

UNIVERSITY OF EDUCATION, WINNEBA

**OCCUPATIONAL HEALTH AND SAFETY PRACTICES AMONG
SANITARY WORKERS IN KUMASI**

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**A thesis in the Department of Public Health Education,
Faculty of Environment and Health Education, submitted to the School of
Graduate Studies in partial fulfillment of the requirements for the award
of the degree of
Master of Philosophy
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In the University of Education, Winneba**

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DECLARATION

STUDENT'S DECLARATION

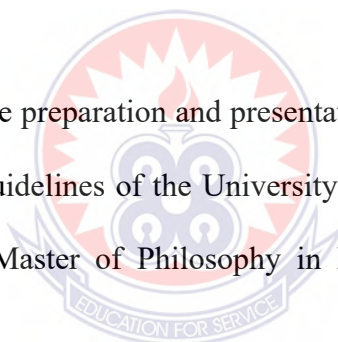
I, Joseph Agyeman Awuah, hereby declare that except for specific references to other people's works which have been duly acknowledged, this thesis is my independent work towards the award of a Master of Philosophy in Environmental and Occupational Health Education and that this thesis or part has not been accepted for the award of a degree in this university, or elsewhere.

SIGNATURE:.....

DATE:

CERTIFIED BY:

We hereby declare that the preparation and presentation of this thesis were supervised in accordance with the guidelines of the University of Education, Winneba on thesis work for the award of Master of Philosophy in Environmental and Occupational Health Education.



Ing. Dr. Isaac Monney (Lead Supervisor)

Signature:.....

Date:

Dr. Bismark Dwumfour-Asare (Co-Supervisor)

Signature:.....

Date:.....

DEDICATION

I dedicate this work to my Mom, Comfort Apprey and my wife, Mrs. Phillipa Amofah and to all who have supported me in this study.



ACKNOWLEDGEMENTS

I thank the Almighty God for granting me the grace in putting this work together. I would like to express my gratitude to my supportive supervisors. Both supervisors, Ing. Dr. Isaac Monney and Dr. Bismark Dwumfour-Asare were very encouraging when times became very hard.

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I want to also thank my colleagues at work especially my Head of Department, Mr. Richard Darko for allowing me to take this study. His encouragement and motivation also added to my getting here.

Last but not the least, I would want to thank my entire family for supporting me in kind and cash in taking this study. I hope that it goes to benefit Policymakers, Professionals in the field, Government Organizations, Non-Government Organizations and all that stand to benefit from this study.

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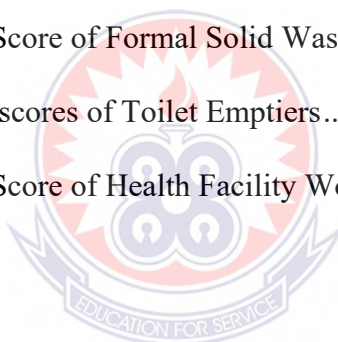
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ACRONYMS/ABBREVIATIONS

CCOHS	-	Canadian Center for Occupational Health and Safety
DFID	-	Department for International Development
FEF	-	Force Expiratory Flow
FEV	-	Force Expiratory Volume
FVC	-	Force Vital Capacity
HSE	-	Health, Safety and Environment
ILO	-	International Labour Organization
MLGRD	-	Ministry of Local Government and Rural Development
OHS	-	Occupational Health and Safety
OSH	-	Occupational Safety and Health
PEF	-	Peak Expiratory Flow
UN	-	United Nations
UNFPA	-	United Nations Population Fund
WHO	-	World Health Organization

ABSTRACT

The exposure to hazards from office cleaning, sweeping, janitorial services, fumigation, weeding, operating of pump stations and solid waste collection puts sanitary workers at risk of accidents and ailments. This study sought to identify work-related hazards, assess health and safety measures and develop a risk ranking system among private and public sanitary workers. The study employed a cross-sectional descriptive study design and multistage sampling technique. A total of 385 sanitary workers selected from private companies (257) and public institutions (128) participated in this study. Data was collected through face-to-face interviews with the use of semi-structured questionnaires. Chi-square and odds ratio analysis were to determine the association between work-related accidents and some specific variables among the private and public sectors using the Microsoft Excel and SPSS software version 25. Females constituted about half (50.6%) of the total study respondents. However, males dominated (77.3%) the public sanitation industry while in the private sector about two-thirds (64.6%) were females. The results of work-related accidents were more prevalent among sanitary workers in the private sector (57.3%). The results showed that public-sector sanitary workers were twice more likely (OR: 2.12: 95% CI 1.38-3.27) to be involved in work-related accidents than private-sector sanitary workers. Musculoskeletal disorders (75%) and respiratory infections (67%) were the two commonest illnesses experienced by the sanitary workers in both sectors. Comparatively, public sector workers constituted the majority that was provided medical healthcare (56.3%) and refund (46.5%) as compared to the private sector workers where the majority relied on self-medication (87.4%) and less than a tenth (9.5%) were given refunds for medical treatment. Again, the majority of public sector workers (60.9%) were medically screened as compared to the private sector

workers (4.7%). Street sweepers, formal solid waste collectors and janitors in health institutions had the highest average work-related risk scores. There is the need for policy makers to design a comprehensive health and safety policy that would focus on training, the use of tools and protective equipment and proper medical healthcare given to sanitary workers.



CHAPTER ONE

GENERAL INTRODUCTION

1.1 Introduction

Over the years, occupational health and safety have become a global concern since according to the International Labour Organization over 2.3 million workers suffer deaths, 340 million suffer incidents of accidents and 160 million suffer cases of illnesses and diseases (WaterAid, 2011). The issue of diseases among workers has further worsened with the outbreak of the novel Covid 19 virus (Patwary *et al.*, 2021). The people who are into the management of sanitary services are known as sanitation workers and their services are a necessity for the health and safety of society and the ecosystem as a whole (Habybabady *et al.*, 2018; Oduro-Kwarteng, 2016). According to Ayaaba (2014), the many sources of occupational-related accidents and illnesses are the working environment, tasks, tools and facilities used at the workplace. Several studies like Ahmed and Fouad (2018), Jaiswal (2018), Poole and Basu (2017), Tiwari (2008) and others have studied how the exposure to physical, chemical, biological, ergonomic and psychosocial hazards through distant or direct contact with various harmful agents, working activities and social atrocities results in all kinds of injuries, diseases or illnesses, psychosocial issues among sanitation workers (ILO, WHO, 2019; Kwankye, 2013). It is among these the International Labour Organisation in their Convention 155 of 1981 requires all member states to have a national health and safety policy for informal and formal workers which would be concurrent with the practices and conditions of that state. Though there exist

general laws like the Labour Act 2003, Factories, Shops and Offices Act 1970, the Workman's Compensation Act 1987 and the various safety Acts, there exist no laws purposely designed to protect sanitary workers (Asumeng *et al.*, 2015).

1.2 Problem Statement

An estimated annual number of 2.3 million occupational-related accidents (injuries and diseases) occur in the world due to physical, biological, chemical, psychosocial and ergonomic exposure or contact with hazardous substances (ILO, 2005). The effect of occupational accidents and diseases results in 5% of the world's Gross Domestic Product (GDP) being lost, yet, an estimated amount of 5 billion United States Dollars is suspected to be spent annually on occupational accidents and diseases. According to Adei and Kunfaa (2007), seven percent (7%) of Ghana's Gross Domestic Product is lost due to occupational hazards. This is a huge sum of money when translated into Ghana Cedis and could be invested in other sectors of the economy (Ashley, 2014).

For instance, Statistics in China have shown that sanitation workers experience 22.86% more health problems than the general working population with 18.90% in the year 2008 (Gong *et al.*, 2013). Also, a recent study by Mushtaq *et al.* (2017), associates work-related hazards with the low level or lack of knowledge surrounding the sanitation profession. It has also been estimated in India that at least one manhole worker dies from unblocking sewers every 5 days (WaterAid, 2020). Moreover, about 40% of sanitation workers in four South Asian countries were deprived of any hand-washing facility amid the risks of Covid-19 infection (Root, 2020).

In recent times, several concerns have been raised about the health and safety of private or public sector sanitary workers in low and middle-income countries due to their gruelling work which comes with poor working conditions (Patwary *et al.*, 2021). Yet access to data on private or public sanitary workers is unavailable and this is according to Kuffour (2020). This may be due to circumstances like under-reporting of incidence of hazards, non-availability of reports from some organizations and exclusion of some categories of workers.

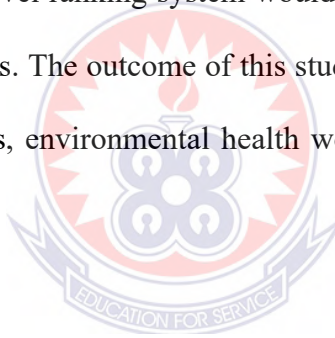
Therefore, protecting the health and safety of sanitary workers in developing countries like Ghana has become even more difficult with the emergence of Covid-19 and the associated risk (Patwary *et al.*, 2021; Root, 2020; WaterAid, 2020). Yet, empirical studies assessing the occupational health and safety hazards and risk faced by sanitary workers in Ghana are limited. Such studies are needed to provide a sound basis for public health interventions to be tailored to the needs of sanitary workers in the country. Moreover, previous works on sanitary workers have either looked at all sanitary workers as one group or in some circumstances either their private or public sector without necessarily comparing the two. It is important to provide an understanding by comparing the hazards faced by both groups in a way that gives more insight into which of the two is more exposed to occupational health and safety hazards to allow for more targeted approaches to public health interventions.

