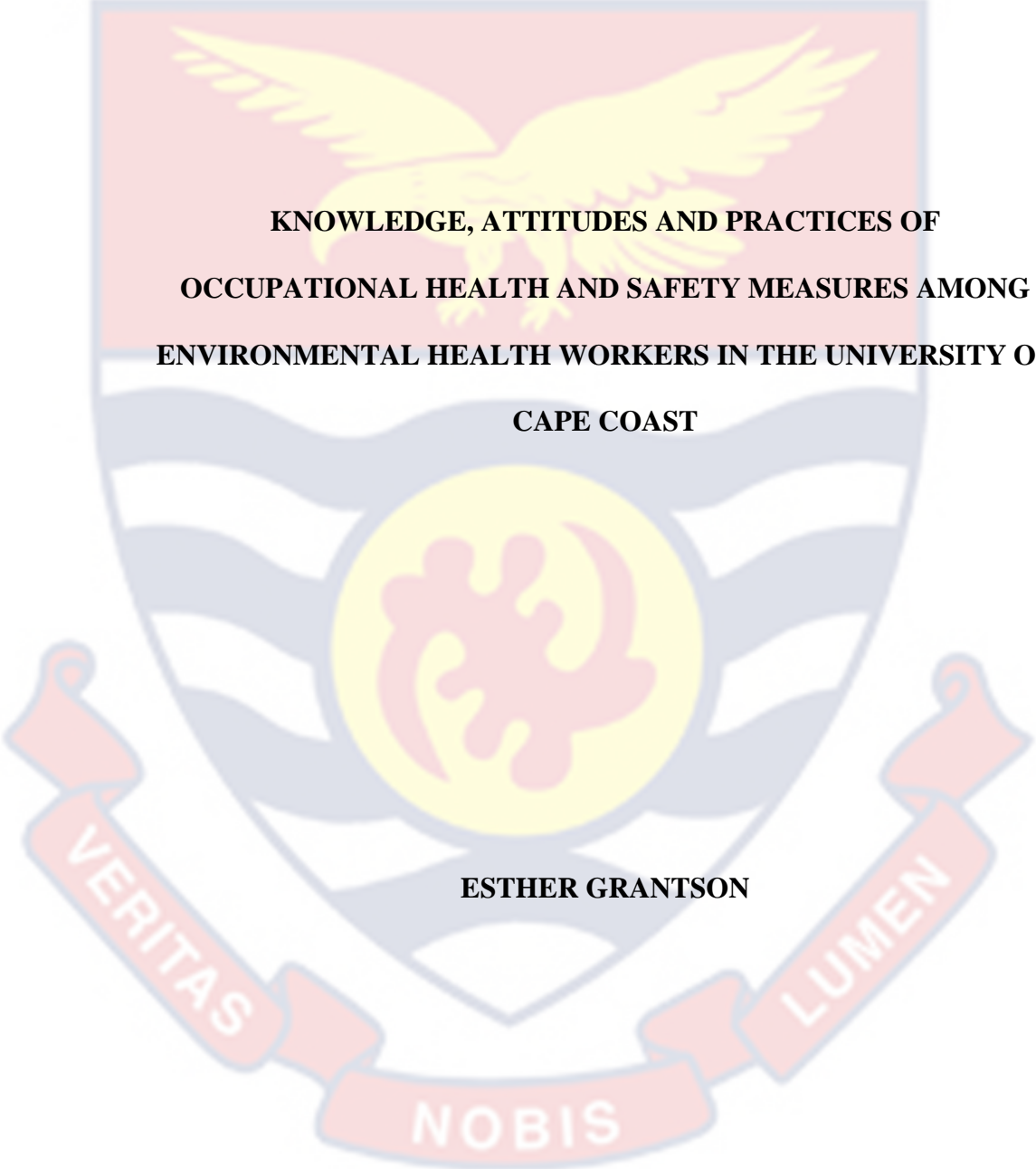


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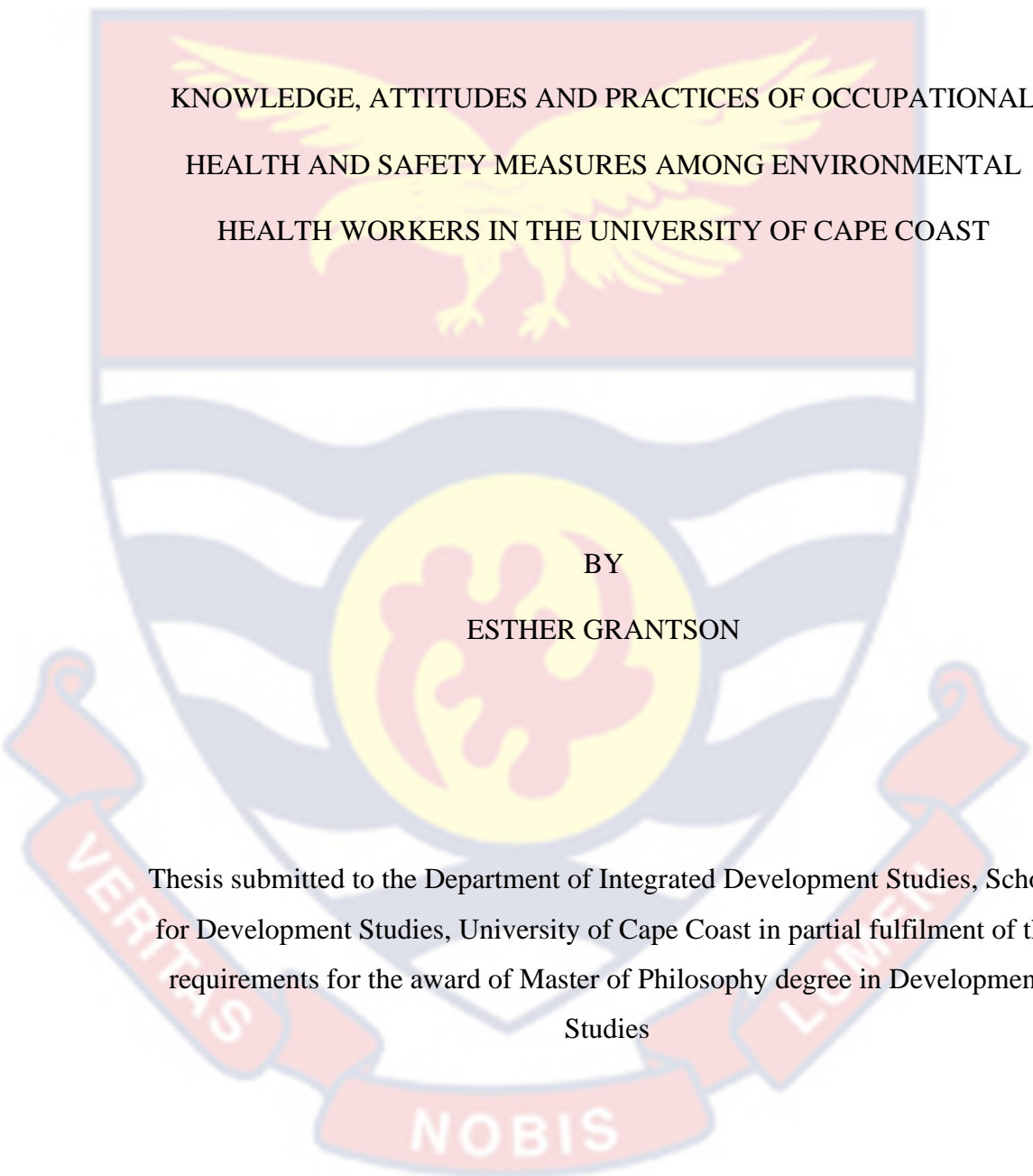


**KNOWLEDGE, ATTITUDES AND PRACTICES OF
OCCUPATIONAL HEALTH AND SAFETY MEASURES AMONG
ENVIRONMENTAL HEALTH WORKERS IN THE UNIVERSITY OF
CAPE COAST**

ESTHER GRANTSON

2024

UNIVERSITY OF CAPE COAST



KNOWLEDGE, ATTITUDES AND PRACTICES OF OCCUPATIONAL
HEALTH AND SAFETY MEASURES AMONG ENVIRONMENTAL
HEALTH WORKERS IN THE UNIVERSITY OF CAPE COAST

BY
ESTHER GRANTSON

Thesis submitted to the Department of Integrated Development Studies, School
for Development Studies, University of Cape Coast in partial fulfilment of the
requirements for the award of Master of Philosophy degree in Development
Studies

MARCH 2024

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature..... Date.....

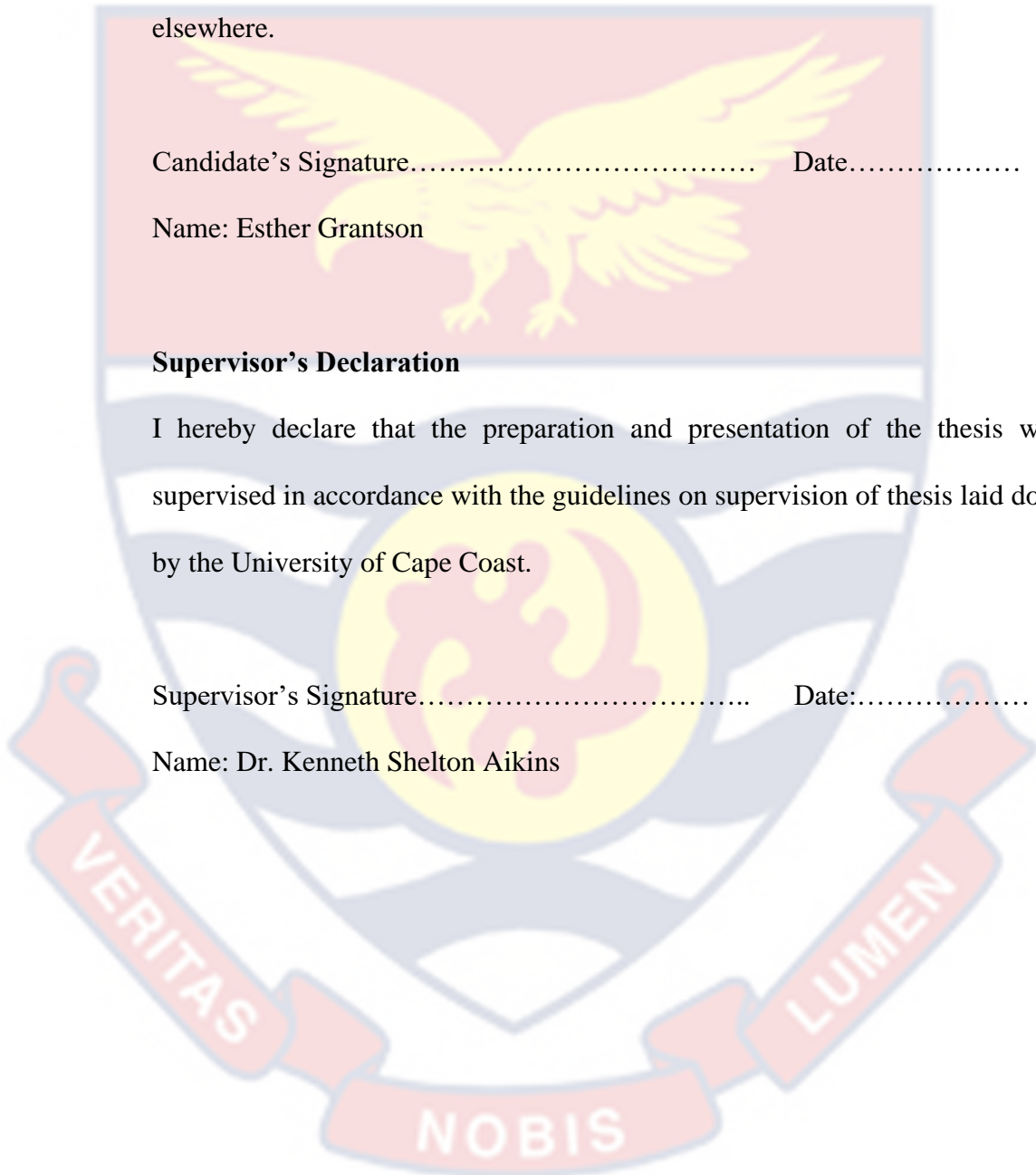
Name: Esther Grantson

Supervisor's Declaration

I hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Supervisor's Signature..... Date:.....

Name: Dr. Kenneth Shelton Aikins



ABSTRACT

A sustainable robust economy requires that human resource may give high priority to occupational health and safety. This study sought to assess the Knowledge, Attitudes and Practices (KAP) of Occupational Health and Safety (OHS) measures among Environmental Health Workers in the University of Cape Coast (UCC). The study adopted a mixed-method research approach. A stratified and systematic random sampling technique were used to capture 146 conservancy workers, 92 sanitary workers, and 52 cleaners, which made up a total sample size of 274 environmental health workers. In contrast, a purposive sampling method was used to capture the Head of the Environmental Health Section (EHS), including the other three sub-sectional heads (Conservancy, Sanitary and Cleaning) as the key informants. An interview schedule was used to collect data from the environmental health workers, while key informant interview guides were used to gather qualitative information from the key informants. The study revealed that majority of the respondents had a high level of knowledge on OHS issues since they agreed to the items used to measure respondents' knowledge level towards OHS at the section. The study concluded that the EHS of the UCC faced OHS challenges including untimely release of funds, inadequate logistics, limited safety training and low wages for the workers. The main recommendation was that management of UCC should provide timely funding and adequate logistics for workers to carry out all the necessary safety OHS training.

KEY WORDS

Attitudes

Environmental Health Section

Knowledge

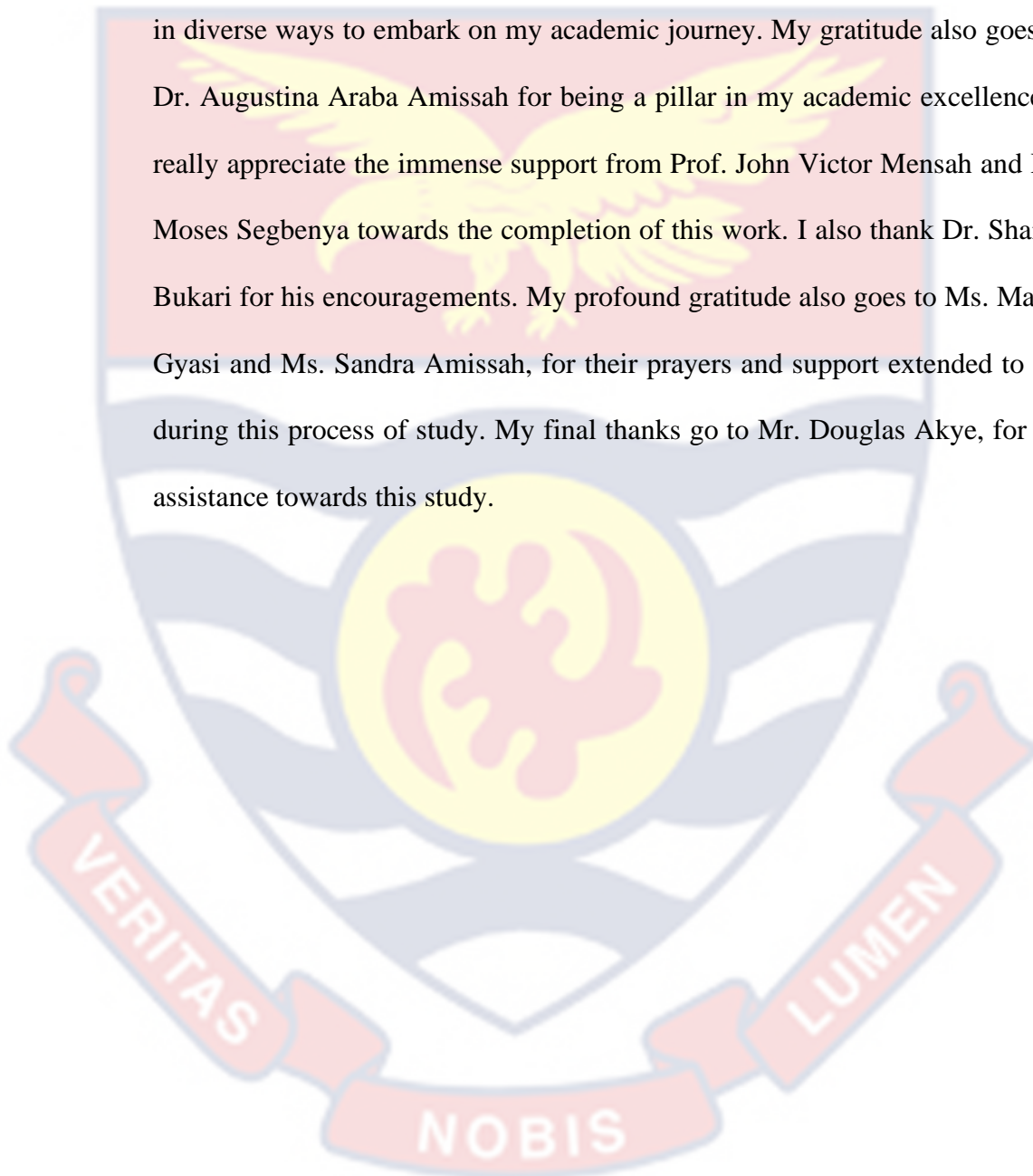
Occupational Health and Safety Measures

Practices



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I am highly indebted to my Supervisor, Dr. Kenneth Shelton Aikins who meticulously guided me at every stage of this thesis. I am also grateful to my husband, Mr. Isaac Kweku Grantson, who encouraged and supported me in diverse ways to embark on my academic journey. My gratitude also goes to Dr. Augustina Araba Amissah for being a pillar in my academic excellence. I really appreciate the immense support from Prof. John Victor Mensah and Dr. Moses Segbenya towards the completion of this work. I also thank Dr. Shaibu Bukari for his encouragements. My profound gratitude also goes to Ms. Mavis Gyasi and Ms. Sandra Amissah, for their prayers and support extended to me during this process of study. My final thanks go to Mr. Douglas Akye, for his assistance towards this study.



DEDICATION

To my dear husband, Isaac Kweku Grantson and children;

Granslynn, Ama, Caleb and Esther.



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LIST OF ACRONYMSThe background of the page features a large, semi-transparent watermark of the University of Cape Coast logo. The logo consists of a shield with a yellow eagle with outstretched wings in the center. Below the eagle is a yellow circle containing a red and white emblem. At the bottom of the shield is a red banner with the Latin motto 'VERITAS NOBIS LUMEN' written in white capital letters.

EHS	-	Environmental Health Section
GSS	-	Ghana Statistical Service
ILO	-	International Labour Organisation
IRB	-	Institutional Review Board
KAP	-	Knowledge, Attitudes and Practice
MELR	-	Ministry of Employment and Labour Relations
OECD	-	Organisation for Economic Cooperation and Development
OHS	-	Occupational Health and Safety
OHSM	-	Occupational Health and Safety Measures
PPE	-	Personal Protective Equipment
SDG	-	Sustainable Development Goal
SPSS	-	Statistical Product and Services Solutions
UCC	-	University of Cape Coast
VIF	-	Variation Inflation Factor

CHAPTER ONE

INTRODUCTION

Development studies place a premium on Occupational Health and Safety (OHS) due to its role in human resource development (van der Merwe, Grobbelaar & Bam, 2019). An essential requirement of a robust human resource economy is to prioritize occupational health and safety (Organisation for Economic Cooperation and Development [OECD], 2019). Martorano, Metzger and Sanfilippo (2020) noted that OHS is relevant for development because the health and safety of workers are relevant for the human resource development of a country.

The study would have theoretical implications in the field of occupational health and safety. It would also provide insight into the current level of understanding and adherence to safety measures among environmental health workers and could identify areas where training and education may be necessary to improve safety in the workplace. Additionally, the study could inform the development of interventions to promote safe practices among environmental health workers and potentially reduce workplace injuries and illnesses. The outcomes of this research would additionally enhance our practical comprehension of how to effectively assist and strengthen environmental health workers in advancing workplace safety. The study contends that the well-being of workers in terms of occupational health and safety is closely linked to their knowledge, attitudes and practices.

Background to the Study

Occupational health and safety deals with the complete physical, mental and social well-being of employees before, during and after their

assigned work (Sinelnikov, Inouye & Kerper, 2015). As Hussein (2016) cited, the Sustainable Development Goal (SDG) 3 has highlighted the importance of occupational health and safety (OHS) for the development of nations via human resource development. Similarly, Jilcha and Kitaw (2017) observed that the International Labour Organisation (ILO) maintains that OHS is essential for reducing workplace burdens and increasing productivity through increased performance from healthy employees. Development experts argue for the practice of occupational health and safety for the growth of organisations and the development of society as a whole (Zhang, Shi & Yang, 2020). Therefore, occupational health and safety do not only contribute to the target nine of SDGs three on the necessity of significantly lowering the number of illnesses and fatalities brought on by dangerous substances as well as contaminations and pollution of the air, water, and land. OHS measures at workplaces also contribute to Sustainable Development Goal Eight, which targets ensuring decent working conditions for workers in both formal and informal economies (Segbenya et al., 2022). More specifically, OHS can be associated with the second pillar of decent work (right at work) since workers are entitled to a safe working environment (Segbenya, et al., 2022).

Meanwhile, the effective implementation and adherence of OHS at the workplace depends on workers and their employers (Jilcha & Kitaw, 2017). As much as employers are required to develop and implement OHS policies for their workplaces, workers are compelled to adhere to the dictate of OHS policies and practices at the workplace for their safety (Sinelnikov, Inouye & Kerper, 2015). Employees' ability to commit to OHS policies depends on their knowledge and attitudes towards health and safety (Jilcha & Kitaw, 2017). It

is for this reason that the thesis statement for this study is that the practice of occupational health and safety measures depends on workers' knowledge and attitudes towards health and safety, which are in turn influenced by the challenges of practicing the measures as well as the socio-demographic factors of knowledge, attitudes, and practices.

Theoretically, Risk Compensation Theory argues that as workers are rational, they adjust their behaviours to suit the risky working conditions such that their prior knowledge of the potential health and safety risks becomes inevitable to predict the path of choices that they made in response to those risks (Wilde, 1982). Job Demand-Resource Theory further explains that unless the challenges of practicing occupational health and safety measures are reduced via the provision of resources, workers are likely to express the resource gap via negative attitudes towards health and safety issues (Bakker & Demerouti, 2007).

Goal Freedom Alertness Theory further explains that the practice of occupational health and safety measures is vital because an established healthy and safety-sensitive workplace preconditions employees to reduce the working time that is wasted on alertness and leverage the potential of the workers for higher productivity and healthy life (Njihia, Nzulwa & Kwena, 2017). Yet, knowledge of health and safety is relevant to serve as facts, information and skills that workers need to acquire via experience, education, and conscious familiarity with the health and safety standards operating within their workplace (Salguero-Caparrós, Pardo-Ferreira, Martínez-Rojas & Rubio-Romero, 2020). In some instances, knowledge does not translate automatically

into practice of health and safety measures but it rather determines the workers' attitudes towards the measures (Mukhtar, Yusof & Isa, 2020).

Attitudes toward occupational health and safety measures reflect the poor or good behavioural expositions that are exhibited by workers about occupational health and safety measures (Hattingh & Acutt, 2016). As García-Lirios (2019) stated, a good attitude is needed to ensure that workers comply with health and safety measures such as the use of personal protective equipment (PPE). The argument is that as workers are assumed to be rational, those who are more knowledgeable and have access to resources such as the list of health and safety measures and PPE are more likely to express positive attitudes towards the practice of occupational health and safety measures than their counterparts who are less knowledgeable and have limited access to resources (Almutairi, Tamrin, Guan & How, 2020).

Eyiah, Kheni, and Quartey (2019) hinted that the resources are meant to support the workers in overcoming the challenges that could have bred negative attitudes towards the practice of occupational health and safety measures. The resources to minimise the challenges include safety experts, funding, and logistics for workers (Loosemore & Malouf, 2019). Similarly, Boadu, Wang and Sunindijo (2020) cited extensive safety measures, safety justice and periodic safety training, while Dzah (2021) suggested safety campaigns and education, and reliable data on incidents at work. However, Bentum, Brobbey, Adjei, and Osei-Tutu (2021) observed that an appreciable number of workplaces in developed nations have the resources to deal with the challenges of practicing occupational health and safety measures, while their counterparts in developing economies are faced with numerous challenges.

