for the academic results each year. As a result, they concentrate more on initiatives to improve academic results as schools in Botswana are rated according to their academic performance at the expense of safety management. Despite the government's effort through Vision 2016 pillar of "a safe and secure nation," the Ministry of Education Skills and Development still puts more emphasis on attaining high academic results rather neglecting the aspect of school physical environment which is a critical aspect that influences academic results. It is therefore necessary to carry out this study to find ways of encouraging safety management and consequently creating safe environment for learners.

2.8.1 Safety Practices

Occupational Health and Safety practitioners encourage Behavioural Based Safety which is a human behaviour theory designed to decrease school and classroom risks by enforcing safe behaviour and identifying causes of unsafe behaviour (Esau, 2015:23). Basically, staff and learners should understand some of the basic hazards in the school that could endanger their lives. Machabe and Indermun (2013:27) highlight the importance of Health and Safety in the workplace as ensuring that an organisation provides a safe working environment for its employees and to minimise the risk of accidents and injuries. This includes having incident registers and good housekeeping measures such as keeping floors dry and clean and walkways unobstructed which prevents slips, trips and falls.

2.8.2 The physical safety conditions of the selected junior schools and their relationship to safety of learning environment

Safety in schools continues to take the centre stage in most countries of the world. This is indicated by the literature debate, and breadth of discussion, about school safety. The school physical environment encompasses the school building and all its contents including physical structures, infrastructure, furniture, and the use and presence of chemicals and biological agents; the site on which a school is located; and the surrounding environment including the air, water, and materials with which children may come into contact with, as well as nearby land uses, roadways and other hazards (World Health Organization, 2010:1).

The above-mentioned components of the physical environment can be hazardous if not managed properly. That is why Xaba (2006:3) views the quality of the security and maintenance of school buildings and grounds as the most visible aspects of the school's physical environment. It is clear that creating and ensuring school building safety revolves around the physical maintenance of buildings, that is, the repair, replacement and general up keeping of buildings which allows for the continued use of space for its intended purpose and serves as an additional manifestation of governorship (Morebodi, 2006:18). This implies a clean and safe environment that is conducive to education and has security of property, well cared for facilities, furniture

and equipment, clean toilets, water and green environment and absence of harassment (Squelch, 2001138).

A healthy school environment includes the following components: good and safe water supply; ample toilet and washing facilities; adequate sewage disposal; sanitary lunch room facilities and accessories; proper ventilation, heating and lighting; adjustable seats and desks; physical education and recreation facilities and adequate first aid equipment supplies and facilities (Ogonyo, 2012:37). That kind of school atmosphere can straightforwardly develop children's health and effectual learning, thereby contributing to the development of healthy adults as skilled and productive members of society. For that reason, it is of vital importance to keep the school environment safe as it has a great influence on the learner health. World Health Organization (2010:3) highlights the following reasons for keeping the school environment healthy:

- the environment is one of the primary determinants of children’s health: contaminated water supplies can result in diarrheal disease; air pollution can worsen acute respiratory infections and trigger asthma attacks; and exposure to lead, arsenic, solvents, and pesticides can cause a variety of health effects and even death; and
- Children may be more susceptible to the adverse health effects of chemical, physical, and biological hazards than adults.

In essence, the school community needs to be protected from the biological, physical, and chemical risks that can threaten their health, infectious diseases carried by water, and physical hazards associated with poor construction and maintenance practices. Remarkably, some countries in Africa are putting in some means of addressing school safety issues. One example of those countries is Angola, in which the country is just taking actions to materialise the introduction into the school curricula of materials related to disaster management (Bastidas, 2011:13).

Kenya also sets a good example whereby its safety manual and guidelines for public schools has been made by its Ministry of Education and some schools are already implementing the guidelines. For instance, the study conducted by Ogonyo (2012:109) established that 56% of the respondents indicated that the safety standards manual was partially implemented while 22% said that it was fully implemented. However, the study was conducted in only one district in Kenya and only public primary schools were included therefore the findings of the study cannot not be generalised to other districts in the country.

As mentioned above, most school environments present hazardous conditions for both learners and teachers. According to World Health Organization (2010:16), they operate in classrooms, outdoor teaching areas and along busy traffic disturbances. Windows are often too small to provide adequate ventilation, un-serviced fire extinguishers in the laboratories; and often expose learners to risks while in most cases a small entrance door would also serve as the emergency exit. On the same note, Isaiah (2013:1) confirms that the staffrooms and classrooms are congested, very cold during winter and extremely hot during summer. Given the Botswana weather conditions, this echoes the dilemma that Gaborone junior schools are faced with.

The selected junior schools are synonymous with makeshift classrooms as congestion and student over-population is the critical characteristic. According to Republic of Kenya, 2008 cited by Ogonyo (2012) and Xaba (2006), no meaningful teaching and learning can take place in an environment that is unsafe and insecure to both learners and staff members and this, therefore, implies that it is important that educational stakeholders foster safe and secure school environment. The school buildings and other components of the school such as water as major elements that can be hazardous to learners and staff members are discussed in relation to physical safety of secondary schools.

2.8.3 School Buildings

A school that is well planned and maintained fosters an environment that enables teaching and learning to take place effectively (Chemeli & Mwongeli, 2015:270). In terms of physical concerns of school safety, the school buildings and grounds as aspects of physical environment are commonly discussed. Morebodi (2006), for instance, focuses particularly on the physical and psychosocial environment as aspects of school safety. On the other hand, some researchers define physical issues of safety as violence and bullying. For instance, in most assimilation of school safety information, Steinberg *et al.*, (2011) particularly focus their debates on violence as the central aspect of school safety.

Although a variety of school safety definitions exist, in this study these are hazards related to the physical environment and the social behaviours that exist in schools which might endanger the lives of both learners and staff members. Carter and Carter (2001) in Nhlapo (2006:15) made it clear that creating and ensuring school building safety revolves around the physical maintenance of buildings, that is, the repair, replacement and general upkeep of buildings and allows for the continued use of a space for its intended purpose and serves as an additional manifestation of ownership and caring

A child typically spends about 1300 hours in a school building each year, and teachers and other staff members are there even longer (Jones *et al.*, 2007:1). As a result, school buildings such as classrooms, toilets and dining halls should not pose physical hazards to learners and staff members. Isaiah (2013:2) further contends that the school building is a prominent type of building in which a high percentage of citizens from all walks of life, ethnicity, gender and religious backgrounds spend a large amount of time. Therefore, as one of the primary features where learners spend extensive time, school buildings should be well maintained for the safety of learners and teachers.

Moreover, the physical state of buildings affects the teacher's self-esteem, peer and student teacher interactions, parents' involvement, discipline, motivation and interpersonal relationships (Isaiah, 2013:3). However, in South African schools Xaba (2006:576) identified common safety threats as poor level of maintenance of broken facilities which ranged from broken fence, exposed electrical wiring, damaged verandas, broken window panes, damaged gates, broken and blocked toilets and damaged furniture lying around the school grounds.

School designs that facilitate students' independent navigation within the building foster feelings of safety and confidence (Uline, Tschannen-Moran, & Wolsey, (2008:20). School buildings such as classrooms, laboratories, staffrooms and dining halls should have windows where occupants can open windows and doors to allow fresh air to circulate whenever there is need. Uline *et al.* (2008:14) share the same view by stating that students in classrooms where windows could open have been found to progress seven to eight per cent faster than those with fixed windows.

Most studies conducted reveal that school building or facilities are neglected thus compromising the safety and security of staff members and learners. However, some countries are really working hard towards achieving safety in schools. This is justified by a study conducted by Xaba (2006:571) which indicates that out of the 19 older schools observed, only 7 had buildings with cracked walls, broken doors and exposed foundations whilst newer schools had neat and secure buildings with properly secured and functional electrical cabling as well as proper window panes and fully functional doors. The above evidence implies that if school buildings are not maintained or renovated, that could compromise the safety of staff members and learners in that school.

The above-mentioned study further revealed that the building design has a bearing on the accessibility of the school facilities. In the older buildings, it was found that access was easy and would need a stringent system of control, whilst in the new buildings access control was easy since visitation was channeled to the administration building. Therefore, new schools as opposed to old schools displayed designs exuding a feeling of safety and security. This clearly indicates that the Department of Education in South Africa is moving towards improving the physical safety of its schools. Having

mentioned that, the study further revealed that almost all schools observed were engaged in renovating and securing the building (Xaba, 2006:571).

Isaiah (2013:7) reveals that the state of buildings teachers work in tend to positively influence their level of job dissatisfaction in that staffrooms and classrooms are congested, very cold during winter and extremely hot during summer. As a result, teachers are calling for proper maintenance of the buildings as they are now a source of danger to them and students. Isaiah (2013:8), further indicated that maintenance and refurbishment of the education estate in junior schools is neglected and dilapidated and are in danger to both teachers and students. The results further divulge that in junior schools there were shortage of rooms and specialized rooms such as science laboratories are used as base rooms.

It has also been observed that some school buildings in Botswana are not conducive for learning. A study conducted by Monyatsi and Monyatsi (2007:11) confirms that some school buildings have small windows and there is very little ventilation. Some buildings lack ceilings and when it rains there is a lot of noise leading to the abandonment of teaching. Isaiah (2013:8) reports that teachers noted with concern that in some schools, health hazard materials like asbestos were still being used in classrooms and staff houses which can impact negatively on the health of learners and staff members.

Despite the fact that Isaiah (2013:1) believes that school facilities influence the teaching and learning process and are central concerns of educational planners, many school buildings are in poor condition and present environmental conditions that inhibit learning and pose unnecessary, increased health risks to students and staff (Jones *et al.*, 2007; World Health Organization, 2010; Xaba, 2006). The status of the buildings in terms of walls, windows, ceilings, floors and electric sockets and plugs needs to be investigated to check whether they endanger the life of learners whilst on the school premises.

While there are opposing views concerning windows in school buildings, for instance, some school buildings having windows that open flexibly and some having windows that do not open, it has been observed that some school buildings do not have window panes due to vandalism by learners and this is a health hazard as learners are exposed to harsh cold in winter. This is a common problem in most of the African countries as proved by a study conducted by Netshitahame and Van Vollenhoven (2002:314) which reveals that most South African rural schools surveyed do not have enough classrooms to accommodate all learners. Where classrooms are available, the condition of these classrooms is not safe for the learners. The walls are cracked, windows are broken; floors are in complete dire need for repair and renovations.

The results of the study by Uline *et al.* (2008) was conducted in the USA and only two schools were selected whereby qualitative methods such as interviews, focus groups, observation and photographs were used as data collection tools. Basically, the results of that study cannot be generalized to all schools. The results by Monyatsi and Monyatsi (2007)' study was conducted in primary schools and only photography and literature search were used as method of data collection. This might not be a true picture of the situation in schools. Triangulating the data might have yielded better results.

The findings by Xaba (2006) might not provide a true picture of the physical safety conditions and cannot be generalized to all schools because the study was conducted in the 23 primary and 12 secondary schools of Sedibeng District of Vaal Triangle and was purely qualitative with observation and photography as the main source of data collection approach, coupled with informal interviews with school principals. The study by Netshitahame and Van Vollenhoven (2002) was conducted in public schools of Soutpansberg East circuit of Northern Cape where ten principals were sampled as participants. The findings of these studies cannot be generalised to a wider population because of the small sample size. As a result, the findings of the two studies might seem accurate, the result yielded might have been influenced by the fact that both studies were purely qualitative and may be the use of mixed method and an inclusion of learner's opinions in the studies would have added weight to the findings of the studies.

The study by Isaiah (2013) had a sample of 225 teachers from junior schools in the South Central region and the quantitative design was employed where data was analysed statistically. Although this might be a true reflection of the facilities situation in Botswana, it might not necessarily provide a true picture of the conditions in Botswana junior schools. The fact that the study employed a quantitative design which does not really provide the views of participants compromised the findings. An inclusion of other members of the school community like learners and non-teaching staff and the use of mixed method design could have added more weight to the findings.

Morebodi (2006:76) reports that school buildings where observations were made generally did not offer safety and security. The study by Morebodi (2006) was conducted in 12 primary schools in the Taung area in which the design was qualitative and the data was analysed by categorising the data into themes. Whilst the above-mentioned study might be true, the outcome might have been influenced by the fact that the study was qualitative and observation and photography were the main source of data collection and informal conversational interviews. An inclusion of quantitative approach and learners in the study population would have added valued to the findings of the study.

Table 2-4: Summary of journal articles on Physical Safety

Authors and Dates	Key aims and objectives	Main findings	Review
Xaba, (2006). South Africa	Investigate the status of basic features of school buildings.	School buildings that are not renovated or maintained compromise the learners and staff safety.	The study employed qualitative design only, a mixed method design would have been ideal
Isaiah, (2013). Botswana	Explore the effects of school facilities on teacher level of satisfaction.	Maintenance in junior secondary schools is neglected and buildings are dilapidated and are a danger to both students and teachers.	Conducted in one region, employed quantitative design and only teachers were included in the sample.
Morebodi, (2006) South Africa	To investigate school physical safety environments in the Greater Taung Area Project Office in the North-West Province.	School buildings in the sampled schools do not offer safety and security.	The study was conducted in primary schools where a qualitative design was employed. A mixed method approach would have been ideal.
Uline,Tschannen-Moran and Wolsey, (2008).	To examine the link between school building quality and student outcomes through the mediating influence of school climate.	Building conditions and design features reinforce and enhance the social environment of school,	Conducted in two schools in the USA. The study employed qualitative design. A mixed method design is recommended.
Netshitahame, Van Vollenhoven, (2002). South Africa.	To investigate into factors that makes certain schools unsafe for learners when others are safe.	Most schools in rural South African schools are unsafe for learners.	Small sample size and the use of qualitative design. A Mixed method approach would have been ideal.

2.9 COMPLIANCE WITH LEGAL AND GENERAL APPLICATION

The ILO Convention on the promotional framework for OHS recommends a national system that specifies the infrastructure which would provide the main framework for implementing national policy and programmes of occupational safety and health. Accordingly, World Health Organization (1994:4) demands that:

> Governments should ensure the development of necessary infrastructures for effective implementation of occupational health programmes, including occupational health services, research programmes, training and education, information services and data banks. Networking of such infrastructures within and among the countries would substantially facilitate their efforts to implement national programmes.

In addition, the ILO Constitution sets forth the principle that employees should be protected from sickness, disease and injury arising from their employment yet for millions of workers the reality is very different. According to Ibojiemenmen (2007:23), the OHS Act places many duties on the employer. Failure to comply with safety duties and responsibilities are considered criminal offences and as such punishable by penalties or imprisonment or both depending on the severity of such violation.

2.9.1 Emergency Preparedness

Emergency preparedness can be defined as the procedure of ascertaining mitigation or prevention, awareness, response and recovery in case of an emergency. In educational institutions such as schools and preschools, a safe and secure environment is a prerequisite for effective child development as well as teaching and learning (Gathanwa, 2011:1). As mentioned earlier on, there is a paucity of studies

that focus more comprehensively on school safety which include emergency preparedness in Botswana. As a result, little is known about how and to what extent schools in Gaborone are prepared for emergencies and disasters. However, several studies on school emergency preparedness have been conducted internationally (Kano et al, 2007; Ogonyo, 2012).

A study which was conducted by Kano, Ramirez, Ybarra, Frias, and Bourque (2007:415) on the assessment of school preparedness in 83 public elementary, middle and high schools in three districts in Los Angeles County indicated that schools in those districts were prepared for emergencies and disasters. This is justified by the fact that eighty-four percent of respondents said they have a personal copy of their school's current written emergency plan and that all respondents reported that their school has a school safety committee. Most of these committees reportedly include the school principal or assistant principal and teachers as members.

Classrooms and other rooms in the school campus should have emergency exits. Emergency exits according to (Ogonyo, 2012) are essential as they provide alternative exits during emergencies. A study conducted by Gathanwa (2011:52) on an investigation into emergency management preparedness of children shows that a proportion of
78.6% school committees reported having no emergency exits designed to cater for quick evacuation of children and their teachers in cases of emergency. On the other hand, a minor proportion of 21.4% indicated their schools had emergency exits though they were not adequately labelled (82.1%). This proves that schools are still lagging behind the safety precautions by not being adequately prepared for emergencies.

In another study, Ogonyo (2012:93) reveals that 36.7% of the respondents disagreed that all doorways in the school open outwards and are not bolted from outside; 20.4% strongly disagreed while 32.7% agreed and 10.2% strongly agreed. This implied that the safety guideline had been partially implemented in most schools and therefore creating a risky situation to the occupants of such facilities in case of an emergence.

The findings by Kano et al. cannot be generalized because the assessment was conducted within three school districts that are geographically clustered in Los Angeles County. Furthermore, the study does not provide much insight into why there are

differences in the ways school prepare for disasters and the extent to which they are prepared. The study by Gathanwa (2011) was a descriptive design with a sample size of 126 pre-school teachers and 588 school management committees in Thika West District of Kenya. The results of the study might have revealed these trends because the sampled population was from a pre-school in Kenya, purely quantitative and the fact that researcher was working and studying at the same time might have compromised the findings. The findings in the Ogonyo (2012) study excluded opinions of students, parents and other stakeholders (Board of Governors) on the awareness of safety standards and guidelines.

2.9.2 Mode of Emergency Communication

Communication is an important management aspect of safety, especially in terms of emergencies (Nhlapo, 2006:90). A study conducted by Kano *et al.* (2007:410) reveals that nearly all respondents indicated that bells and two-way radios were used in their schools to communicate during emergencies. The use of cell phones, regular telephones, and the intercom system were reported significantly less frequently, except in one district where the use of all the above devices were reported to a similar extent. Computers, cable systems, pagers, and broadcast systems were least mentioned as a mode of emergency communication. In addition, Nhlapo (2006:25) reports that 67.4% of respondents reported that they do have communication strategies while 15.8% indicated that they do not have them, and 12.7% indicated that they were not sure. There were 4.0% respondents who did not respond to this question.

The results by Kano *et al.* (2007) might have been influenced by the fact that the study was conducted in Los Angeles where the awareness of safety is high and the fact that a questionnaire was used as the main source of data collection. Although the second study similarly used a questionnaire as the main data collection instrument, the study population comprised only educators. An inclusion of other stakeholders in the second study would have given the study a different perspective. Furthermore, both studies used quantitative method; a mixed method would have provided more convincing results.

2.9.3 Emergency drills and assembly point

Fremont (2004) and Ronan et al. in Zhe and Nickerson (2007:502) suggest that the threat of crisis events can negatively affect children's anxiety levels and that some children become scared when thinking about natural hazards. Emergency drills are meant to test how effective and how well-known the procedures for various emergencies are, by both staff and learners. Emergency drills may be enacted as well as simulated. According to Visser, in Nhlapo (2006:25) the log book for the recording and evaluation of practice and evacuation drills must be made available at all times. However, the findings by Nhlapo (2006) regarding the extent to which emergency drills or exercises are held regularly to test the effectiveness of the school emergency plans revealed that the majority of the respondents (47.8%) indicated that emergency drills are not held regularly, while 15.8% of respondents indicated that emergency drills are held regularly and 33.9% of respondents were not sure.

Zhe and Nickerson (2007:501) suggest that drills implemented according to best practice can increase learner knowledge and skills on how to respond in an emergency without elevating the anxiety or perceived safety. Although there is a dearth of empirical research about drills, existing research suggests that school community must be prepared to respond to different emergencies and practice drills accordingly. The study conducted by Kano *et al.* (2007:409) reports on frequency of emergency drills conducted at the school site during the prior eight months which varied by type of drills and by school level. Fire drills were conducted most often, followed by earthquake drills and lockdown drills.

Researchers advocate for emergency drills exercises in schools which should include all members of the school community as a way of addressing the above-mentioned challenges. Schools should conduct fire drills several times a year to ensure that everyone in the buildings knows how to respond. The fundamental link between day to day emergency readiness and preparedness cannot be overemphasized. Emergency drills should be designed to deal with multiple hazards and consider unforeseen incidents. According to Tippler, Tarrant, Johnson and Tuffin (2016:550), many emergency preparedness activities undertaken daily around the world have their beginnings in schools. Threats to the safety and security of learners and school

property can arise from natural hazards, for example earthquake, floods and storms or from human actions such as vandalism, arson, and violence (Gathanwa, 2011:1).

Furthermore, schools need to be prepared for such emergency and that can be achieved through emergency drills conducted for staff members and learners. The results by Zhe and Nickerson (2007) and Kano *et al.* (2007) might have been due to the fact that both studies were carried out in primary schools in the United States where safety issues are highly implemented and taken seriously.

2.9.4 Inspection

According to the Factories Act of Botswana Cap (43:01) of 1973, factory inspections should be conducted to ensure good working conditions, safeguard against occupational accidents, diseases and injuries and identify occupational hazards and related risks so as to enable control measures to be put in place. Unfortunately, schools are referred to as non-factories and as such the Factories Act does not cover non- factory offices and premises (Republic of Botswana, 1973). However, research has shown that even places which are deemed as factories, little attention is accorded to the health and safety conditions of those premises and their compliance with statutory safety requirements (Gabe, 2010:17). The lacuna here is that there is no statutory instrument that directly addresses OHS needs of schools in Botswana. Therefore, there is need for the country to increase its pace in ensuring occupational health and safety management in educational institutions if it aims to compete globally with other countries. The absence of standards on which to base compliance with OHS standards in Gaborone Schools is aggravated by lack of statutory OHS provisions directly applicable to schools. Lack of health and safety legislation specifically obliging schools to adapt to health and safety programmes creates problems. According to Yu and Hunt cited by Farmer (2010:11) adherence to OHS standards and regulations may be regarded as an important catalyst to guide the employer in providing a safer workplace. However, it should not be the alpha and omega.

The study conducted by Ogonyo (2012:96) found out that 59.2% of the respondents indicated that frequently schools were inspected by the Ministry of Education officials, 6.1% reported very frequently while 22.4% rarely and 12.2% said very rarely. On the contrary, Omolo and Simatwa (2010:5) found out that in public secondary schools in Kisumu East and West Districts, on safety practices the study found out that regular inspection of the school plant had been implemented by majority of the respondents at least once in the preceding year. Eight schools had not been inspected in the same period.

2.9.5 Fire

Fire is significant threat to school life in Gaborone junior schools because it is used in the kitchen to prepare meals for learners as well as at the Home Economics laboratories for learners to prepare dishes during their practical lessons. The same fire can be hazardous if not used properly or if there are gas leakages in the cylinders. Schools are exposed to risks of catching fire, hence learners and staff members must be made aware of emergency escape plans in case of fire. However, many science and Home Economics laboratories in Gaborone junior schools do not have clear adequate exits to escape in cases of fire emergency. In that case learners cannot be deemed safe in schools. According to NOSA (2012:62), statistics on fires in South Africa show that the country loses millions of Rand every year. This is a clear indication that caution must be exercised when dealing with fire and its appliances and these advocates for training or awareness.

It is very important for the school community to understand and have basic knowledge of fire hazards so that accidents can be prevented. Similarly, if there is fire outbreak, staff members and learners should respond accordingly. Furthermore, post-primary schools are legally obliged to have appropriate first aid firefighting equipment, that is, fire extinguishers and fire blankets to reduce the risk of fire spreading and to plan and provide the necessary measures for the evacuation of staff, students and others in an emergency (State Claim Agency, undated: 43).

According to NOSA (2012:64), there are four classes of fire which include the following:

- Class A - Organic (where ordinary flammable materials like plastic, coal and others are present;
- Class B - Flammable liquids (where flammable liquids, lubricants and gases are present;
- Class C - Electrical (fires of A, B, D type on the presence of live electrical installation; and
- Class D - Metals (fires where metals like magnesium, sodium and others are present.

2.9.6 Fire control systems

Awareness on fire and knowledge and the category of fire will determine which type of fire extinguisher to use as different classes of fire require different types of fire extinguishers. In the event of fire, anyone should be able to contact the fire department quickly. A very important point worth noting is that fire lanes should be unobstructed so that fire fighters can easily have access to the building.

Fire control systems include items such as fire extinguishers, standpipes cabinets, sprinklers and fire hoses (Florida Department of Education, 1993). Post-primary schools are legally required to have systems in place to provide early warning in the event of a fire (Kearns, 2004; 41). According to Scottish Executive (2003:16) the most important feature of promoting safety regarding fire at schools is identifying and managing fire risks. Identifying risks relates to assessing the risk to the health and safety of employees while at work, the health and safety of other persons, in this case, learners, parents and other visitors to the school and recording significant findings of the assessment. The implication here is that schools should have fire extinguishers in place as a way of mitigating or controlling fire risks.

Table 2.5 below outlines the appropriate fire extinguishers for the different classes of fire.

Table 2-5: Portable fire extinguishers for the different classes of fire

Type and colour of marking	Type of fire
Water	Solid combustibles e.g. wood, paper, textiles, and curtains, furniture
Foam	Flammable liquids e.g. petrol, oils, lubricants, paints, alcohol
AFFF (aqueous film forming foam	Solid combustibles e.g. wood, textiles, curtains, furniture and plastics Flammable liquids e.g. petrol, oils lubricants, paints, alcohol
Dry Powder	Flammable liquids and solids e.g. petrol, oils, lubricants, paints, alcohol
Dry Powder (Multi purpose)	Solid combustibles e.g. wood, textiles, curtains, furniture and plastics
Carbon Dioxide	Flammable liquids and solids e.g. petrol, oils, lubricants, paints, alcohol

Source: Adapted from NOSA (2012:64)

A study conducted by Kearns (2004:42) reveals that seven out of sixty-two schools that responded to a questionnaire survey reported that they did not have a fire detection and alarm system installed. Where fire detection and alarm systems were installed, 85% were serviced by external contractors, of these 50% were serviced annually, the remainder were serviced only upon breakdown.

The study further revealed that three out of sixteen field surveyed schools had no emergency lighting in place. Where emergency lighting systems were in place, most schools had them serviced annually by an external contractor. Only one school was carrying out quarterly services in accordance with the recommended code of practice.

Researchers have observed that though most schools do have fire extinguishers, the irony was that most school buildings either have non-functioning fire extinguishers or do not have fire extinguishers at all. In those cases, the physical safety of learners and staff is grossly compromised. Nakitto, Mutto, and Lett (2006) reveal similar results in their study which was conducted in primary schools in Uganda. Nakitto *et al.* (2006:65) reveal that one out of the twenty schools had fire extinguishers. Thus, in case of fire outbreak in schools, learners could be exposed to fire-related injuries.

Basically, the study shows that learners in Kwanape division of Kampala in Uganda attend primary school in unsafe environments that expose them to injury as well as to limited and inadequate access to injury care. The study further reveals that there is no data base for school related injuries, therefore the development of such a database is recommended (Nakitto *et al.*, 2006:66). The study was conducted in 20 schools of Kwanape, Kampala city and it employed quantitative design. 33 head teachers were included in the sample hence the data analysis included frequency analysis. A mixed method design would have yielded better results.

According to the findings by Ogonyo (2012:96), public secondary schools in Marini District partially adhere to safety standards because 40.8% of the respondents strongly disagreed that the school had been fitted with sufficient fire extinguishers while 26.5% agreed the school has been fitted with sufficient fire extinguishers and 6.1% strongly agree. That, according to Ogonyo (2012:114) it implies that safety situation in some schools is wanting.

2.9.7 First Aid and its Equipment

Red Cross Society reports that a First Aid Kit is essential in routine daily life as there are chances that accidents could occur when people least expect them and it is advisable to have First Aid Kit in schools so that students can be equipped to face any circumstances that require emergency evacuation procedures (Ogonyo, 2012:116). Employers have a duty to provide first aid equipment at all places of work where working conditions require it.

Ogonyo (2012:115) reports that 42.9% of the respondents strongly disagreed that the school maintains a school emergency kit, 38.8% disagreed while 16.3% agreed. This implies that the guideline had not been fully adhered to in most schools in Kenya. This is against the safety standards manual guideline that schools must ensure working and adequate First Aid Kit facilities are put in place to provide emergency care in schools. On the other hand, a study conducted by Omolo and Simatwa (2010:641) reveals that there were First Aid kits in 29 schools (96.67%). Only one school did not have First Aid kits in school buildings.

2.9.8 Personal Protective Equipment

Personal Protective Equipment, commonly referred to as "PPE", is worn to lessen exposure to serious workplace injuries and illnesses. These injuries and illnesses may result from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. PPE may include items such as gloves, safety glasses and shoes, earplugs or muffs, hard hats, respirators, or coveralls, vests and full body suits.

According to the General Application Regulations (2007), it is the duty of employers to supply PPE where risks cannot be eliminated or adequately controlled whilst section 13 of the same act places a duty of employees having regard to their training and instructions to make correct use of PPE. In addition, the Occupational Safety Health Administration requires the use of PPE to reduce employee exposure to hazards when engineering and administrative controls are not feasible or effective (Pyrek, 2011:1).

Therefore, Farmer (2010:30) suggests that failure to comply with procedures or safety precautions that is, wearing of correct PPE, should not be negotiable.

The above exposition suggests that employers should ensure that teachers (workers) and learners are provided with personal protective clothing when working in places like laboratories where they are exposed to environmental hazards. A study conducted by Kearns (2004:66) indicates that in the field survey, it was noted that students shared PPEs. This is not acceptable because of the associated hygiene issues and it may also limit the level of protection offered, as the equipment may not be suitable for that individual.

2.9.9 Policy Regulation and Management

According to Netshitahame and Van Vollenhoven (2002:316), the aim of the school safety policy is to guide all stakeholders on implementing safety precautions. The policy provides a framework in which to operate and enable principals to know what they are expected to do in various situations. In the absence of safety mission statements and policies, there is considerable loss of direction and plans which the institution should follow. In view of the latter, Prinsloo and Beckmann in Netshitahame and Van Vollenhoven (2002:316) are of a view that education departments require that each school should have a clear safety programme and policy for learners.

It has been documented that failure to adhere to safety policy can result in serious injuries or loss of life. Reuters (2004) in Ogonyo (2012:27:) reports of an incident in India and China documenting the India school fire of July 2004 tragedy in which 90 children died. The blame was attributed to the school's failure to fully implement safety norms. The school building in this case was overcrowded and had only one exit. There was no emergency door or firefighting equipment.

Omolo and Simatwa (2010:637) report that some safety policies were to a large extent implemented as evidenced by the fact that twenty-eight out of thirty schools had secure fences and gates while a majority of the schools had first aid kits. The study also established that safety policies were implemented to a lesser extent as evidenced by the fact that there was a decreasing trend in conducting fire drills and fire extinguishers.

The findings of the study conducted by Netshitahame and Van Vollenhoven (2002:317) indicate that safety policies and/or rules existed and were applied at 10% of the schools. At another 20%, safety policies existed but were not applied to ensure safety while at 70% of the schools no safety policies or rules existed and nothing was done to ensure safety for the learners in the school property or during official school activities. The study also indicates that most principal interviewed did not have a clear understanding of what is meant by the terms “mission statement and “policies” nor of the importance thereof and that might be the reason why they did not have written safety mission statements and policies for their schools.

On the other hand, Nhlapo (2006:71) reports that a significant number of respondents (67.1%) indicated that there was a school safety policy in place in their schools, about 4.0% of respondents work in schools that do not have a school safety policy and there were 24.2% of respondents who were not sure whether their schools have this document or not. It can be said that most schools adhere to policy by ensuring that there is a school safety policy in their schools whereas the schools that operate without school safety policies can be perceived as being negligent on the questions of school safety

Table 2-6: Summary of Journal articles on Compliance

Authors and dates	Key aims and objectives	Main findings	Review
Omolo, D., & and Simatwa, E. (2010). Kenya.	The extent to which Safety Policies been implemented in Public Secondary schools in Kisumu East and West Districts	The implementation of safety policies was to a large extent satisfactory in most of the public secondary schools in Kisumu East and West Districts.	Small sample size and the use of quantitative design only
Nakitto and Mutto (2006). Uganda.	The study assessed environmental hazards and access to injury care as safety-compromising factors for primary school children.	Almost all the schools sampled did not have fire extinguishers.	The use of quantitative design only. Mixed methods design recommended.
Kearns, A.J. (2004). London.	To assess existing fire safety systems in place.	Majority of the schools sampled did not have fire detection and alarm system in place.	Qualitative design. Mixed methods design recommended
Nhlapo, V. (2006). South Africa.	Communication strategies in Schools	Schools do have emergency communication measures	Only primary schools included in the sample
Wanjuiru, G. (2011). Kenya.	To investigate into strategies are put in place to help reduce risks in preschools.	Majority of schools sampled that most schools adhere to policy by ensuring that there is a school safety policy in their schools	Quantitative design. Mixed methods design recommended
Kano, M., Ramirez, M., Ybarra, W., Frias, G., & Bourque, L. (2007). Los Angeles.	To obtain a baseline assessment of emergency preparedness and SEMS compliance in the schools participating in the project.	The bulk of the sampled schools are well prepared for future emergencies and disasters.	Study conducted in the USA
Ogonyo, (2012). Kenya.	To establish the safety situation in public secondary schools in Marana District, Kenya.	Sampled schools partially adhere to safety standards.	Quantitative design. The use of mixed method is recommended

2.10 STRATEGIES FOR IMPROVING HEALTH AND SAFETY IN SCHOOLS

This section details the strategies that could assist in improving health and safety in schools to create an environment conducive for effective teaching and learning to take place.