1.3 Rationale of the Study

The present working system of sanitation in the world and for that matter Ghana and specifically Kumasi exposes workers to several occupational hazards. This and many other studies have brought to light some of the safety

issues that endanger or put sanitation workers at risk of health and safety. Therefore, the need for a strategy is important, one that works on total work-related issues and not just injuries at work. Notwithstanding the several studies that have been done in the field, there still exists no available study that compares incidents of accidents and illnesses in private and public sector workers.

This study seeks to identify occupational hazards associated with various sanitation services in the private and public sectors and also assess health and safety measures instituted by them. A risk exposure ranking system otherwise known as a risk level ranking system would be designed for all the categories of sanitary workers. The outcome of this study is to add to existing knowledge that policy makers, environmental health workers, educators and so on stand to benefit from it.



1.4 Main objective

The main objective of this study is to compare the occupational health and safety risks among sanitary workers in public and private institutions in Kumasi.

1.4.1 Specific objectives

The specific objectives are to:

- i. Investigate the work-related hazards among sanitary workers employed in public and private institutions
- ii. Assess health and safety measures instituted to protect sanitary workers

- iii. Develop a risk exposure scoring system or risk level ranking system for sanitary workers

1.5 Research Questions

- i. What are the work-related hazards among workers employed in public and private institutions?
- ii. What are the health and safety measures employed to protect sanitary workers?
- iii. What are the work-related risks among the different categories of sanitary workers?

1.6 Significance of Study

Different studies have been carried out in the field of occupational health and safety yet, sanitation unions, policymakers, academicians and sanitation companies and organizations stand to benefit most from this study. This is because the study compares the health and safety-related issues in both private and public industries by establishing occupational-related hazards and measures available to sanitation workers. A risk exposure ranking system would also be generated which would also serve as a guide for institutions and industries.

The outcome of this study would help give a better understanding of the health-related hazards associated with the various sanitation services. It stands to also benefit companies from which they can modify their position on occupational health and safety by instituting more effective and efficient

measures that would reduce occupational-related accidents in the different sanitation services.

In the case of Policy and lawmakers, they would have the basis to implement laws that would guide the affairs of sanitation workers.

1.7 Limitations of the Study

This study was cross-sectional and reflects the views of all sanitary, hence, there could be a possibility of bias. None of the sanitation companies or institutions had records of work-related accidents and illnesses and as a result, respondents had to rely on their memories for all information. Also, most of the illnesses were self-reported without any documented or medical support. Most of the sanitary workers (respondents) involved in the study could neither write nor read which extended the period for administering questionnaires.

1.8. Organization of the Study

The study is organized into six chapters. Chapter one contains the study background, problem statement, objective and the overall significance of this study. Chapter two reviews the literature of the study area whereas the third chapter focuses on the methodology used in arriving at study objectives. Chapter four is a presentation of the result while chapter five discusses it. The last chapter which is chapter six brings out the conclusions and recommendations of this study.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Occupational Health

Occupational health and safety were initially monopolized to mean the risk of disease and injury associated with the worker and his/her working environment (ILO, 2016). Over the years, it has become multi-sectorial and multi-disciplinary looking at prerequisite areas that focus on the complete state of the worker, his working environment, bystanders and customers that either indirectly or directly have some kind of relationship with the workplace (Greeperson, 2013). Occupational Health and Safety have become so important since the working majority constitutes more than half of the world's population and their total welfare according to Amirhossein *et al.* (2012) is so paramount. According to a joint work by the WHO and ILO, incidents of health and safety in most developed countries and industrialized institutions are on the decline as compared to that of the industrializing and developing countries which are level or increasing (Alli, 2008).

Occupation, as defined by the Merriam-Webster dictionary is the work a person does or activity that a person spends time doing whereas their definition of health, is the condition of being sound in body, mind or spirit (Merriam-Webster, n.d.). The World Health Organization (1948) also defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity”. The term has been defined differently by several authors and authorities. The ILO defines Occupational

Safety and Health (OSH) as a discipline that emphasizes identifying and controlling the working environment by putting measures in place that would curtail incidents of accidents, diseases and any other unforeseen misfortunes that could negatively impact life of a worker (Alli, 2008). Occupational health and safety help to improve the human capital by protecting the health of the labour force that forms the core of every occupation. Again, it is a science of anticipation, recognition, evaluation and controlling of hazards arising in or from the workplace that could impair the health and well-being of workers, while also taking into account the possible impact on the surrounding communities and the general environment (ILO, 2016). The Joint WHO and ILO Committee defines Occupational health and Safety as, “the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations” (Joint ILO/WHO Committee, 1995).

In the Public Health context, Occupational health and safety studies the trends of illnesses and injuries in the working population by proposing and implementing strategies to regulate issues (D. Haldane, 2012). According to Haldane (2012), connecting public health and occupational health is to use public health initiatives and strategies to promote workplace safety. Also by the WHO 1995, it is the use of a holistic approach towards putting measures in place to promote the total wellbeing of an employee in the working environment.

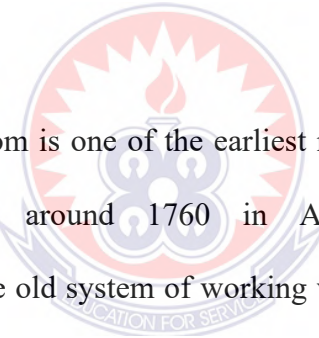
Occupational health and safety is a multidisciplinary concept that aims to protect the complete well-being of the worker through the use of multi-sectorial subjects such as occupational medicine, occupational hygiene,

ergonomics and occupational safety (Rantanen & Fedotov, 1995). Quoting Amponsah-Tawiah & Dartey-Baah (2015), occupational health and safety have been “treated as a throw-away” subject with all the other disciplines such as law, economics, medicine, technology, psychology and among others feasting on it when “hungry”. This is to mean that all working professions fall on the need for either one of these specialist in the case of injuries, diseases, psychological issues and even in the case of death. In any industry, company or an institution, the impact of occupational health is not just a one sided management system, but instead, it requires a joint force of specialist (e.g. occupational hygienist, safety officers, ergonomist, psychologist etc.), stakeholders (e.g. employers, employees, customers, bystanders) and other related influences to work effectively and efficiently (Rantanen & Fedotov, 1995). Instilling health and safety can be very expensive, yet being complacent and reducing health and safety standards can be more costly and involving. That is why one should never think of the cost of safety since the effect of accidents, diseases, psychological issues can be more costly in terms of money and in terms of taking the life of people.

2.2 Brief History of Occupational Health

The issue of Occupational Health and Safety became a great concern when industrialization emanated especially around the 70s and 80s. It was then that a scholar known as Pliny the Elder made face mask out of an animal bladder to protect workers from dust and lead fumes (Rix-Standing, 2020). Fast forward to 1556 a German scholar known as Agricola in his book “De Re Metallica” also investigated common health issues such as silicosis associated

with mine workers and proposed measures to protect them. The names such as Bernardo Ramazzini (father of industrial hygiene), Ulrich Ellenborg, Percival Pott and so on cannot be left out when discussing the history of occupational health and safety (Admin, 2020). Over the years, occupational health has become so much of a topical issue because of the springing up of various industries and companies without proper safety measures. According to Kwanky (2012), the cause for the absence of proper safety measures in many companies and institutions was that workers were replaceable in times of serious illnesses and injuries (Kwanky, 2012). The fear of this impacted workers not reporting illnesses, injuries and infections (Jehring & Heinrich, 1951).



The United Kingdom is one of the earliest nations to go industrialization and factories systems around 1760 in Abraham Darby's foundries at Coalbrookdale. The old system of working was replaced with the new system that involved mechanization which came with several occupational health and safety issues. The quest for cheap labour constituted some of the major causes of accidents and injuries in the workplace during this era. Children were made to work long hours in unfavorable working conditions which exposed them to all sorts of injuries, diseases and psychosocial hazards that had an impact on their education and livelihood (Eves, 2017). This according to Eves (2017) prompted the passing of the Factories Act 1833 where the executive and judicial powers were given to four inspectors who had sub-inspectors to oversee the implementation and promotion of the Act. Subsequently, there was the adoption of the Employers Liability Act of 1880 which gave room for

families or employees to sue employers for issues of occupational health and safety. Yet, it was for those directly and indirectly affected to prove their case by showing that the cause of injury was from the employer. This was a major challenge in the act that influenced the passing of the Workmen's compensation Act of 1987 where affected individuals were only supposed to show that the cause of injury was at the workplace (Eves, 2017).