Besides providing resources to overcome the challenges of practicing occupational health and safety measures, Hussain (2021) contributed that attention needs to be paid to the positive socio-demographic factors of knowledge, attitudes, and practice (KAP) of occupational health and safety measures. In this respect, Okenna (2020) cited employees' demographic characteristics such as sex, age, years of schooling, and working experience issues to be considered in the deliberations on safety. Asgedom, Bråtveit and Moen (2019) mentioned participation in occupational health and safety training as well as access to the list of workers' rights and duties, while Esaiyas, Sanbata and Mekonnen (2018) cited sources of information on occupational health and safety and perception about risks as some of the socio-demographic factors.

Empirically, Tetemke, Tefera, Sharma and Worku (2014) reported that male sex, years of experience, participation in safety training, and access to a list of workers' rights or duties had a direct significant association with the workers' knowledge of occupational health and safety in Ethiopia. Similarly, Ibrahim, El-Karmalawy, Hassan and Hafez (2017) found that education significantly improved knowledge of occupational health and safety measures by workers in textile factories in Egypt, while Esaiyas, Sanbata and Mekonnen (2018) revealed that access to sources of information such as news-papers, radio, television, colleagues, and health workers significantly correlated positively with good knowledge, attitudes, and practices by wood and metal workers in Ethiopia. Asgedom, Bråtveit and Moen (2019) also found that permanent workers had better knowledge and attitudes than temporal workers in Zambia.

Similarly, Lombardi, Verma, Brennan and Perry (2009) reported that age and access to occupational health and safety training had a statistically significant relation with good attitudes and usage of PPEs while working in Massachusetts, United States of America. Similarly, Zeb, Riaz, Tahir, Anwar, and Altaf (2017) found that good knowledge and good attitudes had a statistically significant association with good practices of occupational health and safety measures by workers in Pakistan, while Mukhtar, Yusof and Isa (2020) got a significant association between workers' level of knowledge and attitudes concerning the practice of occupational health and safety measures in Malaysia. Okenna (2020) finally reported that the young age group correlated positively with knowledge, significantly affecting attitudes and practices of Nigeria's occupational health and safety measures.

Concerning Africa, Akinwale and Olusanya (2016) observed that the continent has subscribed to the International Labour Organisation's (ILO) instruments on safeguarding practices and programmes regarding safety. These instruments include the Labour Inspection (No. 18), the Occupational Safety and Health (No. 155), the Occupational Health Services (No. 161), the Chemical Safety (No. 170) and the Prevention of major industrial accidents (No. 174). Though international organisations spelled out these laws, Ncube and Kanda (2018) remarked that most Southern African countries face the challenges of combining safety policies and practices with their political, social, and economic settings. As Moyo (2020) opined, efforts are being made to overcome the challenges of inadequate resources, inadequate personnel to champion the safety agenda and poor access to safety services.

Ghana has also subscribed to and promulgated numerous statutes to serve as guidance to organisations in the practice of safety. Asumeng, Asamani, Afful, and Agyemang (2015) highlighted the Factories, Offices and Shops Act 1970 (Act 328), the Labour Act 2003 (Act 561), and the Mining Regulations 1970 (LI 665) as instances of similar statutes. Employees who sustain an injury while performing their jobs should receive compensation under the Workmen's Compensation Law of 1987 (PNDC 187) (Eyiah et al., 2019). These legislative instruments are designed to shape and promote safety at workplaces, but there are challenges to implementation due to the varied nature of the country's industrial sector and its operations (Boadu, Wang & Sunindijo, 2021).

The University of Cape Coast (UCC), one of Ghana's state universities, aims to develop highly educated and skilled educational leaders and luminaries (University of Cape Coast, 2020). As part of the University's measures to ensure proper occupational health and safety observance and practices, the Environmental Health Section (EHS) was set up (Owusu, Akoto & Abnory, 2016). The 2018 Vice Chancellor's Annual Report revealed that the EHS of UCC is tasked with promoting and providing health and safety services such as proper sanitation, inspection of market and food vending areas, spraying, and daily cleaning of the university environment. The University environment, in this case, was made up of offices, lecture theatres, washrooms, and halls of residence, coupled with the dislodging of solid and liquid waste and fumigation.

Statement of the Problem

Occupational health and safety issues are components of the global developmental agenda guiding the world till the year 2023 as encapsulated in SDG three and eight as well as the ILO Convention 155 (Segbenya & Yeboah, 2022). The national relevance of occupational health and safety to Ghana is also found in the provisions of the Labour Act, 2003 (Act 651), which compels employers to ensure health and safety measures are put in place to ensure the safety of workers in the workplace (Ackon, 2020).

The University of Cape Coast, a public educational institution in Ghana, is equally enjoined by the Labour Act (Act 651) and SDG goals to ensure that her workplace complies with its workers' occupational health and safety requirements in the 21st century (Ackon, 2020). Apart from the legal requirement for the health and safety of the workplace, there are also economic and humanitarian requirements for the University of Cape Coast to ensure occupational health and safety at the workplace. This suggests that industrial accidents and diseases suffered by workers due to failure to adhere to OHS practices could have untold economic implications for the university, and lives lost could not be recovered (Segbenya & Yeboah, 2022).

Existing studies on OHS at the University of Cape Coast by Obese (2010), Ackon (2020), and Quaidoo, Nyieku, and Owuyaw (2021) have indicated that there are OHS challenges at the University for workers. These challenges were that workers were frequently observed performing tasks like sweeping, cleaning, scrubbing, and mopping without utilising essential Personal Protective Equipment (PPE) such as gloves, masks, protective overalls, and boots. These poor attitudes threaten occupational health and

safety because environmental health workers are usually exposed to junk, human remains, urinals, and rubbish (Mpe, 2018). These earlier studies suggest that studies need to unearth or unravel the reasons behind the high level of OHS challenges at the University of Cape Coast.

Meanwhile, Preminger (2018) and Gharpure et al. (2020) have revealed that one significant way of dealing with occupational health and safety challenges at the workplace is by enhancing the knowledge, attitudes, and practices (KAP) of OHS at the workplace among workers. Thus, KAP of OHS among workers at the University of Cape Coast could help to deal with OHS challenges identified by earlier studies. Earlier studies on OHS at UCC by Ackon (2020) and Quaidoo, Nyieku, and Owuyaw (2021), respectively, focused on OHS among academics at the College of Distance Education (CoDE) and the examination Unit at CoDE. These studies did not consider the knowledge, attitudes, and practices of OHS from workers' perspective, and the studies were not carried out in the Environmental Health Section (EHS) of the University of Cape Coast. Thus, a conceptual gap needs to be filled in terms of how KAP among workers at the University's EHS can help reduce OHS challenges among workers. Workers at the EHS of the university are very much exposed to OHS challenges due to the nature of their jobs, such as being exposed to junk, human remains, urinals, and rubbish (Mpe, 2018).

Existing studies on KAP on OHS conducted by Tetemke, Tefera, Sharma, and Worku (2014), Ibrahim, El-Karmalawy, Hassan, and Hafez (2017), Esaiyas, Sanbata and Mekonnen (2018), and Asgedom, Bråtveit, and Moen (2019) were done outside Ghana. Though the earlier studies above considered KAP on OHS at the workplace, these studies failed to explore how

socio-demographic characteristics or factors of workers such as educational level, age, sex, years of working experience among others. Thus, both contextual and conceptual gaps exist in terms of how demographic characteristics influenced the practice of KAP of OHS among EHS workers of the University of Cape Coast. This study takes the position that the level of education among workers at the EHS, could influence the level of KAP at the workplace and the number of years of experience among workers at the section could also influence their KAP of OHS at the section.

Similarly, Verma, Brennan and Perry (2009), Zeb, Riaz, Tahir, Anwar and Altaf (2017), Mukhtar, Yusof and Isa (2020), and Okenna (2020) studied the associations among knowledge, attitudes, and practice of health and safety measures. Moreover, these studies used the quantitative approach, which did not allow for detailed occupational health and safety issues to be documented. Thus, methodologically, the qualitative perspective or the mixed method perspective was lacking in these earlier studies creating methodological gaps that need to be filled. Thus, to fill the contextual, conceptual, and methodological gap identified with earlier studies, this study seeks to employ the mixed-method approach to examine the knowledge, attitudes, and practices of occupational health and safety measures among environmental health workers at the University of Cape Coast. The study also further examines how the demographic characteristics of EHS workers influence their level of KAP of OHS at the workplace.

Objective of the Study

The general objective of the study was to assess the knowledge, attitudes and practices of occupational health and safety measures among environmental health workers in the University of Cape Coast.

The specific objectives were to:

1. Describe the nature of knowledge, attitudes, and practice of occupational health and safety of the environmental health workers at the University of Cape Coast.
2. Examine the influence of socio-demographic factors on the knowledge, attitudes, and practices of occupational health and safety among environmental health workers at the University of Cape Coast.
3. Examine the relationship between knowledge, attitudes, practices, and occupational health and safety outcomes among environmental health workers at the University of Cape Coast.
4. Examine the challenges faced in achieving occupational health and safety measures among environmental health workers at the University of Cape Coast.

Research Questions

In order to address the stated objectives of the study, the following associated research questions were posed:

1. What is the nature of knowledge, attitudes, and practice of occupational health and safety of the environmental health workers in the University?

2. How do socio-demographic factors influence the knowledge, attitudes, and practices of occupational health and safety among environmental health workers at the University of Cape Coast?
3. How do knowledge, attitudes, practices, relate to occupational health and safety measures among environmental health workers at the University of Cape Coast?
4. Which challenges are encountered in achieving occupational health and safety measures among environmental health workers at the University of Cape Coast?

Significance of the Study

The study on knowledge, attitudes, and practices of occupational health and safety measures by Environmental Health workers at the University of Cape Coast is anticipated to guide policy on reducing safety risks and promoting healthy work. It is hoped that the university management will eventually be informed of the challenges that environmental health workers face in practicing occupational health and safety measures in the university. The study's results will offer insights into the socio-demographic factors influencing individuals' knowledge, attitudes, and practices regarding occupational health and safety practices. This information could aid the university's human resource management in determining suitable candidates for positions within the environmental health sector. Furthermore, the research will add to the existing body of knowledge concerning occupational health and safety knowledge, attitudes, and practices. Consequently, it can be utilized as a point of reference for future investigations in this area.

Delimitations

Though there are several categories of employees at the University of Cape Coast, the study was narrowed to environmental health workers since they are more often exposed to junk, human remains, urinals, and other unsafe materials at work. The theoretical scope is framed with Goal Freedom Alertness, Risk Compensation, and Job Demand-Resource, which informed the choice of particular empirical works. Among the socio-demographic factors of knowledge, attitudes, and practices, the study limited itself to workers and their demographic characteristics, participation in safety training, access to the list of rights and duties, and sources of information on safety as well as perception of risks.

Limitations

The limitation of this study relates to the focus of the thesis. That is though, there are several categories of employees in the University of Cape Coast, the study focused on only the environmental health workers. Thus, the outcome of this study could not be generalised for any other category of workers in the university but for only workers at the EHS. Also, the methodological limitation of this study is that the information used in the analysis was based on the mental records of the workers as most of them did not have records on their occupational health and safety issues. Hence, knowledge on occupational health and safety was measured based on the scores that the respondents obtained from a set of questions, while attitudes and practices were measured based on a rating scale.

Definition of Terms

Attitudes: Behavioural expositions that are exhibited by workers in relation to the practice of occupational health and safety measures

Knowledge: Facts, information, and skills that the workers acquire through experience, education, and conscious familiarity and practical understanding of the occupational health and safety measures

Occupational Health and Safety: Complete physical, mental, and social wellbeing of employees before, during and after their assigned work

Occupational Health and Safety Measures: A set of broad-based systems of policies, activities, strategies and procedures for enhancing a healthy work

Practice: A framework of actions or inactions that defines, directs and regulates how workers operate in response to the aim of ensuring a healthy and safe workplace

Organisation of the Study

This study is organised into five main chapters. The first chapter is an introduction, which is composed of the background to the study, a statement of the problem, the objectives of the study, and research questions. Other sections of the first chapter are the significance of the study, the scope of the study, operational definitions of concepts, and the organisation of the study.

In Chapter Two, the major theories and concepts are reviewed. Following how Goal Freedom Alertness, Risk Compensation, and Job Demand-Resource theories show the relationship among knowledge, attitudes, and practice of occupational health and safety measures, the study examines some empirical studies that test those relationships.

Chapter Three describes the methodology underpinned by pragmatic philosophy. These are followed by the description of the main instruments such as the interview schedule and guides as well as the sampling methods. The method of data analysis and the ethical considerations of the study are discussed. Chapter Four presents results and discussion based on the specified objectives. Chapter Five focuses on the summary, conclusions, and recommendations of the study.



CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

This chapter conducts an essential examination of relevant literature on the topic under investigation (KAP and OHS). The first part of the chapter focuses on the theoretical review of KAP and OHS. Three main theories were considered and reviewed in this chapter, and these theories were the Goal Freedom Alertness, Risk Compensation, and Job Demand-Resource theory. The second part of the chapter also reviewed the literature on the domain of occupational health and safety measures, specifically focusing on the concepts of knowledge, attitudes, and practices. The last part of the literature review in this chapter also dealt with the empirical review of relevant studies on the subject in recent times. The conclusion of the chapter includes insights gained from the empirical review and a summary of the chapter.

Goal Freedom Alertness Theory

In the Goal Freedom Alertness theory, the originator, Kerr (1957) argues that a mentally fulfilling and constructive work environment lead to healthy and safe performance of work demands and related exercises. Subsequently, Hosseinian and Torghabeh (2012) opine that the Goal Freedom Alertness theory communicates the possibility that workplace hazards are bad-quality exercises because of upsetting working environments. As Tabish and Jha (2015) explained, alertness is brought down, and thus, the higher and the more conducive the working environment is as far as monetary and non-financial freedoms are concerned, the more the possibility of alertness to be made. Thus, Hou, Chi, Tarn, Chai, Panuwatwanich, and Wang (2017)

concluded that low alertness results in better employee performance and a hazard-free working environment.

The contributions by Njihia, Nzulwa, and Kwena (2017) suggest that the theory premised on the assumption that the work environment is a determinant factor in the outcome of employees and thus a psychologically healthy and safety-sensitive workplace preconditions employees to leverage their potential for higher productivity. On the other hand, Boudreaux, Nikolaev, and Klein (2019) hinted that it is also assumed that a workplace that does not have good health and safety policies encourages employees not to put up their best. Characterising a healthy and safe working environment, Pratomo and Wardani (2021) maintain that such a workplace is where the workers are energised to play out their best, participate, orchestrate reachable objectives and enhance strategies for accomplishing those objectives.

Chavoushi and Valliere (2021) shared a view that the theory assumes that within a healthy and safe working environment, the workers are free to take part in recognising and taking care of work issues, while the administration framework allows their workers to set objectives for themselves and let them improve strategies for accomplishing their objectives. In an early paper, Urban (2017) contributed that the board can work on the environment of work for employees by administrative strategies, participative techniques, and laying out characterised objectives for labourers. Thus, as Karabulut (2016) had noted, the Goal Freedom Alertness theory empowers employers to reduce the challenges of the workers in an attempt to practice occupational health and safety measures by ensuring the availability of PPE,

enforcement of PPE policies via supervision and paying reasonable wages to provide psychological comfort for the workers.

Accordingly, Hu, Wang, Zhang and Bin (2018) indicated that the Goal Freedom Alertness theory is relevant for explaining how adherence to occupational health and safety measures may increase employees' output via avoidance of work-related injuries and accidents. The Goal Freedom Alertness theory neglects factors such as the knowledge and attitudes of workers, which are equally relevant to the practice of occupational health and safety measures (Pirhadi, Soleimanof & Feyzbakhsh, 2021). In order to overcome this weakness, Wang, Liu, Ma and Liu (2021), among other scholars, have integrated the Risk Compensation theory.

Risk Compensation Theory

Gerald Wilde (1982) is noted to have propounded the Risk Compensation Theory, which premises that people are rational or knowledgeable and as a result, they are able to adjust their behaviours to suit working conditions, especially when there are risks involved. Pless (2016) explained that the main argument of the theory is that individuals regularly change their conduct in the face of hazards such that they turn out to be cautious where they sense serious danger and less cautious in the absence of danger. In this respect, occupational health and safety decision-making requires prior knowledge of the potential safety risks at the workplace, which helps to predict the path of choices made against the effects of such risks (Masson, Lamoureux & De Guise, 2020).

As Kasting, Wilson, Zollinger, Dixon, Stupiansky and Zimet (2017) indicated, such prior knowledge may be facts, information and skills that the

workers acquire through experience, education, and conscious familiarity with the risks within their work environment, which are necessary for informed decision towards such risk that undermines occupational health and safety. Relatedly, Marcus, Katz, Krakower, and Calabrese (2019) suggest that the theory maintains that people compare the costs and benefits of decisions and take actions whose benefits outweigh the expected risks. Trinh and Seetaram (2022) proposed that the implication is that individuals or workers turn to choose health and safety alternatives that have lower costs or disadvantages.

According to Mantzari, Rubin and Marteau (2020), it is in the light of the balance of the costs and benefit factors that the behavioural outcomes of workers' knowledge are known. In this regard, Hasanzadeh, de la Garza, and Geller (2020) suggested that the Risk Compensation theory offers an in-depth understanding of workers' responses to health and safety-related issues at the workplace. Kumar, Haderxhanaj, and Spicknall (2021) added that every work has a level of risk, but while some forms of work directly reveal the risk exposure, others do not. Yet, Oliver (2021) shared a view that whether a job reveals its associated risks or not, the consensus of the theory is that when workers are exposed to higher risks, it has grave consequences on their level of commitment and subsequently affects output.

Nevertheless, similar to any other theory, the Risk Compensation theory possesses certain drawbacks that imply its insufficiency as a theory in the realm of occupational and safety. Blank (2021) critiqued that the theory is based on the fact that risky work must be compensated for by the organisation in order to encourage the workers to leverage their potential thereby neglecting the organisation's responsibilities in educating workers on occupational and safety

measures and its implications when not taken into deliberation. Trogen and Caplan (2021) added that the risk competency theory was weak in terms of neglecting the role of management in the provision of occupational health and safety resources such as PPEs, which are relevant for the prevention of hazards rather than compensation. Owing to the weaknesses of the Risk Compensation theory, this study further reviews the Job Demand-Resource theory to compensate for the identified weakness.

Job Demand-Resource Theory

Job Demand-Resource theory is a work-related pressure model proposed by Bakker and Demerouti (2007), which argues that strain or hazard is a reaction to irregularity between demands on the worker and the resources that the employee needs to manage those demands. The theory argues that rather than zeroing in exclusively on adverse result factors such as burnout, chronic sickness, and monotonous strain, both negative and positive pointers resulting from worker prosperity should be incorporated into occupational health and safety issues (Ghanayem, Srulovici & Zlotnick, 2020). In as much as attention is paid to the effects of occupational hazards, resources should be made available for the workers to prevent their occurrence in the first place (Hongqing & Jiuling, 2021).

The fundamental assumption of the Job demands-resources hypothesis is that both job satisfaction and risk factors are grouped into two classes such as work demands and work resources (Rashid, Islam & Ahmer, 2019). Wu and Zhou (2020) explained the work demands as parts of work including social, progressive, mental, and actual effort in carrying out the work in a healthy and safe manner. In this respect, Ahmad, Munir and Hussain (2021) stated that

when work demands are unprecedented and drawn out, they can negatively affect an employees' inherent resources since more effort should have been invested into such energy endeavours.

Job demands coupled with other related demands such as the practice of occupational health and safety measures may have a collective impact, which can create an aggravated impact on employee performance and organisational goals (van Woerkom, Bakker & Nishii, 2016). When this happens, a danger is posed to the employee's occupational health and safety (Downes, Reeves, McCormick, Boswell & Butts, 2021). The theory argues that resources ought to be made available to reduce the impact of the demands on the employee and thus cushion them to achieve the job demand and practice occupational health and safety measures concurrently (Saric & Lunde, 2021).

Nauman, Raja, Haq and Bilal (2019) cited skills, training, a decrease in job demands, and incitement of self-awareness and advancement as well as PPEs as some of those resources. Similarly, Ayob and Nor (2019) considered human resource management as a job resource, that incorporates self-rule, task essentialness, job lucidity, and interest. Relatedly, Shah and Huang (2021) as well as Charoensukmongkol and Phungsoonthorn (2021) have noted that there are social resources such as social help, administrative instruction execution input, and colleague support. As Ahmad, Munir, and Hussain (2021) concluded, these job resources impact job execution, job fulfillment, authoritative duty, and the practice of occupational health and safety.

The theory calls for the education and training of workers on the specific job roles and the risks involved in order to enhance their preparations

for such jobs (Paganelli et al., 2018). In this respect, Tappura, Teperi, Kurki, and Kivistö-Rahnasto (2018) opined that managers ought to pay attention to their workers' demographic background, schooling, working experience, participation in occupational health and safety training, source of information, perception of hazards or risks and ensure the workers know about rights and duties in relation to their occupational health and safety. The theory serves as a foundation for the relationship between knowledge and employee outcomes, such as attitudes and practice of occupational health and safety measures (Hussain, 2021).

Occupational Health and Safety

Stellman (1998) characterised the idea of occupational health and safety (OHS) as a multidisciplinary thought that highlights the progression of health, safety, and administrative assistance to workers. Sinelnikov, Inouye and Kerper (2015) added that the concept covers the mental, energetic, and genuine thriving of an employee according to the display of work and thus denotes an essential subject of interest that influences the achievement of the targets of businesses. Similarly, Reese (2018) defined OHS as actions taken to prevent work-related illness that may hinder the health and success of workers. Accordingly, the basic conceptualisation of OHS is that it is a multidisciplinary field concerned with the safety, health, and welfare of people at work.

The health component requires a state of complete physical, mental and social success in addition to illumination of all forms of contamination or illness (Badri, Boudreau-Trudel & Souissi, 2018), while Zhang, Shi and Yang (2020) the safety aspect deals with genuine assessment and evaluation of the

workplace conditions and equipment as a working framework to distinguish the deficiencies that can cause accident (Salguero-Caparrós, Pardo-Ferreira, Martínez-Rojas & Rubio-Romero, 2020). In this respect, health concerns behavioural issues, while safety is engulfed with a healthy physical working environment (Van Woerkom, Barker & Nishii, 2016). Hence, one may conclude that safety mirrors and administrative systems of personnel procedure, guidelines for participation, and planning courses of action towards the realisation of healthy work require certain measures.

Occupational Health and Safety Measures

Occupational health and safety measures are broad-based systems that incorporate the policies, activities, strategies, and procedures for protecting the health and safety of the workforce of an organisation (Hussein, 2016). These systems and procedures serve the purpose of preventing harm, injuries, and accidents, which more often than not occur in the workplace (Nikulin & Nikulina, 2017). The systems and procedures provide mechanisms to ensure that the working environment is threat-free and safe for working (Fonseca & Carvalho, 2019).

In this respect, occupational health and safety measures are considered paramount as there are concerns for the promotion of the health and safety of workers (Rosemberg, 2020). Ramos, Afonso and Rodrigues (2020) opined that the measures are the written and unwritten standardised procedures formulated by the organisations as the benchmarks for improving the health and safety requirements of the members, while Salguero-Caparrós, Pardo-Ferreira, Martínez-Rojas and Rubio-Romero (2020) stated that since written

standardised safety measures can be easily referenced in case of addressing health and safety needs, most organisations prefer them to the unwritten ones.

However, Watterson (2020) maintained that not every issue needs to be included in the health and safety policy. Therefore, relevant issues such as mechanisms for health and safety inspection, specific roles of safety supervisors with respect to ensuring effective health and safety, instructions on the use of PPEs for their specified jobs and the use of chemicals and their applications are usually included in the written measures. Mei, Wang, Liu, Zhou and Zhang (2020) added that other relevant information to be included in the written policy are the reporting lines and procedures for supporting accident victims, while other health and safety requirements such as communication of the measures to all members in clear and concise mediums are not written but are also necessary for a holistic practice of occupational health and safety measures.

The practice of occupational health and safety measures are actually the manifestations of the policies in the actions and inactions of the workers (Fonseca & Carvalho, 2019). Different organisations have adopted different health and safety practices or manifestations to suit their industrial conditions, needs and clientele (Ivancevich, 2015). That notwithstanding, Hussein (2016) has made provisions for five essential practices vital for every organisation to achieve occupational health and safety. These practices are management commitment, safety training, worker involvement, safety rules and procedures, and provision of safety promotion PPEs.