2.10.1 Management Commitment

Management involves an individual's efforts to influence the behaviour of others and having responsibility to accomplish an organisation's goals. Managers wield formal authority to direct work, and they are formally responsible for the quality of that work. They lay down goals that represent some level of growth for a particular group in a particular environment like schools. Reese (2015:20) argues that the accountability for work and safety and health falls upon management and management members are the very ones who are responsible for all aspects of safety and health programmers.

The protection of workers from occupational accidents and diseases is mainly management accountability, in comparison with other managerial tasks such as setting production targets, ensuring the quality of products or providing customer services. According to Farmer (2010:29), an integral part of management is their commitment to safety as to ensure that it remains a priority. Management commitment to safety in the organisation addresses all work-related hazards, not only those covered by government standards. Regarding that, Farmer (2010:2) emphasizes that the most frequent method for managing occupational health and safety has been through a control-oriented approach to human resources, one that assumes that workers are motivated to exert only as much effort as is necessary for task completion.

The safety and security of learners is an immediate and time sensitive priority, which can only be addressed through proactive planning and management (Equal Education, 2016:18). As such, it is management's responsibility to employ its legitimate authority to control employee behaviour. All levels of management must make health and safety a priority. Fernández-Muñiz, Montes-Peón, and Vázquez-Ordás (2007:11) concur by

stating that employees' behaviour and involvement in safety activities is positively influenced by the managers' commitment and by the safety management system implemented in the organisation, which in turn, is conditioned by managers' commitment.

Principals, as managers of schools, contribute to a large extent to the safety solutions that prevail in schools. The role of principals and teachers in the implementation of policies and procedures is critical to the successful management of occupational health and safety risk (State Claims Agency, Undated: 23). Reviewed literature indicates that secondary school principals experience multiple challenges which include sponsors interference and intimidation, widespread insecurity issues linked to students' unrest, lack of adequate resources, lack of adequate and qualified teachers and drug abuse as they execute their roles and responsibilities. (Onderi & Makori, 2013:67).

2.10.2 Employee Involvement

Agumba (2013:95) confirms that employee involvement has been a behavioural-oriented technique that involves individuals or groups in the upward communication flow and decision-making process within the organisation. Literature reveals that employee involvement can be the best ingredient for occupational health. People become more committed to actions where they have been involved in the relevant decision-making and are less competitive or more collaborative when they are working on joint goals. When the school community make Occupational Health and Safety decisions together, their commitment to OHS is greater and that would improve the safety of the school environment. Several people deciding together make better decisions than a single person. Moeti-Lysson and Boy (2011:6) state that the best outcomes in Occupational Health Safety come when employees are involved in the process. Low levels of involvement, with safety solely dependent on managers and safety officers, will not win people over to the safety effort. Continuous involvement of all stakeholders is encouraged to assist members to be accountable for their safety actions.

Employees' involvement leads to a reduction in absenteeism and an improvement in workers' satisfaction and motivation, as they feel they are an important part of the organization, and that their managers value their opinions and contributions (Fernández-Muñiz *et al.*, 2007:10). According to Farmer (2010:29), one of the most important indications of a good safety foundation in an organisation is the extent to which employees are actively involved in safety on a daily basis.

Esau (2015:55) suggests that it may be useful to develop management practices that foster employee involvement in health and safety initiatives to ensure the integration of an effective OHSM system. A participative leader seeks to involve other people in the process, possibly including subordinates, peers, superiors and other stakeholders. Machabe and Indermun (2013:27) have the same opinion when they state that Health and Safety should be a joint responsibility between the company, management and employees. However, more often than not, stakeholder's inputs in the day to day running of the school are often overlooked. Machabe and Indermun (2013:27) argue that often times workers' opinions on health and safety are often ignored due to various management styles and lack of an adequate health and safety policy.

It is an appreciated fact that for Occupational Health and Safety practices to succeed in schools, the principal and school management should involve the teachers, non-teaching staff, parents and learners in the planning and implementation of the policies. Basically, this suggests that the school management should try as much as possible to involve staff and learners in the running of occupational health and safety management if they are to succeed. One way of involving them is through communication which indeed is a good safety strategy.

2.10.3 Communication as a Strategy for Improving Safety Management

Communication is a very important tool in any organisation. According to Mostert (2006:24), for employees to perform their work efficiently and effectively, they need to feel that they are given adequate feedback about their work and that they are valued by the organisation. Moreover, Morebodi (2006:22) contends that no comprehensive guidelines are available for school administrators and other health and education professionals interested in addressing the problem of injuries in the school

environment. The same circumstances prevail in Gaborone junior schools. School principals are faced with a challenge in communicating effectively with learners and staff members if they need to maintain good safety management in schools. A better option of targeting the leading causes of injury and prevention could be empowering school administrators and teachers to assess the cause and injuries within individual schools. This proves futile as school principals deal with vast range of issues and face constant pressure of making decisions to ensure the viability of their business.

According to Vecchio-Sadus (2007:1) safety communication comes in varying forms including policies and procedures, performance statistics, hazard and incident reports, workplace induction, risk assessment and training. Safety communication in any organisation is done to advise, inform, and assist in the training. If communication is not done properly there are barriers which could hinder the accurate reception of the intended message. Communication skills in the workplace can be enhanced by solving problems together. This challenge includes viewing each encounter as an opportunity to express more appreciation, and each argument as an opportunity to translate complaints into requests (Vecchio-Sadus, 2007:4). A strong safety message and focus is critical when people are worried about the future and how the business situation may touch them personally (Krause, Groover, Smith, & Apking, 2009:11).

Communication allows people, tasks, processes and systems to interact purposively and co-operatively to achieve health, safety and environment objectives (Vecchio-Sadus, 2007:1). The safety message provides an opportunity to let people know that the organisation really does care about them and to enlist their support in keeping safety and the business on track (Krause *et al.*, 2009:11). To keep workers safe, communication is indispensable.

Workers must be consulted about the prevention of the risks they face. In order to succeed in that, Dasinger, Krause, Deegan, Brand, and Rudolph (2000:11) support the view that employees should be involved in the development of policies and procedures and be included in decision-making which leads to increased loyalty and makes them more supportive of organisational goals and objectives which inevitably leads to increased productivity and better staff morale. This information should be presented in apparent, non-technical language that is easily understood.

2.10.4 Training of school community on occupational health and safety

Provision of safety related training will help make the employee to increase their knowledge about health and safety at work. According to Robotham in Schweitzer (2007), lack of safety education and training can result in high-risk workplace injury and illness which can include pain, suffering, and even death. A key element in effective safety and security and security programme according to Reese (2015:318) is training and education. Training is conducted to respond to gaps in knowledge, to target high risk groups or areas, and to adjust perception of risk (Vecchio-Sadus, 2007:3) Worker orientation and training are an essential part of an effective health and safety program. According to Machabe and Indermun (2013:35), provision of safety related training will help to make the employee to increase their knowledge about health and safety at work.

The purpose of training and education is to ensure that employees are sufficiently informed about the safety and security hazards to which they may be exposed and thus are able to participate actively in their own and their core workers protected Reese (2015:319). Adams, Simms, Chartier, Bartram, and Organization (2009:13) further suggest that the water supply, sanitation and hygiene subject should be included in the curriculum for subjects such as biology and social science. Training allows managers, supervisors and employees to understand safety hazards associated with a job.

The need to give appropriate training in occupational health and safety to workers and their representatives in the enterprise should thus be stressed as a fundamental element of OHS policy, and should be stated explicitly in the policy document (Alli, 2001:36). Because of the importance of occupational health and safety, measures should be taken to include these subjects in education and training at all levels in all trades and professions, including higher technical, medical and professional education. OHS training may include making employees aware of any aspect of the Occupational Health and Safety topic. Sawyer and Penman (2011:1) argue that in the world of computerisation, the awareness and priority given to this important technological consideration will prove advantageous for the schools and the students. Learners should learn the principles of ergonomics that relate to computer use early to prevent future health problems.

A study conducted by Sawyer and Penman (2011:4) indicate that to increase the application of ergonomics in daily computer use in schools, interventions of educational sessions have been conducted. The study further divulges that students and teachers feedback reflect that ongoing, short educational sessions that were conducted, especially in relation to correct posture and the value of stretching can be valuable in providing information to school students about computer health problems and the proper use of computer technology. The study further recommends that efforts must be directed at increasing students' capabilities and knowledge about health- related computer disorders, identifying warning signs and symptoms, and understanding the importance of applying the principles of ergonomics to their work and study place.

Dockrell, Earle, and Galvin (2010:6) reveal that the discomfort which resulted from use of the computer was less during post-intervention than it was during pre-intervention. The study further revealed that intervention had a positive effect on children's posture and that the effect was reflected in all aspects of posture. This clearly shows that improvement in posture can be achieved through education and some changes to computer stations. The results of the two studies might be because the outcomes measures were objectives and specific in nature with little scope for assessor misinterpretation or bias. Inclusion of independent assessor might improve the quality of the studies.

Schweitzer (2007:52) found that safety training meetings occurred at least once each year in 77.9% of the districts and at least quarterly in a third of the districts. There is an indication that the staff in the United State public school do have safety training and this might be seen as best practice. However, the study cannot be generalized to a wider population because the design used to generate data was purely quantitative with questionnaire as the main data collection tool. Therefore, if the same study could have been conducted in a different population it would have yielded different results. A mixed method design might have yielded informative results since the inclusion of qualitative design could provide a clear perception of the stakeholders.

OHS training should meet the needs of all workers, and should be promoted in a manner that is appropriate to national conditions and practice. The idea is to incorporate OHS principles related to the student's need. Schools are facing increasing

expectations and pressures, many of which need to be addressed immediately (Queensland Government, 2011:5). In that regard, it is the thesis of this work that school management should take initiatives to sensitize school community on and equip them with knowledge on issues of health and safety which may come in form of training teachers and learners on how to respond to fire alarm. The school management should not always expect help from outside.

Table 2-7: Summary of Journal articles on Strategies

Authors and dates	Key aims and objectives	Main findings	Review
Sawyer and Penman, (2011). Australia.	To provide guidelines for healthy computing in an effort to improve comfort and efficiency	Ongoing short educational session's programmes can be valuable in providing information to students about computer related health problems.	Quantitative design. Mixed methods design recommended.
Dockrell, Earle and Galvin (2010). Ireland.	Assess effects of an ergonomic intervention on the posture and discomfort of a primary school child.	Improvement in posture can be achieved through education and some changes to computer stations.	Quantitative design. Mixed methods design recommended.
Kano, M., Ramirez, M., Ybarra, W., Frias, G., & Bourque, L... (2007) Los Angeles.	Assessment of school emergency preparedness.	All schools report the availability of some kind of communication device for use in an emergency,	Quantitative design. Mixed methods design recommended.
Schweitzer, D.K Ohio, USA.	Practices, challenges, and perceptions of safety climate in public school district foodservice programs	Safety training is done in all the district at different intervals	Quantitative design. Mixed methods design recommended.

2.11 SUMMARY

While occupational health plays an important role in helping create a safe and healthy working and learning environment, it is rarely a core function within schools. Nhlapo (2006:2) argues that school safety is everyone's business. The occupational health and safety gap exists in Gaborone Junior schools. School principals and stakeholders have an important part to play in preventing the health and safety risks of both learners and teachers by fostering promoting good hygiene practices, access to water and sanitation, establishing and managing occupational health services and facilitating conducive teaching and learning environments.

A learner's performance is likely to be influenced by the level of morale and motivation of staff members at their school. According to Onderi and Makori (2013:69), teachers and learners want to feel safe for any effective teaching and learning to take place and therefore a safe environment is critical to successful teaching and learning. Schools should therefore adapt occupational health and safety practices to the constantly changing context and needs of occupational hazards. Putting effort into school health and safety practices demonstrates to staff members and learners that the management cares about their well-being. It is of great benefit to encourage schools to develop a philosophy that promotes health and safety, and to take advantage of the many opportunities that exist to promote and develop health and safety skills and strategies both through the curriculum and good practice. The next chapter deals with research methodology.

CHAPTER THREE.

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

This chapter presents the design and methodology of the study that were used in evaluating the Occupational Health and Safety practices among staff members and learners in Gaborone Junior schools and the strengths and weaknesses of each. It further explains the justification of the methods employed, how the research was conducted and what steps were taken to ensure the reliability and validity of the study.

3.2 STUDY PARADIGM

The study adopted a pragmatic paradigm as the researcher wanted to identify different perspectives on OHS practices and place mixed method information into a robust real-world context. Wilson (2009:279) defines a research paradigm as the norms of a field of a study in which certain researchers work, concerning, inter alia, beliefs about the nature of what is being studied, the kind of knowledge that is possible, and suitable procedures for coming to such knowledge and reporting it. A paradigm is a set of assumptions adopted by a scientific community which define the nature of the world and the place of individuals within it (O'Reilly & Kiyimba, 2015:3). The research paradigm provides an overarching conceptual view, as well as the social and cultural framework for doing research. It also shapes how well we understand ourselves and determines what counts as valuable, legitimate and scientific knowledge.

The pragmatic paradigm pays attention to the research problem rather than method (Creswell and Creswell, 2017). The pragmatist combines the quantitative, qualitative, and photograph observation approaches in order to obtain results that complement each other. The researcher employed quantitative methods to gather and interpret data

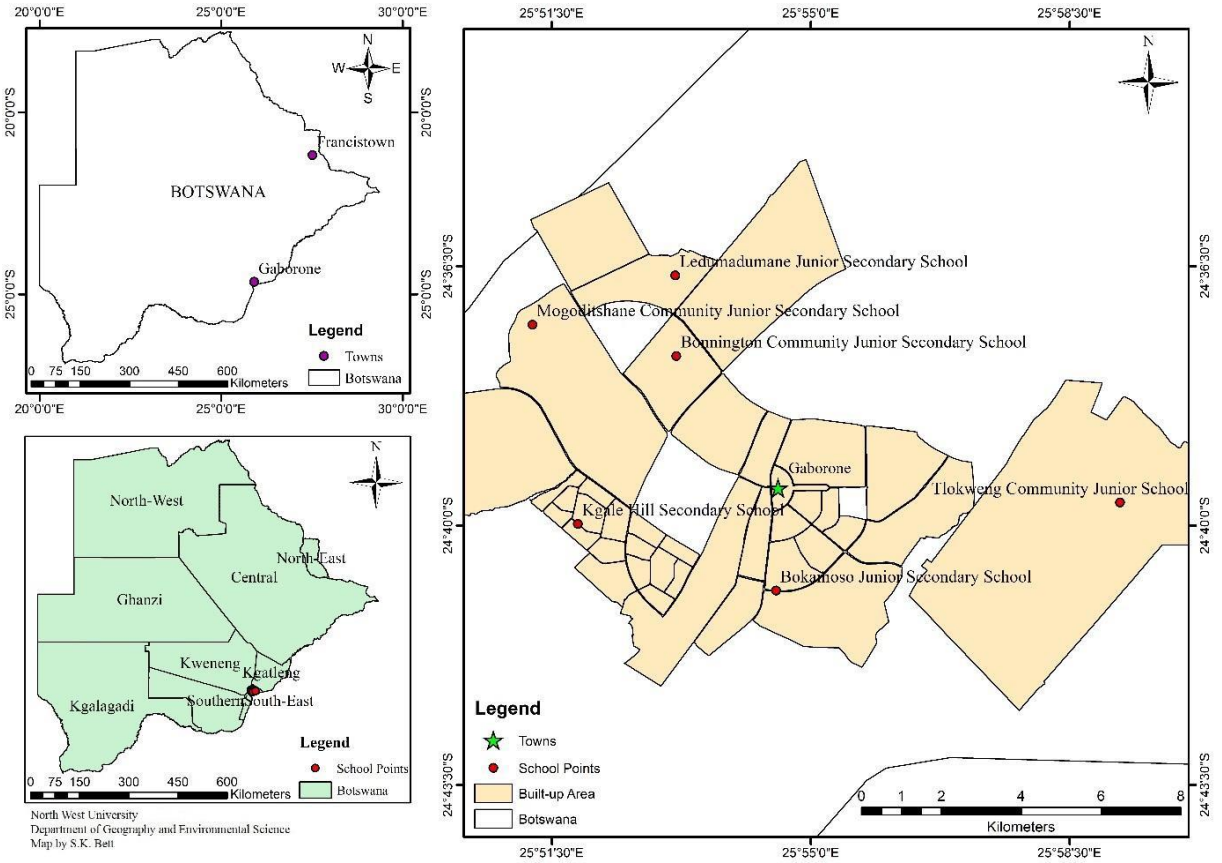
from the teachers and learners. The qualitative method, on the other hand, assisted the researcher to tap into school principals and the experiences of non-teaching and their perceptions regarding OHS in Botswana junior schools. Having realised that there is a comprehensive knowledge of OHS in junior schools, the researcher employed the pragmatic paradigm to help her obtain deeper understanding.

Pragmatism suggests that the overall approach to research is that of integrating data collection methods and data analysis procedures within the research process. Working from this paradigm assisted the researcher to employ multiple methods, different assumptions, as well as different forms of data collection (Creswell,
2014). In this study, the researcher was interested in the staff members and learners' perceptions about OHS practices in their schools hence allowed the researcher to interact with them and get to know their experiences.

3.3 STUDY SETTING

The study was conducted in Botswana which is situated in Southern Africa. The research setting pertains to the place where the data is collected (Polit & Beck, 2009). In this study, data were collected in seven junior schools in Gaborone. Gaborone is the largest city in Botswana, and the capital. The population in Gaborone is approximately 232,000 (Botswana, 2017). Gaborone has fourteen junior schools and only seven schools were selected for empirical investigation. The enrolment is between seven hundred to one thousand learners with staff members ranging from fifty to eighty on average. Figure 3.1 below is a map of Botswana indicating the study area:

Figure 3-1: Map of Botswana indicating the study area



The inclusion of seven junior schools in this study was influenced by the location in terms of traffic, the socio-economic status of family and accessibility. The schools were chosen using convenience sampling technique. Informal contacts were used to find entry to study each school. The description of the study sites includes geographical location, the distance from the main road, the status of the buildings from the researcher's viewpoint, and population of staff members and learner enrolment. Data was collected from staff members and learners from seven government aided junior schools in Gaborone. The fact that the selected schools are government schools implies that most learners are from the middle and low-income classes. All schools had mixed gender learners. The selected junior schools are described in the following paragraphs.

Out of the seven-selected junior schools, six of the schools are situated close to the main road thus exposing learners to physical and traffic hazards.

School "A" is in the western side of Gaborone and many learners come from low income families. The school comprises seven hundred and eighty-nine (789) learners, fifty-nine (59) teachers and seventeen (17) non-teaching staff.

School “B” is in the western side of Gaborone with a majority of learners coming from low income families. It is not situated near the main road and as such learners are not exposed to road safety hazards. The school comprises eight hundred and forty-four (844) learners, fifty-five (55) teachers and sixteen (16) non-teaching staff.

School “C” is in the eastern side of Gaborone with a majority of learners coming from the middle-class families. The school buildings looked new. In terms of enrolment, the school has learner enrolment of seven hundred and sixty-nine (769), fifty-nine teachers (59) and fifteen (15) non-teaching staff.

School “D” is situated in the eastern side of Gaborone with a majority of learners coming from the middle-class families. The school is situated close to the main road but the gate is further away from the main road. It comprises seven hundred and twenty-four (724) students, fifty-eight (58) teachers and seventeen (17) non-teaching staff.

School “E” is situated in the eastern side of Gaborone with a majority of learners coming from low income class families. The school gate entrance is situated next to the busiest traffic lights in Gaborone thus exposing learners to road safety hazards. It comprises of one thousand and eight (1008) learners, eighty-four (84) teachers and nineteen (19) non-teaching staff.

School “F” is situated in the eastern side of Gaborone with a majority of the learners coming from low income class families. The school has an enrolment of nine hundred and ninety-four (994) learners, eighty-three (83) teachers and nineteen (19) non-teaching staff.

School “G” is situated in the eastern side of Gaborone with a majority of learners coming from low income class families. It comprises of six hundred and seventy-one (671) learners and fifty-three (53) teachers, twenty-two (22) non- teaching staff.

3.4 RESEARCH APPROACH

Research approach is the technique employed to structure a study, gather and analyse information in a systematic way (Polit & Beck, 2009). Educational research has been dominated by two main approaches for the past few decades. The trend has been to employ either qualitative or quantitative research approach at a time (Mbengwa. 2010: 115). The two approaches can be mixed together in order to harmonize one another in a mixed methods approach. The current study was guided by the mixed method approach.

3.4.1 Quantitative Approach

Quantitative research is associated with the production of numerical data that exists independently of the researcher (Denscombe, 2014). Quantitative approach is based on a predetermined concept which is tested through a variety of instruments and statistical procedures. To answer the research questions about the safety (physical conditions), occupational health (ergonomics and the psychosocial) and safety compliance aspects of Gaborone junior schools, a quantitative survey was conducted.

3.4.2 Qualitative Approach

Qualitative research allows one to examine people's experiences in detail, by using a specific set of research methods such as in-depth interviews, focus group discussions, observations, content analysis, visual methods and life histories (Hennink, Hutter, & Bailey, 2011). Furthermore, the researcher used this method because it enabled her and the participants to discuss and portray the situations in depth, honesty and in detail. The researcher also wanted to study the school community in their natural setting, to identify how their experiences and behaviours were shaped in the context of their lives (Gray, 2014:166; Hennink *et al.*, 2011:9).

According to Fraenkel (2014:15) and Gray (2009:166), qualitative design is employed so as to gain understanding of situations and events from the viewpoints of participants. In this study, to gain a deeper understanding of the experiences of staff members regarding Occupational Health and Safety management in Gaborone junior schools, the researcher also used such a qualitative design. The researcher got as close as possible to the focus group of teachers, non-teaching staff and principals from the selected Gaborone junior schools to obtain insights into their perceptions regarding the state of OHSM.

The method is best suited to address the above mentioned research objectives because it provides thick descriptions that render a clear and accurate picture of school culture and contributes to the development of general theories about human culture (Drew, Hardman and Hosp. 2008: 185).

3.4.3 Mixed Methods approach

According to Schifferdecker and Reed (2009:637), a mixed method is an approach in which a combination of qualitative and quantitative approaches in a single study are combined in order to obtain and understand the breadth of the area of investigation as well as corroborating results.. Creswell (2009) confirms that the purpose of using mixed methods of research is to provide a better understanding of a research problem or issue than either research approach alone. Thus, in this study, the self-administered questionnaires, interviews, photographic observation data and the focus group discussion were used to collect data, which was analysed, integrated and interpreted to investigate staff members and learners' OHS experiences. The researcher collected this data at the same time and integrated the information into the interpretation of the overall results (Denscombe, 2014). The aim was to gain a comprehensive understanding and corroboration of Occupational Health and Safety issues in schools, while counterbalancing the weakness inherent to use each approach by itself.

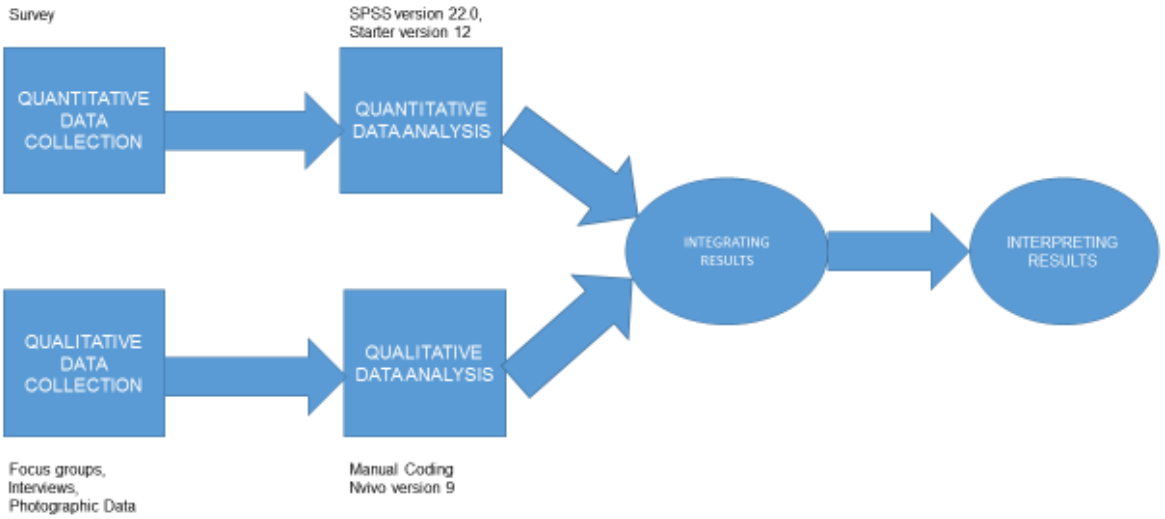
3.4.3.1 Concurrent mixed methods

One of the most advantageous characteristics of conducting mixed method research is the possibility of triangulation. Data collected using the four instruments in this study was used to triangulate the findings. The researcher triangulated data collected so that she could check the extent to which conclusions based on qualitative sources were essentially supported by a quantitative perspective and vice versa (Punch, 2009). The researcher was aware of the weaknesses of each method therefore used mixed methods to corroborate evidence or dismiss it altogether (Johnson & Christensen, 2008). This integration provided additional information where each method was insufficient to probe the perceptions. This helped to get a deeper understanding of the issues that positively or negatively affect safety in Botswana junior schools.

The purpose of concurrent mixed methods was that by integrating the results of quantitative and qualitative data it strengthened knowledge claims of occupational health and safety experiences in relation to the variables that were under investigation thus expanding better understanding in the perceptions of staff and learners about the OHS practices in schools as having an impact on learners and staff members.

The researcher collected data at the same time frame where both quantitative and qualitative approaches were given equal weight. These concurrent mixed data collection strategies were employed to validate one form of data with the other form and to address the different types of objectives (Creswell & Clark, 2007). Quantitative data from questionnaires was used to measure relationship of OHS and variables. Concurrently, staff members' perceptions and experiences were explained through interviews and focus group discussion and photograph observations. Comparison of results from the four data collection methods was done to determine similarities and differences. Figure 3.2 shows the concurrent design employed for this study.

Figure 3-2: Concurrent Triangulation Visual Model



Source: Adapted from Creswell (2007)

Self-administered questionnaire was used as an instrument to collect quantitative data (Appendix G and H). In addition, Focus Group Discussions (FGD) was used to capture the qualitative data required by asking guiding questions (Appendix I), Interviews with principals (L) and photographic data (Appendix 0). In this study, this model was chosen because the researcher collected data during the same time frame. As a result, the data collection process was quicker in concurrent design compared to other mixed methods design, as data from questionnaires and focus group discussions were collected simultaneously which was cost effective. Additionally, the concurrent data collection results in a shorter data collection time period as compared to one of the sequential approaches because both the qualitative and quantitative data are gathered at one time at the research site The two databases were compared to determine if there is convergence, difference or some combination. Both qualitative and quantitative data were given equal weight as they complemented each other. Quantitatively, SPSS (version 22.0) and Stata version 12 were used for data analysis, whereas qualitative data was analysed thematically and by identifying recurrent patterns.

The model generally uses separate quantitative and qualitative methods as a means to offset the weaknesses inherent within one method with the strengths of the other (or conversely, the strength of one adds to the strength of the other). The simultaneous integration for this mixed method resulted in the discussion section where quantitative statistical results are followed by qualitative quotes and vignettes that support or disconfirm the quantitative results.

3.5 STUDY POPULATION

According to Berndt, Petzer, Kotzé, and Higgs (2011:165), population is the total collection of elements about which the researcher wants to make inferences. The population for this study was mainly principals, teachers, non-teaching staff and learners of the seven selected junior schools of Gaborone, as depicted in Table 3.1 below:

Table 3-1: Population of Junior schools selected and its participants

Schools sampled	**No. of all teachers per school**	**No. of all learners per school**	**No. of all non-teaching staff per school**	**No of Principals**
A	59	789	17	1
B	55	844	16	1
C	59	769	15	1
D	58	724	17	1
E	84	1008	19	1
F	83	994	19	1
G	53	671	22	1
Total	**451**	**5799**	**125**	**7**

3.6 SAMPLE SIZE

Sample size was calculated with Raosoft sample size calculator (Raosoft, 2012). This is a computer based technique. The target sample for this study was seven junior schools of Gaborone. The sample size for teachers was calculated by taking the total teacher population, 451 at a 95% confidence thus defining confidence critical limit of ± 1.96. The sample size generated for the teachers was 361. The same procedure was done for non-teaching staff whereby the total population of non- teaching in the sampled schools was 125 at a 95% confidence thus defining a confidence critical limit of ± 1.96. The size generated for this study was 95. For learners, the sample size was calculated by taking the total learners population of 5799 at a 95% confidence thus defining a confidence critical limit of ± 1.96. The sample size generated for this study was 361. Further, upon simulating with large sample of population size, it was observed that from a range of 2000 learners to about 20 000, the recommended sample size computed was 337, and this was deemed suitable for this study which had an aggregate total student population of 2769. Therefore, to define robust representativeness of the learner population in the sample, learners from selected junior schools in Gaborone were randomly selected to participate in this study.

3.7 SAMPLING PROCEDURE

Sampling is the act, process or technique of choosing an appropriate representation part of a population for the purposes of determining characteristics of the whole population**.** Two sampling techniques were used in this study which are stratified random sampling for the quantitative aspect and purposive sampling for the qualitative. The stratified random was employed to select learners, while purposive was employed for the selection of staff members, who were principals, teachers and non-teaching staff.

3.7.1 Stratified Random Sampling

Saunders, Lewis, and Thornhill (2012:276) highlight that stratified random sampling is a modification of random sampling in which one divides the population into two or more strata based on specific attributes. Stratified random sampling was used to select learners to answer questionnaires in this study. The lists of all learners in each of the seven selected junior schools were requested from the area Head of Department. Based on the lists supplied per school, learners were randomly sampled by dividing them into various strata and randomly selecting the final participants proportionally from the different strata. From each school 35 learners were sampled. The total number the researcher targeted was 245 learners, consisting of 35 learners from each participating school, while (10) teachers from each school were purposively selected, suggesting that 70 teachers and 245 learners responded to the questionnaires. Table 3.2 below depicts the stratified and purposive sampling of learners and teachers who responded to the questionnaire.

Table 3-2: Stratified random and purposive sampling

Schools sampled	**No. of all learners per school**	**No of teachers per school**
A	35	10
B	35	10
C	35	10
D	35	10
E	35	10
F	35	10
G	35	10
Total	**245**	**70**

3.7.2 Purposive Sampling

Purposive sampling means that participants are selected based on some defining characteristics that make them holders of the data needed for the study. Johnson and Christensen (2008:180) support aim of using purposive sampling by affirming that it

locates information-rich individuals or cases, that is, those who are likely to be knowledgeable about the phenomena under investigation.