In a developing country like Ghana, the concept of occupational health and safety saw the light of the day through the establishment of laws and measures by slave masters. Laws put in place to promote health and safety by the government of the United Kingdom were to be implemented in industries in countries they have colonized (Bavon, 2000). According to Appiah (2014), Ghana's occupational health and safety legislation started with the establishment of the Factories Ordinance of 1950 which was later improved in 1970 with the Factories, Offices and Shop Act 328. Subsequently came the law in 1987 (Workmen's Compensation Law (PNDC L187)) that made room for persons involved in accidents to make claims. Other available laws on occupational health and safety are the 2003 Labour Act 651 section 118 to 120, the Mining Regulations 1970 LI 665 etc. (Appiah, 2014). Even though there exist some occupational health and safety laws in the country, several sectors lack adequate provisions that safeguard their work and activities. It is according to this the ILO recommends member states have a national health and safety policy that would capture all sectors (Asumeng *et al.*, 2015).

2.3 Sanitation Workers

Sanitation is defined as the proper disposal of all waste including that of humans and animals (i.e. urine, faeces) and it is by establishing measures that would keep the human environment free from disease-causing vectors through the proper disposal of domestic and street wastes and as well as wastewater (Acheampong, 2010). Sanitation is an effort to promote the social, economic and physical environment of all individuals by instituting measures that would develop and maintain a clean, safe and pleasant physical environment in every sector (Ministry Of Local Government and Rural Development, 2001). The accumulation of waste is expected wherever humans are and this is because, human activities generally generate waste that when not properly managed can cause diseases and other ailments which are the concerns of sanitary workers (Kaza *et al.*, 2018). Sanitation workers are referred to as people who are employed or responsible for cleaning, maintaining, operating or emptying a sanitation technology at any step of the sanitation chain (Cimino, 1975; World Health Organization, 2018). Their work also involves the cleaning of toilets and caretakers in domestic, public and institutional settings (ILO and WHO, 2019). Sanitary workers play an important role by putting measures in place to maintain the environment (Habybabady *et al.*, 2018) and this is directly proportional to morbidity (Mara *et al.*, 2010).

2.3.1 Sanitation Services

In the history of the world, the urban population is projected to grow by around 5 billion by the year 2030 and the consequence is that necessities such as water, housing, job and for the benefit of this study “**sanitation**” would all

face enormous challenges. This according to a study by United Nations Population Fund would affect the life of especially the poor in the urban areas (Lahariya, 2008). The competition for resources would be in high demand as documented in the United Nations Development Programme on Human Development Report for 2006. As envisaged by the Occupational Safety and Health Council (OSHC, 2003), sanitary workers would be needed for activities like Office cleaning, sweeping, janitorial services (conservancy or washroom cleaning), fumigation, weeding, operating of pump stations, solid waste collection and desilting of drains or chocked gutters would also be in high demand (Acheampong, 2010; Habybabady *et al.*, 2018; Oduro-Kwarteng, 2016). This in effect is supposed to affect environmental issues which in other words would reflect on the health of the general population (Pugh, 2000). A study by WaterAid shows that “improved sanitation” is the greatest medical asset to managing and controlling most health issues (WaterAid, 2011). Services offered by sanitary workers are organizational and institutional dependent and in the revised 2009 Environmental Sanitation Policy of the Ministry Of Local Government and Rural Development in Ghana, services offered by them include the management of liquid and solid waste, fumigation, cleaning of public and private places, etc. (Ministry Of Local Government and Rural Development, 2010). Yet, Kuffour (2020) also states the following responsibilities of sanitation workers and they include the management of communities by cleaning, transporting, treating and disposal of both solid and liquid waste. This helps to either curtail or reduce the incidence that may result in the pollution or contamination of our environment.

2.4 Occupational Risk and Hazards Associated with the Sanitary Work

The definition of risk and hazard has been interchangeably used as one defines risk to mean hazard and hazard to mean risk. This according to the Canadian Centre for Occupational Health and Safety confuses their use. The Canadian Centre for Occupational Health and Safety defines risk as the chance or probability that a person will be harmed or may experience an adverse health effect if exposed to a hazard whereas hazards may be the source of potential damage, harm or adverse health effect on someone or something. In simple words hazard is the source of harm whereas risk aims to give the likelihood or probability of a hazard occurring and the level of consequences if it happens (Ashley, 2014). The Canadian Centre for Occupational Health and Safety mentions the following as general factors associated with risk occurring at the workplace, the nature of exposure, how exposure occurs and severity of the exposure. Yet, several reviews on studies and researches done in the field of occupational health and safety also record the following as specific risk factors associated with the worker in his or her working environment and this include the style of work, lack of basic working facilities, negligence, lack of technical know-how, age, health status and length of exposure.

According to the study by ILO, WHO, WaterAid and World Bank (2019), the activities of sanitation workers are so hazardous that the minimum lapse of instituted health and safety measures can expose workers to various physical, biological, chemical, psychosocial which can result in occupational injuries, diseases, and psychological issue and to more extend among workers. Some of the hazards include: Biological health hazards: Hepatitis B, Cholera,

Diarrhoea, Respiratory disease (flu), Nasal irritation and nausea and eye irritation (ILO WHO WaterAid and World Bank, 2019; Jerie, 2016)

Physical Health Hazard- Hearing loss, High temperature in the working environment resulting in dizziness, Hypothermia from low temperature, Frostbites and Flu (ILO WHO WaterAid and World Bank, 2019; Jerie, 2016)

Ergonomic-Musculoskeletal injuries (MSI's), Repetitive strain injuries (RSI's), Long-term back pains and eventually stroke (ILO WHO WaterAid and World Bank, 2019; Jerie, 2016)

Safety-Limb loss from compactor hydraulics, Acidic corrosion, burning at dumpsites after explosions of pressurized containers like aerosols and so forth (ILO WHO WaterAid and World Bank, 2019; Jerie, 2016).

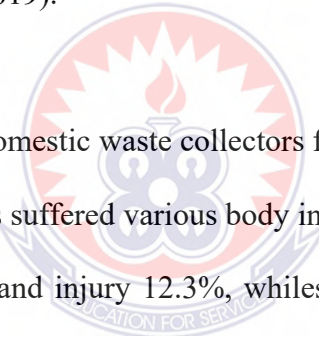
Chemical Hazards- Cancers from carcinogens, Disorders to Central Nervous System (CNS), and possible lung and kidney or liver damage (ILO WHO WaterAid and World Bank, 2019; Jerie, 2016)

In looking at some of the specific factors for causes of hazards at the workplace, it is realized that solid waste collectors experience high workload, lifting of heavy containers, long exposure to waste, intense vibration of solid waste trucks, splashing of chemicals (heavy metals, acids, etc.) while forking or lifting of containers containing solid waste, working for long hours, jumping/falling from moving vehicles, inhalation of dust and car smokes, contact with microbes, stigmatization, insults, cuts from sharp edges, pinch from blunt objects, exposure to unfavorable weather conditions and many others (Ahmed & Fouad, 2018; Ayaaba, 2014; Jerie, 2016; Kayode *et al.*, 2014). Due to some of these factors, the Netherlands has instituted guidelines for reducing the risk associated with sanitary workers involved in solid waste collections. This includes how waste should be bagged, the

quantum of waste to be collected and the number of hours waste should be collected and disposed of. In contradiction, Ayaaba (2014) also believes that the introduction of new techniques of working would not necessarily reduce or prevent occupational hazards instead, it may also result in the occurrence of new hazards. Therefore, in a developing country like Ghana, a surveillance system should be developed to monitor specific work-related hazards which would help to reduce incidents of accidents.

In the case of street sweepers, a study of female workers in India by Johny *et al.* (2014) shows respiratory symptoms resulting from inhaling soil dust, plant fragments, bioaerosols and smoke from motor vehicles. Other risk exposure includes the repetitive swinging of the hand, accidentally stepping on broken glass or sharp object, high workload, long working hours, wrong standing positions, dog and rodent bites, the stress of waking up early, trauma resulting from living children at dawn to work, stigmatization, and other social atrocities like verbal abuses, stigmatization, etc. (Pandey, 2004). In the case of liquid waste workers, some of the risk exposed to their work includes direct contact with liquid or faecal waste, working in dangerous circumstances like walking on weak slabs which sometimes can collapse, drowning in pits, working in deep septic tanks with little or no air causing asphyxiation, force to do high workload, exposure to harmful gases (Methane, Carbon Monoxide, Ammonia, hydrogen disulfide), exposure to loud noise, lifting of heavyweight slabs, contact or exposure with biological and chemical agents, slips, cuts from sharp objects that are in pits, etc. (ILO WHO WaterAid and World Bank, 2019; Jaiswal, 2018; WHO, 2018). Occupational risk of sanitation fumigators

includes contact with harmful chemicals, carrying heavy spraying machines, being bitten or attacked by a snake or pest, fire explosion from spraying machines, inhalation of harmful gases, etc. (Food and Environment Hygiene Department, 2017). The occupational risk exposure of cleaners also includes the inhalation of dust, high workload, lifting heavy loads, climbing long tables to do cleaning, being knocked down by falling objects, trauma from falling from high surface areas, etc. According to Andres Hueso a senior sanitation analyst from WaterAid, the effect of some of these issues psychologically sometimes influences workers to engage in the intake of alcohol and other illegal drugs to forget some of the social stigma and other issues they go through (Vesper, 2019).