Yi et al. (2016) hinted that in organisations where management throws their weight behind health and safety measures, it is not out of place to see the

best health and safety practices being displayed because the management's commitment to health and safety measures motivates the organisational members to support and practice such measures. This suggests that managers at different levels bear the responsibility of promoting health and safety practices, acting as influential role models for the implementation of workplace health and safety measures (Ilbahar, Karaşan, Cebi & Kahraman, 2018).

For the practice of occupational health and safety measures to be effective, workers need to be committed (Fonseca & Carvalho, 2019). The axiom has been that when workers are involved, the health and safety systems of the institutions are strengthened. The reason is that employees are the greatest stakeholders of an organisation and they provide the best judgment on health and safety issues (Taufek, 2016). The implication is that employees are the best informants that management can rely on for health and safety needs and ways of improving or suggesting other new safety requirements (Ghanayem, Srulovici & Zlotnick, 2020). In view of this, employees need to provide feedback and make health and safety recommendations to management.

The workers also require safety training to promote the practice of occupational health and safety measures (Ayob & Nor, 2019; Oliver, 2021). The specification was that the heads of the various organisational departments and the employees should be given continuous training on safety measures. Hussein (2016) has hinted that the training programmes should mostly concentrate on identifying foreseeable accidents and responding to accidents and emergency situations such as fire outbreaks and electrocutions. Bhagawati

(2015) cited a mounting up of strategies to address the use of PPEs, proper use of chemicals, and how to stay safe and healthy in the workplace. The primary purpose of the safety training is to enhance the workers' knowledge of occupational health and safety (Said, 2015).

Knowledge of occupational health and safety refers to facts, information, and skills that the workers acquire through experience, education, and conscious familiarity with the health and safety standards that are operating within their work environment for a practical understanding of occupational health and safety issues (Zeb, Riaz, Tahir, Anwar & Altaf, 2017). Though it was argued that this knowledge is relevant for a holistic practice of occupational health and safety measures (Asgedom, Bråtveit, & Moen, 2019), some scholars such as Guerin and Toland (2020), as well as Mukhtar, Yusof, and Isa (2020), maintained that knowledge does not translate automatically in practice but it rather affects the workers' attitudes towards the occupational health and safety measures. Attitudes refer to the behavioural expositions that are exhibited by workers in relation to the practice of occupational health and safety measures (Almutairi, Tamrin, Guan & How, 2020).

The availability of safety rules and procedures as well as safety promotion PPEs, are also relevant to promoting the practice of occupational health and safety measures (Riccò, Cattani, Casagrande, Gualerzi & Signorelli, 2017). As noted by Sis-Çelik and Aydın (2019), the safety rules in Ghana include the Act 1987 PNDCL 187, and Labour Act 2003, Act 651, which require that employers ensure the safety and health of employees. Relatedly, the safety procedures are employees should visit safety officers for checkups, report hazards or risks regularly at work, participate in health and

safety training, and read labels of chemicals before using them (Mukhtar, Yusof & Isa, 2020). On the other hand, safety promotion PPEs include glasses or goggles, gloves, masks, overall coats, earplugs, safety boots, and machine guards (Guerin & Toland, 2020).

In summary, OHS measures are policies, activities, strategies, and procedures for protecting the health and safety of the workers. The practice of the OHS measures are the actual manifestations of the measures in the actions and inactions like management commitment, employee involvement, safety training, safety rules and procedures, and provision of safety promotion PPEs. Relatedly, knowledge and attitudes affect the practice of OHS measures. Yet, the contributions by Hurst (2016) suggest that KAP also has other socio-demographic factors that ought to be given extreme attention because all of them eventually influence OHS.

Socio-demographic factors that influence Knowledge, Attitudes and Practice of OHS Safety Measures

The socio-demographic factors that influence knowledge, attitudes, and practice that are considered in this study include workers and their demographics such as sex, age, household size (Lombardi, Verma, Brennan & Perry, 2009; Okenna, 2020), years of schooling, and tenure of working experience (Tetemke, Tefera, Sharma & Worku, 2014). Other socio-demographic factors that influence KAP are participation in OHS training, access to a list of workers' rights and duties as well as a source of information on OHS (Esaiyas, Sanbata & Mekonnen, 2018), and perception of hazards or risks (Asgedom, Bråtveit & Moen, 2019).

In terms of demographic characteristics, Ncube and Kanda (2018) argued that considering the sex of a labour force is crucial in guaranteeing a holistic OHS. Accordingly, Cavalli et al. (2019) opined that distinctions that exist between male and female workers provide the basis for establishing compelling OHS strategies that are founded on more exact data about the healthcare needs of each worker. Wekoye, Moturi and Makindi (2020) added that female and male workers might be presented with different physical and mental dangers in the work environment, thus requiring contrasting control measures because the literature is inconstant about the nature of the association of female or male sex with KAP of OHS measures.

With respect to the age of workers, Aderaw, Engdaw and Tadesse (2011) reported that age correlated negatively with KAP of OHS measures, while Dragano, Barbaranelli, Reuter, Wahrendorf, Wright, Ronchetti and Iavicoli (2018) observed that grown-up labourers are more aware of business-related risks and dangers than more young ones and thus have good KAP of OHS. Nevertheless, as noted by Peng and Chan (2019), there is a need to dissociate working experience from age because aged workers are vulnerable to risks, while experienced workers have better KAP of OHS measures. Thus, though the literature is not particular about the correlation between age and KAP of OHS measures, it is consistent that years of experience positively correlate with KAP of OHS.

Workers' educational background is also a significant correlate of KAP of OHS measures. As Hattingh and Acutt (2016) opined, only occasionally are profoundly educated and very much prepared workers associated with low or poor KAP of OHS measures since they react rapidly to

safety issues. Tappura, Teperi, Kurki and Kivistö-Rahnasto (2018) explained that the practice of OHS measures requires that the workers go through some form of education that would empower them to peruse the guidelines on the use of PPEs coupled with other safety rules and procedures at the workplace.

Hussain (2021) considered education to be the essential human resource factor that correlates positively with KAP of OHS measures because it enables workers to practice crucial personal health and safety.

Relatedly, Caffaro, Cremasco, Bagagiolo, Vigoroso and Cavallo (2018) hinted that participation in OHS training is positive with KAP of OHS measures because it is a form of informal education. As noted by Asad, Hassan, Sherwani, Ibrahim and Soomro (2018), this happened because the OHS training has the tendency to reduce carelessness during the utilisation of PPEs, and non-adjustment to safety measures as the workers receive the practical feel of the OHS measures through the training. Participation in OHS training is relevant for promoting good KAP of OHS measures (Andersen, Malmros, Ebbehøj, Flachs, Bengtson & Bonde, 2019).

The contributions by Yanar, Lay and Smith (2019) suggest that access to a list of workers' rights and duties concerning occupational health and safety positively correlates with desirable good knowledge, attitudes, and practice of occupational health and safety measures. Frequent access to information on the roles of workers and their employers in ensuring OHS helps to inculcate good KAP of OHS measures into the workers and the management at large as they familiarise themselves with the measures (Alhammedi, Tayeh, Alaloul, & Jouda, 2021). Similarly, Beebeejaun and Gunpath (2022) have demonstrated that workers who are provided with vital

information on OHS measures are more likely to exhibit better KAP of OHS measures than their counterparts.

Perception about occupational hazards or risks is deemed necessary in advancing the goal of good KAP of OHS measures (Guzman, Recoco, Padrones & Ignacio, 2022). Chong, Chen, Peng and Yu (2022) opined that the axiom has been that the workers who perceived higher occupational hazards or risks associated with their work are more likely to exhibit better KAP of OHS measures than the workers who perceive no or less occupational hazards or risks of their works. Yet, O'Neill, Gopaldasani and Coman (2022) hinted that due to stress, workers who do overtime are less likely to perceive the risks associated with their work and thus develop poor KAP of OHS measures than those who work within the stipulated time.

In summary, the reviews suggest that workers who are highly educated, and experienced participated in OHS training, accessed a list of workers' rights and duties coupled with a source of information on OHS, and perceived high hazards or risks associated with their work are more likely to develop better KAP of OHS than their counterparts. Yet, the literature was inconsistent on how the sex and age of workers relate to the KAP of OHS. That notwithstanding, Walters and Lamm (2003) observed that there are challenges involved in the relationship between KAP and OHS Measures.

Challenges Involved in the Relationship between KAP and OHS Measures

Insufficient talented labour in the occupational health and safety section is a main challenge influencing the relationship between KAP and OHS Measures. This position is exemplified by Eyiah et al. (2019) in a study

of Ghana's health service system. Their study uncovered that the OHS department could not maintain profoundly qualified and experienced overseers because of poor working conditions. Similarly, Boadu, Wang and Sunindijo (2020) observed that the auditors in the departments of OHS are considered civil servants in Ghana and are given low compensation and retirement benefits. Thus, staff who are experts in the scrutiny of OHS leave these establishments for rewarding offers somewhere else (Awuviry-Newton, Tavener, Wales & Byles, 2021).

Problems of funding and logistics remain another major challenge of the relationship between KAP and OHS Measures. As noted by Paltiel, Zheng and Walensky (2020), the relationship between KAP and OHS Measures is faced with the ill effects of a perpetual funding shortage, which makes it difficult to execute the measures. Couto and Cates (2019) explained that the relationship between KAP and OHS Measures needs assets to utilize more overseers and train them as well as to buy the proper devices and office gear to guarantee the arrangement of satisfactory healthcare administrations. Ghana is particularly noted for not having the necessary gear and innovation to attempt reviews and investigations, and thus, the existing hardware is obsolete and deficient to empower the inspectors to do different appraisals according to safety principles adequately (Eyiah et al., 2019).

Relatedly, Kheni and Braimah (2014) observed that the absence of extensive occupational health and safety guidelines, principles, and plans is a critical challenge for the relationship between KAP and OHS Measures in Ghana. Annan, Addai and Tulashie (2015) opined that the current safety laws in the country are divided, conventional, lack motivation and restricted in

scope without national research on safety with clear orders and financing that manage explicit perils or dangers. Consequently, safety investigators are constrained to embrace guidelines and principles from different nations in their inspection obligations, which vary from the underlying foundations of the Acts of Ghana (Adinyira, Ghansah & Danku, 2019). Thus, the relationship between KAP and OHS Measures may change based on the social setting (Loosemore & Malouf, 2019).

Non-realisation of the relationship between KAP and OHS Measures is seen to be supported by delay and deficient instances of discipline and application of the rule of law against culpable organisations or bosses (Loosemore & Malouf, 2019). As Eyiah et al. (2019) revealed, in spite of the fact that safety offences under the Ghana Constitution Act 328 and Act 651 are criminal in nature, they have often not been dealt with in any case. Similarly, Boadu, Wang and Sunindijo (2021) hinted that there have often been postponements in case hearings and court decisions regarding safety offences, which deter the safety experts from sending OHS offences to court since it may waste their time and money.

Worldwide, one of the significant obligations of safety inspectors is the intermittent issuance of functional direction materials, such as codes of training, to direct associations on the best way to consent to legitimate obligations under the appropriate safety measures. Tragically, poor safety information service infests developing nations (Deepak & Mahesh, 2019), including Ghana, with the public authority neglecting to circulate informed safety information. Yet, this training is obviously missing in the administrative and requirement obligations of the foundations. This is a challenge in the

relationship between KAP and OHS Measures because the directional material would have successfully raised mindfulness and advanced the execution of health and safety measures (Worksafe, 2020).

Education on developing health and safety in work environments is low or practically non-existent in Ghana (Simpson & Sam, 2019). Dzah (2021) opined that the absence of safety campaigns and education has been partly blamed for the overall absence of mindfulness and information on safety laws and for poor health and safety execution in Ghana. Bentum, Brobbey, Adjei, and Osei-Tutu (2021) added that safety campaigns and education fundamentally follow the model of prompt and convince, which is, for the most part, focused on collaboration, appeasement, and arrangement to accomplish the aim of the administrative framework rather than to rebuff wrongdoers for safety offences. With campaigns and education, a punitive strategy could be applied where any compliance falls short (Enticott et al., 2022).

Information on occupation-related calamities and illnesses is extremely inadequate and scarcely dependable as there is no system for reliable detailing of OHS offences. For example, the Ministry of Employment and Labour Relations (MELR), in their distributed Statistical Report for 2016, expressed that there were 2697 announced work-related accidents in 2015 (MELR, 2017), while the report from the Ghana Statistical Service (GSS) in their Labour Force Report for 2015, assessed work-related accidents of 586,213 (GSS, 2016). These figures are obviously unreliable and very upsetting particularly coming from two government agencies. These call for empirical works to reveal the situation of occupational health and safety and thus, the

next section presents some empirical works related to knowledge, attitudes, and practices of occupational health and safety measures.

Empirical Review

Lombardi, Verma, Brennan and Perry (2009) described the factors that influence the practice of OHS measures by primary workers in construction, manufacturing, services, and retail industries in Massachusetts, United States of America. The Risk Compensation Theory and Job Demand-Resource Theory were used to support the thesis statement that the practice of OHS measures is influenced by socio-demographic factors that influence KAP. A qualitative approach was adopted in which the workers were purposively sampled, while focus group discussion guides were used to gather the data from the focus group. Manual thematic analysis was used to derive meaningful information from the data obtained.

The researchers reported that the practices of the workers were in line with OHS activities, such as the use of protective eyewear PPE and procedures like enforcement and reinforcement of PPE usage policies. It was also reported that the practices were influenced by the perception of hazards or risks, young age, and lack of OHS training, while the challenges involved in the relationship between practices and OHS measures include lack of comfort of using PPE while working as well as forging and scratching of the eye. The conclusion was that reducing the challenges involved in the relationship between practices and OHS measures would lead to an increased practice of OHS measures among workers. However, the study used a qualitative approach, which does not allow for generalisation of the findings.

The work by Tetemke, Tefera, Sharma and Worku (2014) also used a quantitative approach that followed a cross-sectional study design to assess workers' knowledge and safety practices concerning OHS measures in the textile industry in Ethiopia. Goal Freedom Alertness, Job Demand-Resource, and Risk Compensation theories informed the argument by the researchers that knowledge and good practices positively affect OHS measures. A simple random sample of 560 workers was interviewed using pre-tested and self-structured questionnaires and observation checklists. OHS measures were based on the policies, strategies, practices, and procedures that the industry used to ensure OHS. The study used Binary logistics to identify the socio-demographic factors influencing knowledge score and safety practices with OHS measures.

The result of the analysis showed that the majority (64%) of the respondents had knowledge of OHS measures and that a good number (54%) of them practiced the use of protective equipment (PPE) while working. The paper also reported that sex, years of working experience, participation in safety training, and list of workers' rights and duties were significant socio-demographic factors influencing knowledge. In contrast, sex, participation in safety training, years of schooling, job section, and supervision had a direct significant association with the practice of using PPEs while working. The conclusion was that participation in safety training was a common factor for increased knowledge and practice of OHS measures, which needs to be encouraged together with supervision. However, attitudes towards occupational health and safety measures were omitted.

In order to overcome this research gap, Zeb, Riaz, Tahir, Anwar and Altaf (2017) assessed KAP of OHS measures among onshore oil rig workers in Pakistan. The Risk Compensation and Job Demand-Resource theories were used to establish an argument that good KAP promotes OHS measures, which promotes performance and reduces occupational accidents. A quantitative cross-sectional study was carried out on a total of 404 workers that were captured via multi-stage random sampling. KAPs were measured on a binary scale, such as good and poor, while the OHS measures were conceptualised as the national and organisational-based policies and activities that are carried out to ensure OHS. The interview schedule was the data collection instrument used, while the data were analysed using Chi-square statistics and logistic regression.

The researchers indicated that the majority (55.4) of the respondents had good occupational safety, while almost 63 percent (62.6%) of them had good knowledge about occupational safety. Similarly, it was reported that the majority (53.5%) of the respondents exhibited good attitudes about occupational safety issues, while about 65.2 percent of the respondents reported good practices associated with OHS measures. The paper also found that the workers' good practices had a statistically significant association with good knowledge and good attitudes. The final outcome was that the workers who reported good knowledge, attitudes, and practices were more likely to report good outcomes such as low accident rates, high productivity, low healthcare costs, and good health status. The conclusion was that knowledge, attitudes, and practices affect OHS measures, which in turn affects

occupational safety. Notwithstanding, the socio-demographic factors that influence KAP were omitted.

In an attempt to narrow that research gap, Ibrahim, El-Karmalawy, Hassan and Hafez (2017) conducted a quasi-experimental study to evaluate the effects of OHS training as an antecedent of KAP of workers at a textile factory in Damietta City. Job Demand-Resource fortified the argument of the study that OHS training serves as a resource that enables workers to exhibit good KAP towards OHS. Participation in OHS training was the independent variable, while knowledge, attitudes, and practice of workers were the dependent variables, which were computed as composites of items. A census of 108 workers was interviewed using a structured questionnaire, and pre-post analysis was done using analysis of variance (ANOVA) and Chi-square tests.

It was reported that prior to the occupational health and safety education, the majority (92.6%) of the respondents had poor knowledge, while all of them had negative attitudes, and the majority (89.8%) had poor practices in relation to OHS measures on policies, strategies, procedures and activities. The researcher found that after the OHS training, statistically significant improvements were seen such that the majority (84.3%) of the workers reported a good level of knowledge, while all exhibited positive attitudes. The majority (63.0%) of the same respondents had good practices. According to the study, there was no statistically significant correlation between total knowledge score and total attitudes score or between total practice score and total attitudes score. However, there was a significant positive association between respondents' total knowledge and practice scores.

The study concluded that the OHS training programme successfully improved KAP regarding OHS and that socio-demographic factors that influence KAP are relevant for OHS. Yet, the challenges involved in the relationship between KAP and OHS measures were not considered. Thus, Esaiyas, Sanbata and Mekonnen (2018) replicated the study among wood and metal workers in Ethiopia and further examined the challenges involved in the relationship between KAP and OHS measures. A quantitative approach was used and a cross-sectional study was designed on a census of 382 workers. Data were gathered by use of interview schedules, while knowledge and attitudes were measured with the use of a composite score that was generated from the responses to items related to them. Chi-square tests were used to analyse the data.

The paper found that the main challenge was that the majority (65.1%) of the respondents did not undergo OHS training and that most (69.5%) did not know that improper exposure to chemicals causes health problems. Yet, the researchers revealed that the majority (83.1%) had knowledge of OHS from different sources like newspapers, radio, television, colleagues, and health workers, while most (87.2%) showed favourable attitudes towards OHS measures. Finally, the paper reported that most (62.7%) respondents did not practice using three or more mandatory PPEs, such as safety glasses, gloves, masks, earplugs, safety shoes, and helmets. The paper concluded that the challenge involved in the relationship between KAP and OHS measures is that there should be continuous OHS training to reorient workers. However, the limitations of the study, like self-reported data, should be taken into consideration when interpreting the findings.

Similarly, Mukhtar, Yusof and Isa (2020) examined the association among workers' knowledge, attitudes and practices concerning OHS measures at petroleum companies in the Teluk Kalung industrial area in Malaysia. Risk Compensation and Goal Freedom Alertness Theories were applied to establish the argument that there are interdependent associations among knowledge, attitudes, and practices. A quantitative approach that followed a cross-sectional study design was used on a total simple random sample of 152 workers. Data was gathered using interview schedules. Level of knowledge was measured as low, moderate, and high, while attitudes were measured as negative, neutral, and positive. Practice of the occupational health and safety measures was measured as poor, fair, and good, while OHS measures were measured in relation to policies and strategies for safety promotion at work.

Descriptive statistics and Chi-square statistics were used to analyse the data. The researchers found a significant association between the workers' knowledge of OHS measures and their attitudes towards OHS measures ($\chi^2 = 17.5$, p-value = 0.002). However, the study found no significant association between the workers' knowledge of OHS measures and the level of practice of the OHS measures ($\chi^2 = 4.15$, p-value = 0.390). Relatedly, no significant association was found between the workers' attitudes towards OHS measures and their level of practice ($\chi^2 = 6.3$, p-value = 0.18). The paper concluded that training on safety measures is relevant for improving safety knowledge, positively affecting workers' attitudes towards occupational health and safety measures. However, the study failed to reveal how the workers' demographic characteristics serve as socio-demographic factors that influence KAP concerning OHS measures.

This research gap was attempted by Okenna (2020), who investigated socio-demographic factors that influence KAP among environmental hygiene workers in the state-owned universities in the River State of Nigeria. The researchers applied the ideas from theories like Goal Freedom Alertness, Risk Compensation, and Job Demand-Resource to establish the thesis statement that socio-demographic factors that influence KAP significantly explain the workers' level of KAP on OHS measures. A quantitative approach that was based on a descriptive survey design was adopted. A stratified random sampling method was adopted to capture 540 environmental hygiene workers across three state-owned universities in the River State of Nigeria, while interview schedules were used to capture the data from the respondents.

The indicators for OHS measures were policies, strategies, procedures and activities that are targeted towards OHS. Descriptive statistics and Chi-square tests were used to analyse the data. The result was that the majority (87.1%) of the respondents had a high level of knowledge, while all of them identified poor wages or salaries as a challenge in the relationship between KAP and OHS measures. Yet, the study found no significant association between the respondents' age group and knowledge ($\chi^2 = 3.736$, p-value = 0.443) and between working experience and knowledge ($\chi^2 = 7.864$, p-value = 0.097), whereas there was a significant association between educational status and knowledge on OHS measures ($\chi^2 = 10.541$, p-value = 0.014). The paper concluded that education is vital for environmental hygiene workers to appreciate and safeguard against the occupational hazards that they often come into contact with due to the nature of their jobs. Yet, the study could have used

a mixed method to ensure that the unique and detailed experience of the environmental hygiene workers is integrated into the results.

Based on the available literature reviewed, there are several research gaps related to the knowledge, attitudes, and practices of occupational health and safety measures among environmental health workers. For instance, most of the research (Okenna, 2020; Mukhtar, Yusof & Isa, 2020; Esaiyas, Sanbata & Mekonnen; 2018) focused on the general population of environmental health workers, without looking at specific groups such as waste collectors, pest control workers, or food safety inspectors. There is a need for research that examines explicitly these groups' knowledge, attitudes, and practices of occupational health and safety measures. Thus, this study intends to study the cleaners, sanitary, and conservancy workers.

Relatedly, most of the existing research on environmental health workers (Okenna, 2020; Mukhtar, Yusof & Isa, 2020) has been conducted in high-income countries, leaving a gap in understanding the knowledge, attitudes, and practices of occupational health and safety measures in low-income countries where environmental health workers face different challenges. Accordingly, this study was conducted in Ghana, which is considered a low-income country. Moreover, there is a gap in research on how to improve their practices through behavioural change interventions. Further research is needed on how to effectively promote positive changes in behaviour among environmental health workers.

There is a need for more research on the impact of occupational health and safety measures on the health outcomes of environmental health workers. Most studies (Esaiyas, Sanbata & Mekonnen, 2018; Ibrahim, El-Karmalawy,

Hassan & Hafez, 2017; Tetemke, Tefera, Sharma & Worku, 2014) have focused on the knowledge, attitudes, and practices of environmental health workers, but not on the effectiveness of specific interventions or policies in reducing occupational hazards and improving health outcomes. Hence, this study aimed to address the existing gaps in the literature by employing a mixed-method approach to evaluate the knowledge, attitudes, and practices related to occupational health and safety measures among employees within the environmental health section of the University of Cape Coast.

Conceptual Framework

The Conceptual Framework (Figure 1) presents the linkages among KAP and OHS measures. It illustrates that the practice of OHS measures depends on the workers' knowledge and attitudes towards health and safety, which are in turn, influenced by the challenges of practicing the measures and the socio-demographic factors of knowledge, attitudes, and practices. The socio-demographic factors that influence KAP are the prerequisites for the workers' KAP, which in turn affects OHS measures. Thus, the workers who have good KAP towards OHS measures are expected to experience outcomes such as lower accident rates, high productivity, less healthcare costs, good health status, and vice versa.