Furthermore, Bryman (2015:418) states that the goal of purposive sampling is to sample participants in a strategic way so that those sampled are relevant to the research questions posed. As such, in this study teachers were sampled because they teach and supervise learners in the laboratories with chemicals and physical hazards, while principals were sampled because as overseers of their schools, the assumption was that they were knowledgeable about chemicals and hazards that the teachers, learners and other staff members face in laboratories. Non-teaching staff were purposively sampled as they worked in areas where they are exposed to hazards and also had practical experiences of the occupational health and safety practices. Principals' inclusion was influenced by their managerial positions in the schools selected, and they were responsible for ensuring the school environments are healthy and safe for school community, while the inclusion of non-teaching staff was influenced by their work as laboratory technicians and cleaners in laboratories exposed to chemical and physical hazards

Table 3-3: Participants selected for focus groups

	Sample size		
Schools	Interviews	Focus Groups	
	(Principals)	(Teaching Staff)	(Non-Teaching Staff)
School A	1	0	0
School B	1	8	0
School C	1	0	0
School D	0	0	0
School E	1	0	8
School F	1	0	0
School G	1	0	0
Total	6	8	8

3.8 DATA COLLECTION INSTRUMENTS

3.8.1 Questionnaire

The researcher distributed seventy (70) questionnaires to the teachers and two hundred and forty-five (245) to the learners. All in all, three hundred and fifteen (315) questionnaires were distributed to seven junior schools in Gaborone. The researcher requested the HOD of each of the sampled schools to appoint a research assistant. The researcher then organised time to provide them with the necessary training for data collection. The research assistants were briefed on the overall design, background information, purpose of the study, questionnaire administration and to guide and develop understanding of each section of these instruments. The briefing helped to explain difficult areas of the topic. The research assistants were also reminded of the confidentiality of the information to be gathered in line with the research ethics that had to be observed.

The seven research assistants facilitated in the distribution and collection of questionnaires from learners and colleagues. They assisted the researcher in selecting the sample of learners in each school. The researcher contacted the research assistants regularly in schools to check progress of participation and to check if they had collected all the questionnaires. The researcher finally collected all the questionnaires, started familiarizing herself with the data and uploaded the data herself to the SPSS version 22 which was installed to her computer.

3.8.2 Format and content of questionnaire

Quantitative data was collected by means of questionnaires. Leedy and Ormrod (2013:191) prefer questionnaire because participants can respond to questions with some assurance that their responses would not come back to haunt them. Furthermore, participants may be more truthful than they would be in a personal interview, especially when addressing sensitive issues. In this study, a self-administered questionnaire was used to collect quantitative data from learners and teachers. Questionnaires carry the assumption that the respondents have the literacy

skills required to complete the questionnaire (Leedy and Ormrod, 2010:191). The researcher adapted a workplace health and safety checklist from Gabe (2010) on Safety-Health and Working Conditions inspections and customized it to schools. Furthermore, the researcher assumed that teachers and learners in Gaborone junior schools were literate and therefore distributed questionnaires which were written in English to gauge their responses or experiences and to determine their perceptions regarding the state of Occupational Health and Safety management in their respective schools.

Each category of participants in the sample was asked the same series of questions and the responses were then organised so that conclusions could be drawn from them. The questionnaire was divided into the following four sections:

Section A: Physical safety conditions of selected junior schools and relationship to safety of learning environment.

Section B: The ergonomic and psychosocial conditions and their impact on health and safety of the environment.

Section C: The occupational health conditions and their perceived influence on the learning environment.

Section D: Strategies of improving OHSM amongst learners and teachers.

Regarding the questionnaires as one of the research instruments used in this study, no translation into another language was done because all respondents were able to read and write in English.

The researcher prepared two sets of questionnaires for learners and teachers. The entire questionnaires were divided into two sections. Section A for learners consisted of three (1-3) questions aimed at gathering biographical information about the respondents. Section B consisted of thirteen (13) questions to gather information about occupational health and safety practices and management in junior schools (See Appendix H).

As for teachers, section A consisted of seven biographical data questions. Section B consisted of thirteen (13) questions. These questionnaires used a five-point Likert-type scale, where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. These were based on the topical issues covering physical conditions, ergonomic and psychosocial factors, and safety compliance aspects (See Appendix G).

The choice of both closed and open ended questions in the questionnaire provided an interface to the respondents in which their feelings and perceptions were respected without fully directing them had the questionnaire been wholly closed ended in nature (McMillan & Schumacher, 2014). These questionnaires were administered to the selected and sampled respondents of the junior schools in the East and West area in Gaborone, Botswana.

3.8.3 Pilot testing

A pilot test is a preliminary test of the researcher's questionnaires (Johnson & Christensen, 2008:18)**.** Pilot testing was done to determine if the study was feasible in terms of availability of participants, time and quality of questions. The purpose of pilot testing was to identify ambiguous items in the questionnaire that needed clarification and ensuring that the questionnaire was measuring the intended constructs (Creswell & Clark, 2007). Before the major study, pilot testing of questionnaires was done at Gaborone junior schools with eight learners and four teachers from junior schools selected, but these did not form part of the major study.

The researcher managed to collect all eight questionnaires from the learners and four from the teachers. No flaws were found from the questionnaire piloted but the pilot test assisted the researcher in determining the amount of time needed to complete the questionnaire which was approximately half an hour.

3.8.4 Interviews

Leedy and Ormrod (2013:190) assert that face-to-face interviews have the distinct advantage of enabling the researcher to establish rapport with potential participants and therefore gain their cooperation. The researcher found interviews as the best tool to use as it helped her gain access to principal's perceptions, exact opinions about construction and Occupational Health and Safety situations in Gaborone Junior schools.

The following challenges were encountered during interviews and tape recording process:

- It was not easy to schedule the interview as the targeted group of principals were school managers and at the time they were busy with the book counting process;
- Some participants were not at ease during the interview;
- Since some of the interviews were conducted during working hours, the participants had to pause at times to attend to official calls which at times derailed the whole process;
- The JC results were released during the data collection process and that affected some participants who ended up withdrawing from the interview.

3.8.4.1 Format and content

In this section, qualitative data was collected through interviews with school principals and focus group discussions with teachers and non-teaching staff. In this study, the researcher developed one set of interview questions. She interviewed both principals and focus groups using the same questions. The interview questions were divided into three sections.

- Section "A" had eight questions based on Physical Safety conditions.
- Section "B" had seven questions based on Occupational health.

- Section “C” had three questions based on Compliance to Safety Standards for photographs observation. In this section, the researcher focused on the following:

  - Conditions of the classrooms, status of chairs and tables
  - School physical conditions
  - Status of fire extinguishers and fore assembly points
  - Safety hazards
  - Emergency equipment
  - Environmental hazards
  - Health hazards.

3.8.4.2 Administration procedures

The researcher drew an interview schedule prior to the interview sessions containing the following: some comments to open the discussion, a possible list of prompts to promote further discussion and some comments to close the interview (Briggs, Morrison, & Coleman, 2012: 252; Saunders *et al.*, 2012: 375). The interviews were semi-structured and these provided principals of Gaborone junior schools opportunity to elucidate and make their observations regarding the state of Occupational Health and Safety management in their respective schools.

The researcher met with Principals to find out the position of the schools regarding OHS practices. The interviews were conducted at times convenient to the participants. Three were conducted in the morning before the school started, one was conducted during school hours and the rest were conducted in the afternoon during study time. All the interviews were conducted at the site where participants worked (Principal Offices).

The researcher audio taped the interviews with some of the principals. According to Drew *et al.* (2008:83), the use of tape and video recording is undoubtedly the most common, accurate and convenient method of recording in qualitative interviewing though these can also be intimidating to some respondents. Participants were made to understand about the tape and video recording process as a method of data

collection and were asked to provide informed consent on its use. The researcher then informed the school principals why she preferred audio-taping as this was beneficial and offered guarantees about participant's rights.

The researcher informed the participants that the audio-taped and video-taped information would be transcribed without using their names or the names of their institutions and that the tapes would be destroyed after the analysis process since the data would be used for academic purposes only. The researcher tried to persuade principals to refer to lived experiences and relate lived instances of the perceptions they shared. Principals were interviewed about the general state of OHSM in their schools because the researcher wanted to understand the deeper perspective that could be captured through face-to-face interaction and observation in the natural setting (Marshal and Rossman, 2011:91) (See Appendix L).

Out of the seven school principals that the researcher had intended to interview, only five agreed to do the interviews as the other principals withdrew because 'some projects' were conducted in their schools and that demanded their full attention. Out of the five interviews that the researcher conducted, only four agreed to be audio taped and the researcher managed to capture and save only four audio taped interviews and one that was recorded in writing by the researcher. However, where the audio interviews could not be saved, a detailed transcript of the interview was kept as the researcher was also writing her notes during the interviews. This assisted the researcher a lot at a later stage during data analysis.

The researcher ensured that the devices were in working order before conducting individual interviews. Although the tape-recorded data allowed the interviewer to capture a lot of the explicit details, she still took notes during the interview as backup evidence. The audio-tape was used for individual interviews whereas video was used for focus groups. The recorded tapes were labelled immediately after the interviews and were later transferred to the laptop.

3.8.5 Focus Group Discussions

The focus group, according to Neuman (2011:459), is a special qualitative research technique in which people are informally interviewed in a group discussion setting. In this study, the focus group discussions were used to collect information from teaching and non-teaching staff regarding their perceptions about OHS practices in their respective schools. A focus group discussion comprising 16 staff members, 8 teachers and 8 non-teaching staff from selected Gaborone junior schools, were conducted.

In this study, the researcher identified two schools in each area for focus group discussions. Each area had its own set of group. The choice of the school was based on the availability of participants at the time of the data collection time. The researcher then organised an interactive group discussion where information was obtained about the participants' different views and opinions related to the themes (See Appendix L and M). The focus group discussions were conducted in two stages.

The first stage involved eight (8) non-teaching staff from the Western schools which was conducted at the school kitchen. Majority of the participants in this group were the kitchen staff since the school kitchens are the most exposed to OHS hazards and therefore the researcher wanted to establish if the kitchens are OHS compliant. The second stage of focus group discussions involved eight (8) teachers from a school in the eastern area of Gaborone.

After agreeing with the Head of Departments (HODs) of the concerned schools about the time and location of the focus group discussions, the researcher then identified the participants who would take part in the focus group discussions. The participants were subsequently informed orally well in time about the date, time and location of the focus group discussions. Written confirmation letters were delivered a day prior to the date for focus group discussions. On the day of the discussions as the participants arrived at the venue they were warmly welcomed. Refreshments were served before the start of the discussions. For each FGD, the researcher introduced participants to the research topic and made them feel comfortable with the topic of discussion. The researcher engaged one research assistant for the focus group discussions who was to video tape the focus group discussions.

For each focus group discussion, the researcher introduced herself to the participants and let them formally introduce themselves to each other. The researcher asked for permission from participants to use the video tape and informed the participants that the purpose for recording the discussions was to capture data as it was not easy to note exactly what the participants said and how they said it. Consent was given by participants to video-tape the discussions. The participants and the researcher then agreed on the ground rules. The researcher led and facilitated the discussions by probing and ensuring that everybody took part in the discussions. Each interview began with open-ended question which linked to the objectives of the study. The researcher further controlled and guided them so that the teachers and non-teaching staff could focus on issues pertaining to their perceptions of OHS practices in schools.

Although the participants in the groups knew each other, the researcher had designed numbers for each participant during the discussion for easy facilitation. Information on the topic, purpose and objectives of the focus group was highlighted. Participants were once again reassured on confidentiality and anonymity. Towards the end of the discussions participants were asked to bring suggestions on how they thought OHS practices in junior schools could be improved. The researcher finally thanked the participants for their time and participation in the discussions. The participants were reminded to keep the discussion confidential. The video-taping process was stopped after exhausting all the views. The duration for both discussions was fifty to sixty minutes.

All the focus group discussions were conducted in the afternoon at convenient places for both groups. At the end of the discussion, the researcher had collected data from eight non-teaching staff from one school in the Western side and eight teachers from one school in the Eastern side. This was a deviation from the researcher's initial plan which was to have two members from both non-teaching and teaching staff from each of the selected schools. The deviation was due to the location and proximity of the sampled schools for accessibility and logistical purposes.

3.8.6 Observation and Photography

Regarding observation and photograph, the researcher focused on the conditions of the classrooms, status of chairs and tables; school physical conditions; status of fire extinguishers and fire assembly points; safety hazards; emergency equipment; environmental hazards; and health hazards.

3.8.7 Photographic data

Photographs of the school physical features were taken prior to distributing the questionnaire and conducting interviews. The photographs were subsequently used to stimulate interviews and were viewed as concretization of the focus group (Gray, 2014). Photographs were appropriate for this study because they allowed the detailed recording of facts, including the presentation of lifestyles and living and working conditions (Gray, 2009). According to Marshall and Rossman (2011; 184), photographs have the unique ability to capture visible phenomena in a seemingly objective manner from the perspective of the observer.

The researcher took photographs of safety hazards, occupational hazards as well as environmental hazards. In supporting the use of photography in qualitative research, Holm (2008:6) asserts that photographs taken by the researcher tend to focus on aspects that the researcher has found interesting, incomprehensible or important in some way. In this study, photographs were taken when the researcher went out to collect the questionnaire from schools. Photographs were used to supplement textual data and also as a tool for eliciting and validating data in interviews. The photographs were observed and analysed in terms of relevant categories that were identified in the literature study.

3.9 DATA ANALYSIS

3.9.1 Quantitative data analysis

Data was analysed using univariate, bivariate and multivariate approaches. Responses collected from the questionnaire were imported into SPSS (Version 22.0) and Strata (Version 12.0). Data were checked for completeness and accuracy. Both descriptive statistics and inferential statistics were used. Quantitative data analysis implies applying data using some statistical techniques to analyse and interpret data (Wilson, 2009). Quantitative research aims at testing hypothesis with numerical values rather than explaining complex phenomena through verbal descriptions.

3.9.1.1 Univariate analysis

The study used frequency, percentages and totals displayed either on the tables or the charts to describe the characteristics of the participants, physical safety conditions, the ergonomic and psychosocial conditions, the occupational health conditions, compliance with international standards and reasons for noncompliance.

3.9.1.2 Bivariate analysis

Pearson's Correlation Coefficient was used to test the association between OH and Safety variables. At bivariate level each dependent variable was checked on its relationship with the outcome variable, and analysis of variance was used in the study.

3.9.1.3 Hypotheses Testing using Multivariate analysis

The following was used to develop the model in this study: binary logistic regression model reporting odds ratio to test the hypothesis in the sampled schools. The following logistic model was developed using Logistic regression: where there is the probability that an event is to occur, and the probability that the event does not occur, the constant term on condition that all other terms in the equation are "**0**", is the odds ratio coefficient

showing the effect of the explanatory variable and is error.

To assess the goodness-of-fit of variables in the model, Hosmer-Lemeshow test was conducted and a **p-value** of more than **0.05** indicated good fit. The significance of each predictor variable in the model was measured and a **p** value was set at **0.05**. The odds ratio (exponential β) was used to explain the probability of an event occurring or not. Coefficients were rounded up to four significant figures.

3.9.1.4 Variables and Measures

- **Dependent Variables**

The two dependent variables were employed as a proxy measure of occupational health in junior schools of Gaborone, Botswana. Waste disposal was used as a variable to find out if the school environment was clean and healthy. These are waste disposal practices which were created as a composite variable for questions: *Do you remove the waste every week of the month? Are bins emptied immediately they are full? Do you make sure that the school environment is free of litter?* The responses were "yes" and "no". These variables were combined to create a composite index having 0, 1 and 2 as the answer. Thereafter, the researcher recomputed the new variable as 0, for all 0 outcome and 1 for either 1 or 2 agreements to waste disposal practice. This generated a waste disposal practice as a dichotomous variable.

Similarly, a safety management indicator was defined using the questions that were asked: Are *floor surfaces in good condition? Do all doors have locks that are in working order? Is there sufficient lighting? Is there a dedicated store room available? Is there appropriate Safety Signage in place? Does the store room provide sufficient space? Is racking provided? Is the store well laid out? Is there good access and way out from the store for the delivery and handling of materials? Are there any portable gas or electrical heaters present?* Using the linear combination, the sum of these variables was computed. Based upon the values that were computed, the mean score was derived. After this, the values that were below the mean were defined as non-compliant and marked 1 and 2 for otherwise to create a dichotomous variable compliance to occupational health standard.

- ***Explanatory Variables***

The variables used for quantitative analysis were created as the composite variables to create indices to hypothesise physical safety conditions, knowledge of emergencies in schools, physical environment status, drug abuse, violence and disorder, psychosocial condition management and ergonomic factors. These variables were derived after linear combination of the individual indicators that was set to understand safety and occupational issues happening in junior schools of Gaborone.

- ***Algorithm adopted to derive the composite index***

Firstly, the linear sum of the variable under each section was computed. Using a score of 100, all the totals falling below 33% were defined as *low, unsafe or worse* and the score between 33% and 66% were defined as *average, moderate and medium* and 66% and higher defined as *safe and high*. However, violence was categorised at low if less than 50 and higher for otherwise. These variables of physical safety conditions were defined as *safe, average and unsafe*. Knowledge of emergency was defined as high, moderate and low; physical environment status was defined as *safe, average and moderate*; Drug abuse was defined as *high, medium and low*; Violence and disorder was defined as *high* if the score was above 50% and low for otherwise. Psychosocial condition management was defined as *better, medium and low*; and ergonomic factors were defined as *worst, average and better*. The measures are as presented in Table 3.1.

Table 3-4: OHS Indicators for model development

Variables	Measures
Number of respondents	
physical safety Condition	Safe
	Average (1)
	Unsafe (0)
Knowledge of emergency Management	
	High
	Moderate (1)
	Low (0)
Physical environment	
	Safe
	Average (1)
	Unsafe (0)
Drug Abuse	
	High (0)
	Moderate (1)
	Low
Violence and Disorder	Low
	Moderate (1)
	High (0)
Psychosocial condition management	
	Better (3)
	Medium
	Low (0)
E**rgonomic Index**	
	Worst (0)
	Average (1)
	Better (3)
Dependent Variables	
Waste Disposals practice-safety index	Yes (1) if practised; No (0) in not
Compliance to occupational health index	Yes (1) if compliant; No(0) in not

3.9.2 Qualitative data analysis

Qualitative data analysis involves the following: organising data and breaking data into manageable units and coding it and searching for patterns. Nieuwens in Maree (2010:99) purports that data analysis is an ongoing and iterative (non-linear) process. The data collection, processing, analysis and reporting are intertwined and not merely a number of successive steps. In short, data analysis is making sense of data in terms of participants' definition of the situation by breaking down data, examining data, noting patterns, themes, categories and scrutinizing so as to draw meaningful conclusions.

Regarding qualitative data analysis, the researcher imported some aspects of the theoretical frameworks that she used in chapter two to analyse the qualitative data. In Maslow's hierarchy of needs, the safety needs and physiological needs were used as analytic tools to locate occupational health and safety practices in the principal and focus group data. The researcher used Maslow's safety needs inductively to identify the safety conditions that can expose learners and staff members to physical risks or injuries. Aspects of the physical conditions such as status of the school buildings and firefighting equipment were used to evaluate the extent to which those aspects could create or reduce physical injury.

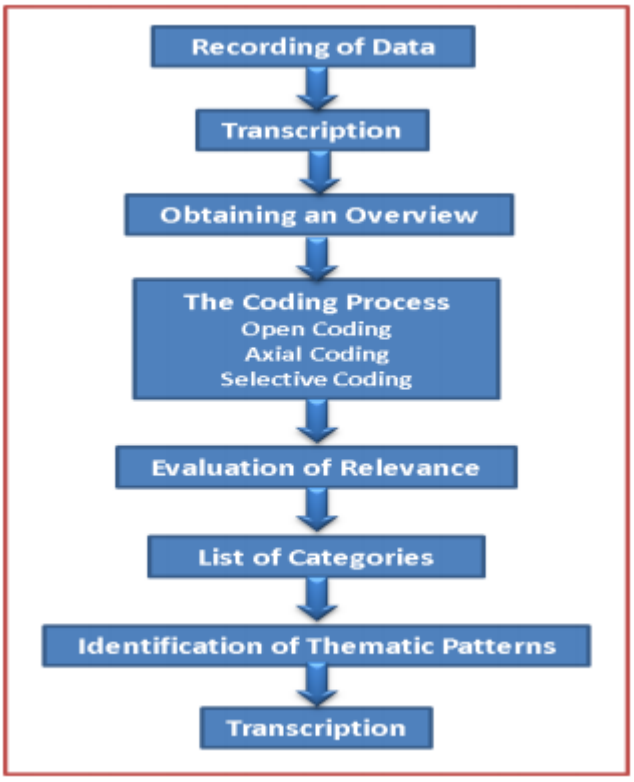
Regarding the physiological needs, the researcher adapted this hierarchy of needs to observe some of the Occupational Health aspects by looking at the activities that the school provides to improve the working conditions of staff members and learners. Conditions such as provision of clean and healthy food, good hygiene practice such as necessary breaks and provision of bathroom facilities for kitchen workers were taken into consideration.

The Health Belief Model was equally used to look through the occupational health aspects in the focus group. The HBM was employed to consider the data aspects relating to food safety and food handling and hygiene practices such as washing hands before handling food, proper food storage and provision of soap and water in learners' toilets for use.

3.9.2.1 Data Analysis Process

The data analysis process aims at making sense of volumes of unorganised data. According to Quinlan (2011), this process encompasses mixing raw data, extrapolating important themes from the data and finally making conclusions on the basis of interpretation. To gain insight into the state of the occupational health and safety practices of selected junior schools of Gaborone, the researcher interviewed five principals and conducted focus group discussions with eight teachers and eight non-teaching staff. The interviews from principals and focus groups from teachers and non-teaching staff were transcribed. Figure 3.3 illustrates the qualitative data analysis process for this study.

Figure 3-3: Qualitative data analysis process



Source: Vosloo (2015:366)

Neumann (2011:518) holds the opinion that no single qualitative data analysis approach is widely accepted, while Schurink, Fouché and De Vos (2011:403) confirms that authors disagree on the description and number of steps the same process of data analysis must take. Therefore, the data analysis process followed in this research was designed exclusively for this study. In view of the foregoing, a qualitative content analysis process as proposed by Creswell (2013:182-188) was used to analyse data. The researcher employed the following qualitative content analysis procedures:

- A digital voice recorder was used for audio recording during the interviews (Principals) while focus groups were captured on video. Notes were taken as a backup for electronic mistakes and errors and to provide the context to the interviews.

- Verbatim transcription of the audio records commenced within a week of the interview. The researcher listened to the recordings three times before transcription in order to acquaint herself with the content. The use of transcription notation symbols, and field notes was used in the case of unclear audio in order to decipher a clear picture as proposed by Henning, Van Rensburg and Smit (2004:76-77). Reliability and validity of the data was safeguarded by presenting the written transcriptions to the participants for verification and ratification.

- The abstraction process of coding began where units of meaning were identified or labelled. According to Henning et al., (2004:104) and Neuman, (2011:510), codes are labels allotted to specific segments of related meaning identified within the field notes and transcripts.

The interview recordings were transcribed and then loaded individually into Nvivo (version 9) qualitative analysis software. The adoption of Nvivo was to enable organisation of data analysis by first disaggregating it into related responses to facilitate coding. Key themes and sub-themes as well as categories and sub-categories were grouped according to codes to identify meaning connections, relationships and trends with the aid of the software. The following three steps were followed in the coding process as described by De Rond and Thiétart (2007:139) and Neuman (2011:510-514), namely: open coding, axial coding and selective coding.

- Open coding: Parts of meanings from field notes and transcripts were identified and named in terms of the research topic. Open coding concentrated on phrasing consistency wording, context, rate, depth of commentaries. Portions of the transcripts and field notes were segmented into meaningful parts, labelled and evidently marked.
- Axial coding: The original codes identified during open coding were reviewed to identify patterns that were organized according to causality, context and coherence.
- Selective coding: This last coding procedure involved careful review of all codes to compare, contrast and link them to the research aim and objectives to establish possible linkages.

The final process involved the evaluation of codes for relevance to the research aim and objectives. The associated codes were listed in categories according to the theoretical review and research aim and objectives. The researcher concluded the qualitative analysis process by sketching the thematic relationships and patterns of relevance to the research. The identified themes were further used as a basis for deliberation, argumentation, reasoning, scrutiny and the construction of syntheses and inferences to develop an Occupational Health and Safety model for Gaborone Junior schools in Botswana.

3.10 RIGOUR FOR EMPIRICAL DATA

Rigor in research is demonstrated through researcher's attention to and confirmation of traits explored in a research undertaking. The goal of rigor in research is to precisely represent study participants' experiences.

3.10.1 Methods used to establish trustworthiness in quantitative research

3.10.1.1 Validity

The quality of research is determined by the validity of the collected data and the results (Creswell & Clark, 2007). Validity was maintained as correct and complete since quantitative data was collected by using a piloted questionnaire. (Creswell and Clark, 2007)

Face Validity

Face validity refers to the relationship (similarities/correlation) between the researcher's description of concepts and his/her description of the categories measured (Lacobucci and Churchill, 2010:257), face validity, was maintained by giving experts in in the OHS Department and an expert in statistics to review the questionnaire. Their comments were incorporated in the final questionnaire to ensure face validity. Some comments required rewording of statements and others were deleted. In addition, most questions on the questionnaire have a logical link with objectives

Content Validity

In this study, content validity was adopted. Content validity refers to the extent to which the theoretical framework is reflected in the individual items in the questionnaire or test items (Thomas, 2009). In this study, the questionnaires and the interview questions were designed on the theory in chapter 2.

Construct validity

Construct validity was also obtained by collecting the completed questionnaires from the participants and the same questionnaire was administered to both teachers and learners to see if they would provide the same responses, the same applied to interviews. The researcher also maintained construct validity by defining and explaining the meaning of the concepts of interest in the study. While every precaution was taken in ensuring validity, it remains impossible for the instrument to be one

hundred percent valid because of standard errors inherent in all measurements (Cohen, Manion, & Morrison, 2013).

Reliability measures the extent to which a research instrument will give the same result, if the study is repeated using the same methods under the same conditions and circumstances, it will yield the same results (Holloway & Wheeler, 2013; LoBiondo-Wood & Haber, 2014 In this study, the questionnaire was pilot tested to ensure reliability so that if reused later in similar conditions the results will be more or less the same. Measures of reliability was achieved by using and distributing questionnaires to teachers and learners from the 7 junior schools sampled and the same results were obtained, similarly to the interview questions of focus groups. Furthermore, adapting standardized checklists adapted from Gabe (2010) for conducting safety, health and working conditions inspections enhanced the reliability and validity of the instrument.

3.10.2 Methods used to establish trustworthiness in qualitative research

3.10.2.1 Credibility

Credibility refers to the quality, capacity or power to elicit belief (O'Leary, 2013:361). According to Hair, Bush and Ortinau (2000:662) credibility is the quality that comes about by developing a final report that is accurate, believable and professionally organised**.** It is the method used to establish trustworthiness through examining the data, data analysis, and conclusions to see if the study is correct and accurate. In this study, the researcher took on the following activities in order to increase probability for the findings to be trustworthy:

- The researcher ensured credibility by showing the summary of the findings to some participants to confirm whether it was a true reflection of their perceptions and experiences

- The researcher prolonged her engagement with the participants so as to learn their traditions and customs and build trust. The researcher spend a good amount of time at the selected junior schools to examine if these schools environments are healthy and safe for the school community.

- The researcher's supervisor persistently observed this research from the proposal stage up to last chapter. He was looking in-depth at all the steps she did in evaluating the occupational health and safety practices and management in junior schools of Gaborone.

- Peer debriefing was also used. The researcher asked her colleague who is a PhD holder and a friend who is a Professor to assist in making sure that she was not using biased opinions about the management of health and safety conditions in junior schools selected. They looked over the study for credibility and determined if the results aligned with the data.

- Finally, the researcher used member checking whereby participants reviewed the data, the analytic categories and the interpretations and conclusions which were all tested by the participants. This allowed the researcher to examine the overall accuracy of the study, and to verify the results.

3.10.2.2 Confirmability

Confirmability is the degree of consistency in the decision made on the data collected, and clearly presenting the evidence that leads to the conclusion made to attain the aim of the study (Holloway & Wheeler, 2013). It relates to the way the researcher document confirmability of findings. In this study, the researcher maintained confirmability by tape recording and video-taping interview and focus group data and transcribing the verbatim without any alteration.

3.10.3 Methods used to establish trustworthiness in both qualitative and quantitative research

3.10.3.1 Triangulation

The purpose of triangulation is to obtain complementary quantitative and qualitative data on the same topic and bring together the different strengths of the two methods (Maree, 2014:39). The use of triangulation in terms of methods and triangulation of sources implied that trustworthiness was guaranteed. Stake (2010:123) maintains that triangulation is a form of confirmation and validation. The use of different methods of collecting data and triangulation of sources guaranteed validity because each method and source complemented the other.

In this study, data was triangulated through different research instruments such as questionnaires, interviews, focus groups, and photographs observations. Questionnaires were distributed to teachers as experts in practical subjects and working in laboratories exposed to chemical and physical hazards, and to the learners doing practical subjects in laboratories exposed to chemical and physical hazards. Interviews were conducted with principals and focus groups of non-teaching and teaching staff because of their experiences and beliefs regarding the state of occupational health and safety management in their respective schools. In addition, field notes as well as the use of tape recording were used to establish trustworthiness of the study.

3.10.3.2 Transferability

O'Leary (2013) defines transferability as the procedure of establishing whether findings and conclusions from a sample, setting or group lead to lessons learned that may be relevant to a larger population, a different setting or another group. Qualitatively, this study is transferable because the researcher provided a detailed description of the study's site, participants and procedures used to collect data, which enables other researchers to confirm that the results of this study can be generalised. For quantitative research, external validity was used to generalize from the research sample to the larger population. Therefore, the researcher examined the sampling techniques to

determine the trustworthiness of her study. She used external validity in the form of statistically confident limits to make reasonably accurate deductions. The researcher looked into factors that could affect external validity and generalisability, like subjects (principals, teachers, learners, and non-teaching staff), situation (healthy and safe schools' conditions), time, intervention (management of school's environment to be healthy and safe), and measures (actions taken by school management regarding safety of learners and staff).

In addition, the researcher ensured transferability by ensuring that the information collected was meaningful and credible so that the users of findings from this study can make valid decisions on the applicability of the results in other similar settings. The results of this study can be transferred to other similar settings in Botswana.

3.11 ETHICAL CONSIDERATIONS

The researcher applied ethical principles and followed legal rules as laid down in the code of conduct and research guidelines and exercised care that the rights of the participants were protected in research and that participants were also protected from harm or risks, as Holloway & Wheeler (2013) suggested. Ethical standards are guidelines that attempt to provide directions for the decision making process and actions involved in conducting research (Lapan & Quartaroli, 2009:3). According to Leedy and Ormrod (2013:104), most ethical issues fall into one of four categories; protection from harm, voluntary and informed consent, right to privacy and honesty to professional colleagues. The proposal, on which this research rests, was reviewed and approved by the Ethics Committee at the North-West University, School of Education Leadership and Development, to ensure protection of the participants. In this study, the researcher adhered to the following standards to avoid violation of participant's rights:

3.11.1 Permission to conduct the study

The researcher sought permission from the University of North- West by filling in ethical form to do the research in the selected schools (Appendix F).

In this study, the researcher complied with the ethical standards outlined by the guidelines of the Ethical Committee of the Faculty of Education at the North-West University which are as follows:

Before the commencement of the study, the researcher requested permission from the Ministry of Education Skills and Development (Research Unit) to conduct research in Gaborone schools (Appendix A).

Sort permission with the school principals of the selected schools (junior schools) to collect data from them, support staff, learners and the Appendix B).

Assured the Research Officer verbally that the final report of the findings would be provided to the office.

The researcher also sought parental consent because some of the participants are learners who are under age (Appendix E).