In a study of 667 domestic waste collectors from the same sanitation company, 17% of the workers suffered various body injuries. The rate of back injury was 14.9%, knee and hand injury 12.3%, while that of the foot, teeth, head, eye and finger were 11.4%, 9.7%, 7.9%, 6.1% and 5.3% respectively. According to the study, the nature of the collection of solid waste exposes workers to various accidents. The causes of injuries include being hit by an object or vehicle, falling prostrate from the back of a compactor truck, stepping or coming into contact with sharp objects, being squeezed by a machine or container, being bitten by a dog etc. This is to show that a large number of injuries occur in the sanitation industry which exposes workers to various hazards. Other health issues are respiratory infections (like chronic and acute bronchitis, asthma etc.), wounds, hearing losses, diseases and illness (Hepatitis B, Cholera, Diarrhoea, Eye diseases, Cancer), high temperature, dizziness,

nausea etc. (Jerie, 2016). In another study of Manual Scavengers in India (mostly liquid waste collectors), workers of this section experience high health issues like cardiovascular degeneration, musculoskeletal issues which range from osteoarthritis changes and intervertebral disc herniation. Common recorded infections also include hepatitis, leptospirosis and helicobacter, skin infection, respiratory infections and altered pulmonary infections (Soju *et al.*, 2015). Similarly, the study of sanitation sweepers in New York City had more of their workers involved in Coronary diseases than the other working groups (Cimino, 1975; Mamtani & Cimino, 1992). The study found high exposure or absorption of Carbon Monoxide from sanitation trucks to be the major cause of Coronary Diseases in sanitation workers. The effect of high intake or absorption of Carbon Monoxide causes Ischemia or Infarction, which is the inability of the body parts to receive blood resulting in a shortage of oxygen in that part of the body. The effect of this causes stroke, heart attack, and pains in the leg and the abdomen.

2.5 Legislative Intervention available to sanitary workers

The literature in this current study has indicated the several hazards associated with the services provided by sanitary workers yet, they constitute an important section because of the various work they do to reduce or prevent environmental and health issues as especially government bodies, professionals and NGO's are all struggling to meet the demand of the populace for better sanitation (Acheampong, 2010). It is therefore right for the health and safety of sanitary workers to be protected and given a high priority even if not the number one on the list and this can only be done with the

support of policymakers (ILO, 2016). Sanitary workers constitute part of the working populace with minimum legal backing (protection) not only locally but also internationally as cited in the 2019 joint document of the ILO, WaterAid, WHO and World Bank. According to the joint document, even at the international level where relatively much focus is given to sanitation workers there still exist few legislations which can be applied to them, like that of the World Bank Environmental and Social Standards (ESS) and the International Labour Organization (ILO WHO WaterAid and World Bank, 2019).

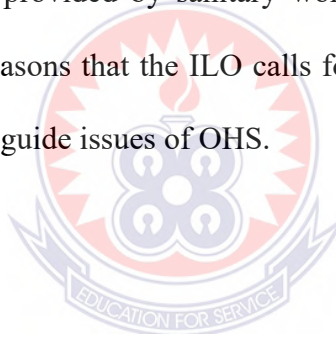
This issue is worse in a developing country like Ghana where the informal sector dominates (Appiah, 2014). Most sanitation industries in countries like this are often private companies that are involved in contract cleaning of private and public companies and institutions (ILO WHO WaterAid and World Bank, 2019). They are often with temporal and casual employment status and are involved in precarious working conditions, little or no legal protection, low monthly salary and have no proper contractual agreement and insurance (ILO, 2015). They have no means of being identified and therefore escape regulations, health surveillance and risk prevention control and their condition of service that protects and gives them better working conditions is minimal (Kaza *et al.*, 2018; Zock, 2005). Though the situation may be paramount in the informal or most private sectors, the public and formal sectors also have their challenges and are not different (Oduro-appiah *et al.*, 2019).

Many of the literature associate some of these plights with the low educational level of workers, lack of strong associations to advocate for better conditions of service and the unwillingness of political influencers to advocate by designing a legislative instrument that would protect sanitary workers (Amponsah-Tawiah & Dartey-Baah, 2009). This is why it has been the agenda of the WHO, ILO and other organizations to take into focus the welfare of workers by championing health and safety with the use of the slogan “**no one left behind**” which is to be achieved by the year 2030 (ILO WHO WaterAide and World Bank, 2019). This can however be achieved with the help of governments in the implementation of structured OHS policies. It is therefore mandatory for all member countries under the ILO to develop, implement and periodically review a health and safety policy that would be in line with the activities of that country (Taderera, 2012). As stated in Asumeng *et al.* (2015) the labour act of Ghana makes it emphatically clear that every citizen is entitled to a fundamental human right of working under safe and healthy conditions and this implies that every worker is supposed to be protected from any form of hazards whether it being injury, disease or psychosocial issues. Despite the admonishing by the ILO, Ghana as a country has not complied with this convention and therefore has no national policy guiding health and safety at the workplace and this according to Amponsah-Tawiah and Dartey-Baah (2011) can be associated with the non-political willingness by past and present governments. Though in the year 2000 a joint drafted policy was put together by some ministries (Ministries of Manpower Youth and Employment, Health and Lands, Forestry and Mines), it is yet to be implemented (adopted)

for use by the Parliament of Ghana (Amponsah-Tawiah & Dartey-Baah, 2009).

Despite the non-existence of a comprehensive national health and safety policy for use by the country, there are specific industries like the road and transport, mining industry, etc. that have institutional policies which guide their health and safety (Kuffour, 2020). For example, the road and pedestrian users have the 1999 Road Safety Commission Act 567 while the Mining Regulation 1970 is for those in the minerals commission. The 1994 Environmental Protection Agency Act 490 is for matters concerning the environment whereas the 1999 Ghana Health Service and Teaching Hospital Act 526 are for health workers. Agencies involved in radiation activities are governed and monitored by the Radiation Protection Board of the Ghana Atomic Energy Commission. Though there is the existence of these acts to govern the activities of the aforementioned institutions on occupational health and safety in Ghana, those in the sanitary sector under normal circumstances have none except the following general acts (the Factories, Offices and Shops 1970, Act 328 and the Labour Act of 2003, Act 651) which is full of lapses because it looks at the general working population than targeting specific sectors of institutions and companies. It also lacks uniformity and is limited in scope when it comes to hazard prevention (no strategic provision for risk assessment, health surveillance and other preventive methods) and mostly focuses on the formal sector leaving the informal sector (Amponsah-Tawiah & Dartey-Baah, 2011; Appiah, 2014). According to Appiah (2020), some of these lapses can also be associated with improvement in technology which

current legislation does not factor during their development for adoption (Appiah, 2014). The Workman compensation law (PNDC L187) is an instrument established for the payment of compensation for those involved in injuries, accidents and deaths at the workplace. This law as also insisted by Amposah-Tawiah & Dartey-Baah (2012) is not detailed in scope and does not provide sufficient compensation for those involved in occupational health and safety issues. In the study of Occupational Health and Safety Challenges Facing Sanitary Workers in Sekyere Central District in Ghana by Kuffour (2020), the availability of basic amenities and comprehensive OHS statistics were either unavailable or inadequate and all these influenced risks associated with the services provided by sanitary workers. It is based on some of the aforementioned reasons that the ILO calls for a need for all member states to have the policy to guide issues of OHS.



CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Site

The study was conducted in Kumasi. Kumasi is made up of the Central Business District (Nhyiaeso, Subin, Manhyia South and North, Bantama,) and its newly created Municipalities such as Asokwa, Asokore Mampong, Kwadaso, Suame, Old Tafo Pankrono, Oforikrom. Kumasi forms the central business center for the Greater Kumasi districts like Ejisu, Juabeng, Bosomtwe, etc. This is where a large population of the people in the districts works to earn their living and it also serves as a central point for most commercial, administrative and transportation activities for travelers to and from of the city and region as a whole (Oduro *et al.*, 2014).

Kumasi is located in the Ashanti Region which according to the 2010 Population and Housing Census had a population size of 4,780,380 making it the most populated region in Ghana. This number in the 2021 population and housing census shot to 5,440,463 making it the second most populated region in Ghana. The male and female size of the region is 2,679,914 and 2,760,549 respectively (Ghana Statistical Service, 2021).

Based on the 2010 population and housing census, about two-thirds out of 1,156,647 of those 15 years and above are economically active and because of that earn money either from family, work or other areas. About 91.4% of the economically active people are employed. Slightly above one-quarter of the people employed are into commercial activities like selling and service

delivery (repairs). It is only 0.3 percent of the people who are into the water supply, sewerage system management and remedies. More than three-thirds and just a little over one-tenth of the working populace are employed in the private informal sector and private formal sector respectively. Only 8.6 percent work in the public sector.

The percentage of households in agriculture in Kumasi is very low representing 8.5%.

The city of Kumasi has two rainfall patterns with an annual average between 740 and 890 mm. The first in the year is from March to July whereas the second which is short is from September to November. Kumasi has a dry and wet climate with relatively an annual constant temperature (Agyirifo & Otwe, 2011).

Kumasi is the second-largest city in Ghana and is located 270km North of the Nation's capital Accra, with its latitude and longitude being 6.700071 and -1.630783 respectively (Adannaney *et al.*, 2015).