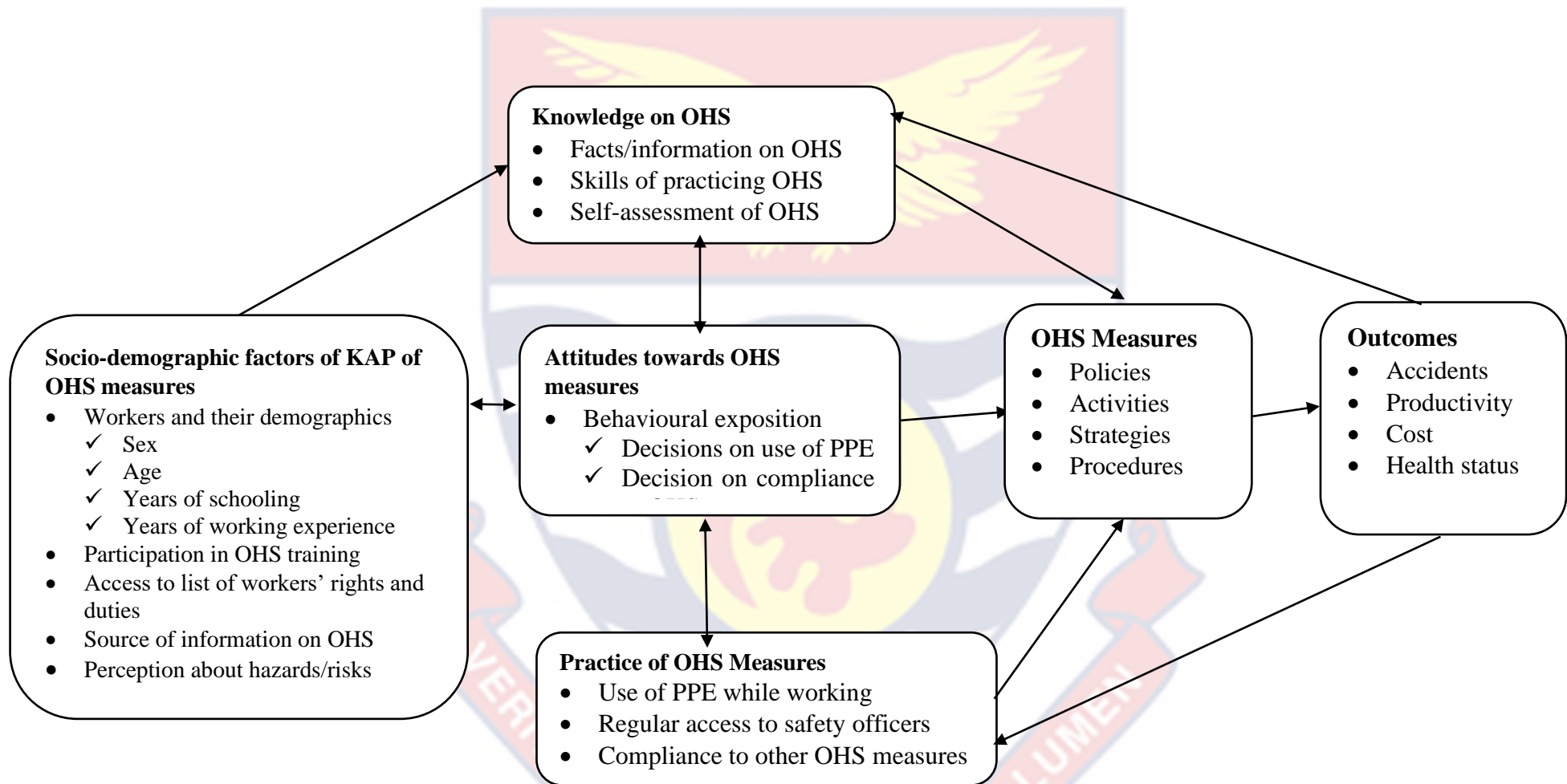


Figure 1: Conceptual Framework showing KAP of OHS Measures

Source: Adapted from Punnett, Cherniack, Henning, Morse, Faghri and CPH-New Research Team (2009)

The relationship between KAP and OHS measures demands some resources to be fulfilled and where there is a resource gap, it serves as a challenge to the expected relationship between the KAP and the OHS measures. Knowledge was measured in terms of being aware of the essence of PPE, composite score from related items, being aware of the effects of improper exposure to chemicals, and self-assessment, such as good or poor or low, moderate, and high. Relatedly, attitudes were measured in relation to a decision to use or not to use PPE, composite score from related items, and self-assessment such as good or poor or negative, neutral, and positive, while practices were captured with respect to the use of PPE, access to the safety officer at work, self-assessment such as good or poor or poor, fair, and good.

Chapter Summary

A review of related theories, concepts, and empirical studies revealed that while the Goal Freedom Alertness theory expounds how adherence to occupational health and safety (OHS) measures can enhance employees' productivity, it falls short in explaining the significance of workers' knowledge and attitudes in the implementation of OHS measures.

Although the Risk Compensation theory reveals that the practice of OHS measures is determined by workers' prior knowledge or rationality and attitudes toward risks, it does not explain what informs a particular attitude toward the risks. Job Demand-Resource argues that attitudes towards OHS are directly comparable to the resources available to fulfill the job demand.

With respect to the operationalisation of concepts, it was learned from the review that knowledge refers to facts, information, and skills that the workers acquire via experience and conscious familiarity with OHS measures

operating within their work environment for a practical understanding of OHS issues. On the other hand, the attitudes were understood as behavioural expositions that are exhibited by workers in relation to OHS measures, while practices are the framework of actions or inactions that define, direct and regulate how workers operate in response to their health and safety at work.

On the issues of methodological lessons, Lombardi, Verma, Brennan and Perry (2009) used a qualitative approach, and Asgedom, Bråtveit and Moen (2019), who adopted a mixed-method approach, a quantitative approach was the most preferred by the studies reviewed. Cross-sectional study was the dominant design used in the studies reviewed. Relatedly, probability sampling techniques used in the studies reviewed cut across multistage, simple random, census, proportionate or stratified random sampling, while convenient or purposive sampling was the only non-probability sampling technique adopted. Quantitative data were primarily collected with either interview schedules or questionnaire, while the qualitative were collected with interview guides, focus group discussion guides or observation checklists.

Descriptive statistics, Chi-square tests, logistic regression and ANOVA were the quantitative analytical methods, while content or thematic analysis was used for the qualitative data. Socio-demographic factors of safety knowledge include age, years of schooling, sex, years of working experience, participation in safety training, and a list of workers' rights and duties towards work and source of safety information. Other socio-demographic factors of attitudes were perception of risks, availability of PPEs, enforcement or reinforcement of PPE policies, and temporary or permanent work. At the same time, challenges of practising safety measures include discomfort using PPE

when working, inadequate supervision, poor wages or salaries, and inadequate OHS measures.



CHAPTER THREE

METHODOLOGY

Introduction

This chapter presents the research methodology used to undertake the study. The thesis used a mixed-method approach, which is underpinned by the pragmatist philosophy. This philosophy argues that a method of study is valid if it works satisfactorily so that the choice of a method of enquiry is justified by its practicality and that unpractical methods should be rejected. These ideas informed the choice of interview schedule as the data collection instrument for gathering quantitative data from the environmental health workers who could hardly read and write, while interview guides were designed to gather qualitative data from the head of the Environmental Health Section and three sub-sectional heads who served as key informants.

Research Design

A mixed-method approach was adopted based on the research gaps identified in the literature and the specified objectives of the study. Mamatov (2019) notes that the mixed-method design is underpinned by pragmatism, which focuses on what works best under specific conditions. This design aims to readily comprehend and use flexible methods to discover ideas in their natural settings (House & Kádár, 2021). Accordingly, a mixed-method approach was used in this study because, as explained by Teil (2021), it empowers the researcher to undertake a comprehensive study to consolidate various important elements into the study completely.

The mixed-method design aligned itself to both qualitative and quantitative approaches, which Almeida (2018) argued to be relevant because

it allowed for the two-fold data to complement each other in assessing the knowledge, attitudes and practice of health and safety measures among environmental health workers. The quantitative aspect enabled the researcher to identify the number of respondents that have poor or good KAP as well as to reveal the nature of its association with their socio-demographic factors and the challenges involved in the relationship between KAP and OHS measures. On the other hand, the qualitative aspect of the mixed-method design helped the researcher to obtain information on the reasons for the observed level of knowledge, attitudes, and practices among the environmental health workers as well as to reveal the rationale behind the nature of the observed associations among the variables.

Study Design

Precisely, the study adopted the embedded design. Timans, Wouters and Heilbron (2019) explained that this study design allows qualitative information to be integrated into quantitative results. The researcher gathered subjective information in this study design to explain why knowledge, attitudes, and practice systems work (Per Pollock et al., 2020). Thus, as suggested by Baran (2022), information obtained on knowledge, attitudes, and practice of occupational health and safety measures was used to assess the KAP and OHS among workers of the Environmental Health Section of the University of Cape Coast.

A significant feature of the correlational study design is that the study ought to administer a research instrument to solicit information from the entire population or from randomly sampled respondents (Gyasi, 2019). It was based on the responses the respondents were classified into those with poor levels of

KAP or good levels of KAP. The study was limited to only environmental health workers at the University of Cape Coast.

Study Institution

The University of Cape Coast, located in Ghana's Central Region (See Figure 2), is a public university. It was founded in October 1962 as a college associated with the University College of the Gold Coast, now the University of Ghana, Legon (Kwarteng, Boadi-Siaw, & Dwarko, 2012). An Act of Parliament known as "The University of Cape Coast Act, 1971 (Act 390)" made the University College an independent institution on October 1st, 1971, with the power to award its degrees, diplomas, and certificates. The University of Cape Coast Law, 1992, eventually replaced the original Act (PNDC Law 278). The current Law (PNDCL 278), which has been in effect for 25 years, is being reviewed (UCC, 2018: 3).

The university's management was reorganised in response to the revision of its mission. Five colleges – the College of Agriculture and Natural Sciences (CANS), College of Humanities and Legal Studies (CHLS), College of Health and Allied Sciences (CoHAS), College of Education Studies (CoES), and College of Distance Education (CoDE) as well as new faculties or schools were established. The fundamental goal of the reorganization was to unite linked disciplines to foster cooperation, guarantee efficiency, and decentralize administrative functions. In order to support the university's mandate, the Environmental Health Section (EHS) was also established to provide a conducive environment to its workers.

This study focused on the Environmental Health Section (EHS) of the University of Cape Coast. Mpe (2018) notes that environmental health work

has mainly presented severe occupational health and safety risks to the workers because of their continuous exposure to junk, human remains, urinals and tidies. Thus, the absence of information on knowledge, attitudes, and practices of environmental health workers may aggravate work-related risks, sickness and injury coupled with the spread of illness and poor practice of occupational health and safety measures (Preminger, 2018). As Rosemberg (2020) argued, amid the COVID-19 pandemic, a knowledge, attitudes and practices survey are needed on the existing occupational health and safety problems faced by environmental health workers.

Accordingly, the core mandate of the Environmental Health Section (EHS) of the University of Cape Coast is to promote health and provide health services by ensuring proper sanitation in the academic halls and libraries, health centers, offices and bungalows that are within and outside the University campus. The general environment of the university is in the care of the EHS; thus, the section provides advisory services on environmental issues, performs fumigation and spraying services, an inspection of the markets and food vending areas on the university campuses, dislodging solid and liquid waste, and daily cleaning of the university environment (UCC, 2019).

The Environmental Health Section of the University has three sub-sections, namely, conservancy, sanitary, and cleaning. These sub-sections, together, take care of environmental sanitation, waste management, disinfection and disinfestation, food hygiene, and control of stray animals. Thus, the three sub-sections ensure employees work in a healthy and conducive environment. The works of the sub-sections cut across halls of residence, academic areas (colleges, departments, and lecture halls), central

administration, the main library, and the University of Cape Coast Hospital.

Figure 2 shows the map of the study area.

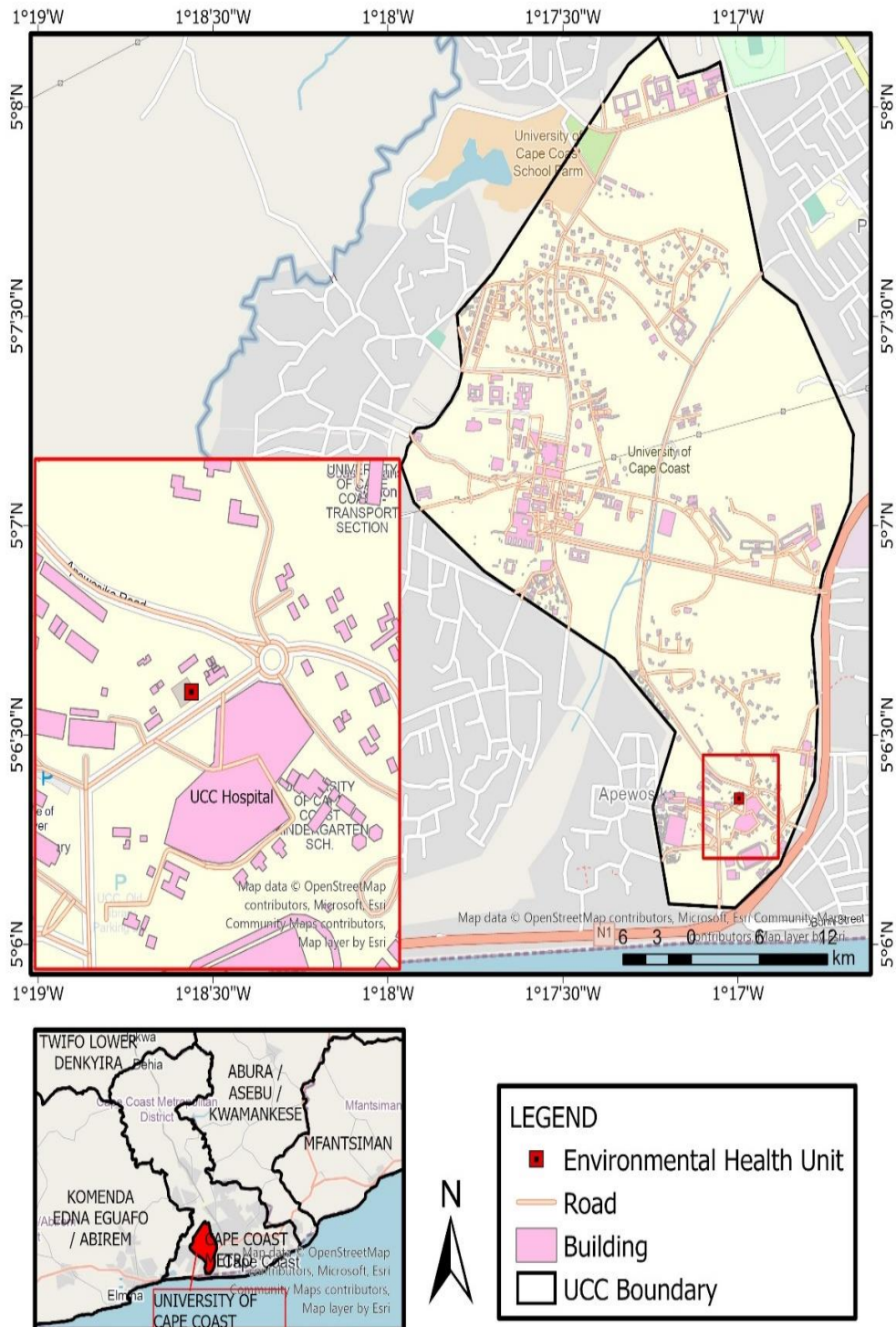


Figure 2: Map of the University of Cape Coast

Source: Cartography Unit, Department of Geography and Regional Planning, University of Cape Coast

Study Population

The study population was the environmental health workers employed by the University of Cape Coast. The study targeted this population because it constitutes the workers who are mainly responsible for the health, safety and sanitation of the university community and thus, are mostly exposed to occupational safety risks. According to the Management Information Section (MIS) (2022) of the University of Cape Coast, the population of environmental health workers was 1,134. These constituted 571 conservancy workers, 359 sanitary workers and 204 cleaners who were spread across 139 sub-workplaces based on different halls of residence, academic sections, central administration, main library, and the hospital.

Sampling Procedure

Based on the research gaps identified and the specified objectives of the study, both non-probability and probability sampling techniques were used. A probability sampling procedure was used to get respondents for the quantitative data collection. Krejcie and Morgan's (1970) sample size determination table was used to estimate a sample size of 290 respondents from the population of 1134 environmental health workers at the University of Cape Coast. Subsequently, the stratified random sampling technique was used to capture 146 conservancy workers, 92 sanitary workers, and 52 cleaners. The essence of using stratified random sampling was to ensure that every worker was given an equal chance of getting sampled and thus provided a sample that mimics the characteristics of the population. A detailed Table on how the sample was selected from the study population and the various strata in the population is therefore presented in the Appendix.

The three primary strata of the population with their respective population sizes, such as 571 conservancy workers, 359 sanitary workers, and 204 cleaners are also indicated in the Table shown in Appendix A. The sampling was done by numbering pieces of paper in correspondence with the identity of the respondents and kept in three different boxes. The application of the probability random sampling technique in this study was explained by the fact that a field assistant was entrusted with randomly selecting individuals from each of the three boxes, and the corresponding identification of the environmental health workers was documented until the sample sizes were achieved for each stratum of the population. In terms of non-probability sampling, the Head of the Environmental Health Section and the heads of the three sub-sections were purposively sampled as key informants for the qualitative dimension of the study. The inclusion criteria used were that every respondent ought to have been an employee of the EHS of the university and should have worked with the section for a year and above. This criterion was deemed appropriate based on the recommendation by Lamm and Lamm (2019) that participants and respondents for studies on KAP of OHS should have some adequate experience to be able to respond adequately.

Data Collection Instruments

Data from the environmental health workers was gathered using an interview schedule. The interview schedule (Appendix B) was designed into three sections coupled with 19 major items. Section A was about the socio-demographic factors and KAP, which constituted eight items. Apart from sex and work position that was measured as categorical variables, the rest of the items, such as age, schooling, household size, income as well as working

experience, were measured on a continuous scale, while the eighth item related to occupational health and safety was measured on a five maximum rating scale.

Section B was about the workers' knowledge, attitudes, and practice of safety measures, which constituted six items. The first three items concerned knowing about GHS Health and Safety Policy and its contents as examples of the contents, which were measured as categorical variables. On the other hand, knowledge of occupational health and safety measures was measured on a three-level nominal scale made up of sub-items 14 factors, while attitudes towards occupational health and safety measures were measured on a five maximum rating scale made up of 10 sub-items. Similarly, the practice of occupational health and safety measures was measured on a five-maximum rating scale made up of 11 sub-items.

Finally, Section C concerns the challenges of practicing occupational health and safety measures, composed of two major items. The first issue was whether the respondent noticed some challenges associated with the practice of occupational health and safety measures and thus was measured as a categorical variable. On the other hand, Section D was about rating the challenges faced in practicing occupational health and safety measures on a five-maximum rating scale comprising 14 sub-items. Again, the last items seek recommendations from the workers on improving occupational health and safety at the environmental health section of the school.

Using an interview guide, information was gathered from the three sub-sectional heads and the head of the environmental health section, who served as key informants (see Appendix C). To allow for the integration of the

information from the key informants into the quantitative results, themes similar to those in the interview schedule were used to develop the interview guide. Thus, information was asked about the characteristics of the workers, which promote or annihilate the transfer of occupational health and safety knowledge, attitudes, and practices. The key informants also provided information on the level of knowledge, attitudes, and practices of occupational health and safety among the workers in the section. Finally, in-depth information was gathered on the challenges of practicing occupational health and safety measures by the environmental health workers at the University of Cape Coast.

Pre-Test of Instruments

To ensure consistency and clarity of the items designed in the instrument, the interview schedule conducted a pre-test with a sample of twenty people chosen at random from the environmental health workers at Cape Coast Technical University. Because it shares traits with the University of Cape Coast, such as being a university with environmental health professionals, the Cape Coast Technical University was chosen for the pre-test. The researcher was able to evaluate and adjust a few elements that were difficult to correctly translate into the local Fante language by using the pre-test. For example, ‘rate the frequency at which you practice the following occupational health and safety measures on a scale of 1 as lowest to 5 as highest’ was a reviewed version of “How often do you practicalise occupational health and safety measures.” Again, a few close-ended questions were changed into open-ended questions as a result of the multiplicity of the responses that were obtained. Eighty percent (80%) of the pre-test respondents

responded, rousing the researcher's interest in alerting environmental health workers ahead of time about the primary fieldwork. This was meant to increase the response rate in the main fieldwork.

Training of field assistants

The researcher involved four research assistants to aid in the data collection. The field assistants were trained on the purpose of the study and how to interpret the questions in the Fante local language of the respondents. The leader of the field assistants had a Master of Philosophy degree in Development Studies, while the other three assistants were graduate students of Geography and Regional Planning. Thus, they had a fair knowledge of the study. To improve the field assistants' understanding of the items, they were made to take part in the pre-testing of the instruments.

The field assistants were trained on the specific interviews used for data collection and on how to use the interview schedule required for data collection. They were also trained in data quality control by properly labelling data to spot and correct errors and how to follow data collection protocols. I also trained them on communication and teamwork skills so that they can communicate effectively with other team members, as well as with the respondents, which would enable them to work effectively as part of a team to coordinate data collection efforts. Relatedly, the fieldworkers were trained on ethical considerations on how to obtain informed consent from participants, how to protect participant privacy, and how to handle sensitive data.

Fieldwork

The researcher visited all three sub-sections of the environmental health workers such as conservancy, sanitary and cleaning with the identity of

the potential respondents that were sampled. The purpose of the visit was explained to the sampled or potential respondents that the researcher is a Master student at the University of Cape Coast who is undertaking her study. Hence, she pleaded with the potential respondents to answer the questions as they applied to them. The potential respondents were equally informed about the duration of responding to the questionnaire (35 minutes maximum). Once the potential respondents decided not to participate, the researcher left and visited the subsequent potential respondents on the sample list.

However, after the potential respondents made the decision to take part in the study, the researcher read the questions to them, and either the researcher or field assistants prepared the responses. Permission was also sought from the key informants on the basis that the interview was for academic purposes and needed some information from them to embark on the study. Once they accepted the researcher including the field assistant started asking the questions while recording the interview for onward transcription and analysis.

Field Challenges

A major challenge faced during the data collection was that most of the sampled workers could not read and write. The researcher and the field assistants overcame this challenge by reading the questions and interpreting them in the local Fante language for the respondents, and by writing the responses. Another major challenge was that some of the workers were not willing to participate and even some of those who were willing to participate, were requesting monetary rewards. The researcher and the field assistants had to remind the workers that the research was for academic purposes and as a

student, the researcher did not make provisions for that. A related field challenge was the lack of occupational health and safety records by the workers. The researcher and the field assistants had to wait patiently for the workers to fall on their mental records to provide the needed data. In terms of the qualitative data gathering, the researcher encountered challenges such as the business of the section heads and the need to reschedule of interview appointment time at the most convenient time for the participants.

Data Processing and Analysis

After being reviewed for consistency, the quantitative data from the interview schedules were revised, coded, and inputted into Statistical Product and Services Solutions (SPSS) version 23 for further processing and analysis. The consistency of the responses to the questions about knowledge, attitudes, and OHS practices was examined as part of the data management procedure. Frequencies and percentages were utilised to characterise the knowledge, attitudes, and OHS practices of the environmental health workers at the University of Cape Coast. Similarly, inferential statistics like t-tests and one-way ANOVA were employed to investigate the socio-demographic characteristics that affect workers' knowledge, attitudes, and practices about occupational health and safety measures. Meanwhile, before the inferential analysis was conducted, the normality of the data to qualify for inferential analysis was checked, and the results were presented.

With respect to determining how knowledge, attitudes, practices, and their socio-demographic factors relate to occupational health and safety outcomes, a correlation matrix was used. All individual items were pulled to form the respective variables of the study. That is, fourteen items were pulled

to form the knowledge variable, nine items for attitudes, eleven items for the practice variable, and finally, five items formed the occupational health and safety outcome variable. Criteria suggested by Cohen (1988) are used as the guidelines for the interpretation of the correlation results. Finally, the investigation of the challenges involved in the relationship between KAP and OHS Measures was done using two steps. First, the descriptive analyses of the various items were used to form the challenge variable to ascertain the predominant challenges associated with KAP and OHS measures. Second, the correlation matrix examined the relationship that exists between challenges, KAP, and OHS measures.