3.11.2 Anonymity

The participants and the institutions' identity remained anonymous and were not identifiable in the research report as numbers have been used instead of names (Burns & Grove, 2010). As way of adhering to the latter, in this study, the researcher assured participants that names of schools and participants in the study would not appear in the thesis. Regarding pictures and photographs, the researcher asked permission from the principals of the concerned schools to take photographs depicting safety features. The researcher further assured principals that the names of the schools would not be mentioned in the photographs taken and that the pictures would be used for research purpose only**.**

3.11.3 Confidentiality

Hennink et al. (2011) explains confidentiality as a situation where research information is protected by the researcher. It can also refer to the researcher not revealing information that is discussed between the researcher and the participants. However, Hennink *et al.* (2011:70) argue that it is often difficult to assure complete confidentiality in qualitative research because researchers report the study findings and in qualitative research quotations from participants are often included in these reports. In this study, the researcher assured the participants that the information provided by them during data collection will never be linked to them publicly.

3.11.4 Informed and voluntary participation

In this research study, the researcher informed the participants what she was doing and explained about her study before conducting interviews. She then asked for oral consent and permission to use tape recorder during the interviews. The participants were informed that they could stop the interview session at any time and if they feel uncomfortable. As a result, one of the participants did not agree to the tape-recorded interviews hence the researcher just interview that principal orally and noted down the points with that principals' approval. The researcher did the same with the Focus Group Discussions.

Since the study involved learners as participants, permission from parents and legal guardians was sort via their school principals. The researcher did the best she could to inform participants about the nature of the study conducted and gave them a choice of either participating or not participating (Leedy & Ormrod, 2013:105). It has been pointed out by Author, Waring, Coe, and Hedges (2012:35) that the researcher needs to gain voluntary informed consent of all participants in his or her research. Regarding questionnaire for learners, the researcher explained to teachers that only learners whose parents had returned the consent (ascent) forms may be included in the sample.

According to Neuman (2011:52) informed consent is an agreement by participants stating that they are willing to be in a study and that they know something about what research procedures will involve. The primary principle of informed consent according

to Crow et al., in Gray (2009:75) and Ruane (2005:19) means that the research participants are provided with sufficient and accessible information about a project so that they can make an informed decision as to whether to become involved or not.

3.12 SUMMARY

This chapter presented the design and methods used in the study. It also described the study paradigm and setting, population and sampling, research approaches and data collection instruments. The chapter described validity and reliability of the research instruments used to collect data, pilot testing of the instruments, format and content of the research instrument. This was extended and further discussed the procedures followed when collecting empirical data and how data was analysed. Finally, this chapter detailed ethics considered in the study.

The next chapter provides the findings.

CHAPTER FOUR.

QUANTITATIVE RESULTS: TEACHERS' AND LEARNERS' QUESTIONNAIRE

4.1 INTRODUCTION

This chapter presents quantitative results of the study. Two sets of questionnaires were developed for the participants, one for the teachers and the other one for the learners of the selected junior schools of Gaborone. The sample of this section of the study was 70 teachers and 245 learners. From 245 questionnaires administered to the learners, 228 were completed and returned, indicating a response rate of76%. From 70 questionnaires administered to the teachers, 40 were returned and the response rate was 57%. The chapter further describes the Univariate, Bivariate and Multivariate aspects of Occupational Health and Safety factors of the selected schools in Gaborone. The results of the perceptions of the respondents are presented in the following order as determined by the initial objectives:

- The characteristics of the participants and physical safety conditions of selected junior schools in Gaborone.
- The ergonomic and psychosocial conditions of selected junior schools.
- The Occupational Health conditions of the learning environment.
- Compliance with International requirements and determining reasons for non-compliance.
- A model to promote safe school environment and improve OHS management in Gaborone junior schools.

4.2 THE CHARACTERISTICS OF THE PARTICIPANTS AND PHYSICAL SAFETY CONDITIONS OF THE SELECTED SECONDARY SCHOOLS IN GABORONE

4.2.1 Characteristics of the Participants

This section provides information on the demographic characteristics of participants regarding their age, gender, highest qualification and teaching experience.

4.2.1.1 Age of the participants (teachers)

The teacher participants from the selected schools were requested to indicate their ages. From Table 4.1 it was established that 2 (5%) of the participants were between 25 to 30 years old, 9 (22.5%) were between 31 to 35 years, 11 (27.5%) were between 36 to 40 years, 9 (22.5%) were between 41 to 45 years, 6 (15%) were between 46 to 50 years, while 3 (7.5%) were 51 and above. This implies that the researcher selected relevant people for the study, who are knowledgeable about occupational health and safety.

Table 4-1: Age of the participants (teachers)

Age	**Frequency**	**%**
Below 25 years	0	0
25 – 30 years	2	5
31 – 35 years	9	22.5
36 – 40 years	11	27.5
41 – 45 years	9	22.5
46 – 50 years	6	15
51 and above	3	7.5
Total	**40**	**100**

4.2.1.2 Gender of the participants (teachers and learners)

The teacher participants were requested to indicate their gender. As shown in Table 4.2 28 (68%) of the participants were males and 12 (32%) were females, while with learner participants there were 100 (44%) males and 128 (56) females. This implies that information about occupational health and safety from the selected schools comes from both male and female teachers and learners as they are almost equally represented.

Table 4-2: Gender of the teacher and learner participants

	Gender	**Frequency**	**%**	**Total**	**%**
Teachers	Male	28	68		
	Female	12	32		
Learners	Male	100	44		
	Female	128	56		

4.2.1.3 Highest professional/academic qualifications (teachers)

The participants were requested to indicate their levels of education. As reflected in Table 4.3 all teachers in the selected schools are qualified. The qualifications ranged from Bachelor's degree which accounted for 21 (52.5%), Post-Secondary tallied 11 (27.5%), Master's degree had 6 (15%), while those with a PhD were only 2 (5%). This suggests that all of them could provide rounded comments about health and safety in their schools.

Table 4-3: Qualification of the participants (teachers)

Qualification	**Frequency**	**%**
Post-Secondary teaching certificate, diploma or non-degree Equivalent	11	27.5
Bachelor in Education or equivalent	21	52.5
Master in Education or equivalent	6	15
PhD in Education or equivalent	2	5
Other	-	-
Total	**40**	**100**

4.2.1.4 Years of teaching

The participants were requested to indicate the number of years spent in teaching. Table 4.4 shows that all participants were sufficiently experienced as teachers. Majority, 30% had spent between 11- 15 years in education, followed by 1-5 years which tallied 27.5%, then those with 16-20 years' experience adding up to 25% and 6-10 with 17.5%. The inference was that commenting on occupational health and safety was not problematic to them.

Table 4-4: Number of Years in Teaching of the Participants

Years of teaching	**Frequency**	**%**
1-5	11	27.5
6 -10	7	17.5
11-15	12	30.0
16 – 20	10	25.0
Total	**40**	**100**

4.2.2 Physical safety conditions: Respondents both teachers and learners

The participants were requested to respond to questions on the physical safety conditions in their schools. As displayed in Table 4.5, following is the response on physical safety conditions of the selected secondary schools in Gaborone as perceived by both teacher and learner participants. Items analysed include: floors and walkaways being even, intact ceiling tiles, electrical cords and plugs in good conditions and switch boxes being covered.

-

The respondents 'responses on the physical safety condition of selected junior schools as provided in Table 4.5.

The most unsafe physical safety condition as perceived by learners was the condition of ceiling in their classrooms and labs. About 129 learners representing 56.8% reported that Ceilings in classrooms and labs were damaged. Twenty six teachers, representing 65% reported that electrical cords and plugs in their classrooms were not in good condition against 104 learners. Majority of the participants agreed that that floors and walkaways in their schools are even and not obstructed. This means that the schools management does not do renovations regularly for physical safety (45.6%) (See Table 4.5).

Table 4-5: The physical conditions of Gaborone Junior Secondary Schools

ITEMS	RESPONDENTS	YES	NO	TOTAL
		N (%)	N (%)	N (%)
1.Floors and walkways in my school are even and not obstructed	Learners	122 (53.5%)	106 (46.5%)	228 (100)
	Teachers	23 (57.5%)	17 (42.5%)	40 (100)
2. Ceilings for classrooms and labs in my school are intact	Learners	98 (43.2%)	129 (56.8%)	227 (100)
	Teachers	15 (37.5%)	25 (62.5%)	40 (100)
3.All electrical cords and plugs in our classroom	Learners	124 (54.4%)	104 (45.6%)	228 (100)
	Teachers	14 (35.0%)	26 (65.0%)	40 (100)
4.All switch boxes are	Learners	129 (56.6%)	99 (43.4%)	228 (100)
	Teachers	21 (52.5%)	19 (47.5%)	40 (100)

4.3 THE ERGONOMIC AND PSYCHOSOCIAL CONDITIONS SCHOOLS SELECTED

4.3.1 The Ergonomic and Psychosocial Conditions of Gaborone Junior Schools

This section provides the participants' responses on the ergonomic and psychosocial conditions of the selected secondary schools as provided in Table 4.6. Following is the analysis of their responses:

Table 4-6: The Ergonomics and psycho-social conditions of Gaborone Junior schools

ITEMS	RESPONDENTS	YES	NO	TOTAL
		N (%)	**N (%)**	**N (%)**
1.The height of equipment controls or work surfaces are raised to avoid bending postures for standing workers	Learners	97 (42.5%)	131 (57.5)	228 (100)
	Teachers	24 (60%)	16 (40%)	40 (100)
2.Work tables of suitable height for seated learners are provided to avoid too high or low hand positions	Learners	133 (58.3%)	95 (41.6 %)	228 (100)
	Teachers	24 (60%)	16 (40%)	40 (100)
3.Chairs of correct height or adjustable seat for staff members are provided	Learners	169 (74.1%)	59 (22.9%)	228 (100)
	Teachers	21 (52.5%)	19 (47.5%)	40 (100)
4.Chairs with back rest of proper size to support lower back should be provided	Learners	184 (80.7%)	44 (19.3%)	228 (100)
	Teachers	29 (72.5%)	11 (27.5%)	40 (100)
5.Computer chairs in school do have arm rest	Learners	87 (38.2%)	141 (61.8%)	228 (100)
	Teachers	10 (25.0%)	30 (75%)	40 (100)
6.There are cases of alcohol abuse in my school	Learners	130 (57.0%)	98 (43.0%)	228 (100)
	Teachers	31 (77.5%)	5 (22.5)	40 (100)
7.There are often cases of learners smoking cigarettes in my school	Learners	176 (77.2%)	52 (22.8)	228 (100)
	Teachers	35 (87.5%)	5 (12.5%)	40 (100)
8.The use of drugs such as gamma, marijuana and others is a common practice in my school	Learners	137 (60.0%)	91 (39.9%)	228 (100)
	Teachers	29 (72.5%)	11 (27.5%)	40 (100)

74% of the learners and 52.5% of the teachers indicated that chairs of correct height or adjustable seat for staff members are provided. Regarding alcohol abuse and smoking of cigarettes, 57% of the learners and 77% of the teachers indicated that there are cases of alcohol in their schools whilst 77 of learners and 87% of teachers indicated that there are cases of smoking cigarette in their schools.

4.4 THE OCCUPATIONAL HEALTH CONDITIONS OF THE LEARNING ENVIRONMENT

The respondents' responses on the occupational health conditions of selected secondary Schools are provided in Table 4.7.

Table 4-7: Occupational Health conditions of the learning environment

ITEMS	**RESPONDENTS**	**YES** N (%)	**NO** N (%)	**TOTAL N (%)**
1. Do you always clean waste and other unnecessary material from the work room?	Learners	184 (80.7%)	44 (19.3%)	228 (100)
	Teachers	33 (82.5%)	7 (17.5%)	40 (100)
2. Does your school have adequate waste bins for different types of waste?	Learners	76 (33.3%)	152 (66.7%)	228 (100)
	Teachers	16 (40.0%)	24 (60.0%)	40 (100)
3. Are there is proper drainage of waste water in your school?	Learners	97 (42.5%)	131 (57.5%)	228 (100)
	Teachers	25 (62.5%)	15 (37.5%)	40 (100)
4. Are machines and tools in the labs maintained and adjusted to reduce noise?	Learners	141 (61.8%)	87 (38.2%)	228 (100)
	Teachers	1 8(45.0%)	22 (55.0%)	40 (100)
5. Is dust in your school removed using proper material?	Learners	100 (43.9%)	128 (56.1%)	228 (100)
	Teachers	9 (22.5%)	31 (77.5%)	40 (100)
6.Waste in my school is disposed weekly	Learners	118 (51.8%)	110 (48.2%)	228 (100)
	Teachers	15 (37.5%)	25 (62.5%)	40 (100)
7.Waste containers to throw away sanitary pads is provided	Learners	77 (33.8%)	151 (66.2%)	228 (100)
	Teachers	15 (37.5%)	25 (62.5%)	40 (100)
8. Learners in my school use flushing Toilets	Learners	71(31%)	157 (69%)	228 (100
	Teachers	27 (68%)	13 (32%)	49 (100)

80.7% of the learners and 82.5%% of the teachers indicated that they always clear waste and other unnecessary material from the work room.
56% of the learners and
77.5% of the teachers indicated that dust is removed using improper material.

4.5 COMPLIANCE WITH INTERNATIONAL STANDARDS

The participants' responses on the compliance to International Standards of selected secondary schools are provided in Table 4.8.

4.5.1 Responses of compliance with international standards by learners

Table 4-8: Compliance with international standards as presented by the learner

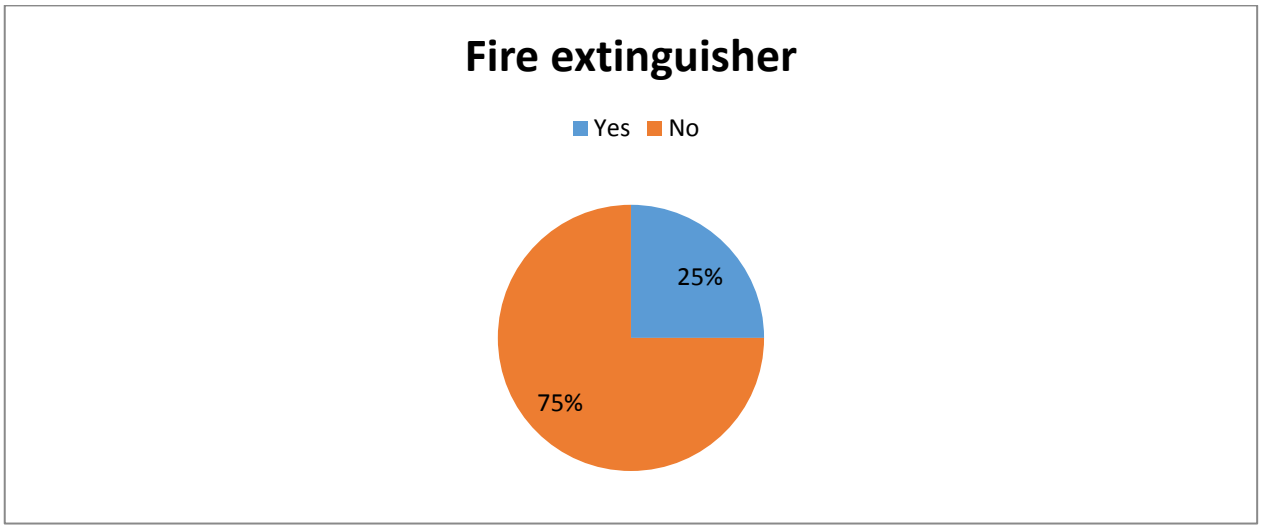
ITEMS	**YES N (%)**	**NO N (%)**	**TOTAL N (%)**
1. All classrooms in my school have two emergency exits with visual emergency signs	29 (12.7%)	199 (87.3%)	228 (100)
2. The escape ways for these rooms are free from obstacles	78 (34.2%)	150 (65.8%)	228 (100)
3. Provision of protective clothing to staff members and learners in my school is enforced	84 (36.8%)	144 (63.2%)	228 (100)
4. Personal Protective Equipment are maintained and replaced regularly	92 (40.4%)	136 (59.6%)	228 (100)
5. Enough appropriate fire extinguishers are provided in my school	75 (32.9%)	153 (67.1%)	228 (100)
6. First aid equipment is provided	152 (66.7%)	76 (33.3%)	228 (100)

87.3% of the respondents indicated that all classrooms in their schools do not have two emergency exits with visual emergency signs. It was quite revealing to identify that 67.1% pointed out that there are insufficient fire extinguishers provided in their schools.

4.5.2 The response on compliance with International standards as presented by teachers: Fire Extinguishers

The respondents' estimation on the clear labelling of fire extinguishers of selected secondary are provided in Figure 4.1

Figure 4-1: Compliance with International Standards as presented by teachers: Fire Extinguishers

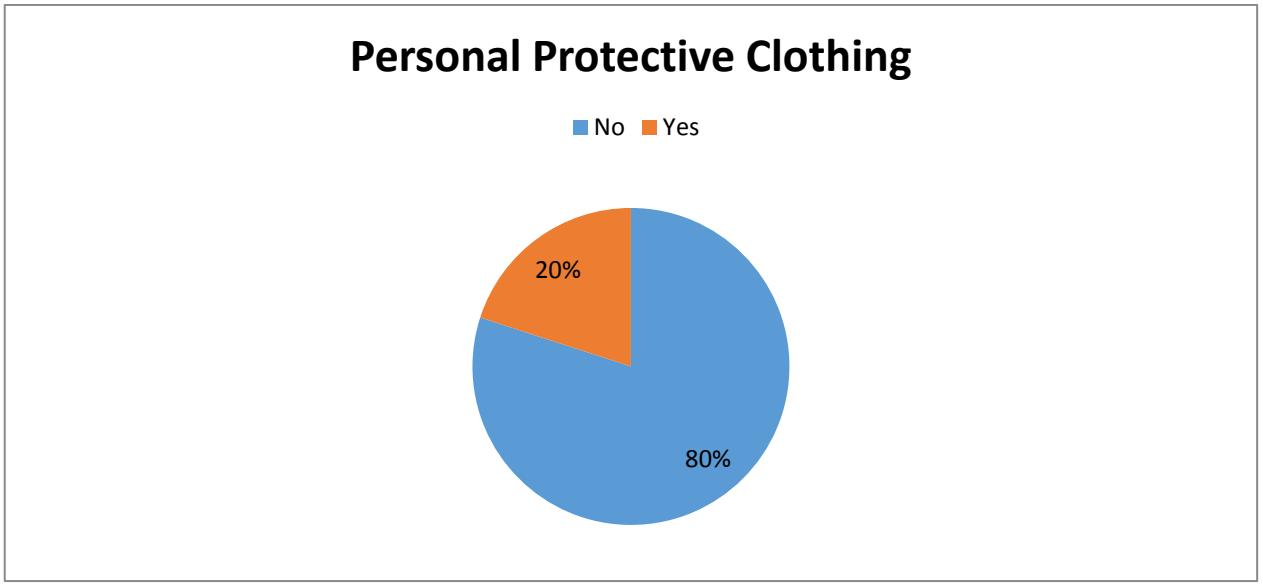


75% of respondents; agree that each fire extinguisher in the school has been clearly marked with the date of last inspection (Figure 4.1).

4.5.3 Response on compliance with International Standards as presented by teachers: Personal Protective Clothing

The respondents' responses regarding personal protective clothing of selected junior schools are provided in Figure 4.2.

Figure 4-2: Compliance with International Standards as presented by teachers: PPE



20% of the teachers reflect enforcement of PPE to teachers by management (Figure 4-2).

4.5.4 Fire Safety Compliance (Teachers)

Responses indicating compliance on fire safety as provided by respondents are provided in Table 4.9.

Table 4-9: Fire Compliance as presented by teachers

ITEMS	YES	NO	TOTAL
	N (%)	N (%)	N (%)
1. Is there an automatic fire detection and alarm system in place?	34 (85.0%)	6 (15.0%)	40 (100)
2. Are there fire hose reels and/or fire extinguishers in place?	28 (70.0%)	12 (30.0%)	40 (100)
3. Is there an emergency lighting system in place?	0 (0.0%)	40 (100.0%)	40 (100)
4. Are fire drills carried out?	0 (0.0%)	40 (100.0%)	40 (100)
5. Is the designated means of escape adequate in the labs or classrooms?	35 (87.5%)	5 (12.5%)	40 (100)
6. Are there maintained exit routes?	36 (90.0%)	4 (100%)	40 (100)
7. Are fire exits free from obstruction?	30 (75.0%)	10 (25.0%)	40 (100)

85.0% of the respondents indicated that there is automatic fire detection and alarm system in place. All the respondents indicated that there are no fire drills carried out and emergency lighting system in place. 75.0% indicated that fire exits are free from obstruction. Systems for communicating emergencies in schools (Safety and Emergency)

Responses indicating the state of emergency equipment as provided by respondents are provided in Table 4.10.

Table 4-10: Safety and emergency communications systems

ITEMS	YES, IN WORKING ORDER	YES, NOT ON WORKING ORDER	NO	TOTAL
	1	2	3	
1.Intercom	0 (0.0%)	0 (0.0%)	40 (100.0%)	40 (100)
2.Loud speakers	5 (12.5%)	0 (0.0%)	35 (87.5%)	40 (100)
3.Telephone	37 (92.5%)	0 (0.0%)	3 (7.5%)	40 (100)
4.Siren	30 (75.0%)	5 (12.5%)	5 (12.5%)	40 (100)

All the respondents indicated that there is no intercom in their schools. About 92.5% of the respondents indicated that there is telephone in their school and is working properly.

4.5.5 Association between levels of students and compliance

Responses indicating association between levels of learners and compliance as provided by respondents are provided in table 4.11.

Table 4-11: Association between levels of students and compliance

		Response				
Compliant Items	Form	Yes	No			p-
Provision of PPE to staff members and learners in my school is enforced	1	37	41			0.012*
	2	36	63			
	3	11	40			
Enough appropriate fire extinguishers are provided in my school	1	33	45			0.036*
	2	24	75			
	3	18	33			
First aid equipment is provided	1	62	16			0.011*
	2	61	38			
	3	29	22			
Learners know what to do in cases of fire	1	43	35			0.06**
	2	32	67			
	3	18	33			
Learners know what to do in cases of armed robberies	1	32	46			0.000*
	2	15	84			
	3	18	33			
All doors have locks that are in working orders	1	10	68			0.000*
	2	40	59			
	3	29	22			
*** p<0.001; ** p<0.05						

Table 4.11 presents the association of perception of learners by form (study level) about provision of PPE, provision of first aid, fire extinguishers. There was significant association between the forms of respondents and the items investigated as shown in Table 4.11.

4.5.6 p-value test on Ergonomic and physical safety conditions as presented by learners and teachers

This subsection presents responses indicating association between levels of learners and compliance as provided by respondents are provided in Table 4.12.

Table 4-12: Ergonomic and physical safety conditions as presented by both learners and teachers

		Response		
Item		Yes	No	p-value
All electrical cords and plugs in our classroom are in good condition	Learners	124	104	0.024**
	Teachers	14	26	
Is there proper drainage of waste in my school?				
	Learners	97	131	0.019
	Teachers	25	15	
All machines and tools in the laboratory are maintained and adjusted to reduce noise	Learners	141	87	0.045**
	Teachers	18	22	
Is the height of work surfaces raised to avoid bending postures for standing workers?	Learners	97	131	0.041***
	Teachers	24	16	
***p <0.001; **p<0.05				

Ergonomic and physical safety conditions as presented by learners and teachers were found to be significant in the ergonomic and physical conditions. The responses on adjustment of machines was near marginal p=0.045.

4.6 A MODEL ON PREPAREDNESS FOR SAFETY AND OCCUPATIONAL HEALTH CONDITIONS

The responses from learners and teachers were computed to derive the composite indices of physical safety condition, knowledge of emergency management, physical environment status, drug abuse, violence and disorder and ergonomic conditions in the schools and tested to detect whether they influence teachers' and learners' preparedness to improve occupational health and safety in selected junior schools of Gaborone. The model on preparedness toward improving safety and occupation health environment across selected junior schools is presented in Table 4.13.

4.6.1 Occupational Health and Safety Indicators

This section presents results of different occupational health and safety indicators, which were tested to indicate the levels of preparedness to safety and occupational health among teachers and learners in Gaborone Junior schools. These indicators include: physical safety conditions, knowledge of emergency management, the status of physical environment, drug abuse, violence and ergonomics.

Table 4-13: Occupational Health and Safety indicators

Safety Indicators	Combined	Western	South East
	N=228	N=64	N=124
Physical safety Condition	%	%	%
Safe	15	15.56	15.27
Average	54	54	53.93
Unsafe	31	30.44	30.8
Knowledge of emergency			
High	14.91	14.89	14.92
Moderate	54.39	54.22	54.45
Low	30.7	30.89	30.63
Physical environment			
Safe	18.42	18.67	18.32
average	69.74	69.56	69.81
unsafe	11.84	11.78	11.87
Drug Abuse			
Low	66.67	67.11	66.49
Moderate	17.54	17.33	17.63
High	15.79	15.56	15.88
Violence and Disorder			
High Low	45.61	46.22	45.8
E**rgonomics**	54.39	53.8	54.6
Worst			
Average	57.02	57.56	56.81
Better	34.65	34.22	34.82
	8.33	8.22	8.38

The model for safety indicators was found to be average when combined and computed separately in areas of physical safety, knowledge of emergency, the physical environment. The abuse of drug was quite low in the schools studied, while violence was high. The state of ergonomics was less than average (see Table 4.13).

4.6.2 Logistic regression and indicators by location

Responses indicating association between levels of learners and compliance as provided by respondents are provided in Table 4.14.

Table 4-14: Logistic regression model and preparedness for safety by location

	Western	South East
Factors	OR (95% CI)	OR (95% CI)
Physical Safety Condition		
Safe	1	1
average	14.9(3.11-27.5)**	11.98(4.58-31.3)***
Unsafe	1.07(0.22-5.14)	0.85(0.32-2.25)
Knowledge of emergency		
High	1	1
Moderate	0.35(0.12-0.97)**	0.45(0.25-0.82)**
Low	0.31(0.11-0.89)**	0.37(0.19-0.69)**
Physical environment		
Safe	1	1
Average	0.54(0.24-1.19)	0.55(0.39-0.92)**
Unsafe	0.22(0.07-0.66)**	0.22(0.11-0.43)***
Drug Abuse		
High	1	1
Moderate	2.18-0.96-4.93)*	2.23(1.34-3.7)**
High	2.32(0.91-5.89)*	1.99(1.11-3.55)**
Violence and Disorder		
High	1	1
Low	0.55(0.31-0.95)**	0.55(0.39-0.79)**
Ergonomic Index		
Better	1	1
Average	0.85(0.45-1.55)	0.89(0.61-1.3)
Worst	0.28(0.10-0.79)**	0.26(0.13-0.49)***

Location of the school was found to significantly affect almost all the safety indicators, except for average rating of ergonomic indicator and unsafe physical condition (Table 4.14).

4.6.3 Multivariate logistic regression model of preparedness for safe schools in Gaborone.

The pictorial representation of multivariate logistic model of preparedness for safe conditions in junior schools is presented in Figure 4.3.

Figure 4-3: Multivariate logistic regression model of preparedness for safe schools in Gaborone

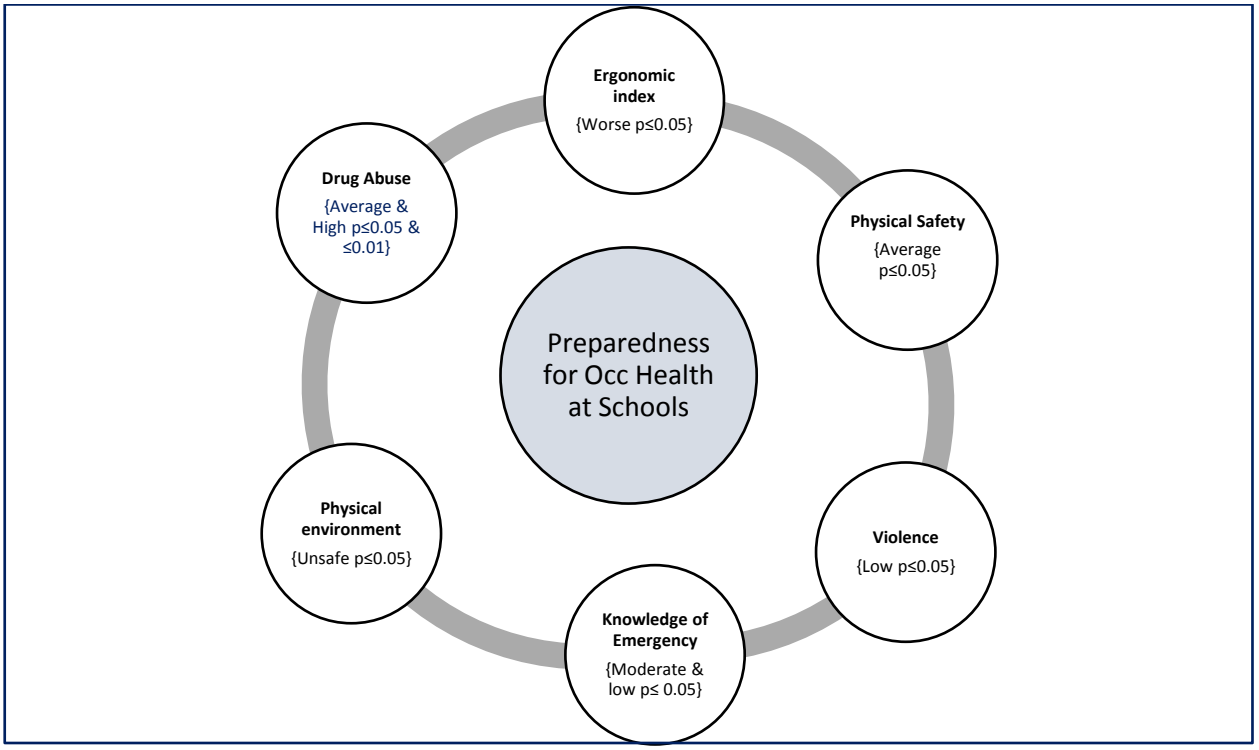
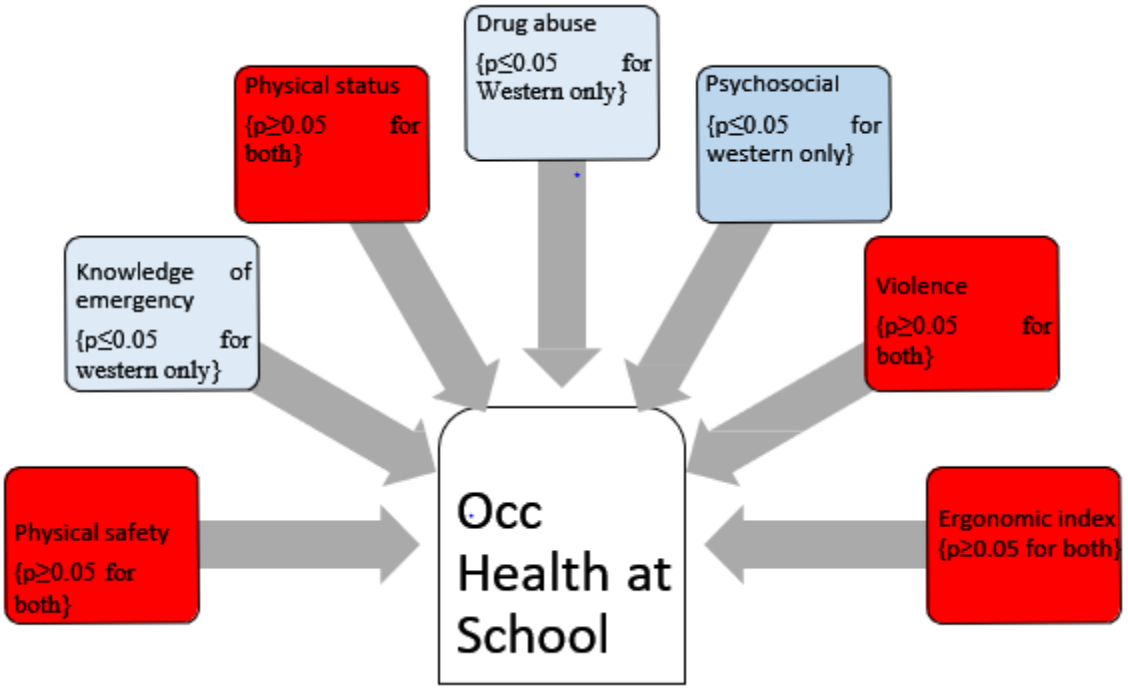


Figure 4.3 above shows the multivariate logistic regression results represented as odds ratios of the association between the environmental factors in selected junior schools and respondent's preparedness to improve occupational health and safety situation in Gaborone. As the results indicate, it was found that on aggregate, average physical safety conditions experienced by respondents in selected junior

schools of Gaborone were more likely to have their school environment improved on the occupational health and safety status relative to those with safe physical safety condition. The Western and South-Eastern schools would therefore benefit from OHS intervention that seeks to promote safety.