3.2 Study Design

A cross-sectional descriptive study design was used in current study. The general objective of this study was to investigate occupational health and safety practices among private and public sanitary workers in Kumasi. This approach was used because it provided the relevant data needed for valid investigation of the variables to meet the study objectives.

3.3 Study Population and Units

The population of this study constitutes both men and women in various sanitation services in Kumasi. For purposes of this study sanitation workers constituted street sweepers (Open area sweepers), janitors (Conservancy and office cleaners), fumigators (Open and closed area sprayers), informal solid waste collectors (Tricycle waste collectors), formal solid waste collectors (Truck waste collectors), dislodging, rehabilitation and construction of sewer line worker (Liquid waste and sewer system workers) and sanitary workers in educational and health facilities.

3.3.1 Inclusions and Exclusion Criteria

Individuals recruited for the study included all consented sanitation laborers and supervisors directly involved in sanitation services such as street sweeping, janitorial cleaning, fumigation, solid waste collection (door-to-door solid waste collectors, tricycle riders and dumpsite collectors), dislodging, rehabilitation and construction of sewer line workers. The study excludes mechanics, administrators and people who are not directly involved in the sanitation service.

3.3.2 Initial data collection

Data on the total population of sanitary workers in Kumasi was unavailable. Based on this, a visit was paid to the various Youth Employment Agencies (YEA) in charge of recruiting sanitary laborers at the various assemblies. A visit was also paid to recognized sanitation institutions like Zoomlion and Clean Team Ghana, whiles that of the Kumasi Waste Management

Department was for the collection of data of the various companies in charge of liquid waste activities. Those in the private and public health and educational institutions were also visited for the data of their sanitary worker.

3.4 Sampling technique

A multistage sampling technique was used in selecting respondents for this study. The stratified sampling technique was deployed to assess the health and safety practices among sanitary workers. The purposive sampling technique was used to select specific private and public sanitary companies and institutions for this study (health facilities, sanitation organizations, municipal district offices and educational facilities) whereas the stratified random sampling technique was used to select workers from a specific category of services in the sanitation industry to be interviewed. The population of the category of sanitation workers was estimated through key informant interviews and this was used to determine the proportion of workers in each sector. The various proportions were multiplied by the calculated sample size. This gave the sample size for each category of sanitation workers to be involved in the study.

3.5 Sample Size

An estimated sample size of 386 sanitary workers was selected from the total population of this study. Slovin's formulae ($n = \frac{N}{1 + Ne^2}$) were used in estimating the sample size below:

$$n = \frac{N}{(1 + Ne^2)}$$

Where;

n = the sample size,

N = Total population size and

e = the margin of error (Stephanie, 2021).

N = Total population size = 2845, and e = margin of error = 0.05.

Therefore; $n = 2845 / (1 + 2845 * 0.05 * 0.05) = 351$

Since it is virtually impossible to get a 100% response rate when administering questionnaires, an estimated 10% rate was included to make room for any situation of non-responses. Therefore the 10% non-respondent rate was 35.1 raising the total sample size to 386.

Table 3.1: Total Number of Respondents Estimated for each Service

Sectors	Total number of each sector	Percentages (%)	Estimated sampling proportions
Street Sweepers	1824	64	247
Janitors (Conservancy cleaners)	223	8	30
Fumigators	113	4	15
Informal Waste collector (Tricycle riders)	400	14	54
Formal Solid waste collectors (Truck Riders)	104	4	14
Toilet Emptier (Cesspool emptier)	127	4	17
Health facilities workers (Conservancy, cleaners, sweepers, etc.)	54	2	7

3.6 Data Collection Techniques and Tools

The primary source of data used in this study was solicited with open and closed-ended questionnaires through face-to-face interviews. A semi-structured questionnaire that elicited the appropriate responses relevant to meeting the study object was used. The questionnaire was divided into 6 sections i.e. Socio-demographics characteristics, specific work activities and experiences, prior experience with work-related accidents, common illnesses and interventions, measures to protect against occupational health and safety and the last is Risk assessment. Due to the nature of respondents and the location of their worked, the researcher recruited additional people to help in the administering and collection of data. The training was given to the people before the commencement of the interview whereas their core quality was for them to be able to read and translate English to Twi language. This was important since majority of the people could not read or understand English. Trained data collectors administered questionnaires in the presence of respondents by first informing them of the purpose and relevance of this study, after which they were asked to give their consent.

3.6.1 Pre-testing

The questionnaire meant for the study was pre-tested in Ejisu which has similar characteristics to the main study area. A random sampling technique was used in selecting sanitary workers in the various categories of services to administer at least 10 percent of the total sample size. During the pre-testing, clarity, consistency and acceptability of respondents to questions helped for the necessary corrections to be made.

3.7.1 Data Management

All data collected for statistical purposes was coded and entered into the SPSS and Microsoft Excel for cleansing and standardizing followed by an analysis after which it was stored in a dropbox for use.

3.7.2 Data Analysis

Data were analyzed using SPSS Version 25 and Microsoft Excel 2016. A descriptive statistics was used in analyzing frequencies and averages of this data. Chi-square and Odds ratio were used in finding the association and strength of association between variables respectively, hence, p - values less than 0.05 was considered statistically significant.

3.9 Risk Score

Risk scoring is an important aspect of the risk evaluation system which forms part of the safety analysis meant to provide the basis for either accepting or rejecting an incident (hereby known as hazards). The risk score is an estimated value which is a multiplication of the severity or seriousness of an incident and the likelihood or probability of the event occurring (Intaver Institute Inc., n.d.). According to (Fabbri (2020) risk scoring assessment can either be qualitative or quantitative and this is done by estimating hazards. A quantitative assessment would be numerical while a qualitative one would be explanatory. A risk scoring system should have a quality of being self-explanatory, the method of data collecting must be easy and the information collected must be reliable and applicable both locally and internationally. In

various circumstances by different or same users, it should be consistent and give the same results (Tejjink *et al.*, 1993).

3.9.1 Basis for arriving at risk scores in Current Study

In the current study, respondents were asked during data collection to estimate between a scale of 1 to 5 on the severity of known hazards and the likelihood of accidents occurring. The severity and likelihood for each specific risk were calculated based on the average of the respondents' exposure. The average severity and probability were multiplied which gave the risk score for each risk. Tables 3.2, 3.3 and 3.4 are the description of the scales.

Table 3.2 Impact or Severity Scale (Level of Harm if it Happens)

Scale (5-1)	Impact	Impact description
1	Insignificant	Non-injury/ Not harmful of trivial
2	Minor	Requires medical attention/ Short period of sick leave
3	Moderate	Requires hospitalization but not necessarily having to miss work for more than a day/ Long period of sick leave
4	Major	More than a day or more lost/Disablement
5	Death	Certain to cause death/ Fatality

(Ghana Railway Cooperation, 1999; Intaver Institute Inc., n.d.)

Table 3.3 Probability or Likelihood Scale (Possibility of an Event Happening)

Scale (1 - 5)	Category	Probability
1	Very unlikely	1 in a 1000 years
2	Unlikely	1 in 10 years
3	Likely	Once a year
4	Very likely	Once a month
5	(Certained) Very likely	Once a day

(Ghana Railway Cooperation, 1999; Intaver Institute Inc., n.d.)

Table 3.4 Risk Description (Seriousness of Hazard)

Scale (1-25)	Seriousness of hazard	Description of safety procedure needed
1 – 5	Low	Negligible risk
6 – 11	Medium	Acceptable Risk, no safety measure is required
12 – 15	High	Safety Measure Recommended
16 – 25	Very High	Safety Measures essential

(Ghana Railway Cooperation, 1999; Intaver Institute Inc., n.d.)

3.9.2 Calculation of the Total Average Risk Score

The Total Average Risk Score is the sum of the Average Hazards Score. The Average Hazards Score is calculated by finding the average of the sum of each type of hazard for each of the sanitation services in this study.

3.10 Limitations in data collect

The study was limited by;

- i. The descriptive cross-sectional study survey. This design did not permit a causal effect relationship investigation.
- ii. The readily availability of respondents to answer questionnaires due to the Covid-19 measures instituted by most organizations, institutions and companies.
- iii. Language barrier since the most of the respondents could neither read, write nor understand English, hence questionnaires had to be filled and translated by the researcher



CHAPTER FOUR

4.0 RESULTS

4.1 Socio-demographic characteristics of respondents

Table 4.1a and 4.1b shows the socio-demographic characteristics of three hundred and eighty-five (385) participants who were recruited for this study. Close to 2/3 (n=166; 64.6%) of the study respondents from the private sector were females, while in the public sector, a little over 2/3 (99; 77.3%) were males. About 1/2 (51%) of the study respondents were females. Among the private sector, almost 1/2 of the respondents (118; 45.9%) were above the age of 45 years while in the public sector the majority (40; 31.3%) was between the ages of 36 – 45 years. Among the private (135; 52.3%) and public sector (70; 53.2%) were married with 33.9% of the private and 33.6% of the public having children between 4 -5. Most of the respondents in the private (57.4%) and public sector (52.8%) had primary and Junior High School (JHS) education (Basic School Education) whereas the majority of the private (74.8%) and public (56.7%) had permanent employment status.