Ethical Considerations

To ensure that the study does not cause harm to the respondents and other researchers, the data collection process was subjected to reliable research ethics, sought from the Institutional Review Board (IRB) of the University of Cape Coast (Appendix D). The researcher ensured, that data analysis methods did not violate the laid down ethical considerations. The potential respondents were duly informed about the study's objectives and asked for their consent to participate in order to uphold the moral standards of informed assent. Anonymity was maintained by not disclosing the respondents' identities or connecting any response to a specific respondent. Under no circumstances was any prospective participant required to participate in the study, and participants' data security and anonymity were guaranteed. Thus, methodical strategies that were suitable were applied to convey the results and discussion.

Chapter Summary

The thesis used a mixed-method approach, which is underpinned by the pragmatist philosophy. The study adopted the embedded design. It focused on the Environmental Health Section (EHS) of the University of Cape Coast since the work has particularly, presented serious occupational health and safety risks to the workers and their continuous exposure to junk, human remains and urinal. We employed both stratified random sampling and purposive sampling. Data collection from environmental health workers was conducted using an interview schedule, while key informants were interviewed using interview guides. To ensure uniformity and clarity of the specified items, the interview schedule was pre-tested on 20 randomly selected environmental health workers at Cape Coast Technical University.

The four field assistants were trained on the purpose of the study and how to interpret the questions in the Fante local language of the respondents. The data collection process was subjected to reliable research ethics, sought from the Institutional Review Board (IRB) of the University of Cape Coast. The quantitative data were analysed using descriptive statistics and logistics, while the qualitative data were analysed thematically.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter presents the results of the study based on the four objectives guiding the study. The presentation of the results is divided into two parts. The first part of this chapter dealt with the demographic characteristics of the respondents, and part two focused on the results of the study's main objectives. The chapter further discussed the results and linked them to previous studies in terms of agreement or otherwise with previous studies.

Demographic Characteristics of Respondents

Though the demographic characteristics of the respondents do not directly address any of the research objectives, it is meant to help the reader understand the characteristics of the respondents to whom the main results of the study relate. The demographic characteristics of the respondents considered in this section were sections, educational levels, age, rank, household size, working experience, sex, and income level. The sections of the respondents are presented in Table 1. The table shows that most of the respondents were conservancy workers (48.9%), followed by sanitary workers (32.8%) and cleaners (18.2%).

Table 1: Section of Respondents

Section	Frequency	Percent
Cleaning	50	18.2
Sanitary	90	32.8
Conservancy	134	48.9
Total	274	100.0

Source: Field data (2022)

The second demographic characteristic of respondents reported in this section is the educational level of respondents and the results are presented in Table 2.

Table 2: Educational Levels of Respondents

Educational level	Frequency	Percent
Primary	70	25.5
JHS	92	33.6
SHS	70	25.5
Others/higher education	42	15.3
Total	274	100.0

Source: Field data (2022)

The results revealed that most of the respondents had Junior High School (JHS) leavers (33.6%) followed by primary education (25.5%) and Secondary school (25.5%). That notwithstanding, some workers had other or higher educational experiences (15.3%).

In terms of age of respondents, the results are presented in Table 3. Most of the respondents from the EHS of the university were 40-49 years (45.6%) and 50-59 years (39.1%). This means that the majority of the workers at the section were 40 -59 suggesting that most of the workers were very old.

Table 3: Age of Respondents

Age (Years)	Frequency	Percent
20-29	4	1.5
30-39	38	13.9
40-49	125	45.6
50-59	107	39.1
Total	274	100.0

Source: Field data (2022)

The fourth demographic characteristic of interest (because a worker's rank could show the level of responsibilities required and how that could relate to how KAP of OHS is considered among this category of workers) was the rank of respondents and the results are presented in Table 4. The results show that most of the respondents were Headmen (45.6%) followed by Senior labourers (38.0%) and Senior headmen (16.4%).

Table 4: Rank of Respondents

Rank	Frequency	Percent
Senior labourer	104	38.0
Headman	125	45.6
Senior headman	45	16.4
Total	274	100.0

Source: Field data (2022)

Results presented in Table 5 is the fifth demographic characteristic reported which was the household size of respondents. Table 5 shows that the majority (56.9%) of the respondents had a family or household size of 6-10 followed by 39.8 percent with 1-5 family size. The lowest family size of respondents reported in Table 5 was 11 and above.

Table 5: Household Size of Respondents

Household size	Frequency	Percent
1-5	109	39.8
6-10	156	56.9
11 and above	9	3.3
Total	274	100.0

Source: Field data (2022)

Another demographic characteristic of interest to this study is the working experience of workers at the EHS of the university and the results are presented in Table 6. The results as presented in Table 6 revealed that the majority (79.9%) of the respondents had worked with the EHS of the University for 11-15 years. This was followed by workers who had been with the EHS for 6-10 years (16.1%). The results mean that most of the respondents had worked for more than 10 years and were able to give accurate and relevant information with regard to activities in the section.

Table 6: Working Experience of Respondents

Working experience (Years)	Frequency	Percent
1-5	11	4.0
6-10	44	16.1
11-15	219	79.9
Total	274	100.0

Source: Field data (2022)

The last two demographic characteristics of interest to this study are sex of respondents and their income level. The results as presented in Table 7 show that 85 percent of the 274 respondents of the study were male workers and the remaining 15 percent were female workers at the EHS of the University. Specifically, out of 166 respondents that had a monthly income of 500-1000 Ghana Cedis, the majority (85.5%) of them were males and the remaining 14.5% were female workers. In terms of the category of workers who earned 1001 to 1999 Ghana Cedis monthly, the majority (84.3%) of the respondents were male workers as against the 15.7 percent counterparts who were female.

Table 7: Sex and Income Level of Respondents

Monthly Income (GH¢)	Sex				Total	
	Male		Female		f	%
	f	%	f	%		
500-1000	142	85.5	24	14.5	166	100
1001-1999	91	84.3	17	15.7	108	100
Total	233	85.0	41	15.0	274	100

Source: Field data (2022)

From the analysis of all the demographic characteristics above, as much as the long working experience is very encouraging (79.9%) and could lead to commitment and better performance due to knowledge of operations of the sections, the income levels and the family size could be very problematic in these challenging economic times facing Ghana. This is because most of the respondents are expected to spend about GH¢100.00 monthly on each family member (1000 monthly income divided by ten persons in the household), leading to GH¢3.00 a day.

Nature of Knowledge, Attitudes, and Practices of Occupational Health and Safety of the Environmental Health Workers at the University of Cape Coast

The quantitative perspective of the first objective of the study was analysed with frequencies and percentages. The first objective had three components-knowledge, attitudes, and practice dimensions. The results for the knowledge of OHS among environmental health workers are presented in Table 8.

Table 8: Knowledge of Occupational Health and Safety among Environmental Health Workers

Responses	True		False		Don't Know		Total	
	F	%	f	%	f	%	f	%
1. OHS measures are put in place in the EHS	188	68.6	86	31.4	0	0	274	100
2. There is a health and safety committee at the EHS	121	44.2	116	42.3	36	13.1	274	100
3. Safety training was part of my orientation on my first employment	153	55.8	71	25.9	50	18.2	274	100
4. Safety training is part of the on-the-job training package	181	66.1	68	24.8	25	9.1	274	100
5. Safety training is part of the GHS safety policy	171	62.4	77	28.1	26	9.5	274	100
6. Exposure to dust causes health problems	188	68.6	58	21.2	28	10.2	274	100
7. Exposure to chemicals during work causes health problems	196	71.5	65	23.7	13	4.7	274	100
8. Wearing protective clothing important for safety environmental health workers	203	74.1	59	21.5	12	4.4	274	100
9. All type of gloves provides the same level of protection	190	69.3	65	23.7	19	6.9	274	100
10. Fire extinguisher or sand bag should be readily available at work	171	62.4	85	31	18	6.6	274	100
11. Wearing face mask while working is important to escape health risks	190	69.3	72	26.3	12	4.4	274	100
12. Potential hazards included carrying larger load than one could bear.	198	72.3	68	24.8	8	2.9	274	100
13. Experienced workers do not need to use safety devices	144	52.6	98	35.8	32	11.7	274	100
14. Slippery liquid spillage constitutes a potential hazard in the workplace	167	60.9	90	32.8	17	6.2	274	100

Source: Field data (2022)

The results revealed that almost (thirteen out of fourteen items constituting 93%) all of the respondents indicated that the fourteen statements used to measure their knowledge of OHS were true. The item with the highest score out of the 14 items among all the three categories of respondents was “*wearing protective clothing is important for safety environmental health workers*” with true responses above 70 percent (cleaners = 78%, sanitary = 72.2% and conservancy = 73.9%) (see Appendix E).

This means that the environmental health workers were aware of the importance of wearing protective clothing for their safety. Workers having knowledge of using protective clothing and ensuring compliance with the usage of PPEs could lead to a reduction in accidents or injuries among environmental health workers at the University. The results agree with the findings of Esaiyas, Sanbata, and Mekonnen (2018) that knowledge of the usage of PPEs among workers could reduce industrial accidents and diseases in the workplace.

Based on the results, three main items with lower ratings among all the items were “the existence of health and safety committee at the EHS” (44.2%) and “experienced workers do not need to use safety devices (52.6%). The third lowest rated item was “safety training as part of orientation on first employment” (55.8%). The low rating for the OHS committee at the workplace means that the OHS committee at the EHS section was not visibly noticed by the majority of the workers considered in this study. Also, the results revealed a challenge with workers’ perception that experienced workers need not wear safety devices. The wrong impression among these workers could increase work-related accidents and injuries among experienced

workers as against new workers. The notion that experienced workers need not use safety devices at the workplace was very worrying. It was very encouraging to note that orientation on OHS was available for orientation programmes for new workers (See item 3 in Table 8). This will help to prevent or reduce the occurrence of OHS-related injuries or accidents among new employees at the EHS. This means that newly employed workers at the EHS were introduced to OHS issues at the workplace but these workers later did not take the OHS issues seriously as they became experienced with their work processes. The results of this study therefore agree with the findings of Peng and Chan (2019) that experienced workers rather sometimes relax OHS protocols at the workplace which could increase industrial accidents and diseases among them.

The detailed categorical results of the results in Table 8 can be seen in Appendix E. Specifically, other most important factors to the cleaner category of workers in the section were four items (*OHS measures are in place; safety training as part of on-the-job training; provision of all kinds of gloves; wearing of face mask while working is important*). The majority of cleaners agreed with the statements that occupational health and safety measures are put in place at the EHS (*item 1 = 76%*); all types of gloves provide the same level of protection (*item 9 = 76%*). The high rating for all kinds of gloves providing the same level of protection is very problematic. This is because this wrong notion among cleaners could lead to using any available hand glove manufactured for varied purposes. This could further compromise the safety standards and protection of workers.

The remaining two important items were: “safety training is part of the on-the-job training package” (*item 4 = 74%*) and “wearing a face mask while working is important to escape health risks” (*item 11 = 74%*). Knowledge on the importance of wearing of nose mask among workers at the EHS could influence their desire to use the nose mask. Also, the high rating for safety training and its inclusion in on-the-job training could further entrench the understanding and the need for workers to take safety measures seriously at work.

Three items out of the four important items to the cleaner category of staff were equally rated as very important among sanitary workers in the section due to the high level of knowledge on these items. Sanitary workers, however, rated *item 9* (that carrying a larger load than you are able to can be considered a potential hazard in the workplace) more important (71.1%) than “*the importance of wearing a face mask while working*” (*item 11*) which as compared to the cleaner category of workers. The sanitary workers of the environmental health workers were of the view that workloads above their abilities could be a precursor for injuries and death at the workplace. This means that supervisors would need to ensure that workloads for environmental workers are properly determined and assigned to workers. Excessive workloads compared to workers' capabilities could not only be responsible for the inability to achieve such targets due to lack of motivation and underperformance but could also lead to OHS issues such as diseases, and fatal and non-fatal accidents at the workplace. Thus, the findings of Worksafe (2020) state that excessive workload for workers can lead to compromise of

OHS protocols among workers due to an attempt to hurriedly execute the workload is therefore upheld by the findings of this study.

Conservancy workers also rated *items 11 and 12 (respectively on the importance of wearing a face mask during work and the potential hazards associated with too much workload)* as very important just as cleaning and sanitary workers rated them. The point of departure, however, was the high rating that “exposure to chemicals during work causes health problems” (*item 7 = 76.9%*) which was not equally rated very high among cleaning and sanitary workers in the section. Conservancy workers at the EHS will be very careful about their working environment to ensure that there is no exposure to chemicals in their workplace. This could lead to serious environmental challenges, which could affect the health of workers both in the short and long term. The results also call for supervisors and workers to be personally responsible and ensure that they do not personally expose their working environment to dangerous chemicals that could pose health-related challenges to workers. Thus, the assertion of Asgedom, Bråtveit, and Moen (2019) that knowledge of precursors of accidents and diseases at the workplace could help reduce OHS-related challenges is corroborated by the results of this study.

The least perceived item across the three categories of workers (cleaning, sanitary and conservancy) found in Appendix E with regard to respondents' knowledge was the existence of a health and safety committee at the EHS (*item 2*). The results mean that although all environmental health workers were aware of the health and safety committee at their workplace, it did not record a high level of responses compared to other items. This could explain the high false rating for item b among the three categories of workers

who did not believe there was an OHS committee at the workplace. This could mean that though there is a health and safety committee at the workplace, its existence and functions are not very visible to all workers in the environmental health section of the University of Cape Coast.

The quantitative results so far presented in both Table 8 and Appendix E have all shown that workers had a high level of knowledge of OHS at the EHS of the University. Specifically, from Table 8 workers are knowledgeable in terms of OHS measured at work, safety training provided, hazards in their work environment, and the need to wear PPEs for their work among others. That notwithstanding, workers also had a wrong impression (or low level of knowledge) that experienced workers need not use safety devices and that all types of gloves provided the same level of protection.

Qualitative data obtained through interviews with key informants revealed that knowledge of OHS was very important to the EHS of the university. A key informant interview reported that:

We are very much aware that OHS knowledge is relevant for attitudinal change and thus a holistic good practice of OHS measures so our job as the leaders is to reduce the chain of negative attitudes through the OHS training that we provide for the workers. Yet, the workers' level of participation in the OHS training has been low over the years and I think it is because of the lack of an OHS department in the University to handle the OHS issues of the workers, while the leaders concentrate on their specific leadership roles (Informant 2, 1st July, 2022).

From the quote, it is clear that despite the importance of knowledge on OHS to workers at the section, their participation in training that serves as a platform for equipping them with such knowledge is not the best. As can be inferred from the conceptual framework (Figure 1), the workers who are more knowledgeable are likely to possess a good attitude towards OHS measures and are expected to practice OHS measures, but participation in OHS training forms the basis of such links. Risk Compensation Theory hints that as the workers become knowledgeable through such training, they will realize that the benefit of compliance with the OHS measures outweighs the non-compliance to the OHS measures (Mantzari, Rubin & Marteau, 2020). Goal Freedom Alertness Theory adds that in order to maintain the desired association among OHS knowledge, attitudes, and practice, their socio-demographic factors should be given priority for the provision of a healthy working environment and increased employee productivity (Chavoushi & Valliere, 2021).

Attitudes of Environmental Health Workers towards OHS

The second component of the first objective analysed the attitudes of environmental health workers. Descriptive analysis was conducted from the quantitative perspective, and the results are presented in Tale 9 and Appendix F. The results showed that most of the respondents rated eight out of nine items measuring the attitudes of workers at the EHS of the university very high. That is except for the first item the remaining eight items were rated very high. That is most of the respondents moderately rated the necessity for annual medical check-ups for work-related disorders as relevant for workers at the section (28.8%).

Table 9: Attitudes of Environmental Health Workers

Items	Levels	No.	%
	Very Low	12	4.38
1. Annual medical check-ups are necessary for work related disorders	Low	56	20.4
	Moderate	79	28.8
	High	76	27.7
	Very High	51	18.6
	<i>Total</i>	274	100
	Very Low	16	5.84
2. Workers need to be trained on using PPEs.	Low	51	18.6
	Moderate	66	24.1
	High	91	33.2
	Very High	50	18.2
	<i>Total</i>	274	100
	Very Low	20	7.3
3. I think I should not continue working in the absence of PPEs	Low	38	13.9
	Moderate	76	27.7
	High	82	29.9
	Very High	58	21.2
	<i>Total</i>	274	100
	Very Low	16	5.84
4. The existing working environment should be improved for the better health of the workers	Low	40	14.6
	Moderate	78	28.5
	High	91	33.2
	Very High	49	17.9
	<i>Total</i>	274	100
	Very Low	10	3.6
	Low	57	21
5. Health workers should monitor the use of PPEs.	Moderate	73	27
	High	77	28
	Very High	57	21
	<i>Total</i>	274	100

Table 9 continue

	Very Low	16	5.8
	Low	38	14
6. Training on OHS should be	Moderate	77	28
given to workers least once a year	High	96	35
	Very High	47	17
	<i>Total</i>	274	100
	Very Low	12	4.4
	Low	36	13
7. It is wrong to decide not to use	Moderate	88	32
PPE while working	High	91	33
	Very High	47	17
	<i>Total</i>	274	100
	Very Low	20	7.3
	Low	37	14
8. Awareness on PPE and its	Moderate	63	23
essence is important for	High	98	36
environmental health workers	Very High	56	20
	<i>Total</i>	274	100
	Very Low	11	4
	Low	40	15
9. Awareness on effects of	Moderate	77	28
improper exposure is important	High	102	37
for environmental health workers	Very High	44	16
	<i>Total</i>	274	100

Source: Field data (2022)

Annual medical check-ups are very necessary for the early identification of any OHS-related illnesses or injuries for early attention before they graduate to an alarming and uncontrollable level. However, a majority of workers only moderately see the relevance of this element. The relevance attached to the annual check-ups will influence workers' availability and

participation in any exercise or directives for workers to undertake annual medical reviews or check-ups. The results mean that workers' attitudes towards OHS policies are key in ensuring that the workplace is safe for all workers at all times. Thus, the findings of this study corroborate the findings of Chong, Chen, Peng and Yu (2022) that a positive attitude is required from workers to be able to smoothly implement and maintain any OHS-related policies.

Apart from the first items, all the remaining items on training on the use of PPEs (33.2%), use of PPEs while working (29.9%), monitoring of the use of PPEs (28.0%), training on OHS (35.0%), awareness of the relevance of PPEs (36.0%) among others were all rated high among most of the respondents. This is a very encouraging sign to note that most of the workers rated these indicators of OHS at the EHS of the university. This will lead to positive attitudes among workers at the section and will help to reduce OHS-related injuries and challenges at the section.

The disaggregated results in terms of attitudes among workers at the EHS of the university based on categories of workers are also presented in Appendix F. The results revealed that all nine items for measuring staff attitudes were rated very high among sanitary workers at the section since most of these workers rated these items very high with the exception of “*item 4*” which indicated that the current working environment should be changed for the better health of the workers. This means that the sanitary workers have a very high or positive attitudes towards health and safety at the EHS of the University but the existing working environment needs improvement.

The rating of cleaners for the nine items was very different from their sanitary counterparts. That is, apart from *item 4* the two categories of workers rated moderately, and cleaners separately rated other items moderately (*items 1, 4, 5 and 6* on the necessity to have annual medical check-ups, changing of existing working environment, monitoring of the use of PPEs, annual training on OHS). That is, cleaners moderately rated the necessity to have medical check-ups annually for work-related disorders (22.8%), the need for health workers to monitor the use of clothing, gloves, face mask, and glasses (24.7%), and lastly training on occupational health and safety should be given once a year to workers (19.5%) as important issues to them.

Additionally, all the remaining five items out of the nine items rated very high by sanitary workers (*items 2, 3, 7, 8 & 9* on training on PPEs, continue to work in absence of PPEs, the use of PPEs, awareness of the essence of PPEs, and awareness of the effects of improper exposure respectively) indicated earlier were also rated high among cleaners at the EHS. This means cleaning and sanitary workers had positive attitudes towards training for the use of PPEs, stop working if there are no PPEs, failed to use PPEs is wrong, enhancing the awareness of the usage of PPEs and the effect of improper exposure. This is very relevant for ensuring the usage of PPEs at the section as well as ensuring that these categories of workers personally take health and safety requirements seriously at the workplace. The results suggest that as much as PPEs could be supplied by management, there was the need to train workers on the usage and also monitor to ensure that workers use the protective apparel on all occasions.

The results are in tandem with the earlier findings of Guerin and Toland (2020) that management of organisations need to train and monitor their workers' usage of PPEs to reduce OHS-related injuries and death at workplaces. The results further corroborate the findings of Hurst (2016) that regular training on OHS for staff is essential for ensuring a reduction in OHS injuries at the workplace.

The assessment of the nine items measuring the attitudes of workers at the EHS was also differently rated by conservancy workers. Apart from the need for training for PPEs (*item 2*) which was rated moderately by most of the conservancy workers, all the remaining eight items were either rated low or very low. Specifically, the majority of the conservancy workers had low rating (suggesting low attitudes) for annual check-ups (*item 1* = 62.5%), not to work in the absence of PPEs (*item 3* = 63.2%), introducing changes in the current working environment (4 = 70%), among others.

Appendix F further shows that two items were rated very low among the majority of conservancy workers. These items “it is wrong to decide not to use PPE while working” (*item 7* = 75%) and “awareness on effects of improper exposure is important for environmental health workers” (*item 9* = 72.7%). The very low rating relating to poor attitudes on the part of conservancy workers could affect adherence to health and safety measures at the EHS of the university. That notwithstanding the aggregate results in Table 9 also revealed that most of the respondents were conservancy workers (48.9%) followed by sanitary workers (32.8%) and cleaning workers (18.2%).

Occupational Health and Safety Practices among Environmental Health Workers

The third and last component of the first objective looked at the OHS practice among environmental health workers, and the results are presented in Table 10. Eleven items (see Table 10) were used to measure occupational health and safety practices among workers at the EHS and the rate of safety consciousness among workers.

Table 10: Occupational Health and Safety Practices among Environmental Health Workers

OHS Measures Items	Levels	No.	%
1. Use of safety glasses or goggles while working	Very Low	18	6.57
	Low	51	18.6
	Moderate	59	21.5
	High	105	38.3
	Very High	41	15
	<i>Total</i>	<i>274</i>	<i>100</i>
2. Wearing of gloves while working	Very Low	15	5.47
	Low	26	9.49
	Moderate	59	21.5
	High	108	39.4
	Very High	66	24.1
	<i>Total</i>	<i>274</i>	<i>100</i>
3. Use of Masks while working	Very Low	15	5.47
	Low	26	9.49
	Moderate	60	21.9
	High	109	39.8
	Very High	64	23.4
	<i>Total</i>	<i>274</i>	<i>100</i>
4. Wearing Overall coat while working	Very Low	17	6.2
	Low	26	9.49
	Moderate	52	19
	High	115	42
	Very High	64	23.4
	<i>Total</i>	<i>274</i>	<i>100</i>
5. Using Ear plug while working	Very Low	22	8.03
	Low	44	16.1
	Moderate	54	19.7
	High	96	35
	Very High	58	21.2
	<i>Total</i>	<i>274</i>	<i>100</i>

Table 10 continue

	Very Low	12	4.38
	Low	28	10.2
6. Using safety Boots while working	Moderate	63	23
	High	102	37.2
	Very High	69	25.2
	<i>Total</i>	274	100
	Very Low	23	8.39
7. Wearing Machine guards while working	Low	48	17.5
	Moderate	63	23
	High	94	34.3
	Very High	46	16.8
	<i>Total</i>	274	100
8. Visiting safety officers for check-up	Very Low	22	8.03
	Low	37	13.5
	Moderate	63	23
	High	100	36.5
	Very High	52	19
9. Reporting hazards or risks regularly at work	<i>Total</i>	274	100
	Very Low	9	3.28
	Low	42	15.3
	Moderate	74	27
	High	90	32.8
10. Participation in health and safety education	Very High	59	21.5
	<i>Total</i>	274	100
	Very Low	16	5.84
	Low	38	13.9
	Moderate	81	29.6
11. Reading labels of chemicals before using them	High	80	29.2
	Very High	59	21.5
	<i>Total</i>	274	100
	Very Low	12	4.38
	Low	38	13.9
11. Reading labels of chemicals before using them	Moderate	85	31
	High	91	33.2
	Very High	48	17.5
	<i>Total</i>	274	100

Source: Field data (2022)

The results as presented in Table 10 revealed, that it was only item 10 on “participation in health and safety education” that was rated moderately by most of the respondents (29.6%). This means that respondents were not very

convinced about the practices and participation in education on OHS at the section. The relevance of safety education is very important to safety consciousness in workers and also reminds them about safety behaviours and what could be done to reduce OHS-related injuries and accidents. Lack of it could influence the level of OHS-related accidents and injuries at work.