4.6.4 Logistic regression model of occupational health in schools by location

Figure 4-4: Logistic regression model of occupational health in schools by location



The figure above illustrates that knowledge of emergency was found to significantly influence people's preparedness to improve OHS amongst participants ($p<0.05$). It was found that emergency preparedness was not well articulated and known to the respondents and it was not viewed as a matter of concern.

4.7 SUMMARY

Chapter four presented quantitative data. The raw data was processed through the SPSS and Stata software system, and the SPSS and Stata output were factored into the tables. The data was cross-tabulated for ease of presentation and interpretation.

The models from the chi square analysis investigated preparedness of learners and staff members regarding the improvement of either safety or occupational health of the schools in Gaborone. Based on the model, it was found that many indicators were significantly associated with preparedness to improve safety environment among learners and staff members in Gaborone schools. As such, it is submitted that perception of learners and staff members regarding occupational health and safety conditions in selected schools of Gaborone differs. It is significant, therefore, that qualitative results be analysed to synthesise all the information and deduce strategies for the OHS policy makers in schools.

The next chapter discusses these qualitative results in order to reach an informed conclusion.

CHAPTER FIVE.

QUALITATIVE RESULTS: PRINCIPALS' AND FOCUS GROUP DISCUSSIONS, AND OHS PHOTOGRAPHS TAKEN IN SCHOOLS

5.1 INTRODUCTION

This chapter presents results from qualitative data which was collected through interviews to understand the perceptions of school principals, teachers and non-teaching staff focus groups on OHS management in their schools. It also gives the results from OHS photographs taken in schools. Discussion of these findings is dealt with in Chapter six.

5.2 FINDINGS FROM THE SCHOOL PRINCIPALS INTERVIEWED

Eight interview questions were prepared for the school principals. The purpose of these questions was to get the views of principals regarding occupational health and safety practices and management in their schools. The school principals were designated coding labels from "P01" to "P06" as described in appendix L. Below are the results from the eight questions asked.

5.2.1 Number of toilets for the learners in schools

The principals interviewed were requested to indicate the number of toilets in their schools, given the fact that learner enrolments ranged from 671 to 1008 in the schools sampled. The results revealed that all school principals interviewed agreed that they do have adequate toilets for the learners even though the numbers differ from school to school. This is their responses, as reflected in Appendix L:

> *Principal "P04" said, "We have 8 flushing toilets, 4 for boys and 4 for girls."*

Principal "P03" said, "We have thirty-two sets of toilets for learners, 8 pit latrines and 8 flushing for boys and the same sets for girls."
Principal "P05" said, "We have 24 flushing toilets, 12 for boys and 12 for girls."

Principal "P04" has 8 toilets with 724 learners on the roll. The ratio of toilets to learners is which translates to 1 toilet to 91 learners. However, this is below the current prescribed minimum ration of 1 toilet to 33 learners (Omolo & Simatwa, 2010). As such, the school might be classified as non-OHS complaint in this aspect.
Principal "P03" has 32 toilets for an enrolment of 844 learners. This translates to a ratio of 1 toilet to 27 learners. It suffices to conclude that the school is OHS complaint since the ratio of toilets to learners is sufficiently above the specifics (i.e. 1:27).
Principal "P05" has 24 toilets for an enrolment of 769 learners. The ratio of toilets to learners is 1:33 in its simplified form. This ratio is within the prescribed ratio of 1 toilet to 33 learners. The implication here is that schools that participated in this study are compliant with the specifications regulating toilet learner ratio, they are OHS compliant.

5.2.2 Importance of Occupational and Health and Safety (OHS) management in schools

The principals interviewed were requested to indicate the importance of Occupational and Health and Safety management in their schools. The findings revealed that the school principals believed that OHS is important. This is what they said:

Principal "P02" said, "I believe it is important to institute OHS because Safety is imperative for any organization."
Principal "P06" said, "I believe it is important to set up OHS because the way the situations are in schools, the school community is unsafe hence the practice can benefit the schools" (see Appendix L).

The implication here is that establishing OHS in a school is crucial for the welfare of staff, both teaching and non-teaching and for the learners too.

5.2.3 Problems of drug abuse and indiscipline cases in schools

The researcher wanted to know if principals interviewed were experiencing problems of drug abuse and indiscipline cases in their schools. From the principals interviewed, it was found that all agreed that they experienced problems of drug abuse and indiscipline cases in their schools. This is what they said:

> *Principal "P04" said, "We have very few problems of indiscipline, such as bullying."*
>
> *Principal "P02"said, "We do have a problem of drug abuse, students bring "motokwane" (illegal drug) to school."*
>
> *Principal "P05"said "We do have, because of the location the school is in a high density location (see Appendix L).*

This suggests that there are discipline problems in schools, though limited, and this challenge is dealt with through guidance and counselling and disciplinary committee, as reflected in 5.2.4 below, which was a follow up of 5.2.3.

5.2.4 Dealing with problems of drug abuse or indiscipline cases in schools

As a follow up question to item 5.2.3, the researcher wanted to know if the schools have a Guidance and Counselling Department and the role this department plays in their schools.

The results revealed that there are Guidance and Counselling departments in all schools. The findings also revealed that Guidance and Counselling departments play a vital role in dealing with disciplinary cases, while principals said in addition to the interventions provided by the Guidance and Counselling department they also refer severe cases to the police. Below is what they said:

> Principal *"P03"*said, "*For instance, drug abuse issues are dealt with by the guidance and counselling department and the Pastoral Office".*
> *Principal "P02"said, "We had three cases last year, we have since referred the cases to the police and they are still investigating. Those cases are referred to the Guidance and Counselling department (see Appendix L).*

5.2.5 Possible solutions to improving the use of Guidance and Counselling department in schools

The researcher wanted to know from the principals interviewed how the use of Guidance and Counselling department could be improved in schools. It was found that the principals interviewed gave different opinions. The following are their responses:

> Principal *"P04"*said, "*Educating personnel on OHS, coming up with clear policies on OHS and sensitizing the whole school community. I believe that the Ministry should take the lead."*
> Principal *"P02"*said*, "The government should outsource these services."* Principal *"P03"*said*, "The government should change the policy. A qualified nurse should be attached to very school" (see Appendix L).*

This implies that staff members and learners must be educated on the importance of guidance and counselling. In addition, schools must have OHS policies sensitizing school community.

5.2.6 Readiness in emergency cases in schools

In this question, the interviewer wanted to know the readiness of the schools in the event of fire outbreak. The results clearly show that the schools are not ready for fire outbreaks. Their responses consolidate this perception:

> Principal *"P04"*said, *"Heish! It will be chaos and a hassle because we do have doubled storied classrooms. So, I can't imagine what will happen. We do not have fire assembly point".*
> Principal *"P02"*said, *"We do have school assembly point where we conduct our morning prayers. Although not labelled, we have informed the school community to assemble here in case something happens. We do not do emergency drills maybe because we have not had any emergencies. We will face it when something happens."*
> Principal *"P03"*said*, "We do not have assembly point, but we have identified a spot with the help of the company that was installing the fire extinguisher".*
> Principal *"P02"*said, *"We used to have an emergency assembly point and it was destroyed by a car. No! We never conduct any emergency or fire drills" (see Appendix L).*

5.2.7 Funding allocated for safety

The researcher wanted to find out from the principals if there are funds allocated for safety in their schools. The results revealed that in all schools there are funds available for safety measures, even though principals said funds are insufficient. Their responses:

> Principal *"P04"*said, "*We do not service them due to insufficient funds".*
> Principal *"P02"*said, *"Yes, we do!*
> Principal *"P03"*said, *"Yes, the funds are available but not enough".*
> Principal *"P05"*said, *"Yes, we do, but it is usually very little such that it does not cater for other things" (see Appendix L).*

5.2.8 Physical conditions of the schools

With item 5.2.8 the researcher wanted to find out from the school principals if the physical conditions of their schools are conducive for effective teaching and learning to take place. It was found that physical conditions of the schools are not safe, classrooms were not perfect. The principals in this study reported the following challenges in their classrooms:

- *broken furniture;*
- *vandalism;*
- *cracked walls;*
- *broken windows*
- *overcrowded classrooms;*
- *falling ceiling; and*
- *unsafe electrical plugs (see Appendix L).*

This is supported by OHS photographs depicted as Figure 5.1, 5.2, 5.3.Similar cases were reported by teachers in the focus group during their interviews.

5.3 FINDINGS FROM THE TEACHERS' FOCUS GROUP DISCUSSION

A focus group discussion was held. The researcher sought to obtain the views of teachers on the health and safety of learners in their schools. Only two questions were prepared to give the participants enough time to elaborate. The following are the results of the questions asked:

5.3.1 Classroom conditions

The purpose of asking teachers' focus group about the conditions of their classrooms was to merge their responses with those of the school principals and the OHS photographs taken in those classrooms. The findings revealed that the teachers claim that their classrooms conditions were good, only the floors were a serious concern. Their responses:

> Group members, said *"Good because of the latest renovations. However, the floors are very slippery and other people can slip and fall which might cause injuries" (see Appendix N).*

This implies that principals (see item 5.2.8) and teachers agreed that conditions in the classrooms are not entirely safe.

5.3.2 Security personnel

The teachers' focus group was asked questions regarding the security personnel employed in their schools. The findings revealed that the focus group members were concerned about security personnel in their schools. They blame security for most of the challenges experienced in schools. Their responses:

> Teacher 4 said "*Yes, we have got guards at this school but sometimes when they have a protest regarding their employment welfare, they do not come for work and this situation is very worrisome with regards the safety of the property and the environment in general. This situation becomes very scary as you know an environment like school when there is no security, we often get challenges because most of the times I keep my valuables within the school staff room.*"

> Teacher 3 said *"You know what, this school [on] issues of safety is violated by the people we recruit as guards. These people are good for*

nothing and they are thieves. For example, once a student forgets his items such as sweater or jersey during sports, you don't get them even though this school is fenced. And this is a day school and it is fenced, once s/he claims, you will not find it. This is very absurd. Your see mmaetsho! The source of challenges in as far as the safety of this place is concerned is the guards. Because often they are the ones who do not communicate incidents of insecurity on the campus. For example, last year the school head's office was left open and when the next morning comes, we found that some school official stamps were stolen. We did not know what was the reason that caused people to steal the school stamps. The messages were announced to request people to bring these things yet nothing happened to recover the stamps. The school had to change the stamps to avoid issues of future organised crimes."

Teacher 2 said, *"You see some students are hooligans right from the community they are coming from. This situation is very scary when such hooligans are within the school premises and try to do some of the things that they do" (see Appendix N).*

The implication here is that safety is severely compromised in schools selected to participate in this study because security personnel were not committed to what they were employed for.

5.4 FINDINGS FROM NON-TEACHING STAFF FOCUS GROUP DISCUSSION

A discussion with non-teaching staff was also conducted because in all schools selected, there were cooks and cleaners. Therefore, the researcher wanted to collect information about their occupational health and safety conditions. Following are the results of the questions asked:

5.4.1 Safety and training

The researcher wanted to know if non-teaching staff feel safe in their working environment. From their responses, it was found that they feel safe in their schools due to the presence of fire extinguishers, and they were trained to use fire equipment. This is what they said:

> *Non-Teaching Staff4: "We feel safe because we have installed fire extinguishers in the school and we were trained on how to operate them. The company also availed the blanket equipment." Non-Teaching Staff3: "Yes, we have been trained on how to use the fire equipment although other staff members were not present. The blanket is specifically used for people when they get burnt since fire extinguishers cannot be used on them. Training was provided only once we are not sure if we can be able to apply what we learnt" (see Appendix K).*

Their responses are supported by Figure 5.5 and 5.6 which depict fire extinguishers found in schools, but contradict the principals' responses on item 5.2.6.

5.4.2 Informed about compensation

The researcher wanted to find out if the non-teaching staff members were informed about compensation in case they got injured at their workplace. The findings revealed that they were informed about compensation but they were not certain if this is true because nothing had happened warranting any compensation. This is what they said:

> *Non-Teaching Staff4 said "Yes, a workshop has been conducted to inform staff about issues of compensation". Non-Teaching Staff3 said "We cannot comment much about it because nothing has happened as yet that will warrant any compensation" (see Appendix K).*

5.4.3 Clean and safe kitchen

The researcher asked this question in order to know about the safety of all people who eat food prepared in the school kitchens. The findings revealed that school kitchens are unhygienic. They said:

> *Non-Teaching Staff10 said: "You see here within the school we do not have enough kitchens that are to promote cooking in a hygienic and safe environment. We have been recommending to management to perform extensive maintenance and make the place robust for safety, but to no avail*
> *Non-Teaching Staff5: "You can see for yourself the lives of the people are at stake. We do not have proper tables to be used for students in the dining hall, our kitchen cupboards are old and do not have proper fittings such as the rack used to hang our kitchen utensils, this creates laxity in handling the place, hence we put them on the floor and it has become like an acceptable practice now" (see Appendix K).*

The implication is that unhygienic conditions put learners' lives at stake. Kitchen furniture is old and broken such that tables might endanger learners' lives. The issue of old and broken furniture is also mentioned by school principals (see item 5.2.8).

5.4.4 Provision of Personal Protective Equipment

In posing this question, the researcher sought to find out from the non-teaching staff if the school management provided them with protective clothing. The findings revealed that indeed the condition is safe: they were given protective clothing. These are their responses:

> *Non-Teaching Staff6 said: "I would say the safety conditions are good and we are provided with protective clothing. The safety conditions are generally fine. The situation is improving because we have alerted the management on several occasions that we do need safety awareness*

training. We do have protective clothing like helmets, gloves and goggles" (see Appendix K).

This indicates a commendable degree of compliance of schools regarding OHS.

5.4.5 Fire assembly point

The non-teaching staff members were also asked if they do have fire assembly points in their schools. The findings revealed that there were no fire assembly points nor fire drills in the schools selected for this study. Non-Teaching Staff4 said:

"We do not have fire assembly point and we have not conducted any fire drills but there is a spot that is identified in the school" (see Appendix K).

This response confirms and consolidates that of the school principals (see item 5.2.6).

5.4.6 Guidance and Counseling

The non-teaching staff members were also asked if there is guidance and counselling facilities at their workplace and if they make use of it. It was found that they do have guidance and counselling facilities but the non-teaching staff were afraid to use them because they are not assured of the confidentiality. Non-Teaching Staff6 said:

"We are not free to discuss our personal problems with the guidance teacher because we do not know if our problems will not be discussed with other teachers" (see Appendix K).

This response shows that there is a gap between the school management and the non-teaching staff members as far as guidance and counselling is concerned and this gap needs to be closed through information sharing.

5.5 FINDINGS FROM THE OHS PHOTOGRAPHS TAKEN IN SCHOOLS

In addition to the interviews with the school principals, teachers and non-teaching staff focus groups, the researcher took some OHS photographs of the school's physical conditions. The aim was to observe them, analyse them and compare the findings with those from the principals and the focus groups. Discussions of the comparison of these findings are in Chapter 6 as mentioned at the beginning of this chapter.

In all the photographs taken, the aspect of risk assessment was not done because it was not in the scope of this study. Therefore, the researcher is unable to comment on the nature, extent and frequency of the damages, and on the number of the classrooms where hazardous evidence was identified. In addition, because of ethics issues, the researcher is unable to disclose the names of the schools where this study was conducted. The study was conducted in junior schools of Gaborone. Photographs were taken as evidence of the physical conditions of schools and classrooms which pose health and safety hazards to both staff members and students. The following are the research findings from the pictures taken:

Figure 5-1: Damaged and falling ceiling

Figure 5.1 depicts the conditions of the ceiling in some classrooms where daily teaching and content delivery takes place.

Findings from Figure 5.1 reveals the damaged and falling ceiling in some classrooms where teaching and serious content delivery takes place. The damaged ceilings, if not repaired, might fall on the learners or staff member and cause physical injury. Also, dust coming from the damaged ceiling might be a health hazard to learners and

teachers. This was also a concern raised and highlighted by school principals (see item 5.2.8).

Figure 5-2: Broken window

Figure 5.2 depicts broken windows in some classrooms where teaching and learning is taking place.

Findings from this Figure 5.2 reveals the hazards in terms of broken windows which is a situation that prevails in some of the schools that were observed. Broken windows expose both teachers and learners to physical hazards. The broken shards of glass from the window might injure the learners. This was also a concern to the school principals (see item 5.2.8).

Figure 5-3: Unsafe electrical plug

Figure 5.3 depicts unsafe electrical plugs found in some classrooms of the schools selected for the study.

Findings from this figure revealed some classrooms with loose and open electricity cables and some cords. These might cause short circuits when learners touch them. The loose electrical plugs expose learners to physical and fire hazards which may result in physical risks that may cause death or permanent injury.

Figure 5-4: Outdoor teaching area

Figure 5.4 depicts an outdoor teaching area which was used for teaching because of insufficient furniture.

The researcher found that this outdoor teaching area is not conducive for teaching and learning. The seats in this outdoor teaching areas have no back rest, which exposes learners to health hazard, especially in winter when it is cold.

Figure 5-5: Labelled Fire extinguisher

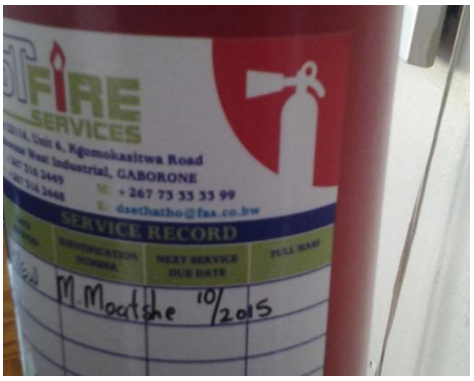


Figure 5-6: Fire extinguisher not labelled

Figure 5.5 and Figure 5.6 depict the fire extinguishers in schools that participated in the study.

Findings from these figures shows the availability of fire extinguishers in schools, but some are labelled and others are not. The implication is that even though fire extinguishers are available in the sampled schools, they are not regularly serviced and members of the school community do not know how to use them. This confirms the principals (see item 5.2.6) response that their schools are unprepared for the eventuality of a fire.

Figure 5-7: Fire alarm

Figure 5-8: Compliant fire detector

Figure 5.7 and Figure 5.8 depict an installed fire alarm and fire detector in some schools.

Findings from these Figures revealed that in some schools there were fire alarms and detectors as a precaution of responding to fire emergencies. This shows some commendable degree of compliance with OHS practices and management.

5.6 SUMMARY

In this chapter, the status of occupational health and safety practices in Gaborone junior schools were identified as shortage of furniture thus creating ergonomics challenges, the ratio of toilets to the enrolment and substance abuse amongst learners. In addition, aspects of safety practices such as ensuring that school buildings are safe were highlighted. The findings reveal that some schools comply with safety equipment requirements but do not comply with the facet of proper service. These are issues that need much urgent attention if the country is to have a robust occupational health and safety practice in place in the schools selected in this study.

CHAPTER SIX.

DISCUSSION OF THE STUDY FINDINGS

6.1 INTRODUCTION

Chapter six presents and discusses findings from the study. The discussion is based on the perceptions of participants regarding the study objectives. The study objects include: the participants' characteristics and physical conditions of the selected Gaborone junior schools more specifically the South East and Gaborone West schools, the ergonomic and psychosocial conditions of selected schools, the Occupational Health conditions of the learning environment, compliance with international standards/ requirements, and a recommended model to promote safe school environment and improve OHS management in Gaborone schools, as reflected in item 1.3.2. Although each objective was discussed in isolation, the current study acknowledged the inter-relation between the physical conditions, occupational conditions and compliance to safety standards.

6.2 THE CHARACTERISTICS OF THE PARTICIPANTS AND PHYSICAL SAFETY MANAGEMENT CONDITIONS OF GABORONE SECONDARY SCHOOLS

6.2.1 The characteristics of the participants (Quantitative only)

The participants were requested to mention their ages, gender, qualifications and years of teaching. It was found that all, 100% of the participants are old enough to give their views on the OHS conditions in their schools. Their ages range from 25 to 51 and above (see Table 4.1). Regarding gender, it was found that majority 68% of teacher participants are males, while 56% are female learners (see Table 4.2). The implication

here is that teachers in junior schools in Gaborone are mostly males and learners are mostly females. In terms of teachers' qualification, all teachers are qualified to teach (see Table 4.3), their qualification ranges from Post-Secondary teaching certificate to PhD. Regarding their Years of experience, balance of teaching years was discovered (see Table 4.4), ranges from 1 to 20 years. This implies that the colleges and universities are still producing teachers, when other retire the new ones are employed. This means there is no shortage of teachers in junior schools of Gaborone.

6.2.2 Perceptions of participants on physical safety conditions (Quantitative and Qualitative)

The study was investigating if the physical safety conditions such as buildings of the schools do not pose threats to staff and learners thus whether the environment is conducive to teaching and learning in selected junior schools of Gaborone. The current study links aspects of the school building such as the walls, ceilings, unsafe electrical plugs, status of windows, slippery floors and ineffective security as hazardous to the school community which in the end could endanger their lives.

In the current study participants reported a need for the government to do regular maintenance of the school buildings so that the classroom environment can be conducive for learning. These findings received support from Carter and Carter in Xaba (2006) who maintain that creating and ensuring school building safety revolves around the physical maintenance of buildings, i.e. the repair, replacement and general upkeep of the buildings, and this allows for the continued use of space for its intended purpose, and serves as an additional manifestation of ownership and caring. Regular inspection and maintenance assist in identifying elements of safety threats in the school buildings. Chemeli et al. (2015) suggest that the school buildings should therefore be put up according to safety policy specifications to avoid situations that would compromise the safety of the occupants. A study conducted by Isaiah (2013), indicated that maintenance and refurbishment of the education estate in junior schools should be expedited as these are neglected and dilapidated and are a danger to both teachers and learners.

6.2.2.1 Damaged ceilings

In this study, damaged ceilings were found to be a contributing factor (56.8% learners and 62.5% teachers) to the physical hazards of staff members and leaners in schools (see Table 4.5, item 5.2.8 & Fig.5.1). Damaged ceilings, if not repaired might fall on the learners or staff member and cause physical injury. Nevertheless, similar findings were reported in a study by Evans, Razia, and Cook (2013) in America, whereby students reported unrepaired ceilings and chipped paint walls as one of the unaccepted building conditions. Similarly, Monyatsi and Monyatsi (2007) concurred with the present study findings by indicating that some school buildings had classrooms with not only handing and unmaintained ceilings but also do have windows that are very small in width and breaths to provide requisite ventilation to provide a healthy environment for the learners.

6.2.2.2 Unsafe electrical plugs

The study revealed that that some classrooms had loose and open electricity cables and some cords that the students were using on some electric appliances had plugs that were not conducive (54.4% learners and 65% teachers) but provide risks, safety threats to the well-being of the learners and staff members (see Table 4.5, item 5.2.8 & Fig.5.3). In a similar study in South Africa which was conducted by Equal Education (2016), the results revealed that schools where electrical wiring had not been properly planned for and installed due to poor infrastructure, collapsing ceilings and walls expose wires thus resulting in short circuits due to roof leakages posing threats to leaners. It has been highlighted in this study that hazard identification would assist in mitigating risks. Exposed wires may endanger the lives of learners and staff members. The risk assessment which is not done, would have helped in identifying those hazards and working on them before they become risks.

6.2.2.3 Cracked walls, flooring and Windows

This study revealed that broken windows and cracked walls (54.4% learners and 65% teachers) are physical hazards in Gaborone schools (see Table 4.5, item 5.2.8 & Fig.5.2). Consistent with these findings, a study in South Africa by Netshitahame and Van Vollenhoven (2002) revealed that laxity in maintenance work in schools do not only provide threatening environment to learning due to dilapidated classroom conditions in the form of cracked walls, broken windows and incomplete flooring, but also is a safety challenge to both learners and staff members. Duyar (2010) maintains that the quality and condition of educational facilities is one of the most neglected organisational factors in educational research.

6.2.2.4 Ineffective security personnel

The findings of the study reveal that ineffective security as the main sources of insecurity (see items 5.3.2 & 5.4.1) in the schools as comprising their physical safety. Based on this study, safety in junior schools in Gaborone experience great security challenges which pose threats to learners. The findings of the study revealed that though schools do have security personnel, there was no access control whereby all visitors entering the school premises should record their names. The procedure helps in monitoring movement in the school.

6.2.2.5 Clean and safe kitchen

This study showed that the school buildings pose physical threats to staff members and learners. The non-teaching staff reported the condition or state of the kitchens which they claim to be old and in need of renovations and maintenance (see item 5.4.3). The kitchen presents threats to learners' lives since tables are old and could fall and injure learners while having meals. Consistent with these findings, Morebodi (2006:76) remarked that school buildings where observations were made generally did not offer safety and security. Previous studies have identified the relationship between school facilities and teaching and learning performance (Cash & Twiford, 2009; Duyar, 2010). These results concurred with those of Isaiah (2013) which revealed that the

state of buildings teachers work in tends to positively influence their level of job dissatisfaction in that staffrooms and classrooms are congested, very cold during winter and extremely hot during summer. Even though Isaiah (2013) believes that school facilities influence the teaching and learning process and are central concerns of educational planners, many school buildings are in poor condition and present environments that inhibit learning and pose increased health risks to learners and staff. In addition, the present study revealed a significant association between learner responses and teacher responses (p=0.024).

The implication here is that there is a need for the government to do regular maintenance of the school buildings so that the classroom environment can be conducive for teaching and learning. According to Carter and Carter in Xaba (2006) creating and ensuring school building safety revolves around the physical maintenance of buildings, i.e. the repair, replacement and general upkeep of the buildings, and this allows for the continued use of space for its intended purpose, and serves as an additional manifestation of ownership and caring. Regular inspection and maintenance assist in identifying elements of safety threats in the school buildings. Chemeli and Mwongeli (2015) suggest that the school buildings should therefore be put up according to safety policy specifications to avoid situations that would compromise the safety of the occupants. A study conducted by Isaiah (2013), indicated that maintenance and refurbishment of the education estate in junior schools should be expedited as these are neglected and dilapidated and are a danger to both teachers and students

6.3 THE ERGONOMIC AND PSYCHOSOCIAL CONDITIONS

This section detailed the participants' perceptions on the ergonomic and psychosocial conditions of the selected junior schools of Gaborone.

6.3.1 The ergonomic conditions and their impact on the learning environment

The ergonomic conditions impact negatively on the learning environment. The ergonomic hazards in this study looked at furniture which impacted negatively on

posture. Regarding the issue of furniture, teachers and learners remarked about the following:

Work tables of suitable height for seated learners are provided

The participants remarked that work tables of suitable height for seated learners are not provided (58.3% learners and 60% teachers in Table 4.6) and this might have ergonomic implication on the students.

Chairs with back rest of proper size to support lower back should be provided

The participants again remarked chairs with back rest of proper size to support lower back were not provided (80.7% learners & 72.5% teachers in Table 4.6) and this might also have ergonomic implication on the students.

This implies that, if chairs and tables are not in good conditions, it implies that learners are sharing chairs and tables and that they might not be sitting in the right posture and that can have long time effects. Sitting in awkward posture may lead to the risk of having Cumulative Trauma Disorder (NOSA. 2012:102). Previous studies have associated bad posture to health hazards (Ismaila *et al.*, 2015 Useh *et al.*, 2011).

6.3.2 The psychosocial conditions

The current study revealed that the psychosocial conditions such as cases of alcohol and drug abuse and bullying which impact on the safety of the learning environment exist in Gaborone schools.

6.3.2.1 Bullying

The study further revealed that there are cases of bullying in schools (see item 5.2.3). These results concur with the findings by Mangope *et al.* (2012) who confirmed that physical and psychological bullying exist in Botswana junior schools. The findings are surprising since junior schools have pastoral, guidance and counselling policies to deal with learner's misconduct. In addition, previous studies conducted by Malete (2007) in Botswana had reported incidents of violence, aggression and victimization. It is probable that current policies are not comprehensive enough to deal with bullying and substance and drug abuse.

6.3.2.2 Drug and alcohol abuse

The study revealed the use of drugs (60% learners & 72.5% teachers) and smoking cigarettes (77.2% learners & 87.5% teachers) as common practice in schools (see Table 4.6). Principals complained about the use of drugs in school by learners (see item 5.2.3). They claim that learners bring illegal drugs to school and that can affect other learners. Previous study by Netshitahame and Van Vollenhoven (2002) reported similar findings indicating safety threats that were discovered in South African schools which included among others; sniffing of fumes such as glue and benzene and alcohol abuse. However, responses from the non-teaching interviews differ from those of the principals in that they reported good behaviour or discipline during meal times. The findings are surprising because the Ministry of Education and Skill Development has recently embarked on a drug abuse project in Botswana junior schools. It is possible that the project does not address challenges faced in schools.

6.4 THE OCCUPATIONAL HEALTH CONDITIONS AND HOW THEY INFLUENCE THE LEARNING ENVIRONMENT

The study revealed that Occupational Health conditions in Gaborone junior schools influence the learning environment negatively. The Occupational Health conditions results included toilet system and ventilation which are discussed below:

6.4.1 Toilet system and drainage

The results on drainage system by teachers and learners disagreed. Teachers, (77.5%) agreed that there is proper drainage of waste in schools, on the contrary, learners (52.5%) disagreed (see Table 4.6). The reasons for the differences are not very clear. This could be related to the fact that the appreciation and understanding of the drainage system is different. Another assumption is that in some schools, toilets are few (see item 5.2.1) and it is possible that the toilet systems for teachers are clean and locked. While those used by leaners are dilapidated and not as clean. The findings are like those of Morebodi (2006:) who reports about dirty and unsafe toilets in South African schools which are not only a danger physically, but can also pose health hazards to all people who use them at schools. This could be the ones that are used by the learners, hence the influence of their responses. In relation to the latter, it is apparent that waste and sanitation management is a challenge in Botswana schools. A study conducted by Silo (2013) confirms this problem as it reveals that teachers and learners in Botswana schools were concerned about the environmental health status of their schools with emphasis on toilet sanitation. Consistent with these findings, Equal Education (2016) reported learner toilets which were routinely filthy, where absolute shortages and broken toilets frequently led to entire schools depending on two or three pit latrines.

The current study revealed that most sampled schools used both flushing and pit latrine toilets (see item 5.2.1). The results also indicated a significance association between learners and teachers' responses regarding perception on drainage at schools ($p=0.019$). The findings are like those by Equal Education (2016) in which 15% of schools visited had flush toilets installed. In addition, the study revealed that personal hygiene and sanitary practices are not applied in Gaborone schools. In relation to that the findings reveal that waste containers to throw away sanitary pads are not provided in the learners' toilets. Silo (2013) supports the findings by indicating that the problem was specifically compounded by poorly maintained and inadequate toilets, poor utilisation of toilets and the shortage of facilities such as girls' sanitary bins, toilet paper and gloves for picking up litter around the toilet area, a practice they felt was highly unsanitary. Similarly, Equal Education (2016) revealed that

compounding the unhygienic environment was the fact that majority of the s schools observed had no toilet paper, no sanitary bins and no soap.

6.4.2 Ventilation

The study revealed that most schools in Gaborone had windows that allowed good ventilation. Even though most were reported broken, but they are big enough and reasonably many in each building to allow enough light which is a good OH practice. Duyar (2010) states that small windows are an environmental condition in school, leading to poor ventilation or heating or lighting problem. The findings are contrary to Monyatsi and Monyatsi (2007) who revealed that some school buildings have small windows and there is very little ventilation. The reason for variation might be since the present study was conducted in junior schools whilst Monyatsi and Monyatsi (2007) study was conducted in primary schools.