In the private sector majority (207; 80.2%) earned a monthly salary below GHC300 while the total that earned GHC1000 and more were among the least (8; 3.2%). In the public sector, none (0.00%) earned less than GHC300, whereas the majority (44; 34.6%), making up about 1/3 earned between GHC301-599. The total of respondents in the public sector that earned above GHC1000 was more than 1/3 as compared to the total of those in the private sector who were less than 1/10. Around 158 (61.5%) of the respondents in the

private sector had previous working experience, while in the public sector the most 66 (51.6%) had working experience from elsewhere. Among the private sector workers majority (50.8%) had previous working experience of fewer than 5 years while in the public sector majority (34.8%) had 6 – 10 years of working experience elsewhere. The majority (n=143; 56.1% and n=76; 60.3%) of the respondents in the private and public sector respectively had part-time jobs, whereas among the private and public sector workers the majority (n=141; 55.3% and n=58; 45.3% respectively) had 5 years and below working experience.

Table 4.1a Demographic Characteristics of Study Respondents (385)

VARIABLES	PRIVATE SECTOR (257)	PUBLIC SECTOR 128
	Frequency (%)	Frequency (%)
Gender (n=385)		
Males	91 (35.4)	99 (77.3)
Females	166 (64.6)	29 (22.7)
Age range (n=385)		
25 and below	16 (6.2)	29 (22.7)
26 – 35	43 (16.7)	21 (16.4)
36 – 45	80 (31.1)	40 (31.3)
Above 46 years	118 (45.9)	38 (29.7)
Marital Status (n=385)		
Single	51 (19.8)	25 (19.7)
Married	135 (52.3)	70 (53.2)
Divorced	17(6.6)	15 (8.3)
Separated	26 (10.1)	9 (9.1)
Widowed	29 (11.2)	8 (9.6)
No. of Children (n=385)		
3 and below	65 (25.3)	35 (27.3)
4 – 5	87 (33.9)	43 (33.6)
6 and above	82 (31.9)	33 (25.8)
No children	23(8.9)	17 (13.3)
Educational Level (n=385)		
No formal Education	76 (29.5)	33 (26)
Primary/JSS (Basic school)	148 (57.4)	67 (52.8)
Senior High School	33 (12.8)	24 (18.9)
Post-Secondary Education	1 (0.4)	3 (2.4)

Table 4.1b Work-related Characteristics of Study Respondents

VARIABLES	PRIVATE SECTOR (285)	PUBLIC SECTOR (128)
	Frequency (%)	Frequency (%)
Employment Status (n=385)		
Casual	9 (3.5)	30 (23.6)
Permanent	193(74.8)	72 (56.7)
Part-time	56 (21.7)	25 (19.7)
Monthly Income(GHC) (n=385)		
Below 300	207 (80.2)	0 (0)
301- 599	9 (3.5)	44 (34.6)
600 – 999	34 (13.2)	35 (27.6)
1000-1500	4 (1.6)	19 (15)
1501 and above	4 (1.6)	29 (22.8)
Previously Worked elsewhere (n=385)		
Yes	99 (38.5)	66 (51.6)
No	158 (61.5)	62 (48.4)
Years of experience in previous work (n=165)		
5 years and below	50 (50.5)	22 (33.3)
6-10 years	21 (21.2)	23 (34.8)
11 years and above	28 ((28.3)	21 (31.8)
Part-time job (n=381)		
Yes	143 (56.1)	76 (60.3)
No	112 (43.9)	50 (39.7)
Years of Experienced in my current job (n=383)		
Below 5 years	141 (55.3)	58(45.3)
6-10	61 (23.9)	31 (24.2)
11-15	47 (18.4)	20 (15.6)
16 years and above	6 (2.4)	19 (14.8)

4.2 Involvement of work-related accidents and Socio-demographic Characteristics among Private and Public Sector

In the present analysis, respondents were interrogated on the involvement of work-related accidents and socio-demographics and how they are associated with the working sector (Table 4.2). The results found gender and involvement in work-related accidents to be significantly associated (less than 0.001; $X^2 = 21.463$). The study rejected the null hypothesis (H_0) that gender and involvement in work-related accidents had no statistically significant

association. More females ($n=51$; 53.7%) in the private sector were involved in accidents compared to the public sector. The age of participants and involvement in work-related accidents was associated with the private and public sector workers ($p = 0.004$; $X^2 = 8.405$). Those 36 years and above in both sectors constituted the majority who were involved in work-related accidents. The working sector of participants did not show any significant difference ($p = 0.488$; $X^2 = 0.481$) with the involvement of accidents and marital status. Therefore the study rejects the null hypothesis (H_0) that marital status and involvement in work-related accidents are associated with the working sector of respondents. Similarly, the number of children and involvement in work-related accidents showed no significant difference ($p = 0.797$; $X^2 = 0.066$) among the working sector of participants. However, those with children 5 and below recorded the highest accidents among both sectors. The involvement of work-related accidents reduced with an increase in a higher level of education. The level of education and involvement in accidents showed no statistically significant difference with the working sector of participants ($p > 0.326$; $X^2 = 0.964$). Similarly, the working sector of respondents found no statistically significant relationship ($p = 0.203$; $X^2 = 1.618$) between involvement in accidents and employment status. In the private (67.4%) and public (57.7%) sectors, permanent employees formed the majority of those involved in work-related accidents. Among the private sector, those that earned GHC599 and below were the majority involved in work-related accidents while in the public sector, it was the majority that earned GHC600 and above. The working sector found a statistically significant relationship between monthly income and involvement in accidents

(less than 0.001; $X^2 = 32.917$). The involvement of work-related accidents and socio-demographic characteristics like previous work experience elsewhere ($p = 0.737$; $X^2 = 0.113$) and years of experience in the current job ($p = 0.325$; $X^2 = 0.969$) found no statistically significant relationship with the sector of work. The study found that the majority of public sector (52.7%) workers who were involved in work-related accidents had no previous work experience elsewhere as compared to the private sector which had the majority (50.5%) with work experience elsewhere. Among both sectors, the majority of those with 10 years and below working experience recorded the highest involvement in work-related accidents. Those involved in work-related accidents among the private ($n=61$; 64.2%) and public ($n=45$; 63.4%) sectors were those with part-time job and this was not statistically significant ($p = 0.912$; $X^2 = 0.012$).

Table 4.2 Analysis of Demographics and Involvement in Work-related Accidents among the Private and Public sectors

VARIABLES	Involvement in work-related accidents				
	Private Sector		Public Sector		(p-value) (X^2)
	Yes: n (%)	No: n(%)	Yes: n (%)	No: n(%)	
Gender (n=385)					
Males	44 (46.3)	47 (29.0)	58 (81.7)	41 (71.9)	<0.001 (21.463)
Females	51 (53.7)	115 (71.0)	13(18.3)	16 (28.1)	
Age range (n=385)					
35 and below	26 (27.4)	33 (23.0)	33 (49.3)	16 (39.8)	0.004 (8.405)
36 and above	69 (72.6)	129 (77.0)	129 (50.7)	49 (60.2)	
Marital Status (n=385)					
Single	21 (22.1)	30 (18.5)	19 (26.8)	6 (10.5)	0.488 (0.481)
Married/Divorced/Separated & Widowed	74 (77.9)	132 (81.5)	52 (73.2)	51 (89.5)	
No. of Children (n=385)					
5 and below	57 (60)	95 (58.6)	44 (62.0)	34 (59.6)	0.797 (0.066)
6 years and above	38 (40.0)	67 (41.4)	27 (38.0)	23 (40.4)	

VARIABLES	Involvement in work-related accidents				
	Private Sector		Public Sector		(p-value) (X ²)
	Yes: n (%)	No: n(%)	Yes: n (%)	No: n(%)	
Educational Level (n=385)					
Up to Basic School Education	84 (88.4)	139 (85.8)	59 (83.1)	42 (73.7)	0.326 (0.964)
Above Basic School Education	11 (11.6)	23 (14.2)	12 (16.9)	15 (26.3)	
Employment Status (n=385)					
Casual/Part-time	31 (32.6)	34 (21.0)	30 (42.3)	25 (43.9)	0.203 (1.618)
Permanent	64 (67.4)	128 (79.0)	41 (57.7)	32 (56.1)	
Monthly Income(GHC) (n=385)					
GHC599 and below	73 (76.8)	142 (87.7)	23 (32.4)	22 (38.6)	<0.001 (32.917)
GHC600 and above	22 (23.2)	20 (12.3)	48 (67.6)	35 (61.4)	
Previously Worked elsewhere (n=385)					
Yes	48 (50.5)	51 (31.5)	34 (47.9)	32 (56.1)	0.737 (0.113)
No	47 (49.5)	111 (68.5)	37 (52.1)	25 (43.9)	
Part-time job (n=381)					
Yes	61 (64.2)	82 (51.2)	45 (63.4)	31 (56.4)	0.912 (0.012)
No	34 (35.8)	78 (48.8)	26 (36.6)	24 (43.6)	
Years of Experienced in my current job (n=383)					
10 years and below	73 (78.5)	129 (79.6)	51 (71.8)	38 (66.7)	0.325 (0.969)
11 years and above	20 (21.5)	33 (20.4)	20 (28.2)	19 (33.3)	

4.3 Work-related hazards among sanitary workers

Figure 4.1 presents an analysis of responses on work-related hazards among study respondents. As indicated in the Figure below, private-sector workers formed the majority (n=95; 57.3%) of study respondents that were involved in work-related accidents. Among the public sector workers 62.0%, 26.8%, 4.2% and 7.0% reported incidents of accidents since being employed once, twice, three times and severally respectively.