Apart from item 10 described earlier, all the remaining ten items out of the eleven items were used to measure the practices of OHS among workers at the EHS of the university. That means that the practices of using safety glasses, masks, overcoats, earplugs, safety boots, and machine guards while working as well as reporting hazards, visiting safety officers and reading labels, were highly rated by respondents at the EHS of the university. This suggests a very high level of OHS practices among workers at the section and these elements have a higher propensity to reduce the occurrence and degree of OHS-related accidents and injuries among the workers.

The disaggregated results presented in Appendix G revealed that cleaners at the EHS practice the use of safety glasses or goggles while working (1 = 22.03%), and using earplugs while working (5 = 20.23%). From Table 10, most of the cleaner category of workers highly practice wearing gloves (2 = 28.85%), masks (3 = 21.1%), wearing overall (4 = 22.61%), safety boots (5 = 22.22%), machine guards (6 = 26.26%) while working. Most of the cleaners also had high ratings for visiting safety officers for check-ups (8 = 26%), reporting hazards or risks regularly at work (9 = 24.44%) and reading labels of chemicals before using them (11 = 24.18%). The results suggest that the OHS practices among cleaners at the section were very high and acceptable. This could lead to a reduction in accidents since this category of

workers ensures that their day-to-day operations at the workplace are underpinned by good OHS practices.

Sanitary workers' assessment of the eleven items as presented in Table 10 was very different from their counterparts in the cleaning subsection presented earlier. Apart from participation in health and safety education (*item 9 = 37.5%*) which was rated highly by most of sanitary and cleaning workers, the remaining ten items were rated by cleaners moderately (*items 2 & 11*), very low (*items 3, 4, 6 & 9*), and very high (*items 5, 7, 1, & 8*). This means that the level of OHS practices among sanitary workers was both low and high for different perspectives of their activities. Sanitary workers had a low level of OHS practices towards using masks (*item 3 = 53.3%*), wearing overall (*item 4 = 47.1%*), and wearing safety boots (*item 6 = 41.7%*) while working. This low level of OHS practices among this category of workers could be a recipe for higher industrial accidents and injuries. It also put the workers at a higher risk since these workers were not protecting themselves adequately while working. The findings of Rosemberg (2020) that the wrong OHS practices among workers increase their chances of adversely suffering from OHS-related injuries at the workplace.

Sanitary workers however, highly practiced good (very high) OHS practices in areas including the use of safety glasses or goggles while working (*item 1 = 39%*), using ear plugs (37.9%) using machine guards (*item 7 = 43.5%*) while working, and visiting safety officers for check-up (42.3%). This is very encouraging OHS practices among this category of workers. The results suggest that though there were few areas of low rating, there are several areas in this category where workers were found to be doing well with regards

to OHS practices at the EHS. Thus, the use of machine guards, earplugs, and visiting safety officers for check-ups will not only reduce the impact of industrial accidents on these workers but will also lead to early detection of possible OHS-related challenges or effects on this category of workers. The results agree with earlier findings of Hurst (2016) that adhering to good OHS practices relates to reducing OHS-associated injuries.

The case of conservancy workers' assessment of the eleven items used to measure OHS practices at the EHS was also very different from their other counterparts (cleaning and sanitary workers). Apart from wearing safety boots (*item 6* = 58.7%) which majority of conservancy workers rated moderately high, all the remaining ten items were rated low and very low. Conservancy workers had very low (or bad) OHS practices towards the use of safety glasses or goggles while working (*item 1* = 66.7%), wearing of gloves while working (*item 2* = 60%), and reading labels of chemicals before using them (*item 11* = 66.7%). Other areas where conservancy workers also had low ratings or bad OHS practices include using masks while working (*item 3* = 80.8), wearing an overall coat while working (*item 4* = 65.4%), and using earplugs while working (*item 5* = 70.5%). The results suggest that there were very bad OHS practices among conservancy workers at the EHS of the university. Poor OHS practices among this category of workers mean that they could suffer frequent occupational injuries and diseases more than the cleaning and sanitary workers at the section.

The composite results in Table 10 (considering total responses for the three categories of workers) suggest that most of the respondents highly rated

the eleven items. This means that the general OHS practices among environmental health workers could be termed as good (high).

The qualitative data gathered during an interview with a management member at the section stated that:

There is no need to undermine the essence of OHS knowledge for inculcating good attitudes in the workers, which is in turn relevant for the practice of OHS measures. Yet, it is difficult dealing with half-educated, but highly experienced workers who have already developed their peculiar attitudes towards OHS issues on the job over the years. Thus, with or without high OHS knowledge, the attitudes of our workers determines whether they will practice the good OHS measures put in place or not (Key informant 3, 4th July, 2022).

The statement suggests that the practice of OHS measures depends on workers' knowledge and attitudes towards health and safety, which are in turn influenced by the challenges of practicing the measures as well as the socio-demographic factors of knowledge, attitudes, and practices. Theoretically, Risk Compensation Theory explains that workers are rational by adjusting their attitudes to suit the risky working conditions such that their prior knowledge of the potential health and safety risks becomes inevitable to predict the path of choices that they made in response to those risks (Wilde, 1982). Job Demand-Resource Theory further clarifies that unless the challenges of the relationship between KAP and OHS measures are reduced through the provision of resources, workers are likely to express the resource

gap via a negative attitude toward health and safety issues (Bakker & Demerouti, 2007).

Examining the Influence of Socio-Demographic Factors on the KAP of Occupational Health and Safety among Environmental Health Workers

Objective two of the study examined four key Socio-Demographic Factors that influence the knowledge, attitudes, and practices (KAP) of OHS at the workplace. These key socio-demographic factors, as captured in the study's conceptual framework based on previous studies were age, sex, educational level and tenure or working experience (Lombardi, Verma, Brennan & Perry, 2009; Okenna, 2020). Inferential statistics such as t-tests and one-way ANOVA were used to achieve the objective. Meanwhile, before the inferential analysis was conducted, the normality of the data to qualify for inferential analysis was checked, and the results are presented in Appendix H. Appendix H presents the results of the normality test for the variables of the study. The criterion used was that the mean, mode and median values must be almost the same, and the skewness values should be within 0.5 and -0.5 (Fidel & Tabachnick, 2001; Segbenya, 2012). It is clear from Appendix H that all the mean, mode and median values obtained were almost the same for each variable. Additionally, the skewness values were also within the threshold. Thus, the normality of the data was achieved and could be used for further analysis using inferential statistics.

The findings of the collinearity statistics used to confirm that the data could be used for inferential analysis as shown in Appendix H. A major collinearity issue was determined by the criteria that a tolerance value of less than 0.1 and VIF (Variance Inflated Factor) values of more than 10 suggest the

presence of multicollinearity. Results shown in Appendix H indicated that values for VIF were less than 10 and tolerance was above the minimum cut-off point of 0.10, indicating that multicollinearity between the study's variables was not present and that an inferential analysis could be performed.

The results for the first socio-demographic factors that influence KAP as indicated in the conceptual framework, sex of respondents, and KAP were analysed with an independent sample t-test, and the results are presented in Appendix H. All assumptions were met, and the results revealed that men respondents or workers in the section perceived all three variables – KAP higher than their female counterparts since the mean values recorded for this category of workers were higher for knowledge, attitudes and practice, as shown in Appendix H. More importantly, the results indicated by the Sig (2-tailed) in Table 11 means also show that there was a statistically significant difference in scores respectively for the male and female perception of attitudes variable of the study [(M = 3.4936, SD = 0.74755); (M = 3.0759, SD = 1.01210); $t(274) = 0.015$].

Table 11: T-Test KAP and Sex

Variable	Sex	Group Statistics					t	Sig. (2-tailed)	95% Confidence Interval		Eta ²
		n	Mean	SD	SE	Lower			Upper		
Knowledge	Male	233	0.6496	0.19014	0.01246	0.204	0.838	0.05819	0.07168	0.00015	
	Female	41	0.6429	0.21958	0.03429						
Attitudes	Male	233	3.4936	0.74755	0.04897	2.524	0.015	0.08496	0.75040	0.02289	
	Female	41	3.0759	1.01210	0.15806						
Practice	Male	233	3.5811	0.77230	0.05060	2.545	0.011	0.07802	0.61104	0.232	
	Female	41	3.2366	0.94095	0.14695						

Source: Field data (2022)

From Table 11, knowledge of the respondents depicts an Eta^2 of 0.00015, attitudes having 0.02289 whilst practices of the respondents showed an Eta^2 of 0.232. There were statistically significant differences in mean score for the perception of practice variable of the study among male respondents [(M = 3.5811, SD = 0.77230) and female respondents at (M = 3.2366, SD = 0.94095); $t(274) = 0.011$]. Meanwhile, there was a non-significant difference in the mean score for the Knowledge variable of the study, respectively, among male and female respondents (M = 0.6496, SD = 0.19014); (M = 0.6429, SD = 0.21958); $t(274) = 0.21958$). The results mean that sex does not predict the knowledge of workers and is not an antecedent of workers' knowledge of OHS at the environmental section of the University. Sex, however, was found to have predicted attitudes and practices on OHS among workers at the EHS of the University. The results mean that the attitudes and practices of OHS among workers in the environmental section of the University differ based on their sex. Thus, the findings of this study disagree with earlier findings of Ncube and Kanda (2018) who found sex to be an antecedent of knowledge. However, the findings of this study agree with the findings of Cavalli et al. (2019) that sex is an antecedent of attitudes and practices among workers on OHS-related issues at the workplace.

A key informant reported that:

The environmental health work had been male-dominated and though the workers demand high income to take care of their OHS, the aged people are the people who served for a longer period and thus earn a higher income. Yet, such elderly workers tend to exhibit negative attitudes

towards OHS measures with the claim that whether they adhere to OHS measures or not, their health is in the hand of their maker but not their OHS behaviour (Key Informant 1, 11th July, 2022)

The statement confirmed that male sex, age and income are associated with poor attitudes towards OHS measures among the workers. As the Job Demand-Resource Theory indicates, it could be that irrespective of the high income levels, the aged workers are expressing resource gap at the workplace via negative attitudes toward health and safety measures (Gruenfeldova, Domijan & Walsh, 2019). The conceptual framework (Figure 1) implicated that demographic characteristics play relevant roles in attitudes towards OHS measures because they underpinned the rationality of the workers. As the Risk Compensation Theory suggests, the socio-demographic of the workers reflects the sentiments about the happenings based on the most unmistakable and imperative idea in contemporary social psychology (Kasting, Wilson, Zollinger, Dixon, Stupiansky & Zimet, 2017).

The remaining three socio-demographic factors that influence KAP found in the literature were equally tested with a One-way analysis of variance. These socio-demographic factors were educational level, age, and working experience, herein termed tenure. A two-way between-group ANOVA was conducted to explore the effect of age, educational level, and tenure on KAP: knowledge, attitudes, and practice as measured by the life orientation test (LOT). The first independent variable or antecedent presented in Table 12 is the age of workers at the environmental health workers.

Respondents' age was grouped into four: 20-29 as 1, 30-39 as 2, 40-49 as 3 and 50 and above as 4.

The results, as presented in Table 12, revealed that respondents within the age categorisation of 40-49 perceived knowledge and practice of OHS as higher than other respondents since their mean value for the two variables was higher than that of others. More importantly, there was a statistically significant difference between age and attitudes of workers [$F(3.867) = 0.010$]. Additionally, there was a statistical significance between age and practices of OHS among environmental health workers [$F(3.115) = 0.027$]. Meanwhile, there were non-significant differences between age and knowledge of OHS among workers at section [$F(.854) = 0.465$]. The results mean that age is not an antecedent of knowledge, but rather only attitudes and practices had a relation to OHS among workers. The results, therefore, disagree with the findings of Dragano et al. (2018) who found that age is the antecedent of knowledge. The results rather confirm the findings of Peng and Chan (2019), who found that age is an antecedent of attitudes and practices in relation to OHS at the workplace.

The second socio-demographic factor presented in Table 12 is the educational level of workers in the environmental section of the university and how it influences the knowledge, attitudes and practices of OHS. The highest educational level attained by respondents was grouped into four: primary, Junior High, Senior High and others representing higher/tertiary qualification. The results revealed that respondents with higher qualifications (others) ($M = 0.6650$, $SD = 0.16126$) rated knowledge variables of the study higher than all the other counterparts.

Table 12: ANOVA Results for Age, Educational Level, Tenure and KAP

Variables	n	Mean	SD	SE	F	Sig.	95% Confidence Interval		
							L. Bound	U. Bound	
<i>Age (years)</i>									
Knowledge	20-29	4	0.6429	0.16496	0.08248	0.854	465	0.3804	0.9053
	30-39	38	0.6053	0.21444	0.03479				
	40-49	125	0.6629	0.19085	0.01707				
	50-59	107	0.6475	0.19233	0.01859				
	Total	274	0.6486	0.19440	0.01174				
Attitudes	20-29	4	4.1111	0.64788	0.32394	3.867	0.010	3.0802	5.1420
	30-39	38	3.6170	0.72502	0.11761				
	40-49	125	3.5058	0.79280	0.07091				
	50-59	107	3.2523	0.81715	0.07900				
	Total	274	3.4311	0.80453	0.04860				
Practice	20-29	4	3.1000	0.35590	0.17795	3.115	0.027	2.5337	3.6663
	30-39	38	3.6158	0.71453	0.11591				
	40-49	125	3.6576	0.74197	0.06636				
	50-59	107	3.3654	0.89254	0.08628				
	Total	274	3.5296	0.80732	0.04877				
<i>Educational level</i>									
Knowledge	Primary	70	0.6561	0.21178	0.02531	0.443	0.723	0.6056	0.7066
	JHS	92	0.6522	0.19873	0.02072				
	SHS	70	0.6265	0.19080	0.02281				
	Others	42	0.6650	0.16126	0.02488				
	Total	274	0.6486	0.19440	0.01174				
Attitudes	Primary	70	3.3794	0.87151	0.10417	2.199	0.089	3.1716	3.5872
	JHS	92	3.5688	0.83747	0.08731				
	SHS	70	3.4413	0.66154	0.07907				
	Others	42	3.1984	0.79729	0.12302				
	Total	274	3.4311	0.80453	0.04860				
Practice	Primary	70	3.4571	0.85271	0.10192	2.384	0.070	3.2538	3.6605
	JHS	92	3.7098	0.80001	0.08341				
	SHS	70	3.4100	0.75107	0.08977				
	Others	42	3.4548	0.79640	0.12289				
	Total	274	3.4311	0.80453	0.04860				

Total 274 3.5296 0.80732 0.04877

Table 12 continue*Tenure /Working experience (Years)*

Knowledge	1-5	11	0.6623	0.18651	0.05624	3.203	0.042	0.5370	0.7876
	6-10	44	0.5812	0.17871	0.02694				
	11-15	219	0.6614	0.19580	0.01323				
	Total	274	0.6486	0.19440	0.01174				
Attitudes	1-5	11	3.5657	0.88535	0.26694	0.280	0.756	2.9709	4.1604
	6-10	44	3.4798	0.89204	0.13448				
	11-15	219	3.4145	0.78485	0.05304				
	Total	274	3.4311	0.80453	0.04860				
Practice	1-5	11	3.5545	0.60558	0.18259	0.152	0.859	3.1477	3.9614
	6-10	44	3.4682	0.89852	0.13546				
	11-15	219	3.5406	0.79951	0.05403				
	Total	274	3.5296	0.80732	0.04877				

Source: Field data (2022)

That notwithstanding, respondents with junior high qualification (JHS) also perceived attitudes ($M = 3.5688$, $SD = 0.83747$), and practice ($M = 3.7098$, $SD = 0.80001$) higher than the other category of respondents.

There was no significant difference between educational level and knowledge [$F (.443) = 0.723$], attitudes [$F (2.199) = 0.089$], and practice [$F (2.384) = 0.070$]. The results suggest that educational level was not an antecedent of KAP as found by earlier studies (Lombardi, Verma, Brennan & Perry, 2009; Okenna, 2020) and captured in the conceptual framework.

This could mean that despite one's educational level prior to joining the section, he/she would still need to be oriented on the basics of OHS to be successful. Hence, a non-significant association between educational level and KAP of OHS in the section. The results, however, disagree with the findings of Hattingh and Acutt (2016) that educational level influences knowledge, attitudes, and practice in relation to OHS at the workplace. Also,

the assertion of Hussain (2021) that educational level influences KAP among workers is further not upheld by the findings of this study.

The third antecedent of KAP reported in Table 12 was tenure or working experience. Subjects were divided into three main groups according to their number of years of working at the section (Group 1: 1-5 years; Group 2: 6- 10 years; Group 3: 11 years and above). Meanwhile, there was a non-statistical significance difference between working experience and attitudes [$F (.280) = 0.756$], and practices of OHS [$F (.152) = 0.859$].

From the results presented, it is clear that working experience was found to be an antecedent of knowledge but not for attitudes and OHS practices among environmental health workers of the university. Thus, the longer one works with the section, the higher and better the knowledge level on OHS, but that does not automatically translate into positive attitudes and good OHS practices among workers. After the acquisition of knowledge on OHS, some other efforts are needed by management, probably training and monitoring for enforcement of OHS rules to ensure positive attitudes and good OHS practices among workers. Therefore, the findings of Tappura, Teperi, Kurki and Kivistö-Rahnasto (2018) that tenure is an antecedent of knowledge of OHS was upheld by the findings of this study. However, the findings of this study disagree with the findings of Hattingh and Acutt (2016) that working experience influences attitudes and OHS practices among workers.

Determining how Knowledge, Attitudes and Practices relate to Occupational Health and Safety Outcomes

Objective three of the study sought to examine how KAP relate with occupational health and safety outcomes (OHSO). A correlation matrix was used to establish the relationship between the variables, and the results are presented in Table 13. All individual items were pulled to form the respective variables of the study. That is, fourteen items were pulled to form the knowledge variable, nine items for attitudes, eleven items for the practice variable and finally, five items formed the occupational health and safety outcome variable. Criteria recommended by Cohen (1988) guided the interpretation of the coefficients (level of significance (p-value) = $p \leq 0.05$ (2-tailed) are as follows:

$r = 0.50$ to 1.0 or $r = -0.50$ to -1.0 strong.

$r = 0.30$ to 0.49 or $r = -0.30$ to -0.49 moderate.

$r = 0.10$ to 0.29 or $r = -0.10$ to -0.29 weak.

The results, as presented in Table 13, revealed that there was a moderate positive and significant relationship between occupational health and safety outcomes (OHSO) and knowledge of OHS at work ($r = 0.328^{**}$, p-value = 0.000); and attitudes towards OHS ($r = 0.434^{**}$, p-value = 0.000). Furthermore, there was a strong positive and statistically significant relationship between occupational health and safety outcomes (OHSO) and practices of OHS at the workplace ($r = 0.507^{**}$, p-value = 0.000).

Table 13: Relationship between KAP and OHS Outcomes

		Outcomes of OHS			
		Knowledge	Attitudes	Practice	
Outcomes of OHS	Pearson Correlation	1			
	Sig. (2-tailed)				
	n	274			
Knowledge	Pearson Correlation	0.328**	1		
	Sig. (2-tailed)	0.000			
	n	274	274		
Attitudes	Pearson Correlation	0.434**	0.376**	1	
	Sig. (2-tailed)	0.000	0.000		
	n	274	274	274	
Practice	Pearson Correlation	0.507**	0.289**	0.594**	1
	Sig. (2-tailed)	0.000	0.000	0.000	
	n	274	274	274	274

** . Correlation is significant at the 0.01 level (2-tailed)

Source: Field data (2022)

The results suggest that there was a positive and significant relationship between OHS outcomes and KAP. Thus, any percentage increment in the knowledge of OHS among workers will result in the same increase in OHSO in terms of timely completion of tasks and quality of work done. Additionally, the results suggest a percentage increase in the attitudes of workers will amount to the same increase in occupational health and safety outcomes in terms of physical fitness and mental soundness among workers.

Lastly, the results mean that any percentage change in OHS practices among workers will lead to the same changes in occupational health and safety outcomes in terms of social orderliness at the workplace. Thus, management's attempt to improve occupational health and safety outcomes at

the workplace should give much attention to the three key independent variables such as knowledge, attitudes and practices of OHS among workers.

The findings of the study agree with the findings of Nikulin and Nikulina (2017) that occupational health and safety outcomes significantly relate with the knowledge level of workers in relation to OHS at work. The assertion that knowledge of OHS does not influence OHS is however not supported by the findings of this study. The results of this study also agree with the findings of Mukhtar, Yusof and Isa (2020) that there is a significant relationship between the attitudes of workers towards OHS and OHSO in the work environment. The findings of this study further corroborate the findings of Almutairi, Tamrin, Guan and How (2020) that good practices of OHS at the workplace among workers positively relate to occupational health and safety outcomes at workplaces.

Investigating the Challenges involved in the Relationship between KAP and OHS Measures

The last objective of the study was to investigate the challenges involved in the relationship between KAP and OHS measures. The results are presented in two-folds. First, descriptive analyses of the various items used to form the challenge variable in order to ascertain the predominant challenges associated with KAP and OHS measures. The second part of the results based on the correlation matrix also examined the relationship that existed between challenges and KAP and OHS measures. Results for the descriptive component are presented in Table 14. The threshold for analysing the results presented in Table 14 was a mean value of $M = 2.5$. All mean values below

this threshold were deemed low, and all mean values above 2.5 were seen as high.

The challenges are presented in order according to their mean values as shown in Table 14. The results show that all the thirteen items used to measure challenges were all rated high since their mean values were above the $M = 2.5$ threshold established to guide the interpretation of the results. Thus, the challenges were very predominant with KAP and occupational health and safety measures (OHSm).

Table 14: Challenges with KAP and Occupational Health and Safety Measures

Challenges	n	Minim um	Maxim um	Mean	SD
1. Funding and logistic constraints	274	1.00	5.00	3.7117	1.11635
2. Lack of periodic safety training	274	1.00	5.00	3.6679	1.04615
3. Low wages from the environmental health work	274	1.00	5.00	3.6423	1.19054
4. Inadequate safety inspectors	274	1.000	5.000	3.59854	1.085771
5. Absence of safety campaigns and education	274	1.00	5.00	3.5401	1.04489
6. Insufficient knowledge on safety	274	1.00	5.00	3.5365	1.08289
7. Inaccurate data on accidents at Work	274	1.00	5.00	3.5328	1.09646
8. Delay in supply and deficient safety devices	274	1.00	5.00	3.5036	1.09694
9. Lack of commitment to safety measures by management	274	1.00	5.00	3.4964	1.11351
10. Absence of extensive safety Measures	274	1.00	5.00	3.4927	1.16808
11. Withdrawn from work by workers because of the risk involved in a task	274	1.00	5.00	3.4672	1.07962
12. Lack of innovative safety enforcement strategies	274	1.00	5.00	3.3723	1.10945
13. Negative expression by colleagues towards safety	274	1.00	5.00	3.3686	1.16066

Not: Scale: 2.0 and below = low, 2.5 and above 3 =high

Source: Field data (2022)

The findings mean that the environmental section of the University is confronted with funding and logistics challenges which could influence the implementation of OHS policies and measures at the section. Lack of funds could have also affected the availability of adequate logistics, which could also affect the performance of workers. Lack of periodic health and safety training as the second challenge means that apart from orientation training, workers of the section do not get regular quarterly or annual training on OHS to be abreast with changes in OHS policies and practices. Workers also revealed that their efforts at work were not adequately compensated as compared to the effort put in or to other work colleagues performing activities other than environmental health work. Inadequate safety officers could also explain why there was an absence of safety campaigns and education for workers at the section of the university. These findings of this study are in agreement with Eyiah et al. (2019) who found a lack of funds and logistics, inadequate safety officers, and lack of OHS training as key challenges facing OHS at workplaces.

The three least rated challenges facing workers at the EHS of the university were negative expression by colleagues towards safety, lack of innovative safety enforcement strategies and halting task performance because of the risk involved in a task. This means that comments from colleagues at work do not encourage adherence to health and safety practices at the section, and such attitudes could increase non-adherence to the usage of PPEs and OHS injuries. This could be due to lack of regular training for workers earlier identified as a challenge facing workers at the section. Also, the performance of workers at the section was hampered upon the notice of

the presence of risk associated with the task. The findings of this study are further corroborated by the findings of Boadu, Wang and Sunindijo (2020) performance of workers suffers in a work environment characterised by a high level of risk.