6.5 COMPLIANCE TO INTERNATIONAL STANDARDS

6.5.1 Emergency Exits

The current study shows that schools in Gaborone junior schools are not compliant with International requirements to safety, the findings indicated that classrooms and staffroom have no emergency exits (53.5% learners & 57.5% teachers) and no escaping ways in classrooms in case of fire or disaster (see Table 4.5). Gathanwa (2011) obtained similar results in an investigation into emergency management preparedness of children which showed that a proportion of 78.6% school committees indicated there were no emergency exits designed to cater for quick evacuation of children and their teachers in cases of emergency, a minor proportion of 21.4% indicated their schools had emergency exit though they were not adequately labelled (82.1%).

6.5.2 Emergency drills and Assembly point

The study revealed that the sampled schools do not have fire assembly (see item 5.4.5) and emergency drills (see item 5.2.6). Emergency drills should be designed to deal with multiple hazards and consider unforeseen incidents. The findings concur with Nhlapo (2006) which revealed that most of the respondents indicated that emergency drills are not held regularly, while minority of respondents indicated that emergency drills are held regularly. Contrary to the study findings, the study conducted by Kano *et al.* (2007) who reported on frequency of emergency drills conducted at the school site during the prior eight months which varied by type of drills and by school level. Kano *et al.* (2007) has different opinion since the study was carried out in primary schools in the United States where safety issues safety are highly implemented and taken seriously.

6.5.3 Knowledge of Emergency

The present study found that knowledge of emergency was found to significantly influence people's preparedness to improve OHS amongst participants ($p<0.05$). It was found that emergency preparedness was not well articulated and known to the respondents and it was not viewed as a matter of concern. This is justified by the fact that although most schools observed had emergency equipment like fire extinguishers, majority of the respondents did not know how to operate them. The results concur with those by Johnson, Ronan, Johnston and Peace (2014) who acknowledged that beyond lack of awareness of the resource, the analysis found the two strongest deterrent factors of teachers' use of the emergency resource were: unfamiliarity with the resource and the perception that training is needed for its use. In addition, emergency preparedness activities like having emergency assembly point and emergency or fire drills were not conducted. The fact that emergency preparedness is not well articulated is disturbing. Though this research is within the context of Occupational Health and Safety, there is need to also to be prepared for other forms of emergencies. The state of preparedness would have been of tremendous value if the recently earth tremor that affected Botswana on the 3rd of April 2017 was of a higher magnitude. The results in this study were divergent to those by Tipler, Tarrant, Johnston and Tuffin (2016) which

show that the many encouraging comments provided by respondents in their study demonstrated that participation in large-scale exercises like the NZ Shake Out earthquake drill do have positive outcomes for schools. The reasons for divergence of results might also be related that New Zealand is perpetually rocked by earth quakes and therefore it is expedient that all establishments including schools should be well prepared. The willingness of the schools in the study by Tipler *et al* (2016) and others to share their state of preparedness might also have influenced the variation of the results. The linking of drill to education that is incorporating safety drills in the education curriculum might also be responsible for the better state of preparedness. Lastly, the variation in the results might be because the current study involved a small sample size and only seven schools whereas the latter, used a very large sample size which involved 514 schools.

6.5.4 Availability of fire extinguishers

The current study show that majority of the sampled schools do have fire extinguishers (75% teachers from Table 4.11, item 5.2.6, item 5.4.1 and Fig.5.5 & Fig.5.6). The findings are like those by Ogonyo (2012) in which majority of respondents in public secondary schools of Marini District acknowledged that their schools adhere to safety standards of having sufficient fire extinguishers. On the other hand, Nakitto *et al.* (2006) revealed that one out of the twenty sampled schools in Uganda had fire extinguishers. The variation in the results might be because the latter investigated primary schools.

6.5.5 Servicing of fire extinguishers

The present study found that fire extinguishers that are available in the sampled schools are not regularly serviced (see Fig.5.6) and members of the school community do not know how to use them. That implied that most schools are still found to be unprepared for the eventuality of a fire. Similar findings were obtained in Kenya secondary school by Chemeli and Mwongeli (2015) which revealed few fire extinguishers that were available did not have signs of being serviced, an indication that they may not be functional.

6.5.6 Toilet versus learner ratios

This study found that some schools' enrolment in Gaborone does not correlate with the number of toilets (see item 5.2.1) and this obviously implies that the toilets are not enough to accommodate all learners in those schools. This problem is prevalent in African countries as evidenced by Omolo and Simatwa (2010) study where they observed that in Kenyan schools only 2 schools (6.67%) complied with the requirement that one toilet be made available for the use of 30 or a fewer number of students. Similar findings were shown in South African schools whereby in 52% of the schools in the Eastern Cape, there were more than 30 learners per toilet, and at 65% there were more than 30 learners per working toilet.

6.5.7 Provision of Personal Protective clothing

The researcher asked this question to find out from if the school management provide staff members with protective clothing. Participants (54.4% learners and 65% teachers in Table 4.5 and item 5.4.4 non-teaching staff agreed that staff members at Gaborone schools are provided with protective clothing.

Based on the participants perceptions discussed, this study rejects the hypothesis that there was no significant relationship between schools' physical conditions and safety of the learning environment in South East and West of Gaborone Junior schools.

The hypothesis that there is no significant association between the OH condition and the learning environment was rejected. The study found out that knowledge associated with emergency management was consistently less likely associated with preparedness to improve safety and occupational health management in South East and West schools. For instance, it was observed that people in Kweneng and South-East region that indicated to have low to moderate knowledge regarding the emergency management were less likely to seek improved safety and occupational health management. On the same note, qualitative results indicate that majority of the respondents had low knowledge of emergency management.

The latter indicate that the preparedness on safety is low and that measures should be put in place to arrest the situation.

6.6 HYPOTHESES TESTING

This study rejected all the hypotheses. The hypotheses that there was no significant relationship between schools' physical conditions and safety of the learning environment in South East and West of Gaborone Junior schools was rejected. The second hypothesis that ergonomic and psychosocial conditions have no significant relationship to learning environments in South East and West Gaborone junior schools was also rejected.

Lastly, the hypothesis that there is no significant association between the OH condition and the learning environment was also rejected. The sampled schools are not OH compliant and therefore the proposed model will assist in implementing OHS in schools.

6.7 SUMMARY

The study highlighted some of the findings that emerged from the study. Based on the findings as arranged according to the objectives of the study, which include; characteristics of participants and physical safety management conditions of Gaborone junior schools, the ergonomic and psychosocial conditions, the occupational health conditions and how they influence the learning environment and the compliance to international standards, it can be concluded that Gaborone junior schools are not safe for both learners and staff. It is evident that majority of respondents, both staff and learners are concerned with unsafe conditions in their schools.

CHAPTER SEVEN.

A PROPOSED MODEL TO PROMOTE OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT IN JUNIOR SCHOOLS

7.1 INTRODUCTION

This chapter outlines the development of a model for promoting Occupational Health and Safety that could assist in the implementation of OHS practices and management in junior schools. WHO encourages all governments to prepare a special national policy and programme that includes actions for providing competent occupational health services for all people at work. Appropriate legal provisions, enforcement mechanisms and inspection by competent authorities especially responsible for occupational safety and health should be ensured (World Health Organization, 1994). However, the findings in this study as presented in Chapter 6 above identified serious gaps in implementing Occupational Health and Safety practices in Gaborone schools. Lack of resources was identified as one of the most significant challenges, accompanied by insufficient training and lack of conceptual knowledge in OHS. Hence, this chapter presents a proposed model that could assist the Gaborone junior schools in creating awareness and the implementation of OHS practices effectively.

7.2 CURRENT OHS SITUATION IN JUNIOR SCHOOLS

Botswana has demonstrated its willingness to comply with OHS standards to prevent and minimise hazards at work by enacting laws, formulating OHS policies and setting up an institution that directly deals with OHS issues in the country. However, these Acts do not address all the sectors, specifically schools. This makes it difficult to enforce the implementation of OHS requirements in schools in Botswana. Although there are some schools that meet all the ILO set standards, it has been established that the selected schools in this study are far from meeting these requirements due to

an array of challenges. It is appropriate to conclude that “occupational health is an important factor for sustainable socio-economic development that enables workers to enjoy a healthy and productive life both throughout their active working years and beyond” (World Health Organization, 1994), noting in particular that this ideal is abrogated in large measure in the schools studied in this research.

7.3 MODEL DEVELOPMENT

This section focused on development of a promotion model for effective implementation of OHS in Gaborone junior schools. This entailed the following steps of the theory generation approach: Concept analysis, classification and description of the model. These steps are described as follows:

7.3.1 CONCEPT ANALYSIS

Chinn and Kramer (2011: 158) define concept as a complex mental formulation of opinions that can be placed on a continuum ranging from empiric to abstract Similarly, The concept used during model development was analysed, defined and described according to the attributes or characteristics.

Concept analysis therefore becomes an activity where concepts belonging to a whole, their characteristics and relationships to other concepts are clarified and described (Nuopponen, 2010). Walker and Avant (2005:37) define concept analysis as a strategy that allows us to examine the attributes of a concept. In a nutshell, Concept analysis entails concept identification and definition (Lester, 2009).

7.3.1.1 Concept identification

For this study, concepts that aided the development of a model for occupational health promotion for the implementation in junior schools of Gaborone were identified. The main concepts of the model were identified from analysis of the interviews. The data analysis indicated that Occupational Health and Safety conditions in Gaborone junior schools are deficient and influence the learning environment negatively.

7.3.1.2 Defining attributes of the main concepts

The defining attributes of a concept determine the differences and similarities of that concept (Lester, 2009). Chinn and Kramer (1999:92) maintain that identifying and clarifying concepts allows one to develop ideas on which the theoretical structure is built. In this study, the concepts were primarily defined from the data originating from the interviews and focus group discussions (see Chapter 5). The researcher explored dictionary, online meanings of the concepts and extensive subject literature. Chinn and Kramer (1999:92) state that in clarifying concepts it is essential to do as wide a reading as possible of materials related to the concept. To this end, the literature parameters were not limited to junior schools in order to reduce profession-specific bias of the conceptual understanding (Walker & Avant,
2005).

The initial stage was to review abstracts and papers that did not include the term promotion in either the title or abstract. To refine the focus further, all papers that did not relate promotion to occupational health and safety in schools were excluded. The analysis was limited to papers published in English with selected material retrieved and reviewed in full to enhance understanding of the definitions and uses of promotion. Then numerous dictionaries and subject books were checked and reviewed to define and comprehend the term “occupational health and safety promotion.” Consequently, the use of promotion outside of junior school education was only considered briefly within this study: to define the concept “occupational health and safety promotion”, the term “occupational health” was defined first, secondly “safety” then, “promotion” and lastly, “occupational health and safety promotion.”

(a) Definition of the concept "Occupational Health"

Occupational Health is a multidisciplinary field of health care concerned with enabling individuals to undertake their occupation in a way that causes least harm to their health. Occupational Health is the promotion and maintenance of the highest degree of physical, mental and social being of workers in all occupations by preventing departures from health, controlling risks and the adaptation of work to people and people to their jobs (ILO/WHO, 1950).

The National Institute of Health (2014) defines Occupational Health as the process of identifying and controlling risks that arise from physical, chemical or other hazards to establish and maintain a safe working environment.

(b) Definition of the concept "safety"

Oxford Advanced Learner's Dictionary (2010) defines safety as the state of being safe and protected from danger or harm.

(c) Definition of the concept "promotion"

Promotion is an effort that supports or encourages a cause, or community awareness. According to Stevenson and Waite (2011) promotion is "an activity that supports publicity of a product or service that increases sales or public awareness" and promote as "support, encourage and make aware."

Promotion as a concept used in sports implies a move by a sports team from playing in one group of teams to playing in a better group (Oxford Advanced Learner's Dictionary, 2010). In marketing, promotion refers to a group of measures for communicating market information about the products or services of an entity in order to create awareness of its activities (Chudyga, 2016:1647). Awareness is an integral part of promotion, being aware is "having knowledge or some sort of perception of the fact in hand" (Stevenson & Waite, 2011). All these definitions were then converged in order to generate specific focus on the promotion of OHS in Gaborone junior schools.

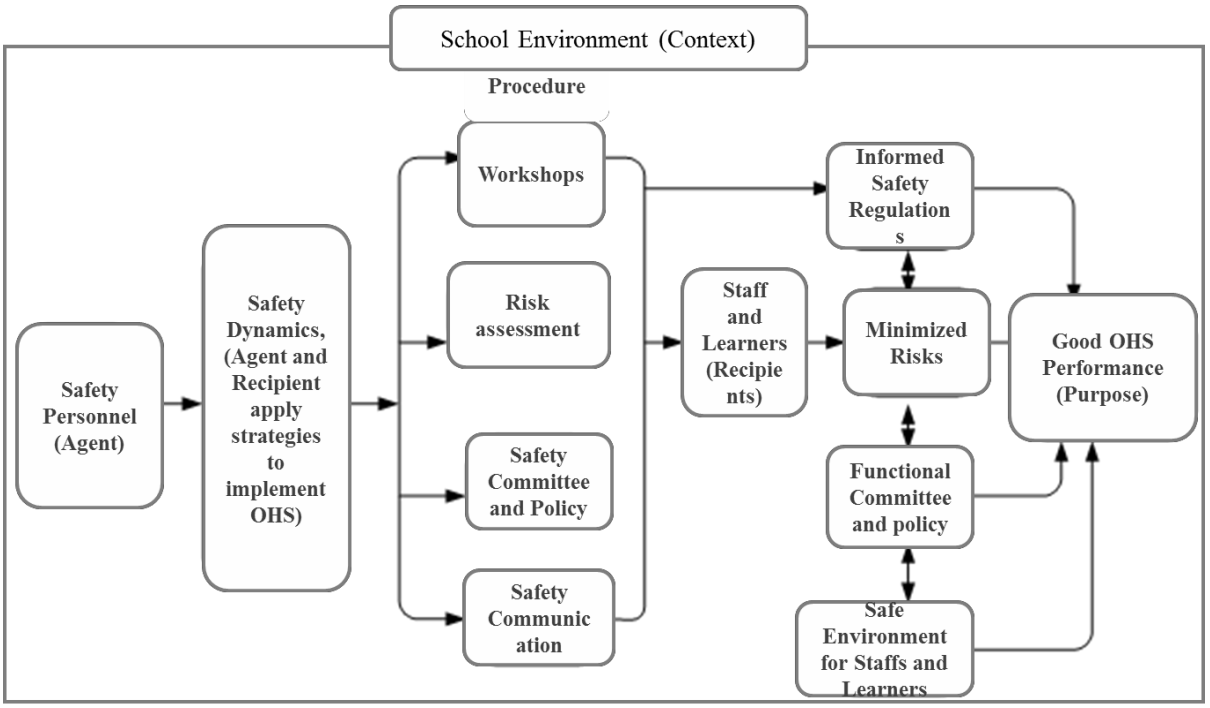
(d) Definition of the concept "Occupational Health and Safety Promotion

Whitehead (2006) states that health promotion holds a unique place in that the health and wellbeing of workers in the workplace inevitably impacts on the health of individual families, the local community and society at large. Health promotion is the process of allowing people to increase control over, and to improve, their health. It moves beyond an emphasis on conduct behaviour towards a wide range of social environmental interventions. Promotion efforts in schools may include protective strategies that emphasise on identifying hazards and mitigating risks within individual schools. In certain junior schools, the question of how OHS could be promoted must be asked and the activities that learners and staff members undertake to promote their own health should be considered.

7.4 DESCRIPTION OF THE MODEL

Once the concepts have been defined and classified the relationship statements constructed, the description of a model to represent the theoretical concepts can be done. In this study, figure 7:1 represents how promotion for effective implementing of OHS can be initiated and sustained in junior schools of Gaborone as suggested by Chinn and Kramer (2011:50).

Figure 7-1: Sustainable OHS model for Gaborone Junior Secondary Schools



Source: Author

The six critical elements of model description by Chin and Kramer (2011:176) were used. These included; purpose, concepts, and definitions of concepts, model structure, assumptions and model evaluations.

- **Purpose of the Model**

The purpose of the model for health promotion is to provide a frame of reference for the staff members and learners in junior schools in Botswana through conducting awareness workshops which could assist in the implementation of OHS.

- **Concepts**

According to Bach and Grant (2015), a concept as a theoretical idea generated through research to help us picture and understand an intangible idea and to enable us to express this idea through language. For this study, the researcher identified that occupational health and safety promotion is essential to enable the implementation of OHS practices in junior schools. The concepts identified are promotion of occupational health and safety. The intention, then was to interrogate promotion as a strategy of creating awareness that supports the implementation of Occupational Health and Safety practices amongst staff members and learners in junior schools of

Gaborone.The main concepts of the model were identified from analysis of the interviews. The data analysis indicated that Occupational Health and Safety conditions in Gaborone junior schools are deficient and influence the learning environment negatively.

- **Concept Definition**

Concept definition aids in clarifying their meaning within the context and in relation to the model. In this study, concepts are defined and described.

- **Nature of relationships between concepts**

After concept definitions, identification of the relationships that exist among them followed. The relationship demonstrated how concepts are connected, Chinn & Kramer, 2011:180) state that these relationships were expressed through relationship statements, namely associative or casual (one concept causing the other).

- **Structure of the Model**

The question of what structure is emerging was addressed once the relationship statements had been developed. Once the structure of the model was done, a diagrammatic representation was displayed. The purpose of this component is making the model comprehensible to others.'

- **Assumptions of the model**

After the model structure, identification of assumptions underlying the model followed. For example, the basic assumption of this study is that promotion is necessary for effective implementation of OHS in Gaborone junior schools. This assumption will lead to operationalization of the model in a form of interventions such as awareness workshops and training

- **Model Evaluation**

The model evaluation by experts was not part of this study but will be done during post-doctoral studies.

7.4.1 CLASSIFICATION OF THE MAIN CONCEPTS

The identified concepts were classified and conceptualized within the six elements of the practice theory as outlined by Dickoff, James and Wiedenbatch (1968) and Chabeli (2004:53).

7.4.1.1 Context: In what context is the activity performed? (Junior schools).

The junior community school setting is an environment that is exposed to different kinds of hazards on a daily basis. OHS practices are crucial in school settings as they help prevent injuries and accidents. The findings in this study reflected that the physical safety needs of learners and staff members are compromised. This is evident from the falling ceilings, broken window panes and exposed electrical wires. In addition, their health is also compromised by overcrowding which leads to more than two learners sharing a chair. In addition, vandalism, which has been identified by most schools as a threat to good physical conditions of school, is seen as a great set back to any gains made. Therefore, Isaiah (2013:8), suggests that maintenance and refurbishment of the education estate in junior schools should be expedited as these are neglected and dilapidated and are a danger to both teachers and learners.

7.4.1.2 Agent: Who or what performs the activity?

The agent for this model is the Occupational Health and Safety key personnel (coordinator) in the school. The coordinator is a qualified junior school teacher who should possess safety skills. It emerged from the data that some of the staff members in the schools have basic safety training courses. As a result, the MOESD could source in-house training or take them for safety training courses to upgrade their current levels of skills and empower the selected staff members. The OHS key personnel in school is responsible for ensuring that the school is a safe and healthy environment. This could be done by empowering staff members and learners with the basic OHS knowledge that would assist them to practice behavioural safety. The empowerment of the learners and staff members can be done through interactive awareness workshops.

7.4.1.3 Recipient: Who or what is the recipient of the activity? (The staff members and learners)

The learners and staff members are the recipients of this model. A learner is a person who has registered for a three-year junior certificate course in a Gaborone junior school. Learners should actively participate in the construction of their own knowledge, skills and attitudes under the guidance and support of the OHS coordinator through interaction. Learners should be able to apply what they have learned on their own and display behavioural safety. This implies that after being taught about good hygiene practices, they should be able to wash their hands after using the toilet without being reminded.

A staff member in this context is any employee who is working in a junior school. This includes both non-teaching staff and teachers. Staff members, just like learners, should possess characteristics that embrace behavioural change that sustains OHS implementation process. Staff members will have their own meetings where OHS issues will be addressed and strategies to implement OHS will be initiated. Interactive awareness workshops will be conducted for staff members and learner representatives. Staff members and learners as recipients of the model should actualise and exhibit behavioural health and safety. The OHS coordinator promotes the OHS knowledge for staff members and learners through workshops in the process of interactive learning. Inherent in the process is intellectual dialogues, discussions and debates on the impact of OHS in schools.

7.4.1.4 Dynamic: What is the energy?

The dynamics are the agents and the recipients, namely the OHS coordinator, staff members and learners of the junior schools who apply strategies to aid in the implementation of OHS in schools. From the results of this study, it was evident that schools are not ready for emergencies. As alluded by almost all principals interviewed, the majority indicated that they had no assembly point and do not conduct emergency or fire drills. The funds allocated by the Ministry of Education and Skill Development have not been used in the schools to exercise good safety practices. The limited funds

do not cater for the yearly service that must be done to fire extinguishers in schools and that affects compliance. As a result, staff members and learners of the sampled schools are exposed to potential risks. However, respondents indicated that most schools complied with the PPE requirements and were successfully enforcing them.

7.4.1.5 Purpose: What is the result of the activity? (Implementation of Occupational Health and safety in junior schools)

In this study, OHS promotion is informed by interactive strategies influenced by the unsafe environment which is triggered by uncertainty of hazards in the school bringing about a state of awareness, which leads to an interactive constructing process followed by consolidation of knowledge, resulting in changed safety behaviour. The implementation of the OHS will be dependent on the ability of the Ministry of Education and Skill Development to allocate enough funds to allow schools to purchase the needed OHS equipment and to empower the key personnel in each junior secondary by allowing them to acquire the OHS skill through university or college training The researcher is of the view that it is high time that the education authorities engage all stakeholders in the funding of OHS programmes, more so now that government is financially challenged due to economic recession. The Stakeholders may include private sector or Non-Governmental Organisations. Furthermore, schools should be encouraged to raise funds for OHS programmes. Schools can benefit by creating inter school training networks to minimise misunderstanding of Occupational Health and Safety Management by training the key personnel who would then cascade the practice to train other staff members within the school.

7.4.1.6 Procedure: What is the guiding procedure?

Procedure refers to the process that the OHS coordinator pursues to improve OHS in schools. The procedure involves strategies that the OHS coordinator and the school community employ to promote OHS in schools. The following five strategies are identified:

- **Workshop for staff members and learner representatives**

Safety training should start from awareness workshop to skill development training. Training should also focus on risk assessment and the operation of fire equipment. The school Management should ensure that OHS systems are implemented by taking the lead in supporting the OHS activities. Findings from teacher's focus group revealed training on OHS as one of the recommendations for OHS improvement in schools. The establishment of OHS training material, tools and resources that promote preparedness to act and offer pertinent response plans are leading indicators of OHS. Training should be an ongoing process. New staff members' training should include general safety orientation, safety regulations and emergency procedures. Retraining of staff members should be explored to create continuous awareness necessary to sustain the practice of health and safety. Training should be provided at no cost to the staff members. In addition to suggestions made in Machabe and Indermun (2013:35), provision of safety related training will help to make the employee to increase their knowledge about health and safety at work.

- **Risk identification and assessment**

Risk assessment is a concept that must always be conducted for the stakeholders to be conversant with the emergent challenges within the school environment in order to minimise consequence of risks. For instance, it is the duty of every stakeholders (staff members and learners) to understand ways of risk assessment practices and procedures in order to create an educationally conducive environment that would promote safety of human life while service delivery is enhanced. Promotion of OHS in schools necessitates proper planning. Planning should entail hazard identification,

anticipation, assessment and mitigation. A critical element of any effective safety and health programme is a proactive, ongoing process of identifying and assessing such hazards.

To identify and assess hazards, staff members should do some of the following activities:

- Collect and review information about the hazards present or likely to be present in the school.
- Conduct initial and periodic school inspections to ascertain new or recurring hazards.
- Investigate injuries, illnesses, incidents, and close calls/near misses to determine the underlying hazards, their causes, and safety and health programme limitations.
- Group similar incidents and identify trends in injuries, illnesses, and hazards reported.
- Consider hazards associated with emergency or non-routine situations.
- Determine the severity and likelihood of incidents that could result from each hazard identified and use this information to prioritize corrective actions.

The next step in risk assessment should entail controlling the identified hazards. The following series of actions can be done:

- Collect existing information about existing hazards in the school environment
- Inspect the school safety hazards
- Identify health hazards
- Conduct incident investigations
- Identify hazards associated with emergency and non-routine situations
- Characterise the nature of identified hazards, identify control measures and prioritise the hazards for control.

Once the above actions are done, then monitoring and record keeping of all actions ought to be prioritised.

- **Safety committees**

The health and safety coordinator should be any one of the members of staff. The health and safety responsibilities may be incorporated into their already existing responsibilities. Training of the appointed individual is also important for them to attain skills and knowledge on health and safety. They should work proactively to prevent staff members and leaners from being exposed to occupational hazards and do this by

ensuring that management eliminates hazards or keeps them under control when they cannot be eliminated.

Occupational Health and Safety coordinator should work with the safety committee members which may consist of representatives from the different houses (Pastoral Divisions of the schools) in the school. Basically, OHS should be everyone's responsibility in the school. Findings from this study revealed that all the sampled schools do not have safety committees. The formation of safety committees in school is therefore recommended to assist in the starting and running of OHS in schools.

- **Safety policy**

The school leadership should facilitate the selection of a Safety Committee which must draft the policy which should be specific in addressing unique health and safety challenges in each of the schools (Ibojiemenmen, 2007:62). OHS policy formulation should be done according to suggestions from stakeholders and should be implemented and enforced by the school principals. The findings of this study indicate that most safety policies are not adhered to by the sampled schools. For instance, most schools do not comply with safety standards. Even though fire extinguishers are available in schools, they are not regularly serviced and members of the school community do not know how to use them. That implies that if fire breaks out, the worst can be expected. Few sampled schools had fire extinguishers which were serviced regularly. The drafting of a safety policy and implementing of the policy could significantly assist in implementing OHS in schools. School policy which speaks to workplace health and safety lifestyles issues can be powerful indicators of the school commitment to OHS for all staff members and learners. Moreover, statements about health and safety need to be included in school policies and annual plans, to support the development of a health and safety focused school culture and to ensure the school will meet its responsibilities.

- **Safety communication**

Communication barriers between school management and staff members should be bridged. This can be achieved through functional safety meetings where issues relating to safety awareness could be discussed and knowledge could be shared for the benefit of the employees and the establishment. The findings from the study indicated that safety communication gadgets like fire alarms and detectors were not available in most sampled schools. Therefore, Krause et al. (2009) agree that safety communication makes people in the organisation to feel that they are supported. Basically, safety communication should be spoken, written and visible. The following may be done to promote safety communication:

- Provide information about hazards, risks and preventive measures to staff members and learners working in the school premises and;
- Discuss health and safety regularly during staff meetings and students assembly.

7.5 SUMMARY

A model to promote Occupational Health and Safety in junior schools has been described for immediate implementation in the selected theoretical frameworks. The proposed model was introduced and an explanation of its development provided. As illustrated in the OHS model above, it is noted that occupation health and safety consists of many factors that are interrelated for the realization of a good safety environment, more especially in environment that is public in nature, such as schools. Therefore, to implement Occupational Health and Safety in schools, the Sustainable OHS model for Schools has been developed and proposed.

CHAPTER EIGHT.

CONCLUSIONS AND RECOMMENDATIONS

8.1 INTRODUCTION

In this chapter, the conclusions of the findings of the study are proffered and highlighted. In addition, policy implications and recommendations based on the findings are outlined for all stakeholders in the education sector. The chapter further highlights limitations and suggestions for further research.

8.2 CONCLUSIONS

Based on the findings of the study as summarised in Chapter six, it can be concluded that Gaborone junior schools are not safe with regards OHS measures that protect both learners and staff members.

- The study revealed that most school buildings are unsafe and not conducive for learning and teaching as ceilings are damaged which expose learners and staff members to physical hazards. In addition, it emerged from the study that the furniture in school is not enough to accommodate all learners and this results in learners sharing chairs or tables which can have ergonomic implications.

Regarding compliance, most schools do not comply with safety standards.

The study found that even though fire extinguishers are available in schools, they are not regularly serviced and the school community does not know how to use them. It is evident that schools are not ready for emergencies. This is confirmed by the fact that almost all principals interviewed indicated that they had no assembly point and do not conduct emergency fire drills. However, respondents indicated that most schools were complying with the wearing of PPE. Furthermore, the principals and staff members

acknowledged that most safety policies were not adhered to as such they made some suggestions about improving the Occupational and Safety conditions.

It is evident that Botswana recognizes the importance of Occupational Health and Safety in the workplace and has established a department which deals directly with issues of health and safety (BOCODOL, 2008). Prevention of workplace accidents and infections is regarded as paramount in the effective strategy of the National Policy. However, it is worthy of note that in Botswana there is no direct Occupational Health and Safety statutory instrument but scattered regulations over many Acts, for instance, the Waste management 1998 Act (65.06) and the Factories Act 1978 (Chapter 44:01). What is evident then is that all matters relating to Occupational Health and Safety are dealt with under the provisions of these preceding Acts. For the schools, they are clearly not given direct attention as work environments that meet their OHS needs. Therefore, inadequate safety and health standards and the hazards identification are evident in the case of selected Gaborone Junior schools.

8.3 POLICY IMPLICATIONS

There is need for government to implement a deliberate policy to ensure that knowledge about occupational health and safety is advocated and known in schools to improve people's awareness. Furthermore, there is need to involve community participation in the process of policy redirection on occupational health and safety in Gaborone junior schools to ensure that issues of safety are a collective responsibility.

As the study indicates, there is laxity in the way maintenance of the school infrastructure is concerned to support occupational health and safety environment in the country:

- As such, the need to develop a deliberate policy that will constantly monitor the schools' environment and quickly come up with action plans to implement those to ascertain the standard of occupation health and safety is enforced across the secondary schools in Botswana. This is done to provide a conducive environment for learners and staff members in Gaborone junior schools, and the country at large.

- In addition, a policy on risk assessment for school is a necessity for the Ministry of Education and Skill Development. Furthermore, schools should document accidents and first aid reports to pinpoint the types of injuries that occurred and what to include in the policy.

It is worth noting that the issues of food safety and limited spaces to prepare food within the schools to comply with OHS standards remain a challenge in Gaborone schools:

- Therefore, there is need for government through Department of Health to investigate this situation and put measures in place that will assist in scaling up the situation to avoid instance or outbreak of food related diseases across the school due to the current situation.

Regarding the ergonomics:

- There is need to reassess the present school safety and occupational health environment to balance the needed infrastructures and material use for delivery of services to ensure that the schools are ergonomically balanced in Gaborone secondary school.

8.4 RECOMMENDATIONS

The respondents suggested three strategies that could be employed to address the OHS conditions which are training, awareness workshops and provision of first aid equipment. In the light of the findings of this study, the following recommendations were made:

8.4.1 Collaboration of government departments

The Ministry of Education and Skills Development in collaboration with the Department of Buildings should conduct regular inspection of school buildings and do maintenance for conditions in schools to be health and safety compliant.

8.4.2 Curriculum review

There is need for the Ministry of Education and Skill Development to take a positive step to review the curriculum and enforce occupational health and safety in all secondary curriculum to promote knowledge and understanding of the disciplines in schools. This implies that the MOESD should benchmark internationally.

8.4.3 Training on issues of occupational health and safety management

It emerged from the findings of this study that staff members are not trained on issues of occupational health and safety management. Therefore, the study recommends training and regular awareness workshops on occupational health and safety matters to keep staff members and learners abreast of the new development.

8.4.4 Legal Acts on OHS

The study found that there is a gap in terms of legal acts that directly address the needs of OHS in school, so it is mandatory that the government enacts such an Act so that there is no need for the courts to infer from and refer to other Acts that are OHS related but do not directly address the OHS needs of the schools.

8.4.5 Infrastructure support

The study recommends that the government and other players responsible for occupational health and safety should change the set-up in some community junior schools to ensure that the infrastructure is supporting all categories of people including those that are physically challenged.