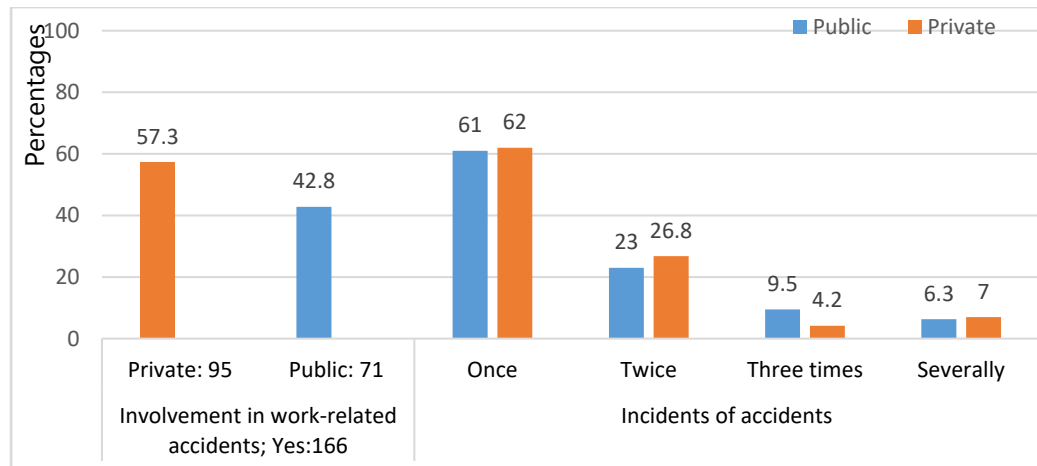


Figure 4.1 Involvement and Incidents of Work-related Accidents

4.4. Prior experience with work-related accidents, common illnesses and interventions

Table 4.3 shows an analysis of prior experience with work-related accidents, common illnesses and interventions. Among some of the accidents described by private-sector workers, 24.0% stated puncture or being pricked by an object, 11.2% as tripping, slipping or/and falling and 8.5% as being cut or scratched by an object. In the public sector, more than one quarter (n=35; 27.6%) of respondents described puncture or being pricked by an object as their major accident whereas 27 (21.3%) described tripping, slipping or/and falling as their accident. Some of the other accidents described include crashes, animal bites and knock by objects. Among both sectors, most in the private sector (n=85; 89.1%) and public sector (n=64; 90.1%) stated that their accident did not occur in the presence of a supervisor. Majority (89.1%) of the respondents in the private sector used self-medication as the mode of healthcare, while in the public sector majority (n=64; 56.3%) indicated they visited the clinic/hospital. With respect to accidents, majority of respondents

(85.9%) from the private sector were made to pay for their treatment while their public sector counterparts (53.5%) stated they were financed by their employers. Among both sectors, greater proportion of respondents (private 87.4% and public 52.1%) did not get a refund of medical expenses even though a considerable number had it in the public sector. As indicated in the Table concerning respondents who had experience illnesses, the private and public sanitary sector workers reported respiratory infection (n=176; 68.2% and n=81; 63.2% respectively), skin diseases (n=45; 17% and n=29; 22.8% respectively), musculoskeletal issues (n=201; 77.8% and n=88; 69.3% respectively), etc.

Table 4.3 Assessment of Prior Experience with Work-related Accidents, Common Illnesses and Interventions

Variable	PRIVATE SECTOR	PUBLIC SECTOR
	NUMBER (%)	NUMBER (%)
Type of accident (n=166)		
Cut or scratched by a sharp object	22 (8.5)	14 (11)
Puncture or prick from objects	62 (24)	35 (27.)
Trip, Slip or/and fall	29 (11.2)	27 (21.3)
Crash (Vehicle, wall etc)	4 (1.6)	5 (3.9)
Animal bite (snake, insects etc.)	1 (0.4)	3 (2.4)
Knock by an object	9 (3.5)	8 (6.3)
Accident occurrence in the presence of a supervisor		
Yes	10 (10.5)	7 (9.9)
No	85 (89.5)	64 (90.1)
In the case of an accident, what is the mode of healthcare		
Self-medication	79 (83.2)	24 (33.8)
Clinic/Hospital	9 (9.5)	40 (56.3)
It depends on the injury	7 (7.4)	14 (9.9)
Who pays for the cost of treatment?		
Employer sometimes	8 (8.4)	9 (12.7)
Employer always	2 (2.1)	38 (53.5)
Self-financing always	85 (89.5)	24 (33.8)

Variable	PRIVATE SECTOR	PUBLIC SECTOR
	NUMBER (%)	NUMBER (%)
Refund of medical expenses on work-related injuries/ casualties/ accidents		
Yes	9 (9.5)	33 (46.5)
No	83 (87.4)	37 (52.1)
Sometimes	3 (3.2)	1 (1.4)
Types of Illness		
Respiratory Infections	176 (68.2)	81 (63.8)
Skin diseases	45 (17.4)	29 (22.8)
Musculoskeletal issues	201 (77.9)	88 (69.3)
Gastro-Intestinal infection	11 (4.3)	7 (5.5)
Hearing losses	22 (8.5)	9 (7.1)
Eye problems	45 (17.4)	15 (11.8)

4.5 Analysis of Work-related Hazards among Private and Public Sanitary Workers

The odd ratio and chi-square test of independence showed involvement in accidents and differences in the exposures to accidents and illnesses within the public and private sector workers. As indicated in the Table 4.3 above, 55.5% of the public sector workers were involved in accidents while 63.0% were reported to the private sector. This was statistically significant ($p < 0.05$). Workers in the public sector were twice more likely to be involved in accidents than the private sector workers. The results indicating the types of accidents only found a statistically significant association among respondents of private and public sector workers in exposure to trip, slip and/or fall ($P = 0.016$). The result showed that private-sector workers had about twice an odd of experiencing trip, slip and/or fall ($OR = 2.10$) as compared to public sector workers. Thus, it is deduced that sanitary workers in the public sector are twice more likely to experience trip, slip and/or falls than their counterparts in the private sector. However, results among the respondents in the private and

public sector and various ailments showed no statistically significant association ($p>0.05$).



Table 4.4 An Analysis to Show Prior Experience with Work-related Accidents and Common Illnesses among the Sectors

Variable	PRIVATE SECTOR		PUBLIC SECTOR		OR (95%, CI)
	Yes	No	Yes	No	
	n (%)	n (%)	n (%)	n (%)	
Involvement in accidents	95 (37.0)	162 (63.0)	71 (55.5)	57 (44.5)	2.12 (1.38-3.27)
Type of accident					
Cut or scratched by a sharp object	22 (8.5)	236(91.5)	14 (11.0)	113(89.0)	1.33 (0.66-2.69)
Puncture or prick from objects	62 (24.0)	196(76.0)	35 (27.6)	92(72.4)	1.20 (0.74-1.95)
Trip, Slip or/and fall	29(11.0)	229(88.8)	27 (21.3)	100(78.7)	2.13 (1.20-3.79)
Crash (Vehicle, wall, etc.)	4(1.6)	254(98.4)	5 (3.9)	122(96.1)	2.60 (0.69-9.86)
Animal bite	1(0.4)	257(99.6)	3 (2.4)	124 (97.6)	6.22 (0.69-60.39)
Knock by an object	9(3.9)	249(96.5)	8 (6.3)	119(93.7)	1.86 (0.70-4.94)
Types of Illness					
Respiratory Infections	176(68.2)	82(31.8)	81(63.8)	46(36.2)	0.82 (0.52-1.28)
Skin diseases	45(17.4)	213(82.6)	29(22.8)	98(77.2)	1.40 (0.83-2.37)
Musculoskeletal issues	201(77.9)	57(22.1)	88(69.3)	39(30.7)	0.64 (0.40-1.03)
Gastro-Intestinal infection	11(4.3)	247(95.7)	7(5.5)	120(94.5)	1.31 (0.50-3.46)
Hearing losses	22(8.5)	236(91.5)	9(7.1)	118(92.9)	0.82 (0.37-1.83)
Eye problems	45(17.4)	213(82.6)	15(11.8)	112(88.2)	0.63 (0.34-1.19)

OR: Odd Ratio, CI: Confidence interval

4.6 Healthcare Interventions against Accidents and Common Illnesses

Figure 4.2 shows results among private and public sector workers on healthcare interventions against accidents and common diseases. Majority of respondents in the public (80.3%) and private (80.6%) sectors reported owning an NHIS card without necessarily showing whiles among those that confirmed by showing it the private and public sector were 4.7% and 12.5 respectively. In the case of common illnesses majority (75%) from the public sector said it was mandatory for them to visit a health care facility as compared to the private sector (93.4%). The majority in both the public (93.8%) and private (52.9%) stated that it was mandatory for their employers to pay medical expenses.