The second part of the results for objective four of the study on the relationship between challenges, KAP and occupational health and safety measures are also presented in Table 15.

Table 15: Relationship between Challenges, KAP and OHSM

Relationship		Knowledge	Attitudes	Practice	Challenges OHS	OHS Measures
Knowledge	Pearson	1				
	Correlation					
	Sig. (2-tailed)					
	N	274				
Attitudes	Pearson	0.376**	1			
	Correlation					
	Sig. (2-tailed)	0.000				
	N	274	274			
Practice	Pearson	0.289**	0.594**	1		
	Correlation					
	Sig. (2-tailed)	0.000	0.000			
	N	274	274	274		
Challenges of OHS	Pearson	-0.078	-0.361**	-0.321**	1	
	Correlation					
	Sig. (2-tailed)	0.198	0.000	0.000		
	n	274	274	274	274	
OHS Measures	Pearson	0.328**	0.434**	0.507**	-0.136*	1
	Correlation					
	Sig. (2-tailed)	0.000	0.000	0.000	0.025	
	n	274	274	274	274	274

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Source: Field data (2022)

Various items used to respectively measure these variables were pulled to form the variables for the analysis. The interpretation of the work

is based on criteria suggested by Cohen (1988) used as the guidelines for the interpretation of the correlation coefficients ($p\text{-value} = p \leq 0.05$ (2-tailed) indicated earlier.

Correlation matrix results obtained and presented in Table 15 for the relationship between challenges and KAP indicate that there was a negative moderate and significant relationship between the challenge of OHS and the attitudes of workers towards OHS at the workplace ($r = -0.361^{**}$, $p\text{-value} = 0.000$) and practices of OHS at the workplace ($r = -0.321^{**}$, $p\text{-value} = .000$). Challenges with OHS, however, obtained a non-significant relationship with knowledge on OHS among workers at the EHS of the university.

The results suggest that for any percentage increase in challenges associated with OHS at the workplace, the same percentage decrease will be experienced for positive attitudes and good practices of OHS at the workplace. Thus, a reduction in challenges will amount to a more positive attitudes and good practices of OHS among workers. The findings of Awuviry-Newton, Tavener, Wales and Byles (2021) that challenges affect the attitudes and practices of OHS is therefore corroborated by the findings of this study. Meanwhile, this study failed to support earlier findings of Couto and Cates (2019) that challenges associated with OHS relate to knowledge on OHS.

It is also important to report on the relationship between occupational health and safety measures (OHSM), KAP and challenges. The correlation matrix results, as presented in Table 15, revealed that there was a weak negative significant relationship between OHSM and challenges at ($r = -0.136^*$, $p\text{-value} = 0.025$). However, there was a positive moderate and

significant relationship between OHSM and knowledge ($r = 0.328^{**}$, $p\text{-value} = 0.000$) and attitudes ($r = 0.434^{**}$, $p\text{-value} = 0.000$) and a strong positive significant relationship between OHSM and practice ($r = 0.507^{**}$, $p\text{-value} = 0.000$). The result means that if the level of challenges affecting OHS at work reduces, measures put in place at the workplace to enhance OHS at work will achieve better results. Additionally, the results suggest that OHS knowledge, attitudes and practices will be enhanced at the workplace if appropriate OHS measures are in place. Thus, OHS knowledge, attitudes and practices at work cannot improve without occupational health and safety measures.

During the key informant's interview, a participant from the cleaning section of the environmental health workers reveals that:

Though I acknowledge that we have behavioural challenges in practicing OHS measures, there is no lack of funding and logistics but it is rather about the delay in the release of the funds and the logistics due to the bureaucracy involved. You know that these issues are handled by the Central Administration so by the time it goes through the procurement process, more than enough time is spent (Key Informant, 20th July, 2022).

The statement indicates that there are behavioural challenges and delay in the provision of fund and logistics necessary for the OHS. As the Job Demand-Resource theory explains, these challenges may lead to occupational hazards as reactions to the gap between demands on the worker and the resources that the employee needs to manage the demands of their work, while at the same time practicing OHS measures (Ghanayem, Srulovici & Zlotnick, 2020). The idea from the Risk Compensation Theory is that the workers may adjust their behaviours to suit working conditions such as the delay in the

provision of funds and logistics and thus exhibit such behavioural challenges (Pless, 2016). The end result may be what the Goal Freedom Alertness theory argues as negative attitudes towards OHS measures are due to the upsetting working environment.

Another challenge that was echoed by participants who were also part of management at the cleaning section, sanitary section, and conservancy section was that “*the University of Cape Coast and for that matter, the Environmental Health Section did not have OHS department and policy*”. Thus, they fall on their personal knowledge of OHS to provide intermittent OHS training to the workers. Insights from Job Demand-Resource Theory suggest that this is a resource gap in practising OHS, which workers are likely to express via negative attitudes towards health and safety issues (Hongqing & Jiuling, 2021).

Chapter Summary

This chapter discussed the results of the study based on the specific objectives of the study and related literature reviewed. It presented the results of the respondents based on their demographics; educational levels, age, rank, household size, working experience, sex and income levels. This chapter also described the nature of knowledge, attitudes and practice (KAP) and occupational health and safety (OHS) in the Environmental Health Section. It further discussed the four key socio-demographic factors that influence KAP such as the age, sex, educational level and working experience of the respondents. The chapter again, showed the relationship between KAP and OHS outcomes of the study. Finally, it investigated the challenges involved in KAP and OHS measures.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The study set out to assess the knowledge, attitudes and practices of OHS measures among environmental health workers at the University of Cape Coast. The relevance of the focus of the study was based on the contextual, conceptual, and methodologic gap identified in the literature. That is previous studies either did not consider the EHS of the University or were carried out in developed economies. Existing literature again failed to consider the demographic characteristics of workers and how they influence KAP and OHS at the workplace or were not carried out from both qualitative and quantitative perspectives. It is for this reason that the study focused on specific objectives such as to describe the nature of knowledge, attitudes, and practice of occupational health and safety of the environmental health workers at the University of Cape Coast; and to examine the socio-demographic factors of knowledge, attitudes, and practices of occupational health and safety among the environmental health workers in the study area. Other objectives of the study were to determine how knowledge, attitudes, practices, and their socio-demographic factors relate to occupational health and safety outcomes; and to investigate the challenges involved in the relationship between KAP and OHS Measures.

The study used a mixed-method research approach, but the quantitative aspect was dominant due to the embedded mixed method employed for this study. A stratified and systematic random sampling technique was used to capture 146 conservancy workers, 92 sanitary workers, and 52 cleaners, which

made up a total sample size of 274 environmental health workers, while a purposive sampling method was used to capture the Head of the Environmental Health Section, including the other three sectional heads (Conservancy, Sanitary and Cleaning) as key informants. An interview schedule was used to collect data from the environmental health workers, while key informant interview guides were used to gather qualitative information from the key informants. Analytical techniques such as descriptive statistics, t-test, two-way analysis of variance, and correlation matrix were used to analyse the quantitative data, while the qualitative information was transcribed and interpreted thematically.

Key Findings

In terms of objective one of the study, which sought to describe the nature of knowledge, attitudes, and practice of occupational health and safety of the environmental health workers at the University of Cape Coast, the key findings that emerged were that:

1. The majority of the respondents had a high level of knowledge on OHS issues since the majority agreed to the items used to measure respondents' knowledge level towards OHS at the EHS. That notwithstanding, the level of knowledge of the availability and relevance of the health and safety committee at the EHS was very low.
2. In terms of attitudes towards OHS at the EHS of the university were that workers at the EHS had a high level of good attitudes towards OHS-related issues at the section. Meanwhile, the

relevance of annual medical check-ups for work-related disorders was not rated high or very high.

3. Lastly, the practice of OHS among workers at the EHS was adjudged to be high since ten out of the eleven items were rated high among workers at the EHS. That notwithstanding, the workers did not rate participation in education on OHS at the EHS of the university.

Key findings recorded for the second objective of the study, which sought to examine the influence of socio-demographic factors on KAP of OHS among environmental health workers in the study area, are:

1. The age of respondents was found to be a predictor of attitudes and practices of OHS since age had a significant effect on attitudes and practices. Age, however, failed to predict knowledge since there was a non-significant effect of age on knowledge of OHS.
2. Educational levels were found not to be predictors of knowledge, attitudes and practices of OHS at the EHS. This is because educational levels had a non-significant effect on KAP.
3. Working experience (tenure) was found to be a precursor of only knowledge of OHS and not for attitudes and practices of OHS at the EHS. This is because tenure had a significant effect on knowledge but a non-significant effect on the attitudes and practices of OHS.
4. Male workers and old workers were found to be associated with poor attitudes towards OHS measures.

Key findings for objective three of the study, which sought to determine how knowledge, attitudes, practices, and their socio-demographic factors relate to occupational health and safety outcomes, were:

1. There was a moderate positive and significant relationship between occupational health and safety outcomes (OHSO), knowledge of OHS at work, and attitudes towards OHS at the workplace.
2. There was a strong positive and statistically significant relationship between occupational health and safety outcomes (OHSO) and practices of OHS at the workplace.

The last objective of the study was to examine faced in achieving OHS measures, and the key findings for this objective were:

1. Major OHS-related challenges facing the EHS of the university were a timely release of funds and logistic constraints, lack of periodic safety training and low wages for workers at the section. Other challenges were insufficient safety inspectors and the absence of safety campaigns and education at the EHS.
2. There was a negative moderate and significant relationship between challenges associated with OHS and the attitudes of workers towards OHS at the workplace and practices of OHS at the workplace.
3. Challenges with OHS, however, obtained a non-significant relationship with the knowledge of OHS among workers at the EHS of the university.
4. Occupational health and safety measures (OHSM) had a weak negative significant relationship with challenges with OHS.

5. There was a positive moderate and significant relationship between OHSM and knowledge and attitudes and a strong positive significant relationship between OHSM and the practice of OHS at the workplace.

Conclusions

It can be concluded from the first objective of the study that workers at the EHS of the university generally had a high level of knowledge, good or positive attitudes, and a high level of practices of OHS at work. It is for this reason that this study concludes that the level of KAP on OHS among these workers will lead to the effective administration of OHS policies at the EHS of the University. That notwithstanding, some workers in the section however did not perceive the existence and functions of health and safety committees, annual medical check-ups as well as education on OHS as very relevant. Thus, knowledge of the role of health and safety committees, attitudes towards annual medical check-ups, and practices of participation in education or orientation in OHS at the section was not the best. The study further concludes that the long-term sustainability of OHS efforts at the EHS could be deflated if workers are not aware of OHS committees at work and refuse to go for annual medical check-ups or decide not to participate in OHS orientation programmes.

In terms of objective two of the study, it can be concluded that socio-demographic characteristics influenced the KAP of OHS among EHS at the University. The study therefore concludes that the level and appreciation of the key factors of this study in terms of KAP of OHS do not influence or appease the respondents in the same fashion. The study further concluded that

the sex and age of workers influenced the attitudes and practices of OHS. Tenure influenced knowledge of OHS at the EHS. Finally, the study concluded for objective two that one's sex and age did not influence their knowledge of OHS suggesting knowledge of OHS did not differ among respondents based on their sex.

The conclusion for the third objective of the study is that the higher the level of KAP of OHS at the workplace, the higher the occupational health and safety outcomes (OHSO) will be. This conclusion was based on the fact that occupational health and safety outcomes (OHSO) are significantly related to the KAP of OHS at the workplace. The study therefore concludes that to influence better OHS outcomes at the workplace, managers will need to give much attention to workers' level of KAP on OHS.

The conclusion drawn for the last objective of the study is that the EHS of the university faced OHS challenges such as lack of timely release of funds and logistic constraints, lack of periodic safety training, and low wages for workers at the section. Other challenges were insufficient safety inspectors and the absence of safety campaigns and education at the EHS. Challenges with OHS are negatively related to attitudes towards OHS at work and OHS measures. That notwithstanding, there was a significant relationship between OHSM and the knowledge attitudes, and practice of OHS at the workplace. The conclusion therefore, is that until these challenges are addressed, the EHS can hardly make any future progress with the KAP of OHS at the workplace.

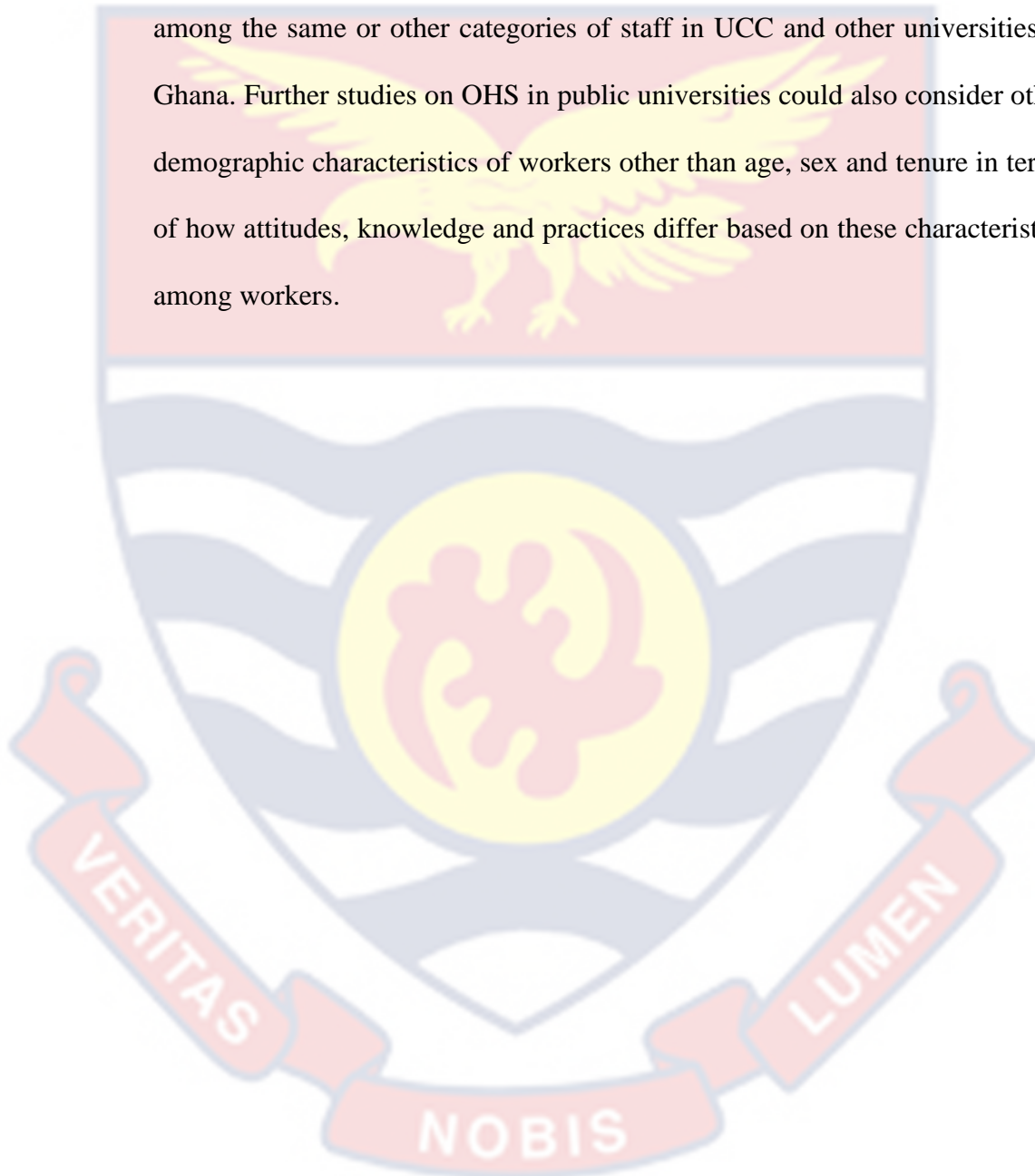
Recommendations

Based on the key findings drawn from the study, the following recommendations are made:

1. Management at the EHS should enhance the level of workers' knowledge, attitudes, and practices of OHS at the section. Management should pay attention to the establishment and empowerment of health and safety committees, educating and sensitising workers on the importance of annual medical check-ups, and participating in education on OHS. The sensitisation can be done through workshops, staff meetings, and seminars among others.
2. The management of the EHS should pay attention to sex, age and tenure since they predict KAP. Tenure predicted knowledge, while sex and age predicted the attitudes and practices of OHS at the EHS. The ability of management to improve upon KAP among workers should not be oblivious to these factors. Thus, in planning programmes to develop KAP among workers, managers should consider that attitudes and practices of OHS differ among male and female workers as well as old and young workers.
3. The University management should provide timely and adequate funding and logistics for the EHS. These would contribute to a positive impact on the knowledge, attitudes and practices of OHS at the workplace.
4. The University management should employ and post more health and safety inspectors to carry out all the OHS activities. The management should provide higher remuneration for the workers.

Suggestions for Further Studies

This study was focused on workers at the EHS of the university of Cape Coast and it is recommended that further studies should focus on OHS among other categories of workers at the university or a comparative study among the same or other categories of staff in UCC and other universities in Ghana. Further studies on OHS in public universities could also consider other demographic characteristics of workers other than age, sex and tenure in terms of how attitudes, knowledge and practices differ based on these characteristics among workers.



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APPENDICES

APPENDIX A

HOW KAP AND THEIR SOCIO-DEMOGRAPHIC FACTORS RELATE WITH NON-EXPERIENCE OF WORKPLACE ACCIDENT

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Cleaners	.784	1.020	.590	1	.442	2.189	.296	16.176
Sanitary workers	2.649	1.666	2.529	1	.112	14.138	.540	370.063
Male sex	.109	.168	.423	1	.515	1.115	.803	1.549
Age	-.085	.148	.329	1	.566	.919	.688	1.227
Years of Education	.224	.343	.427	1	.513	1.251	.639	2.451
Household Size	.001	.002	.331	1	.565	1.001	.997	1.005
Monthly income	-.145	.141	1.049	1	.306	.865	.656	1.141
Years of working experience	.170	.836	.041	1	.839	1.186	.230	6.099

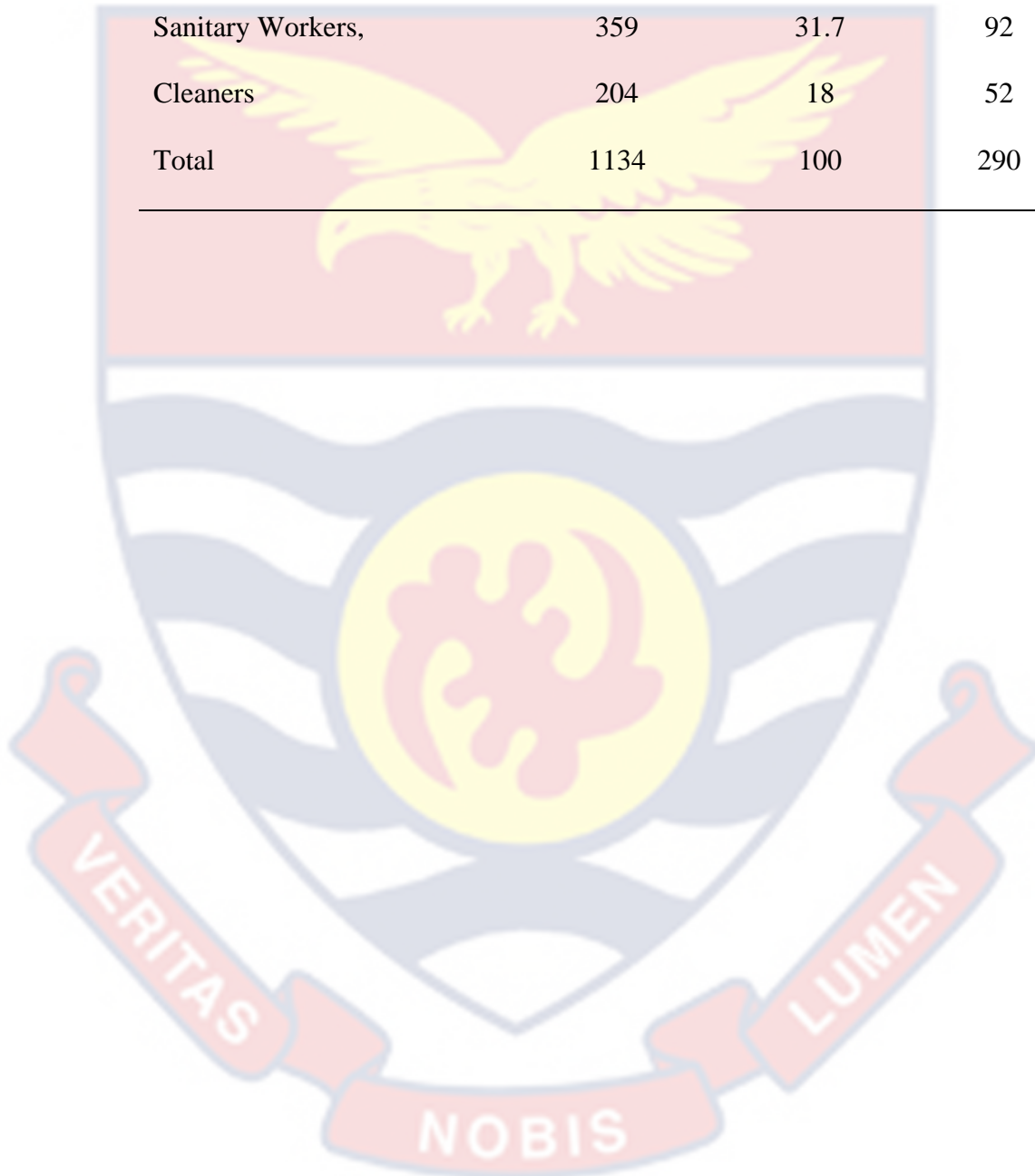


Participation in OHS training	2.038	.959	4.513	1	.034*	7.675	1.171	50.308
Access to list of workers' rights	-.363	.901	.163	1	.687	.695	.119	4.067
Access to information on OHS	-.906	.732	1.530	1	.216	.404	.096	1.698
Perception about hazards	0.0023	0.005	.614	2	.735	-0.001	0.122	0.002
Awareness on GHS OHS policy	-65.200	979	.000	1	1.000	.000	.000	.
OHS knowledge	1.092	1.393	.614	1	.433	2.981	.194	45.740
Attitudes towards OHS measures	-1.413	1.295	1.191	1	.275	.243	.019	3.080
Practice of OHS measures	-.779	1.470	.281	1	.596	.459	.026	8.185



Appendix A: Population and sample for the study

Category of the population	Population size	% of the total population	Sample drawn
Conservancy Workers,	571	50.3	146
Sanitary Workers,	359	31.7	92
Cleaners	204	18	52
Total	1134	100	290



APPENDIX B

INTERVIEW SCHEDULE FOR ENVIRONMENTAL HEALTH

WORKERS IN THE UNIVERSITY OF CAPE COAST

Dear participant, my name is Esther Grantson. I am researching on the topic ‘*Knowledge, Attitudes and Practices of Occupational Health and Safety Measures among the Environmental Health Workers in the University of Cape Coast*’ as part of my MPhil in Development Studies at the University of Cape Coast. Please, kindly assist by answering as many questions as you deem convenient as this study is for academic purposes. Answering all the questions will require a maximum of 35 minutes and all responses would be handled with the utmost confidentiality. Thank you

Section Name _____

Current workplace or Department

Section A: Demographics or Socio-demographic factors of Knowledge, Attitudes, and Practice

- 1. Sex a. Male [] b. Female []
- 2. Please indicate your age
- 3. Please indicate your Years of Education
- 4. Employment Designation or Position
- 5. Please indicate your House Size
- 6. Please indicate your Income per month
- 7. Please indicate your years of working experience.....
- 8. Rate the following factors related to occupational health and safety issues at your workplace on a scale of 1 as lowest to five as highest

a. Your level of participation in occupational health and safety training	1	2	3	4	5
b. Your level of access to list of workers' rights or duties					
c. Your access to sources of information on occupational health and safety					
d. Perception hazards or risks related to your work					

Section B: Knowledge, Attitudes, and Practice of OHS Measures

9. Have you heard of the GHS Health and Safety Policy? i. Yes [] ii. No []

10. Do you know about the content of the GHS Health and Safety Policy?

i. Yes [] ii. No []

11. List any three things you know about the occupational health and safety

- a-----
- b-----
- c-----

12. Tick your responses to the following issues related to your **Knowledge** on occupational health and safety measures

	True	False	I do not know
a. Occupational health and safety measures are put in place in the EHS			
b. There is a health and safety committee at the EHS			
c. Safety training was part of my orientation on			

first employment			
d. Safety training is part of the on-job training package			
e. Safety training is part of the GHS safety policy			
f. Exposure to dust causes health problems			
g. Exposure to chemicals during work causes health problems			
h. Wearing protective clothing important for safety environmental health workers			
i. All type of gloves provides the same level of protection			
j. Fire extinguisher or sand bag should be readily available at work			
k. Wearing face mask while working is important to escape health risks			
l. Carrying larger load than you are able can be considered potential hazard in the workplace			
m. Experienced workers do not need to use safety devices			
n. Spilling of a slippery liquid can be considered potential hazard in the workplace			

13. Rate your **Attitudes** towards occupational health and safety measures based on the following factors on a scale of 1 as lowest to 5 as highest

	1	2	3	4	5
a. I think it is necessary to have medical checkups annually for work related disorders					
b. Workers need to be trained on using clothing, gloves, face mask, glass					
c. I think I should not continue working if I lack personal protective equipment					
d. I think the current working environment (space, PPE availability) should be changed for the better health of the workers					
e. In my opinion health workers should monitor the use of clothing, gloves, face mask, glasses					
f. At least once in a year training should be given to us on occupational health and safety					
g. It is wrong to decide not to use PPE while working					
h. It is wrong to decide not to comply by other safety measures					
i. Awareness on PPE and its essence is important for environmental health workers					
j. Awareness on effects of improper exposure is important for environmental health workers					

14. Rate the frequency at which you **Practice** the following occupational health and safety measures on a scale of 1 as lowest to 5 as highest

	1	2	3	4	5
a. Use of safety glasses or goggles while working					
b. Wearing of Gloves while working					
c. Use of Masks while working					
d. Wearing Overall coat while working					
e. Using Ear plug while working					
f. Using safety Boots while working					
g. Wearing Machine guards while working					
h. Visiting safety officers for checkup					
i. Reporting hazards or risks regularly at work					
j. Participation in health and safety education					
k. Reading labels of chemicals before using them					

Section C: Outcomes and Challenges Involved in the Relationship between KAP and OHS Measures

15. Number of accidents experienced at workplace per year _____

16. Rate the **Outcomes** of OHS based on the following factors on a scale of 1 as least outcome to 5 as highest outcome

Productivity	1	2	3	4	5
a. Timely completion of tasks					
b. Accuracy/quality of work done					
Health Status					

d. Physical fitness					
e. Mental soundness					
f. Social orderliness					

17. Are there noticeable challenges of the Relationship between KAP and OHS Measures at your workplace? i. Yes [] ii. No []

18. Rate the **challenges** involved in the Relationship between KAP and OHS Measures at your workplace based on the following factors on a scale of 1 as least challenge to 5 as highest challenge

	1	2	3	4	5
a. Insufficient safety inspectors					
b. Funding and logistic constraints					
c. Absence of extensive safety measures					
d. Delay and deficient safety justice					
e. Lack of periodic safety training					
f. Absence of safety campaigns and education					
g. Unreliable data on incidents at work					
h. Lack of commitment to safety measures by management					
i. Pulled back at work because of the risk involved in a task					
j. Insufficient knowledge on safety					
k. Negative expressed by colleagues towards safety					
m. Low wages from the environmental health work					
n. Lack of Innovative safety enforcement strategies					

19. What recommendation do you have for improving occupational health and safety at the environmental health section of the school?