8.4.6 Budget to develop OHS material

There is need for government to develop deliberate policy with the aim of establishing the occupational health and safety strategy and enforce them in schools. Therefore, as the enforcement need money, there is a need to have a separate budget in developing occupational health and safety materials, training and infrastructure change in schools to ensure that the occupational health and safety is well articulated in schools. 8

8.4.7 Community engagement in dealing with drug and substance abuse

In as the challenges emanating from drugs and substances abuse, government should make sure that communities are taking part in issues of assisting fighting drugs. This is because the learners do come from the communities and interact with the communities to access drugs and substances. Thus, preventive measures are to be designed that will empower stakeholders in the communities to support the implementation of drug and substance free environment to learners and adolescent, that is significant if the drug and substance free safety environment is to be created.

8.4.8 Audit to discourage smoking

On the other hand, there is need to have an extensive background audits of the staff members to be discouraged to smoking in an open environment that could be noticed by the learners and ensure that strict punitive measures are put in place to promote modest behaviours among both learners and staff members.

8.5 LIMITATIONS

The study encountered the following limitations:

- The current study was limited by geographical coverage. The data obtained could not be generalised as the respondents are not a representative of the entire population of staff members and learners in Gaborone schools.
- The existence of non-significant relationships between variables was a limitation because almost all the hypothesized relationships were not accepted.

8.6 FURTHER RESEARCH

Despite the greater availability of data sources on health and safety at work the current available research remains incomplete, vague or uncertain for many relevant topics.

- In general, there is need to study occupational health and safety in schools with special needs to have the best answers to meet the safety and health demands of the learners and staff members thereby promote the environment in the schools.

- A similar study should be carried in public primary schools which were not studied to explore the occupational health and safety practices at primary school level.

- Research should be conducted to analyse the inclusion of parents in the implementation of occupational health and safety practices in schools.

- There is a need to explore mechanisms that would allow information regarding people safety and health in work place in a longitudinal or panel manner. This would

assist any stakeholders who might be interested in conducting repetitive study either at panel or longitudinal level and identify or project any changes regarding safety and health of people. Thereby informing policies to meet any emergent health needs of the people in the long term.

- There is a dire need to conduct an audit on how the school infrastructure and furniture accelerate the health hazards of the teachers, support staffs and learners in junior schools in the entire country. This would benefit in strategising ways to improve occupational health of the people and minimise health hazards that are not supportive and ergonomic friendly.

- There is a need to investigate ways of enhancing OHSM using Information, communication and Technology infrastructure to make an interactive environment in which issues regarding health and safety are to be discussed among stakeholders' schools and prioritise on awareness and human safety, in the long term.

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Appendix A: Permission to conduct research for a doctoral degree

North-West University

Mafikeng Campus

Private Bag X2046

Mmabatho

2735

South Africa

The Ministry of Education Skills and Development

Private Bag 005

Gaborone

Dear Sir

RE: PERMISSION TO CONDUCT RESEARCH FOR A DOCTORAL DEGREE

I wish to request for extension of two months to collect empirical data for my research project in your region. I am a registered Doctoral student specializing In Educational Management at the University of North West in Mafikeng.

My permission expires on the 15th of September 2014. I was given a new supervisor since the beginning of the year, and the following changes were made with regard to my research project; the topic and the project design was changed from a qualitative to a mixed method approach whereby I have to include focus groups and survey.

The topic for my research is: *Exploration of Occupational Health and Safety Practices and Management in selected junior schools: A Model for Gaborone Schools, Botswana.* I have identified five schools in this region and my population consists of Principal Education Officers, principals, learners and staff members.

I wish my request would reach your favourable consideration.

Yours faithfully

Molaodi V.T. - Researcher

Appendix B: Request for a permit to conduct research

TELEPHONE: 3655469
TELEX: 2944 THUTO BD
FAX: 3185167

MINISTRY OF EDUCATION
AND SKILLS DEVELOPMENT
PRIVATE BAG 005
GABORONE

REPUBLIC OF BOTSWANA

REFERENCE : E1/20/2 XXXIV (11)

6th August 2013

Molaodi V. Thuso
P Bag 26
Mogoditshane

Dear Madam/Sir

RE: REQUEST FOR A PERMIT TO CONDUCT A RESEARCH STUDY

This serves to grant you permission to conduct your study in the sampled areas in Botswana to address the following research objectives/questions /topic:

An Investigating The State Of Occupational Health And Safety Management Amongst Staff And Learners In Gaborone Schools.

It is of paramount importance to seek **Assent** and **Consent** from the Department of Secondary Education, School Heads Teachers of Bonnington, Mogoditshane, Ledumadumane, Bokamoso, Kgale Hill, Tlokweng and Marang Junior Secondary Schools that you are going to collect data from. We hope that you will conduct your study as stated in your proposal and that you will adhere to research ethics. Failure to comply with the above stated, will result in immediate termination of the research permit. The validity of the permit is from **6th August 2013 to 5th August 2014.**

You are requested to submit a copy of your final report of the study to the Ministry of Education and Skills Development, in the Department of Educational Planning and Research Services, Botswana.

Thank you.

E Ranganai
For/Permanent Secretary

Appendix C: Permission to conduct research for a doctoral degree

North-West University

Mafikeng Campus

Private Bag X2046

Mmabatho

2735

South Africa

The Chief Education Officer

South East Region

Private Bag

Gaborone

Dear Sir

RE: PERMISSION TO CONDUCT RESEARCH FOR A DOCTORAL DEGREE

I wish to request for extension of two months to collect empirical data for my research project in your region. I am a registered Doctoral student specializing In Educational Management at the University of North West in Mafikeng.

My permission expires on the 15th of September 2014. I was given a new supervisor since the beginning of the year, and the following changes were made with regard to my research project; the topic and the project design was changed from a qualitative to a mixed method approach whereby I have to include focus groups and survey. The topic for my research is: *Evaluation of Occupational Health and Safety Practices and Management in selected junior schools: A Model for Gaborone Schools, Botswana.* I have identified two schools in this region and my population consists of Principal Education Officers, principals, learners and staff members. The selected schools include; Mogoditshane JSS and Ledumadumane JSS .

Yours faithfully

Molaodi V.T. - Researcher

Appendix D: Request for permission to conduct research

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
MAFIKENG CAMPUS

Private Bag X2046, Mmabatho South Africa, 2735

Tel: 018 389-2111

Education Leadership Development
Tel: 018 3892500 (Secretary)

The Principal/District Official (Ministry of Education Skills and Development)

Dear Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

This is to confirm that **Ms V.T.MOLAODI(Student No: 22399328)** is a PhD student registered at the North-West University, Mafikeng Campus. The title of the dissertation is: **Evaluation of Occupational Health and Safety Practices and Management in selected Junior Schools: A model for Gaborone, Botswana.**

Permission is hereby kindly requested to enter Mogoditshane, Ledumadumane, Bokamoso, Kgale View, Bonnington, Marang, and Tlokweng CJSS, which are in South Central and Kweneng Regions to collect data from the teachers, principals, learners and Principal Education Officers. Data collection will be by way of questionnaires,interviews, focus group ,observation and photography.

Collection of data will occur outside school contact time so as not to interfere with teaching and assessment processes or office duties. The dates and times of the collections are to be agreed upon by the principal and all other participants.

Participants will participate voluntarily in the data collection. The identity of the participants and the school and district will be kept confidential and anonymous. The information collected therefore cannot and will not be used to evaluate the District/school in terms of its performance in comparison with others, because the information collected will not be about academic results or teachers' teaching performance in specific schools.

Appendix E: Request for permission to conduct research

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
MAFIKENG CAMPUS

Dear Sir/Madam

REQUEST FOR PERMISSION TO CONDUCT RESEARCH

The Parents/Guardians of learners at
_____School

This is to confirm that I,**Ms V. T. MOLAODI (Student No:21399328)**am a PhD student registered at the North-West University, Mafikeng Campus. The title of my dissertation is: **Evaluation of Occupational Health and Safety practices and Management in selected Junior Schools: A model for Gaborone Botswana.**

Permission is hereby kindly and humbly requested from you as parent/guardian to allow your child to participate in the research. The aim of the research is to collect data from the learners about safety situations in schools. This data collection will be by way of questionnaires.

Collection of data will be arranged with the principal and staff so as not to interfere with the teaching and assessment processes. The dates and times of the collections are to be agreed upon by the principal and all other participants. Permission has already been granted by the principal that the research may be done in your school.

The identity of your child and the school will be kept confidential and anonymous, as well as yours as parents. The information collected therefore cannot and will not be used to evaluate you as parent or your child, or the teachers or the school in terms of its performance in comparison with others.

Should you enquire more information about the research, kindly contact me Prof Useh, Director if School of Research & Postgraduate Studies. Faculty of Science & Technology. Tel: 01838925321.

Herewith permission is kindly requested from you as parent to allow your child to participate on this research. It would be appreciated if you would kindly grant your **written** consent to this student. The form for that is attached for your convenience.

Yours sincerely,

Appendix F: Ethics approval certificate of project

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

Private Bag X6001, Potchefstroom,
South Africa, 2520

Tel: (018) 299-4900
Faks: (018) 299-4910
Web: http://www.nwu.ac.za

Institutional Research Ethics Regulatory Committee
Tel: +27 18 299 4849
Email : Ethics@nwu.ac.za

ETHICS APPROVAL CERTIFICATE OF PROJECT

Based on approval by the **Human Sciences Research Ethics Committee (HSREC)** on **20/06/2016**, the North-West University Institutional Research Ethics Regulatory Committee (NWU-IRERC) hereby **approves** your project as indicated below. This implies that the NWU-IRERC grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the project may be initiated, using the ethics number below.

Project title: Exploration of Occupational Health and Safety Practices in selected Junior Secondary schools of Gaborone, Botswana.

Project Leader/Supervisor: **Prof U Useh**
Student: **VT Molaodi**

Ethics number: N W U - 0 0 2 9 1 - 1 6 - A 9
(Institution – Project Number – Year – Status)

Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation

Application Type: PhD Application
Commencement date: 2016-06-20 **Expiry date**: 2019-06-20 **Risk**: N/A

Special conditions of the approval (if applicable):

- Translation of the informed consent document to the languages applicable to the study participants should be submitted to the HRREC (if applicable).
- Any research at governmental or private institutions, permission must still be obtained from relevant authorities and provided to the HRREC. Ethics approval is required BEFORE approval can be obtained from these authorities.

General conditions:

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, please note the following:

- *The project leader (principle investigator) must report in the prescribed format to the NWU-IRERC via HRREC:*
  - *annually (or as otherwise requested) on the progress of the project, and upon completion of the project*
  - *without any delay in case of any adverse event (or any matter that interrupts sound ethical principles) during the course of the project.*
  - *Annually a number of projects may be randomly selected for an external audit.*
- *The approval applies strictly to the protocol as stipulated in the application form. Would any changes to the protocol be deemed necessary during the course of the project, the project leader must apply for approval of these changes at the HRREC. Would there be deviated from the project protocol without the necessary approval of such changes, the ethics approval is immediately and automatically forfeited.*
- *The date of approval indicates the first date that the project may be started. Would the project have to continue after the expiry date, a new application must be made to the NWU-IRERC via HRREC and new approval received before or on the expiry date.*
- *In the interest of ethical responsibility the NWU-IRERC and HRREC retains the right to:*
  - *request access to any information or data at any time during the course or after completion of the project;*
  - *to ask further questions, seek additional information, require further modification or monitor the conduct of your research or the informed consent process.*
  - *withdraw or postpone approval if:*
    - *any unethical principles or practices of the project are revealed or suspected,*
    - *it becomes apparent that any relevant information was withheld from the HRREC or that information has been false or misrepresented,*
    - *the required annual report and reporting of adverse events was not done timely and accurately,*
    - *new institutional rules, national legislation or international conventions deem it necessary.*
- *HRREC can be contacted for further information via Estie.Emtoch@nwu.ac.za or 018 299 2873.*

The IRERC would like to remain at your service as scientist and researcher, and wishes you well with your project. Please do not hesitate to contact the IRERC or HRREC for any further enquiries or requests for assistance.

Yours sincerely

Prof LA Du Plessis

Digitally signed by Prof LA Du Plessis
Date: 2016.09.27 14:36:31 +02'00'

Prof Linda du Plessis
Chair NWU Institutional Research Ethics Regulatory Committee (IRERC)

Appendix G: Questionnaire for teachers

Thank you for agreeing to participate in this survey of exploration of occupational health and safety practices and management in selected Gaborone schools. The main purpose of this survey is to explore the state of occupational health and safety management in Gaborone schools by looking at the physical, ergonomic and the psychosocial conditions and sensitise the school community, Ministry of Education Skills and Development and policy makers about the importance of safety practices in schools.

SECTION A: DEMOGRAPHIC DATA

1. How old are you? _____
2. Gender

Male	
Female	

3. What is your highest professional/ academic qualification?

Post-Secondary teaching certificate, diploma or non-degree equivalent	
Bachelor in Education or equivalent	
Master in Education or equivalent	
PhD or equivalent	
Other Please specify	

4. How many years have you been teaching? _____

5. Which department are you in? _____

6. Additional Health and Safety Training and Qualification e.g. First Aid, In-service training, safety training. _____.

7. Which subject do you teach?

Design and Technology	
Home Economics	

Science	
Agriculture/ Art	
Other, please specify	

SECTION B: PHYSICAL SAFETY CONDITIONS

Please rate the following statements according to the scale below. Place an "X." in the appropriate box;

SA (1) Strongly Agree

A (2) Agree

U (3) Undecided

D (4) Disagree

SD (5) Strongly Disagree

STATEMENT	SA	A	U	D	SD
The staffroom and classrooms should have two emergency exit with visual emergency signs	1	2	3	4	5
Floors and walkways be even and not obstructed	1	2	3	4	5
Provision of protective clothing to staff members in Gaborone schools should be enforced	1	2	3	4	5
Personal Protective Equipment(PPE) should be maintained and replaced regularly	1	2	3	4	5
Ceilings tiles should be intact, undamaged and in place.	1	2	3	4	5
Enough appropriate fire extinguishers should be provided	1	2	3	4	5
First aid equipment should be provided	1	2	3	4	5
All electrical cords and plugs should be in good conditions	1	2	3	4	5
All switch boxes should be covered	1	2	3	4	5

Put X in the appropriate box

STATEMENT	Yes	No

The staffroom and classrooms in my school have two emergency exit with visual emergency signs		
Floors and walkways in my school are and not obstructed		
Provision of Protective Equipment to staff members in my school is enforced		
Personal Protective Equipment in my school is maintained and replaced regularly		
Ceilings tiles in classrooms is intact, undamaged and in place.		
Enough appropriate fire extinguishers are provided in my school		
First aid equipment is provided		
All electrical cords and plugs are in good conditions		
All switch boxes are covered		

Put X in the appropriate box

Each fire extinguisher in the school has been clearly marked with the date of last inspection.

YES	
NO	

Staff and learners in my school know what to do in cases of emergencies like;

	YES	NO
Armed robberies		
Electrical faults and failures		
Bullying		
Gang fights		

SECTION C: PHYSICAL ENVIRONMENT

Are storage for tools, raw materials and products provided?

Yes	
No	

Do you always clear waste and other unnecessary material from the work room?

Yes	
No	

Does your school have adequate waste bins for different types of waste?

Yes	
No	

Is there proper drainage of waste water in your school?

Yes	
No	

Are doors and windows in your laboratories in good condition to allow increased natural ventilation?

Yes	
No	

Are machines and tools in the labs maintained and adjusted to reduce noise?

Yes	
No	

Is dust in your school removed using proper material?

Yes	
No	

Waste in my school is disposed weekly

Yes	
No	

School buildings are clean and maintained

Yes	
No	

What type of toilet system is used by learners in your school?

Pit latrine	
Flushing toilets	

CLASSROOM/LAB CONDITIONS AND HOUSEKEEPING

Place an "X' in the appropriate box

Question	Yes	No	Comment
Are floor surfaces in good condition?			
A re all doors have locks that are in working order			
Is there sufficient lighting?			
Is there a dedicated store room available			
Is there appropriate Safety Signage in place?			
Where there is a gas supply, is the gas cylinder isolated within the room?			
Does the store room provide sufficient space?			
Is racking provided?			
Is the store well laid out?			
Is there good access & way out from the store for the delivery & handling of materials?			
Are there any portable gas or Electrical heaters present? Specify.			

What is the physical condition of the rooms?-

_____

_____

_____
_____
_____

What arrangements are in place for waste removal?_____
_____
_____
_____

SECTION D: ERGONOMICS

Please indicate by putting an "X' how important the following statements are in occupational health and safety in terms of the scale below;

STATEMENT	Yes	No
The height of work surfaces are raised to avoid bending postures for standing workers		
Work tables of suitable height for seated staff members are provided to avoid too high or low hand positions		
Chairs of correct height or adjustable seat for staff members are provided		
Chairs with back rest of proper size to support lower back should be provided		
Adequate toilet facilities close to the work are provided		
Computer chairs in school do have arm rest		
Computer workstation, components and accessories are maintained in serviceable conditions.		
Physical activities or sports activities are enforced in my school		

What is the present state of furniture in your school?----------
---

SECTION E: PSYCHOSOCIAL CONDITIONS

DRUG ABUSE

Please mark “X.” in the appropriate box;

Statement	Yes	No
There are cases of alcohol abuse in my school		
There are often cases of learners smoking alcohol in my school		
The use of drugs such as ganja, marijuana and others is a common practice in my school		

VIOLENCE AND DISORDER

To what extent is each of the following a problem in your school? (Not at all, A little, Some, To a great deal).

Statement	Not at all	A little	Some	To a great extent
Physical conflicts among students				
Robbery or theft				
Disorder in the classrooms				
Disorder outside classrooms				
Threats of violence towards teachers				

WAYS OF DEALING WITH PYSCHOSOCIAL CONDITIONS

Please mark “X.” in the appropriate box;

Statement	Yes	**No**
There are problems for handling incidents of verbal abuse in my school		
In my school there are procedure of dealing with bullying		
There is an education programme for dealing with substance abuse		
There are trained guidance and counselling teachers in my school		

What role does the Guidance and Counselling Department play in your school?_____

_____

_____

_____

SECTION G: COMPLIANCE TO INTERNATIONAL STANDARDS

Please mark “X.” in the appropriate box;

STATEMENT	Yes	No	Do not know
Inspection tours for safety purposes are regularly undertaken in my school			
All injuries are investigated			
All property damage are investigated			
There is a procedure followed in reporting injuries and property damage and accidents			

FIRE SAFETY

Please mark “X” in the appropriate box and make comments if you have any in the box provided

QUESTION	YES	NO	COMMENT
Is there an automatic fire detection and alarm system in place?			
Are there fire hose reels and/or fire extinguishers in place?			
Is there an emergency lighting system in place?			
Are emergency contact numbers and details displayed where everyone in the school can see them?			
Are fire drills carried out?			
Is the designated means of escape adequate in the labs or classrooms?			
Are there maintained exit routes?			
Are fire exits free from obstruction?			

Indicate availability and place an “X” in the appropriate box for the systems that are available. The following systems for communicating emergencies are available in my school and are in working order;

	Available (Yes/No)	In working order	Not in working order
Intercom			
Loud speakers			
Telephone			
Siren			

PERSONAL PROTECTIVE EQUIPMENT 9PPE) PROVIDED FOR LEARNERS DOING PRACTICAL SUBJECTS AND TEACHERS TEACHING THOSE SUBJECTS

PPE	Yes	No	Individual Use	Shared
Safety Goggles/Glasses				
Overalls/Machine shop coat/ Aprons				
General purpose dust mask				
Hearing Protection (Ear muffs/ear plugs)				
Other				

Is the wearing of Personal Protective Equipment enforced? _____

If so, by whom?_____

Is there workshop material that learners are prohibited from using without teacher supervision?_____

FIRST AID EQUIPMENT

Question	Yes	No	Comment
Is there a first aid kit present in the lab, if so what does it contain?			
Is there eyewash available in the kit?			

How did you decide on what to put into your first aid kit?_____
_____
_____

SECTION I: STRATEGIES TO SAVEGUARDING THE HEALTH AND SAFETY OF WORKERS

POLICY REGULATIONS AND MANAGEMENT

Please mark "X." in the appropriate box

STATEMENT	**YES**	**NO**
Our school has a school safety policy		
There is an incident register where all disruptions and safety violations are recorded		
Violations of law are reported to the police and the ministry of Education Skills and Development.		
Our staff are trained in detecting weapons		
Signs concerning visitor policy and tress passing are properly displayed at entrance of the school		
There is an emergency team which is organized to implement emergency plans		
There is a communication strategy between the office and staff		
Staff members are trained in first Aid and mouth to mouth resuscitation		

There is an education programme in safety/security awareness		

What do you suggest should be done to improve the state of Occupational Health and Safety Management in Gaborone junior schools?.....
.....
.....
.....
..

THANK YOU FOR YOUR VALUABLE TIME IN COMPLETING THE QUESTIONNAIRE!

Appendix H: Questionnaire for learners

Dear Learner

The purpose of this questionnaire is to obtain information regarding the state of occupational health and safety management amongst teachers and learners in Gaborone junior schools. The information collected with this instrument will be used exclusively for academic purposes. You are further guaranteed about confidentiality and anonymity. Please do not write your name.

You are welcome to ask any question if you need clarity.

SECTION A: DEMOGRAPHIC DATA

Please answer the first section by ticking the relevant block.

1. Gender

Male	
Female	

2. Age in years

3. In which form are you?

Form 1	
Form 2	
Form 3	

SECTION B: PHYSICAL SAFETY CONDITIONS

1. Please place an "X." in the appropriate box;

STATEMENT	Yes	No
All classrooms in my school have two emergency exit with visual emergency signs		
The escape ways for these rooms are free from obstacles		
Floors and walkways in my school are even and not obstructed		
Provision of protective clothing to staff members and learners in my school is enforced		

Personal Protective Equipment are maintained and replaced regularly		
Ceilings for classrooms and labs in my school are not damaged.		
Enough appropriate fire extinguishers provided in my school		
First aid equipment is provided		
All electrical cords and plugs in our classroom are in good conditions		
All switch boxes are covered		

2. Put X in the appropriate box

Learners in my school know what to do in cases of emergencies like;

	YES	NO
Fire		
Armed robberies		
Electrical faults and failures		
Bullying		
Gang fights		
Intruders/trespassers		

SECTION C: OCCUPATIONAL HEALTH

Please indicate by putting an "X' how important the following statements are in occupational health and safety in terms of the scale below;

STATEMENT	Yes	No
The height of work surfaces are raised to avoid bending postures for standing workers		
Work tables of suitable height for seated staff members are provided to avoid too high or low hand positions		
Chairs of correct height or adjustable seat for staff members are provided		

Chairs with back rest of proper size to support lower back should be provided		
Adequate toilet facilities close to the work are provided		
Computer chairs in school do have arm rest		
Computer workstation, components and accessories are maintained in serviceable conditions.		
Physical activities or sports activities are enforced in my school		

What is the present state of furniture in your school?----------
---

The following questions address the physical conditions of the classrooms/laboratories.

Please answer the following by placing an "X" in the appropriate box.

Are storage for tools, raw materials and products provided?

Yes	
No	

Do you remove waste every week of the month?

Yes	
No	

Does your school have adequate waste bins for different types of waste?

Yes	
No	

Are bins emptied immediately they are full?

Yes	
No	

Do you make sure that the school environment is free of litter?

Yes	
No	

Are there is proper drainage of waste water in your school?

Yes	
No	

We do have separate toilets for girls in my school

Yes	
No	

Are machines and tools in the labs maintained and adjusted to reduce noise?

Yes	
No	

Is dust in your school removed using proper material?

Yes	
No	

Waste in my school is disposed weekly

Yes	
No	

Systems for communicating emergencies such as intercom, loud speaker, telephone or siren etc. are in working order

Yes	
No	

All doors have locks that are in working order

Yes	
No	

School buildings are clean and maintained

Yes	
No	

Windows in my laboratories are not broken

Yes	
No	

Waste containers to throw away sanitary pads is provided

Yes	
No	

Water and soap for washing hands inside toilet cubicles is provided

Yes	
No	

Our toilets have lockable doors from inside

Yes	
No	

What type of toilet system is used by learners in your school?

Pit latrine	
Flushing toilets	

SECTION D: CLASSROOM/LAB CONDITIONS AND HOUSEKEEPING

Place an "X' in the appropriate box

Question	Yes	No	Comment
Are floor surfaces in good condition?			
A re all doors have locks that are in working order			
Is there sufficient lighting?			
Is there a dedicated store room available			
Is there appropriate Safety Signage in place?			
Where there is a gas supply, is the gas cylinder isolated within the room?			
Does the store room provide sufficient space?			
Is racking provided?			
Is the store well laid out?			
Is there good access & way out from the store for the delivery & handling of materials?			
Are there any portable gas or Electrical heaters present? Specify.			

SECTION E: PSYCHOSOCIAL CONDITIONS

DRUG ABUSE

Please mark “X.” in the appropriate box;

Statement	Yes	No
There are cases of alcohol abuse in my school		
There are often cases of learners smoking alcohol in my school		
The use of drugs such as ganja, marijuana and others is a common practice in my school		

VIOLENCE AND DISORDER

To what extent is each of the following a problem in your school? (Not at all, A little, Some, To a great deal).

Please mark “X.” in the appropriate box;

Statement	Not at all	A little	Some	To a great extent
Physical conflicts among students				
Robbery or theft				
Disorder in the classrooms				
Disorder outside classrooms				
Threats of violence towards teachers				

WAYS OF DEALING WITH PYSCHOSOCIAL CONDITIONS

Please mark “X.” in the appropriate box;

Statement	Yes	**No**
There are problems for handling incidents of verbal abuse in my school		
In my school there are procedure of dealing with bullying		
There is an education programme foe dealing with substance abuse		
There are trained guidance and counselling teachers in my school		

THANK YOU FOR YOUR VALUABLE TIME IN COMPLETING THE QUESTIONNAIRE!

Appendix I: Focus Group Discussion schedule

Focus Group Interview Schedule

Physical Safety Conditions

- How will you describe the conditions of the floors in the classrooms and offices of your school?
- Do you have security personnel in your school and what do you think their role is?
- How does your school control movement of outsiders who comes to your school.
- In your opinion, do you think the security guards are effective?
- Are there incidents of learners carrying dangerous weapons in your school
- What about cases of bullying, do you have any in your school?
- How safe do you feel when you are in the school premises?
- In your view, do you think school management takes proper actions on security reported matters?

Occupational Health

- What can you say about the general hygienic environmental status of your school?
- Is there anything that you will like to share with us regarding sanitation?
- What can you say about the furniture in your school
- Let us talk about food, how hygienic are they
- What does your school do to ensure that food are safe and healthy?
- Anything else that you may wish to share with us regarding food!
- How does your school cater for disabled learners?

Compliance to Safety Standards

- Does your school provide and enforce PPE
- What if the PPE is lost or damaged, is it replaced urgently?
- Do you have knowledge about fire equipment in your school

Appendix J: Responses to Focus Group 2 (Non-teaching staff)

Responses to focus group 2 Transcripts from FGD (Non-teaching staff)

COMPLIANCE

Non Teaching Staff4: *We feel safe because we have installed fire extinguisher in the school and we were trained on how to operate them.*

The company also availed the blanket equipment.

***Non Teaching staff 1**: Yes , A workshop has been conducted to inform staff about issues of compensation. We know when an employee is compensated and when not.*

***Non Teaching Staff 3:** We cannot comment much about it because nothing has happened as yet that will warrant any compensation.*

***Non Teaching Staff 10**; "You see here within the school we do not have enough kitchens that are to promote cooking in a hygiene safe environment. We have been recommending to management to perform extensive maintenance and make the place robust for safety, but to no avail.*

***Non- Teaching Staff 5**: You can see for yourself the lives of the people are at stake. We do not have proper tables to be used for student in the Dining hall, our kitchen cupboards are old and do not have proper fittings such as the rack to be used to hung our kitchen utensils, this create laxity in handling place, hence we put them on the floor and it has become like an acceptable practice now.*

Appendix K: Analysis of non-teaching staff

ANALYSIS –NON-TEACHING

	COMPLIANCE	***There is safety in the school due to presence of fire extinguishers***
Non-Teaching Staff4*: We feel safe because we have installed fire extinguisher in the school and we were trained on how to operate them.* *The company also availed the blanket equipment.*	*We feel safe because we have installed fire extinguisher*	
Non-Teaching staff 1*: Yes , A workshop has been conducted to inform staff about issues of compensation. We know when an employee is compensated and when not.* ***Non-Teaching Staff 3:*** *We cannot comment much about it because nothing has happened as yet that will warrant any compensation.*	*A workshop has been conducted to inform staff about issues of compensation.*	*Non-Teaching staff are informed about compensation*
Non-Teaching Staff 10*; "You see here within the school we do not have enough kitchens that are to promote cooking in a hygiene safe environment. We have been recommending to management to perform extensive maintenance and make the place robust for safety, but to no avail.*	*we do not have enough kitchens that are to promote cooking in a hygiene safe environment*	*School Kitchen is unhygienic*
Non- Teaching Staff 5*: You can see for yourself the lives of the people are at stake. We do not have proper tables to be used for student in the Dining hall, our kitchen cupboards are old and do not have proper fittings such as the rack to be used to hung our kitchen utensils, this create laxity in handling place, hence we put them on the*	*You can see for yourself the lives of the people are at stake.* *We do not have proper tables to be used for student in the Dining hall,*	Unhygienic conditions puts learners' lives at stake. Kitchen furniture is old such that tables might endanger learners' lives.

floor and it has become like an acceptable practice now.	*our kitchen cupboards are old and do not have proper fittings*	
Non-Teaching Staff 1: *"The way we manage and store in the kitchen is not proper, I don't think we can pass food compliant tests. We are just doing this without getting penalties because we are a public junior school.* *The way we manage and store in the kitchen is not proper, I don't think we can pass food compliant tests. We are just doing this without getting penalties because we are a public junior school" (IDI, Staff member.*		*Kitchen Storage facilities are not in good working condition* *Kitchen might fail hygiene compliance test*
Non-Teaching Staff*::Yes we have been trained on how to use the fire equipment although other staff members were not present. The blanket is specifically used for people when they get burnt since fire extinguishers cannot be used on them. Training was provided only once we are not sure if we can be able to apply what we learnt.*	*Yes we have been trained on how to use the fire equipment although other staff members were not present.*	*Non-teaching staff have been trained to use fire equipment*
Non-Teaching Staff (2:*) Learners are generally disciplined during meal times because we are working hand in hand with the prefects and the teachers on duty during meal times.*		
Non-Teaching Staff 6*: I would say the safety conditions are good and we are provided with protective clothing. The safety conditions are generally fine. The situation is improving because we have alerted the management on several occasions that we*	*I would say the safety conditions are good and we are provided with protective clothing*	*Safety conditions are satisfactory* *Non-teaching staff have protective clothing*

do need safety awareness trainings. We do have protective clothing like helmets, gloves and goggles.	*We do have protective clothing like helmets, gloves and goggles.*	
***Non-Teaching Staff 1:** I have been given the position of fire marshal in this school though I am not trained, maybe it is because of the job that I am doing.*	*I have been given the position of fire marshal in this school though I am not trained,*	***There is a fire marshal in the school***
***Non- Teaching Staff 3:** Generally, we basically feel unsafe in the school.*	*Generally, we basically feel unsafe in the school*	*Non-teaching staff is unsafe in the school*
***Non-Teaching Staff 4**: We do not have fire assembly point and we have not conducted any fire drills but there is a spot that is identified in the school.*	*We do not have fire assembly point and we have not conducted any fire drills*	*There is no fire assembly* *There are no fire drills*
	But there is a spot that is identified in the school.	*There is a space demarcated as fire assembly*
***Non-Teaching 6**: First Aid facilities should be provided. Training or awareness workshops should be conducted regularly.*	*First Aid facilities should be provided.*	*There is no first aid facilities*
	Training or awareness workshops should be conducted regularly	*There is need for workshops focused on disseminating knowledge about fire safety*
GENERAL COMMENTS		
***Non-Teaching Staff 6**: We are not free to discuss our personal problems with the guidance teacher because we do not know if*	*We are not free to discuss our personal*	*Guidance and counselling facility not used by non-teaching staff*

our problems will not be discussed with other teachers.	*problems with the guidance teacher*	
Non- Teaching3: *We do not have a shower and toilet around the kitchen (working area). They are only two sets of toilets which are situated by the staff room for every staff member to use.*	*We do not have a shower and toilet around the kitchen*	*There is no shower nor toilet in the kitchen*