APPENDIX C
INTERVIEW GUIDE FOR HEAD OF THE SECTION AND SUB-HEADS OF CONSERVANCY, SANITARY AND CLEANING AS KEY INFORMANTS

Date of Interview.....

Educational level of the key informant.....

Head of Conservancy, Sanitary, or Cleaning?

Years of work experience with EHS.....

Theme One: Demographics as Socio-demographic factors of Knowledge, Attitudes, and Practice

Differences that exist in Knowledge, Attitudes, and Practice of occupational health and safety measures by the workers based on:

- a. Personal characteristics of the workers
 - I. Sex
 - II. Age
 - III. Schooling or Education
 - IV. Employment Designation or Position
 - V. working experience
- b. Household characteristics of the workers
 - I. House Size
 - II. Income per month
- c. Workplace situations
 - I. Participation or nonparticipation of employees in safety training
 - II. Access or non-access by workers to their lists of rights or duties
 - III. Access or non-access to sources of information on safety by workers
 - IV. Workers' perception on hazards or risks related to your work

Theme Two: Knowledge, Attitudes, and Practice of safety Measures

- a. Description of workers’ level of **Knowledge** on safety Measures such as:
 - I. Measures put in place to ensure safety at work
 - II. Essence of using PPE while working
- b. Description of workers’ **Attitudes** towards safety Measures such as
 - I. Behaviours of the workers related to PPE usage that hinder safety
 - II. Behaviours of the workers that promote safety
- c. Description of **Practice of** safety Measures
 - I. Practice of measures put in place to ensure safety at work
 - II. Usage of PPE
 - III. Regular checkup at the safety section

Theme Three: Challenges of Relationship between KAP and OHS Measures at your workplace

- a. Logistics constraint issues
- b. Funding constraint issues
- c. Adequacy of safety measures put in place so far
- d. Training of workers issues
- e. Adequacy of remuneration for workers
- f. Innovation constraints

Recommendations to improve safety at your operation unit and entire environmental health section.....

.....

.....

Thank you

APPENDIX D

ETHICAL CLEARANCE FROM THE INSTITUTIONAL REVIEW

BOARD OF THE UNIVERSITY OF CAPE COAST

UNIVERSITY OF CAPE COAST

INSTITUTIONAL REVIEW BOARD SECRETARIAT

TEL: 0558093143 / 0508878309

E-MAIL: irb@ucc.edu.gh

OUR REF: UCC/IRB/A/2016/1399

YOUR REF:

OMB NO: 0990-0279

IORG #: IORG0009096

3RD JUNE, 2022

Mrs. Esther Grantson
Department of Integrated Development Studies
University of Cape Coast

Dear Mrs. Grantson,

ETHICAL CLEARANCE – ID (UCCIRB/CHLS/2022/10)

The University of Cape Coast Institutional Review Board (UCCIRB) has granted Provisional Approval for the implementation of your research **Knowledge, Attitude and Practices of Occupational Health and Safety Measures among the Environmental Health Workers in the University of Cape Coast**. This approval is valid from 3rd June, 2022 to 2nd June, 2023. You may apply for a renewal subject to submission of all the required documents that will be prescribed by the UCCIRB.

Please note that any modification to the project must be submitted to the UCCIRB for review and approval before its implementation. You are required to submit periodic review of the protocol to the Board and a final full review to the UCCIRB on completion of the research. The UCCIRB may observe or cause to be observed procedures and records of the research during and after implementation.

You are also required to report all serious adverse events related to this study to the UCCIRB within seven days verbally and fourteen days in writing.

Always quote the protocol identification number in all future correspondence with us in relation to this protocol.

Yours faithfully,

Samuel Asiedu Owusu, PhD

UCCIRB Administrator

ADMINISTRATOR
INSTITUTIONAL REVIEW BOARD
UNIVERSITY OF CAPE COAST

APPENDIX E

**NATURE OF KNOWLEDGE, ATTITUDES AND PRACTICES OF OCCUPATIONAL HEALTH AND SAFETY OF THE
ENVIRONMENTAL HEALTH WORKERS AT THE UNIVERSITY OF CAPE COAST**

Cleaning						Sanitary						Conservancy					
TRUE		FALSE		Don't Know		TRUE		FALSE		Don't Know		TRUE		FALSE		Don't Know	
f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
38	76	12	24	0	0	70	77.8	20	22.2	0	0	80	59.7	54	40.3	0	0
21	42	19	38	10	20	41	45.6	41	45.6	8	9	59	44	56	41.79	19	14
29	58	15	30	6	12	46	51	18	20	26	29	78	58.2	38	28.36	18	13
37	74	10	20	3	6	66	73.3	13	14.4	11	12	78	58.2	45	33.58	11	8.2
28	56	18	36	4	8	57	63.3	22	24.4	11	12	86	64.2	37	27.61	11	8.2
34	68	11	22	5	10	62	68.9	19	21.1	9	10	92	68.7	28	20.9	14	10
31	62	16	32	3	6	62	68.9	23	25.6	5	6	103	76.9	26	19.4	5	3.7
39	78	10	20	1	2	65	72.2	20	22.2	5	6	99	73.9	29	21.64	6	4.5

38	76	9	18	3	6	64	71.1	18	20	8	9	88	65.7	38	28.36	8	6
24	48	24	48	2	4	58	64.4	27	30	5	6	89	66.4	34	25.37	11	8.2
37	74	10	20	3	6	57	63.3	28	31.1	5	6	96	71.6	34	25.37	4	3
27	54	18	36	5	10	64	71.1	26	28.9	0	0	107	79.9	24	17.91	3	2.2
23	46	19	38	8	16	46	51.1	30	33.3	14	16	75	56	49	36.57	10	7.5
25	50	22	44	3	6	59	65.6	25	27.8	6	7	83	61.9	43	32.09	8	6
431	61.57	213	30.43	56	8	817	64.8	330	26.2	113	9	1213	64.7	535	28.53	127	6.8

APPENDIX F
ATTITUDES OF ENVIRONMENTAL HEALTH WORKERS

Items of attitudes	Levels	Cleaning		Sanitary		Conservancy		Total	
		f	%	f	%	f	%	f	%
1. I think it is necessary to have medical check-ups annually for work related disorders	Very Low	2	16.7	4	33.3	6	50	12	100
	Low	8	14.3	13	23.2	35	62.5	56	100
	Moderate	18	22.8	29	36.7	32	40.5	79	100
	High	15	19.7	19	25	42	55.3	76	100
	Very High	7	13.7	25	49	19	37.3	51	100
	<i>Total</i>		<i>50</i>	<i>18.2</i>	<i>90</i>	<i>32.8</i>	<i>134</i>	<i>48.9</i>	<i>274</i>
2. Workers need to be trained on using clothing, gloves, face mask, glass	Very Low	3	18.8	4	25	9	56.3	16	100
	Low	9	17.6	12	23.5	30	58.8	51	100
	Moderate	10	15.2	17	25.8	39	59.1	66	100
	High	21	23.1	36	39.6	34	37.4	91	100
	Very High	7	14	21	42	22	44	50	100
	<i>Total</i>		<i>50</i>	<i>18.2</i>	<i>90</i>	<i>32.8</i>	<i>134</i>	<i>48.9</i>	<i>274</i>
3. I think I should not continue working if I lack personal protective equipment	Very Low	4	20	6	30	10	50	20	100
	Low	6	15.8	8	21.1	24	63.2	38	100
	Moderate	16	21.1	23	30.3	37	48.7	76	100
	High	20	24.4	26	31.7	36	43.9	82	100
	Very High	4	6.9	27	46.6	27	46.6	58	100
	<i>Total</i>		<i>50</i>	<i>18.2</i>	<i>90</i>	<i>32.8</i>	<i>134</i>	<i>48.9</i>	<i>274</i>
4. I think the current working environment (space, PPE availability) should be changed for the better health of the workers	Very Low	2	12.5	6	37.5	8	50	16	100
	Low	6	15	6	15	28	70	40	100
	Moderate	17	21.8	26	33.3	35	44.9	78	100
	High	18	19.8	27	29.7	46	50.5	91	100
	Very High	7	14.3	25	51	17	34.7	49	100
	<i>Total</i>		<i>50</i>	<i>18.2</i>	<i>90</i>	<i>32.8</i>	<i>134</i>	<i>48.9</i>	<i>274</i>
5. In my opinion health workers should	Very Low	2	20	1	10	7	70	10	100

monitor the use of clothing, gloves, face mask, glasses	Low	5	8.77	14	24.6	38	66.7	57	100
	Moderate	18	24.7	23	31.5	32	43.8	73	100
	High	17	22.1	28	36.4	32	41.6	77	100
	Very High	8	14	24	42.1	25	43.9	57	100
	<i>Total</i>	<i>50</i>	<i>18.2</i>	<i>90</i>	<i>32.8</i>	<i>134</i>	<i>48.9</i>	<i>274</i>	<i>100</i>
6. At least once in a year training should be given to us on occupational health and safety	Very Low	3	18.8	4	25	9	56.3	16	100
	Low	4	10.5	7	18.4	27	71.1	38	100
	Moderate	15	19.5	26	33.8	36	46.8	77	100
	High	22	22.9	27	28.1	47	49	96	100
	Very High	6	12.8	26	55.3	15	31.9	47	100
	<i>Total</i>	<i>50</i>	<i>18.2</i>	<i>90</i>	<i>32.8</i>	<i>134</i>	<i>48.9</i>	<i>274</i>	<i>100</i>
7. It is wrong to decide not to use PPE while working	Very Low	2	16.7	1	8.33	9	75	12	100
	Low	6	16.7	6	16.7	24	66.7	36	100
	Moderate	14	15.9	33	37.5	41	46.6	88	100
	High	22	24.2	28	30.8	41	45.1	91	100
	Very High	6	12.8	22	46.8	19	40.4	47	100
<i>Total</i>	<i>50</i>	<i>18.2</i>	<i>90</i>	<i>32.8</i>	<i>134</i>	<i>48.9</i>	<i>274</i>	<i>100</i>	
8. Awareness on PPE and its essence is important for environmental health workers	Very Low	3	15	5	25	12	60	20	100
	Low	3	8.11	10	27	24	64.9	37	100
	Moderate	7	11.1	22	34.9	34	54	63	100
	High	28	28.6	31	31.6	39	39.8	98	100
	Very High	9	16.1	22	39.3	25	44.6	56	100
	<i>Total</i>	<i>50</i>	<i>18.2</i>	<i>90</i>	<i>32.8</i>	<i>134</i>	<i>48.9</i>	<i>274</i>	<i>100</i>
9. Awareness on effects of improper exposure is important for environmental health workers	Very Low	1	9.09	2	18.2	8	72.7	11	100
	Low	5	12.5	12	30	23	57.5	40	100
	Moderate	12	15.6	24	31.2	41	53.2	77	100
	High	27	26.5	32	31.4	43	42.2	102	100
	Very High	5	11.4	20	45.5	19	43.2	44	100
	<i>Total</i>	<i>50</i>	<i>18.2</i>	<i>90</i>	<i>32.8</i>	<i>134</i>	<i>48.9</i>	<i>274</i>	<i>100</i>

Source: Field data (2022)

APPENDIX G

**OCCUPATIONAL HEALTH AND SAFETY PRACTICES AMONG
ENVIRONMENTAL HEALTH WORKERS**

OHS Measures	Levels	Cleaning		Sanitary		Conservancy		Total	
		f	%	f	%	f	%	f	%
1. Use of safety glasses or goggles while working	Very Low	3	16.67	3	16.7	12	66.7	18	100
	Low	10	19.61	14	27.5	27	52.9	51	100
	Moderate	13	22.03	21	35.6	25	42.4	59	100
	High	20	19.05	36	34.3	49	46.7	105	100
	Very High	4	9.756	16	39	21	51.2	41	100
	<i>Total</i>		50	18.25	90	32.8	134	48.9	274
2. Wearing of gloves while working	Very Low	1	6.667	5	33.3	9	60	15	100
	Low	4	15.38	8	30.8	14	53.8	26	100
	Moderate	8	13.56	21	35.6	30	50.8	59	100
	High	29	26.85	33	30.6	46	42.6	108	100
	Very High	8	12.12	23	34.8	35	53	66	100
	<i>Total</i>		50	18.25	90	32.8	134	48.9	274
3. Use of Masks while working	Very Low	1	6.667	8	53.3	6	40	15	100
	Low	1	3.846	4	15.4	21	80.8	26	100
	Moderate	12	20	20	33.3	28	46.7	60	100
	High	23	21.1	40	36.7	46	42.2	109	100
	Very High	13	20.31	18	28.1	33	51.6	64	100
	<i>Total</i>		50	18.25	90	32.8	134	48.9	274
4. Wearing Overall coat while working	Very Low	2	11.76	8	47.1	7	41.2	17	100
	Low	3	11.54	6	23.1	17	65.4	26	100
	Moderate	9	17.31	22	42.3	21	40.4	52	100
	High	26	22.61	41	35.7	48	41.7	115	100
	Very High	10	15.63	13	20.3	41	64.1	64	100
	<i>Total</i>		50	18.25	90	32.8	134	48.9	274
5. Using Ear plug while working	Very Low	3	13.64	7	31.8	12	54.5	22	100
	Low	4	9.091	9	20.5	31	70.5	44	100
	Moderate	11	20.37	18	33.3	25	46.3	54	100
	High	24	25	34	35.4	38	39.6	96	100
	Very High	8	13.79	22	37.9	28	48.3	58	100
	<i>Total</i>		50	18.25	90	32.8	134	48.9	274

6. Using safety Boots while working	Very Low	0	0	5	41.7	7	58.3	12	100
	Low	4	14.29	10	35.7	14	50	28	100
	Moderate	14	22.22	12	19	37	58.7	63	100
	High	22	21.57	35	34.3	45	44.1	102	100
	Very High	10	14.49	28	40.6	31	44.9	69	100
	<i>Total</i>	<i>50</i>	<i>18.25</i>	<i>90</i>	<i>32.8</i>	<i>134</i>	<i>48.9</i>	<i>274</i>	<i>100</i>
7. Wearing Machine guards while working	Very Low	4	17.39	7	30.4	12	52.2	23	100
	Low	2	4.167	11	22.9	35	72.9	48	100
	Moderate	11	17.46	17	27	35	55.6	63	100
	High	25	26.6	35	37.2	34	36.2	94	100
	Very High	8	17.39	20	43.5	18	39.1	46	100
	<i>Total</i>	<i>50</i>	<i>18.25</i>	<i>90</i>	<i>32.8</i>	<i>134</i>	<i>48.9</i>	<i>274</i>	<i>100</i>
8. Visiting safety officers for check-up	Very Low	4	18.18	8	36.4	10	45.5	22	100
	Low	5	13.51	9	24.3	23	62.2	37	100
	Moderate	8	12.7	25	39.7	30	47.6	63	100
	High	26	26	26	26	48	48	100	100
	Very High	7	13.46	22	42.3	23	44.2	52	100
	<i>Total</i>	<i>50</i>	<i>18.25</i>	<i>90</i>	<i>32.8</i>	<i>134</i>	<i>48.9</i>	<i>274</i>	<i>100</i>
9. Reporting hazards or risks regularly at work	Very Low	1	11.11	4	44.4	4	44.4	9	100
	Low	5	11.9	11	26.2	26	61.9	42	100
	Moderate	14	18.92	24	32.4	36	48.6	74	100
	High	22	24.44	28	31.1	40	44.4	90	100
	Very High	8	13.56	23	39	28	47.5	59	100
	<i>Total</i>	<i>50</i>	<i>18.25</i>	<i>90</i>	<i>32.8</i>	<i>134</i>	<i>48.9</i>	<i>274</i>	<i>100</i>
10. Participation in health and safety education	Very Low	2	12.5	2	12.5	12	75	16	100
	Low	7	18.42	10	26.3	21	55.3	38	100
	Moderate	9	11.11	27	33.3	45	55.6	81	100
	High	23	28.75	30	37.5	27	33.8	80	100
	Very High	9	15.25	21	35.6	29	49.2	59	100
	<i>Total</i>	<i>50</i>	<i>18.25</i>	<i>90</i>	<i>32.8</i>	<i>134</i>	<i>48.9</i>	<i>274</i>	<i>100</i>
11. Reading labels of chemicals before using them	Very Low	1	8.333	3	25	8	66.7	12	100
	Low	5	13.16	8	21.1	25	65.8	38	100
	Moderate	15	17.65	34	40	36	42.4	85	100
	High	22	24.18	28	30.8	41	45.1	91	100
	Very High	7	14.58	17	35.4	24	50	48	100
	<i>Total</i>	<i>50</i>	<i>18.25</i>	<i>90</i>	<i>32.8</i>	<i>134</i>	<i>48.9</i>	<i>274</i>	<i>100</i>

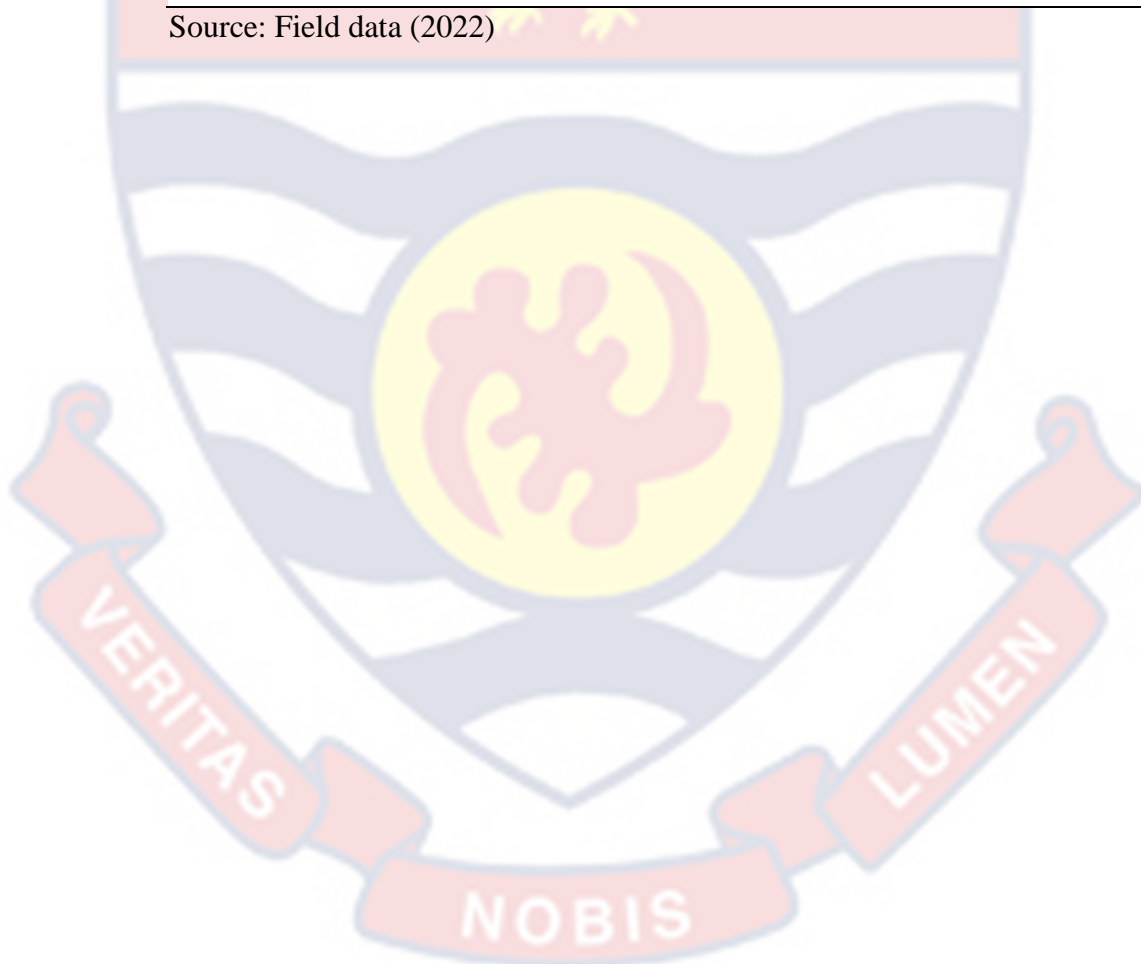
Source: Field data (2022)

APPENDIX H

CHECKS FOR NORMALITY OF DATA

Indices	Factors of				Challenges of
	OHS	Knowledge	Attitudes	Practice	KAF OHS
Sample Size	274	274	274	274	274
Mean	3.0292	0.6486	3.4311	3.5296	3.5331
Median	3.0000	0.6429	3.4444	3.5500	3.6154
Mode	3.25	0.79	3.44	3.90	3.77
Skewness	-0.108	-0.502	-0.449	-0.457	-0.497
Std. Error of Skewness	0.0147	.0147	0.147	0.147	0.147

Source: Field data (2022)



APPENDIX I

COLLINEARITY STATISTICS

Variables of the study	Collinearity Statistics	
	Tolerance	VIF
Knowledge	0.821	1.218
Attitudes	0.555	1.801
Practice	0.556	1.800
Challenges of KAF OHS	0.843	1.186
Factors of OHS	0.689	1.451

Source: Field data (2022)