Appendix L: Qualitative analysis of some questions (Principal Interview Data)

QUALITATIVE ANALYSIS OF SOME QUESTIONS (PRINCIPAL INTERVIEW DATA

Analysis of compliance with respect to toilet provision

Name: How many toilets <Internals\\FGPA> - § 1 reference coded [6.74% Coverage] Reference 1 - 6.74% Coverage How many toilets		COMPLIANCE	NON-COMPLIANT	INTERPRETIVE
Interviewer*: Oh! I see, looking at the enrolment for your school, how many toilets are there for students?*	**School Principal:** *Well we have 8 toilets for learners, four for boys and four for girls.*		*Well we have **8 toilets for learners,** four for boys and four for girls*	Principal (O4)'s has about 724 learners on the roll. The ratio of toilets to learners is 8:724 which translates to 1 toilet to 91 learners. However, this is below the current prescribed minimum ration of 1 toilet to 33 learners (see Omolo and Simatwa (2010). As such, the school might be classified as non-OH complaint in this aspect

Interviewer: Are they flushing toilets or pit latrines	Principal: They are flushing toilets <Internals\\FPO2 > - § 1 reference coded [6.63% Coverage] Reference 1 - 6.63% Coverage How many toilets			
Interviewer: *Oh! I see, looking at the enrolment for your school, how many toilets are there for students?*	**School Principal:** *Well we have eight toilets for learners, four for boys and four for girls.*		***eight toilets for learners**, four for boys and four for girls.*	Principal (PO2)'s school has 8 toilets for about 724 learners. Similar conclusions can be drawn that the school is non-OH complaint in provision of toilets for learners.
Interviewer: Are they flushing toilets or pit latrines	**Principal:** *They are flushing toilets* <Internals\\FPO3 > - § 1 reference coded [5.99% Coverage] Reference 1 - 5.99% Coverage How many toilets	They are *flushing toilets*		
Interviewer: *Oh! I see, looking at the enrolment for your school, how many toilets are there for students?*	**School Principal:** *Well we have thirty two sets of toilets for learners, eight pit latrines and eight flushing toilets for*	*thirty two sets of toilets for learners, eight pit latrines and eight flushing toilets for boys and the same set for girls*		Principal (PO3)'s has 32 toilets for an enrolment of 844 learners. This translates to a ratio of 1 toilet to 27 learners. In

	boys and the same set for girls.		essence, it suffice to conclude that PO3's school is OH complaint since the ratio of toilets to learners is sufficiently above the specifics (i.e. 1:33).
	<Internals\\FPO5 > - § 1 reference coded [6.36% Coverage] Reference 1 - 6.36% Coverage How many toilets		
Interviewer*: Oh! I see, looking at the enrolment for your school, how many toilets are there for students?*	**School Principal***: Well we have 24 toilets for learners, twelve for boys and twelve for girls.*	**School Principal:** Well we have 24 toilets for learners, twelve for boys and twelve for girls.	PO5's school has 24 toilets for an enrolment of 769 learners. The ratio of toilets to learners is 1:33 in its simplified form. This ratio is within the prescribed ratio of 1 toilet to 33 learners. As such, it suffice to conclude that the school is complaint with the specifics regulating toilet learner ratio.
Interviewer: Are they flushing toilets or pit latrines	**Principal:** They are flushing toilets		

	<Internals\\FPO6 > - § 1 reference coded [7.48% Coverage] Reference 1 - 7.48% Coverage How many toilets		
Interviewer: *Oh! I see, looking at the enrolment for your school, how many toilets are there for students?*	**School Principal:** *Well we have 24 toilets for learners, twelve for boys and twelve for girls.*	**School Principal:** Well we have 24 toilets for learners, twelve for boys and twelve for girls.	Similarly, PO6's school is within the prescribed ratio of 1 toilet to 30 learners since the school has 24 toilets servicing about 720 learners
Interviewer: Are they flushing toilets or pit latrines	*Principal; They are flushing toilets*		

Name: Importance of OH and Safety management <Internals\\FGP O4> - § 1 reference coded [7.16% Coverage] Reference 1 - 7.16% Coverage Importance of OH and Safety management	Perception on OH	SAFETY	Interpretive Analysis

Interviewer: *How important do you think Occupational Health and safety management is to your school?*	**School Principal:** *It is important.*	*It is important.*		**Occupational Health is critical in a school setting**
	<Internals\\FPO 2> - § 1 reference coded [3.36% Coverage] Reference 1 - 3.36% Coverage Importance of OH and Safety management			
	School Principal: *Eh..! I believe it is important to institute OHS because safety is imperative for any organisation.*	*..! I believe it is important to institute OH*	*because safety is imperative for any organisation.*	**Establishing OHS in a school is crucial for the welfare of staff and learners**
<Internals\\FPO3 > - § 1 reference coded [3.46% Coverage] Reference 1 - 3.46% Coverage Importance of OH and Safety management				
	School Principal: *Eh..! I believe it is important to establish OHS*	*I believe it is important to establish OHS*	*because safety is very important for any organisation*	**Establishing OHS in a school is crucial for the welfare of staff and learners**

	because safety is very important for any organisation. <Internals\\FPO 5> - § 1 reference coded [6.64% Coverage] Reference 1 - 6.64% Coverage Importance of OH and Safety management			
Interviewer: *How important do you think Occupational Health and safety management is to your school?*	**School Principal:** *Eh..! I believe it is important to establish OHS because safety is very important for any organisation.*	*I believe it is important to establish OHS*	*because safety is very important for any organisation*	**Establishing OHS in a school is crucial for the welfare of staff and learners**
<Internals\\FPO6 > - § 1 reference coded [16.02% Coverage] Reference 1 - 16.02% Coverage Importance of OH and Safety management				

Interviewer: Interesting! *Now let us get to our business. How important do you think Occupational Health and safety management is to your school?*	**School Principal:** *Eh..! I believe it is important to set up OHS because the way the situations are in schools, the school community is unsafe hence the practice can benefit the schools.*	*I believe it is important to set up OHS*	*because the way the situations are in schools, the school community is unsafe hence the practice can benefit the schools.*	**Establishment of OHS is critical and beneficial in a school setting**

Name: Do you have problems of drug abuse and indiscipline in the school <Internals\\FGPO4> - § 1 reference coded [15.68% Coverage] Reference 1 - 15.68% Coverage		Analysis focused on OH-drug abuse	
Do you have problems of drug abuse and indiscipline in the school	**School Principal***:*		
Interviewer: *Do you have problems of drug abuse or indiscipline cases*	**Principal:** *We have very few problems of indiscipline*	*We have very few problems of indiscipline*	**There is indiscipline though limited**
Interviewer*: Now, tell me about the role Guidance and*	**School Principal***: The Guidance& Counselling*	*The Guidance& Counselling department plays a*	**Indiscipline is dealt with through guidance and counselling and**

Counseling play in your school?	*department plays a vital role of dealing with disciplinary cases. Apart from holding talks for students during assembly. It also works hand in hand with the disciplinary committee and the pastoral office in cases of discipline. There is a disciplinary book that is kept in the HOD office to record students who are perpetual defaulters and they are handed to the department of G&C for assistance.* <Internals\\FPO2> - § 1 reference coded [13.12% Coverage] Reference 1 - 13.12% Coverage Do you have problems of drug abuse and indiscipline in the school	*vital role of dealing with disciplinary cases.*	**Disciplinary committee. In PO4"s school indiscipline and probably drug abuse, is addressed internally**
Interviewer*: Now, tell me about the role Guidance and*	**School Principal***; We do have problems of drug*	Students do not bring alcohol to school but they do	**There is drug abuse in PO2's school and dagga**

Counselling play in your school?	*abuse, students do not bring alcohol to school but they do bring "motokwane" (illegal drugs) to school. We had three cases last year, we have since referred the cases to the police and they are still investigating. Those cases are referred to the Guidance and Counselling department. However, staff members are not comfortable to discuss their personal issues with the guidance teachers but they do refer their students.* <Internals\\FPO3> - § 1 reference coded [8.15% Coverage] Reference 1 - 8.15% Coverage Do you have problems of drug abuse and indiscipline in the school	bring "motokwane" (illegal drugs) to school.	**appears to be the most predominant** **The school reports drug abuse cases to the police. All in all drug abuse is addressed by through external assistance**

Interviewer: *Now, tell me about the role Guidance and Counselling play in your school?*	**School Principal**: *When we have problems regarding indiscipline, the guidance and counselling department intervenes. For instance, drug abuse issues are dealt with by the guidance and counselling department and the Pastoral Office.* <Internals\\FPO5> - § 1 reference coded [12.76% Coverage] Reference 1 - 12.76% Coverage Do you have problems of drug abuse and indiscipline in the school	*For instance, drug abuse issues are dealt with by the guidance and counselling department and the Pastoral Office.*	**Drug abuse is present in PO3's school Cases involving drug abuse are dealt with by guidance and counselling together with the pastoral office. In this school drug abuse is addressed internally**
Interviewer: Do you have drug abuse or indiscipline problems in your school?	*Principal: We do have, because of the location that the school is in.*	*We do have, because of the location that the school is in.*	There is drug abuse in the school
Interviewer: *Now, tell me about the role Guidance and Counselling play in your school?*	**School Principal**; *It plays a major role since the school is situated in a school in a site where learners are exposed to all sorts*	*The department handles those cases. They work hand in hand with the disciplinary and the Pastoral Department*	**Drug abuse cases are addressed internally through the guidance and counselling department, disciplinary committee**

	of bad habits like drug abuse. The department handles those cases. They work hand in hand with the disciplinary and the Pastoral Department to conduct talk shows, training and awareness workshops. <Internals\\FPO6> - § 1 reference coded [9.61% Coverage] Reference 1 - 9.61% Coverage Do you have problems of drug abuse and indiscipline in the school		**and Pastoral department**
Interviewer: *Do you have problems of drug abuse and indiscipline in the school?*	**Principal***: Yes, we do have cases of students coming to school with drugs*	*Yes, we do have cases of students coming to school with drugs*	**There is drug abuse in PO6's school**
Interviewer*: Now, tell me about the role Guidance and Counselling play in your school?*	**School Principal***; It plays a major role of dealing with the psychosocial issues in the school.*		**Guidance and counselling handles cases of drug abuse in the school**

Table 5.12: Analysis focused on possible solutions

Name: What do you think can be done to improve the situation in schools <Internals\\FGPO4> - § 1 reference coded [9.11% Coverage] Reference 1 - 9.11% Coverage		Possible ways to address OHS	
What do you think can be done to improve the situation in schools	**School Principal***:*		
Interviewer*: What do you think can be done to improve the situation in schools?*	**School Principal***: Educating personnel on OHS, coming up with clear policies on OHS and sensitizing the whole school community. I believe that the ministry should take the lead.*	*Educating personnel on OHS, coming up with clear policies on OHS , coming up with clear policies on OHS sensitizing the whole school community.*	**Staff members should be educated Schools should have OHS policies Sensitizing school community**
Interviewer: *Thank you so much once again for your time!*	**Principal:** *You are most welcome!*		
	<Internals\\FPO2> - § 1 reference coded [7.22% Coverage] Reference 1 - 7.22% Coverage What do you think can be done to improve the situation in schools		
Interviewer*: What do you think can be done to improve the situation in schools?*	**School Principal***; The government should outsource these services. We hear it is in the process of doing that and we welcome the idea.*	*The government should outsource these services.*	**Outsource OHS services**

Interviewer: *Thank you so much once again for your time!* <Internals\\FPO3> - § 1 reference coded [6.77% Coverage] Reference 1 - 6.77% Coverage			
What do you think can be done to improve the situation in schools? **Interviewer:** *What do you think can be done to improve the situation in schools?*	**School Principal***: The government should change the policy. A qualified nurse should be attached to very school.*	*A qualified nurse should be attached to very school.*	**Allocate schools with nurses**
	Interviewer: *Thank you so much once again for your time!* <Internals\\FPO5> - § 1 reference coded [8.48% Coverage] Reference 1 - 8.48% Coverage What do you think can be done to improve the situation in schools		
Interviewer: *What do you think can be done to improve the situation in schools?*	**School Principal***; Well! I believe that this interview is an eye opener because I have seen how important Occupational Health and Safety management is. Basically, it is important that we establish OHS in schools.*	*Basically, it is important that we establish OHS in schools.*	**Establish OHS**

Interviewer: *Thank you so much once again for your time!* <Internals\\FPO6> - § 1 reference coded [7.85% Coverage] Reference 1 - 7.85% Coverage			
What do you think can be done to improve the situation in schools? **Interviewer:** *What do you think can be done to improve the situation in schools?* **Interviewer:** *Thank you so much once again for your time!*	**School Principal***; Well! I believe that OHS is important and that members of the school should be educated in this matter.*	*Members of the school should be educated in this matter.*	**Educate staff members**

Table 5.7: Analysis focused on school readiness in the event of fire outbreak

Name: What do you think can happen <Internals\\FGPO4> - § 1 reference coded [6.22% Coverage] Reference 1 - 6.22% Coverage		Safety readiness for emergency	Not ready
What do you think can happen **Interviewe**r: What do you think can happen in cases like emergencies like fire?	**School Principal**: Heish! It will be chaos and a hassle because we do have doubled storied classrooms. So, I can't imagine what will happen. We do	It will be chaos and a hassle I can't imagine what will happen. We do not have fire assembly point	PO4's is not ready for fire emergency. The situation is compounded by the realisation that the school's classrooms are

	not have fire assembly point	housed in double storey buildings. The implication is that evacuating learners from classrooms might prove to be chaotic, difficult and might result in disaster. As such it maybe concluded that there is no safety in the event of fire outbreak.
<Internals\\FPO2> - § 1 reference coded [9.65% Coverage] Reference 1 - 9.65% Coverage What do you think can happen **Interviewe**r: What do you think can happen in cases like emergencies like fire?	**School Principal**: **School Principal**: Fire assembly point- not really. We do have a school assembly point where we conduct our morning prayers. Although not labelled, we have informed the school community to assemble here in case something happens. We do not do emergency drills maybe because we have not had any emergencies. We will face it when something happens.	PO2's schools have demarcated the school's assembly point as its fire assembly point in the event of fire outbreak. This appears to be the only mode of safety that the school can provide in the event of fire. The absence of emergency drills presupposes that the demarcated assembly point might not be useful in the event

of fire since the absence of emergency drills denies them the opportunity to realise it as a safety need

<Internals\\FPO3> - § 1 reference coded [4.31% Coverage]
Reference 1 - 4.31% Coverage
What do you think can happen

School Principal: We do not have assembly point, but we have identified a spot with the help of the company that was installing the fire extinguisher. We hope to label it.

We do not have assembly point, but we have identified a spot with the help of the company that was installing the fire extinguisher

but we have identified a spot

We hope to label it.

PO3's school has earmarked a piece of land to use as fire assembly point. The school might be said to be not safe in the event of fire outbreak. There is indecision and lack of commitment in PO2's assertion though he/she is the highest authority in the school. This is derived from his/her talk where he says, "we hope to label it". Hence it is unlikely that the school might

			have a fire assembly point soon.
<Internals\\FPO5> - § 1 reference coded [10.25% Coverage] Reference 1 - 10.25% Coverage What do you think can happen	**Interviewe**r: What do you think can happen in cases like emergencies like fire?		
School Principal: Talking about emergency! We once had an incident here in school whereby a swamp of bees was removed from the hives and everybody was running for his or her or her life. As a result, they attacked one of our staff members who ended up losing his life.	We used to have an emergency assembly point and it was destroyed by a car. No! We never conduct any emergency or fire drills.	We used to have an emergency assembly point and it was destroyed by a car. No! We never conduct any emergency or fire drills.	PO5's school is neither safe nor ready to deal with fire outbreak. There is no fire assembly point and emergency fire drills a never conducted to prepare nor test for fire readiness
	<Internals\\FPO6> - § 1 reference coded [5.20% Coverage] Reference 1 - 5.20% Coverage What do you think can happen		
Interviewer: What do you think can happen in cases like emergencies like fire?	**School Principal**: We do not have an assembly point, so whenever crisis arise, I expect chaos in the school.		**PO6's school does not ready for fire outbreak to the point where only chaos is anticipated in the event of fire. Consequently, it might suffice to**

			say that fire safety needs are not realised
Name: Do you have funds allocated <Internals\\FGPO4> - § 1 reference coded [1.74% Coverage] Reference 1 - 1.74% Coverage Do you have funds allocated? **Interviewer***: Do you have funds allocated for safety*	**Principa**l*: We do not service them due to insufficient funds.*	*We do not service them due to insufficient funds.*	**Funds are in sufficient**
<Internals\\FPO2> - § 1 reference coded [2.22% Coverage] Reference 1 - 2.22% Coverage Do you have funds allocated? **Interviewer***: Do you have funds allocated for safety*	**Principa**l*: Yes, we do!*	*Yes, we do*	**Funds are available**
<Internals\\FPO3> - § 1 reference coded [6.56% Coverage] Reference 1 - 6.56% Coverage Do you have funds allocated? ***Interviewer****:* So, from what I gather there were no funds allocated for safety ***Interviewer:*** *We do appreciate that there are school*	Principal: Yes, the funds are available and not enough	*Yes, the funds are available and not enough*	**Funds are available** **Funds are in sufficient**

managers who can go all the way to source extra funds for the safety of learners! Impressive			
	<Internals\\FPO5> - § 1 reference coded [3.67% Coverage] Reference 1 - 3.67% Coverage Do you have funds allocated		
Interviewer: *Do you have funds allocated for safety?*	**Principal**: *Yes, we do, but it is usually very little such that it does not cater for other things.*		**Funds are available** **Funds are in sufficient**
	<Internals\\FPO6> - § 1 reference coded [3.73% Coverage] Reference 1 - 3.73% Coverage Do you have funds allocated		
Interviewer: *Do you have funds allocated for safety or fire safety*	**Principal:** *Yes, we do have funds although it is very little*	*Yes, we do have funds*	**Funds are available** **Funds are in sufficient**

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Table 5.9: Analysis focused on physical conditions of schools

Name: Physical conditions of classes	Physical Conditions Safety need	
<Internals\\FGPO4> - § 1 reference coded [9.85% Coverage] Reference 1 - 9.85% Coverage Physical conditions of classes **Interviewer:** *Right, let us talk about the physical conditions of the classrooms in your school. How are the ceiling, windows and electrical plugs?*		
School Principal: *Mhm! The physical condition of the classrooms is not perfect in the sense that, though the school had been renovated, we still have broken furniture such as chairs due to vandalism. The school does have shortage of furniture due to insufficient funds.*	*The physical condition of the classrooms is not perfect in the sense that, though the school had been renovated, we still have broken furniture such as chairs due to vandalism.*	There is broken furniture and this is associated with vandalism
<Internals\\FPO2> - § 1 reference coded [12.13% Coverage] Reference 1 - 12.13% Coverage Physical conditions of classes **Interviewer:** *Right, let us talk about the physical conditions of the classrooms in your school. How are the ceiling, windows and electrical plugs?*		
School Principal: *Classrooms are fine for teaching, but we do not have fire extinguishers in the normal base rooms. They are only in specialized rooms like labs and school kitchen. We used to have them in normal classrooms whereby they were placed outside the rooms and they were vandalized. Eh… we do have a challenge of educating our children about the importance of this safety equipment.*	*Classrooms are fine for teaching, but we do not have fire extinguishers in the normal base rooms* *they were vandalized.*	Classrooms are fine for teaching but fire extinguishers not present in classrooms Due to vandalism

<Internals\\FPO3> - § 1 reference coded [17.01% Coverage]

Reference 1 - 17.01% Coverage

Physical conditions of classes

Interviewer*: Right, let us talk about the physical conditions of the classrooms in your school. How are the ceiling, windows and electrical plugs?*

School Principal*: Regarding that, HOD's are asked to come up with strategies of minimising or reducing vandalism and those should be submitted in writing when they submit their termly reports.*

School Principal*: The school is undergoing major cyclist renovation as a result, all the ceilings have been replaced; all the windows and window panes have been repaired. All cracked walls have been maintained and all classrooms have been tiled. The only thing that we are left with is to deal with vandalism.*	*All the ceilings have been replaced; all the windows and window panes have been repaired. All cracked walls have been maintained and all classrooms have been tiled. The only thing that we are left with is to deal with vandalism.*	Classrooms refurbished with new Ceiling, window panes, cracked walls and tiles. Vandalism identified as challenge or threat to good physical conditions
The chairs are enough although we do have overcrowding classrooms of fifty students per class. However, we do have shortage of desks.	*The chairs are enough although we do have overcrowding classrooms of fifty students per class. However, we do have shortage of desks*	There are sufficient chairs There is overcrowding in classrooms. There is shortage of desks

<Internals\\FPO5> - § 1 reference coded [11.87% Coverage]

Reference 1 - 11.87% Coverage

Physical conditions of classes

Interviewer: *Right, let us talk about the physical conditions of the classrooms in your school. How are the ceiling, windows and electrical plugs?*

School Principal: *Yea! We do have classrooms that have falling ceiling and. unsafe electrical plugs. We are still waiting for the department of buildings to come and address these problems as we have been promised. As for furniture, we have enough chairs because the school was once a double shift, the challenge that we do have is that we have is that most desks do not have tops and they are not enough.*

We do have classrooms that have falling ceiling and. unsafe electrical plugs

As for furniture, we have enough chairs

the challenge that we do have is that we have is that most desks do not have tops and they are not enough.

There are falling ceilings

There are sufficient chairs

Desks do not have tops

There is shortage of desks

<Internals\\FPO6> - § 1 reference coded [10.51% Coverage]

Reference 1 - 10.51% Coverage

Physical conditions of classes

Interviewer: *Right, let us talk about the physical conditions of the classrooms in your school. How are the ceiling, windows and electrical plugs?*

School Principal: *Yea! We do have classrooms that have falling ceiling. We are still waiting for the department of buildings to come and address these problems as we have been promised. As for furniture, we have shortage of chairs because our enrolment is big.*

We do have classrooms that have falling ceiling.

we have shortage of chairs

There are falling ceilings

There is shortage of furniture

Appendix M: Observation guide and schedule

OBSERVATION GUIDE AND SCHEDULE

The following were observed as they provided insights on the state of Occupational Health and Safety management amongst teachers and learners in Gaborone junior schools:

- Climate of the school.
- Interaction amongst teachers and school management.
- Provision of breaks in between classes
- Environmental conditions

OBSEVATION SCHEDULE

DATE$ TIME	**SITUATION**	**OHS FEATURES**	**ACTIONS OBSERVED**
January-February 2014	Safety communication features and safety signage	Principals offices and staffroom in general	Whether they are in place and functional
November 2013 & February 2014	Occupational Health conditions	School surroundings, sanitation, learners' classrooms status and furniture	Physical features such as building and environmental safety.
	Fire Safety	Fire extinguishers	Conditions and date of last serviced
April 2014 &Jan 2015	**Physiological and Ergonomic features**	Welfare	Allocation of breaks for learners and staff etc.

Appendix N: Teacher Focus Group Discussions

Table 5.8: Analysis of Focus Group Discussion

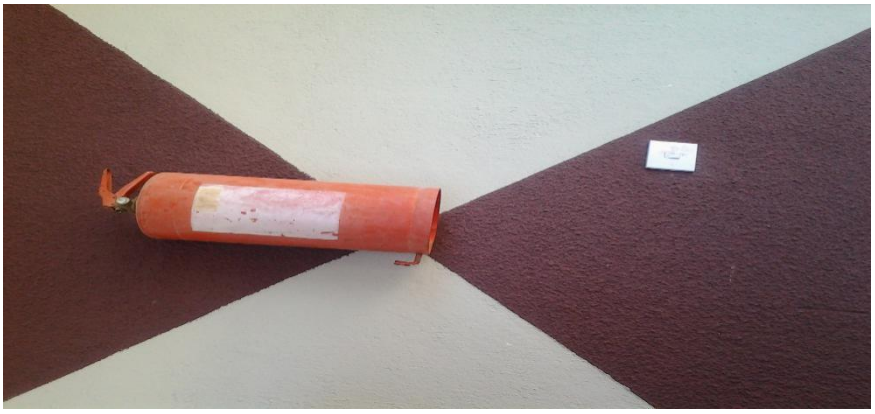
FOCUS GROUP DISCUSSIONS TEACHERS	***PHYSICAL SAFETY***	***Safety Needs***	***Comments***
Classroom conditions		Good because of the latest renovations. However, the floors are very slippery and other people can slip and fall which might cause injuries.	***The school's physical condition in good order due to renovations***
Teacher 3: Good because of the latest renovations. However, the floors are very slippery and other people can slip and fall which might cause injuries.			
Teacher 6: *The physical conditions of classrooms are good because of the latest renovations. However, the floors are very slippery and other people can slip and fall which might cause injuries.*		*The physical conditions of classrooms are good because of the latest renovations.*	
Teacher 4: *Yes, we have got guards at this school but sometime when they have a protest regarding their employment welfare, they do not come for work and this situation is very worrisome to the safety of the property and the environment in general. This situation become very scary as you know an environment like school when there is no security, we often*	**Security Personnel**	*but sometime when they have a protest regarding their employment welfare , they do not come for work and this situation is very worrisome to the safety of the property and the environment in general.*	Protests by security personnel poses threat to safety in schools. Absence of security personnel might also lead to loss of property

get challenges because most of the times I keep my valuables within the school staff room."		
Teacher 3: *You know what, this school issues of safety is violated by the people whom we recruit as guards. These people are good for nothing and they are thieves. For example, once a student forgets his items such as sweater or jersey during sports, you don't get them even though this school is fenced. and this is a day school and it is fenced, once s/he claims, you will not find it. This is very absurd. Your see mmaetsho! The source of challenges in as far as the safety of this place is concerned is the guards. Because more often than not they are the ones who do not communicate incidents of insecurity on the campus. For example last year the school'head's office was left open and when the next morning comes, we found that some school official stamps were stolen. We did not know what was the reason that caused people to steal the school stamps. The messages were announced to request people to bring these things yet nothing happened to recover the stamps. The school had to*	*safety is violated by the people whom we recruit as guards. The source of challenges in as far as the safety of this place is concerned is the guards. Because more often than not they are the ones who do not communicate incidents of insecurity on the campus.*	*Teachers believe that guards are the source of insecurity in the school. They suspect security personnel of acts of theft occurring in the school*

change the stamps to avoid issues of future organised crimes.		
Teacher 4*:* "*This particular place does have standard procedures to check on people that visit the place to make sure that the place is very safe of outsiders. Yet at times what is happening is not what the reality on the ground is. For instance, when the teacher on call is on duty, his/her task does not consider issues of safety check on who is who on the campus. Students that do not have school uniform are sometime allowed to enter the campus without any problems. As such even though an incidents have never happened about the security threat of it's nature, this is safety concern on the campus as these can in the long term be mixed up with unsolicited young criminals that can victimise legitimate students on campus.*		The teachers are concerned that security and safety are compromised by duty teachers who do not verify if visitors do not pose a security threat in the school In addition, they are concerned that learners come into school without school uniform and this might lead to undesirable elements getting into the school pretending to be learners
Teacher 2: "*You see some students are hooligans right from the community they are coming from. This situation is very scary when such hooligans are within the school premises and try to do some of the things that they do.*	"*You see some students are hooligans right from the community they are coming from.*	*The teacher holds that security and safety are also compromised by admitting learners who are thugs.*

Appendix O: Photographs

- Conditions of classrooms, status of chairs and tables
- School physical conditions
- Status of fire extinguishers and fire assembly points
- Safety Hazards
- Emergency Equipment
- Environmental hazards
- Health Hazards




FIRE SERVICE

Appendix P: Chi-square analysis

Chi-square Test of Independence

	Waste in my school is disposed weekly		
Age category	Yes	No	Total
Below 15 yrs.	60	38	98
15 yrs. and above	57	72	129
Total	117	110	N = 227

p-value = 0.011 chi-square statistic = 6.473 df = 1

(b)

	Work tables of suitable height for seated learners are provided		
Age category	Yes	No	Total
Below 15 yrs.	69	29	98
15 yrs. and above	63	66	129
Total	132	95	N = 227

p-value = 0.001 chi-square statistic = 10.648 df = 1

Table 2: Cross-tabulation of perceptions of learners by gender.

	I do physical activities or take part in sports after school		
Gender	Yes	No	Total
Male	64	35	99
Female	98	28	126

Total	162	63	N = 225

p-value = 0.029 chi-square statistic = 4.742 df = 1

Table 3: Cross-tabulation of perceptions of learners by form.

(a)

	Provision of protective clothing to staff members and learners in my school is enforced		
	Yes	No	Total
Form 1	37	41	78
Form 2	36	63	99
Form 3	11	40	51
Total	84	144	N = 228

p-value = 0.012 chi-square statistic = 8.885 df = 2

(b)

	Enough appropriate fire extinguishers are provided in my school		
	Yes	No	Total
Form 1	33	45	78
Form 2	24	75	99
Form 3	18	33	51
Total	75	153	N = 228

p-value = 0.036 chi-square statistic = 6.621 df = 2

(c)

	First aid equipment is provided		
	Yes	No	Total
Form 1	62	16	78
Form 2	61	38	99
Form 3	29	22	51
Total	152	76	N = 228

p-value = 0.011 chi-square statistic = 9.111 df = 2

(d)

	Learners know what to do in cases of fire		
	Yes	No	Total
Form 1	43	35	78
Form 2	32	67	99
Form 3	18	33	51
Total	93	135	N = 228

p-value = 0.006 chi-square statistic = 10.216 df = 2

(e)

	Learners know what to do in cases of armed robberies		
	Yes	No	Total

Form 1	32	46	78
Form 2	15	84	99
Form 3	18	33	51
Total	65	163	N = 228

p-value = 0.000 chi-square statistic = 15.814 df = 2

(f)

	All doors have locks that are in working order		
	Yes	No	Total
Form 1	10	68	78
Form 2	40	59	99
Form 3	29	22	51
Total	79	149	N = 228

p-value = 0.000 chi-square statistic = 28.975 df = 2

4.5.1.2Join perception of learners and teachers about Health and Safety

Table 4: Cross-tabulation of perceptions of learners and teachers by group.

(a)

	All electrical cords and plugs in our classroom are in good condition.		
Group	Yes	No	Total

Learners	124	104	228
Teachers	14	26	40
Total	138	130	N = 268

p-value = 0.024 chi-square statistic = 5.12 df = 1

(b)

	Is there proper drainage of waste in your school?		
Group	Yes	No	Total
Learners	97	131	228
Teachers	25	15	40
Total	122	146	N = 268

p-value = 0.019 chi-square statistic = 5.465 df = 1

(c)

	Are machines and tools in the labs maintained and adjusted to reduce noise?		
Group	Yes	No	Total
Learners	141	87	228
Teachers	18	22	40

Total	159	109	N = 268

p-value = 0.045 chi-square statistic = 4 df = 1

(d)

	Is the height of work surfaces raised to avoid bending postures for standing workers?		
Group	Yes	No	Total
Learners	97	131	228
Teachers	24	16	40
Total	121	147	N = 268

p-value = 0.041 chi-square statistic = 4.187 df = 1

T-Test

```
TEST GROUPS=Age (15)
  /MISSING=ANALYSIS
  /VARIABLES=Robberyortheft
  /CRITERIA=CI(.90).
```

Group Statistics

	Age of Participants	N	Mean	Std. Deviation	Std. Error Mean
To what extent is robbery or theft a problem in your school?	>= 15.00	129	2.7674	1.04964	.09242
	< 15.00	99	3.0000	.96890	.09738

Appendix Q: Focus group confirmation letter

June 2015

Dear_____

Thank you for your willingness to participate in our focus group. As discussed on the phone, we would like to hear your ideas and opinions about the occupational health and safety practices of selected junior schools in Gaborone. You will be in a group of eight staff members in your school. Your responses to the questions will be kept anonymous. Refreshments will be availed at the end of the focus group discussion. The date, time and venue are listed below.

Date

Time

Place

If you will not be able to attend for any reason please call Thuso at 71564414. Otherwise we look forward to seeing you.

Sincerely

Researcher: Vivian.