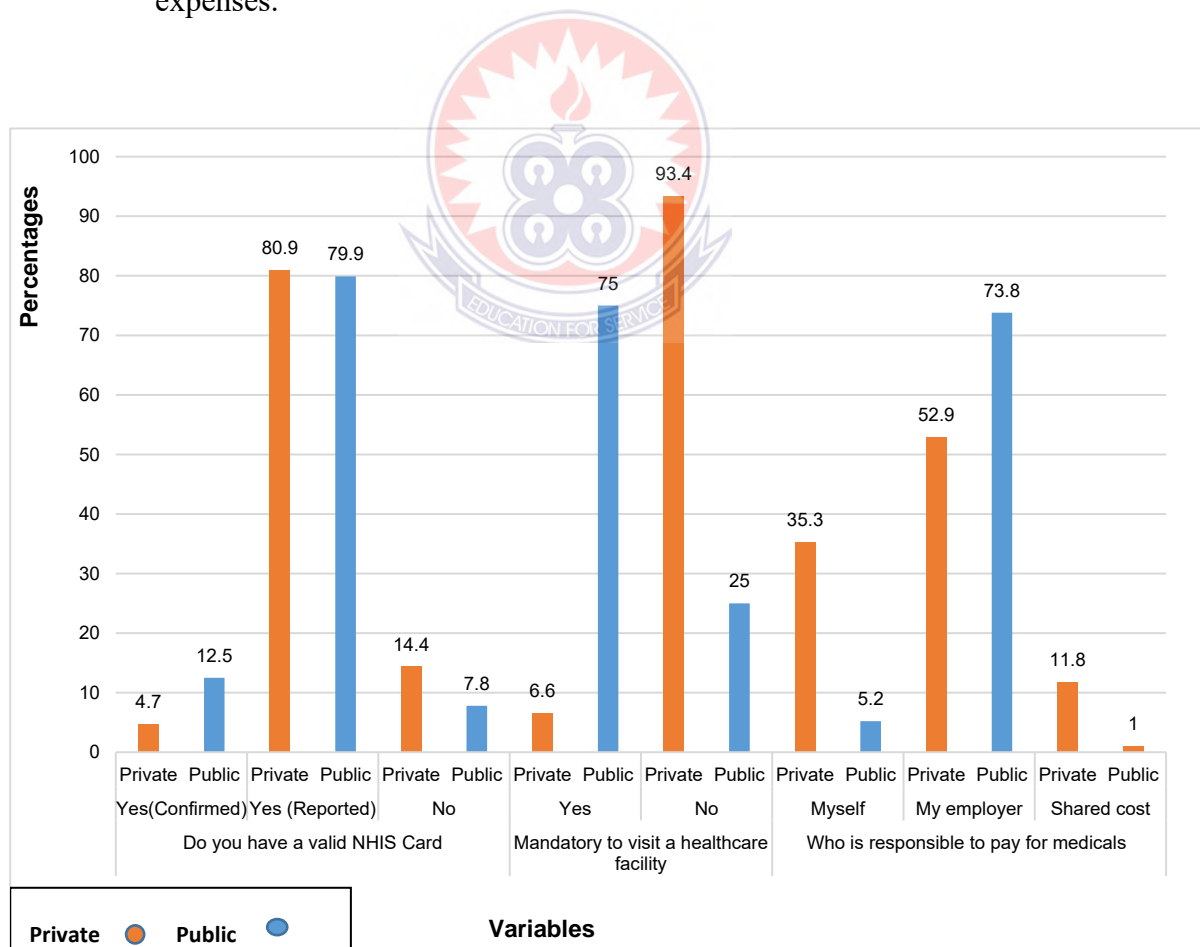


Figure 4.2 Healthcare Interventions

4.7 Measures to protect against occupational health and safety risks

4.7.1 Training before Employment Schedules

Table 4.5 and Figure 4.3.1 and 4.3.2 are results of safety measures. Among both sectors, the majority in the public (n=105; 82.7%) and private (n=164; 63.6%) sectors were trained before employment schedules. In the in-service training, majority (134; 51.9%) in the private sector were not trained as compared to their counterparts in the public sector (82; 64.6%). Both sessions of training had some of the following programs work-related issues, safety practices, administrative issues etc. Among the training before employment schedules 81.9%, 52.8%, 16.5%, 10.2% and 8.7% were trained in work-related issues, safety issues, work ethics, administrative issues and pension schemes respectively.

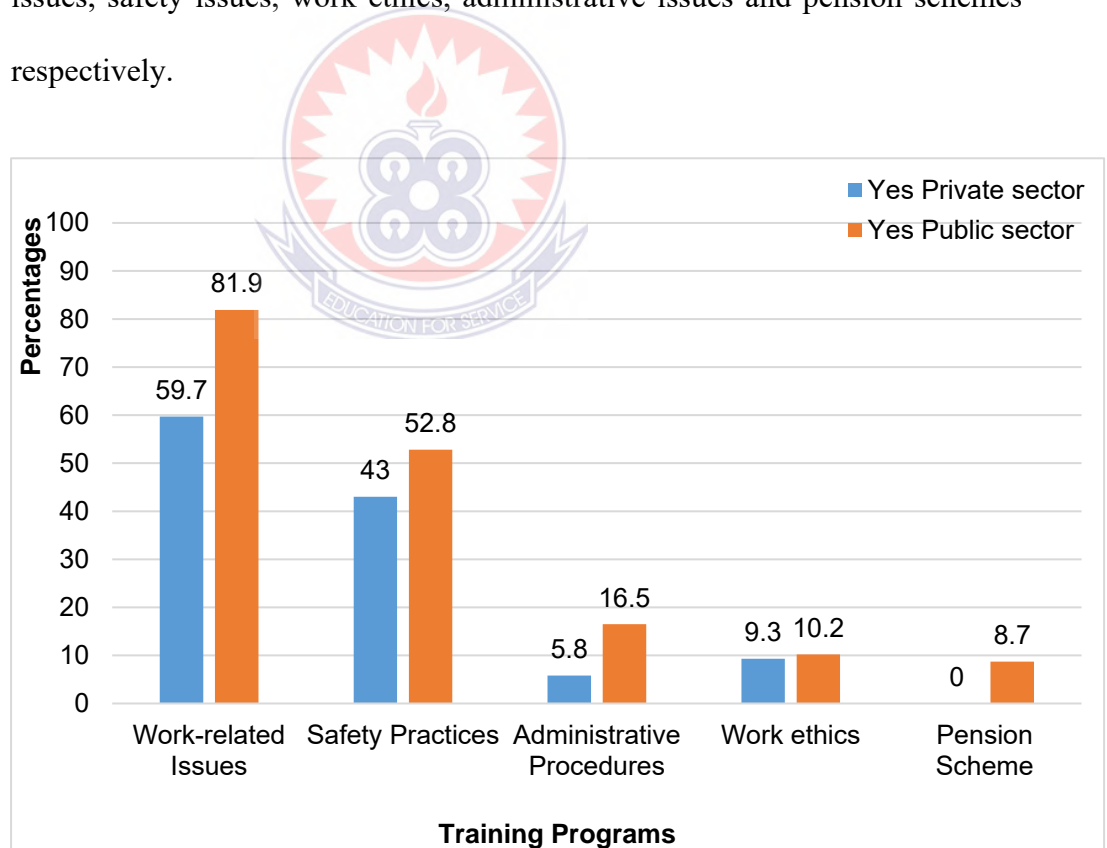
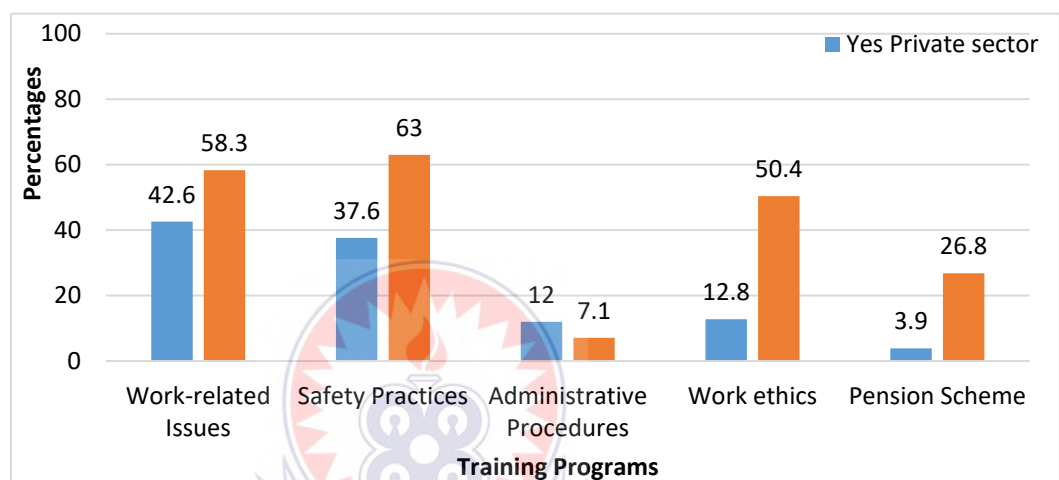


Figure 4.3.1 Training Before Employment Programs

Table 4.5 Summary of Responses on Health and Safety Measures

VARIABLES	PRIVATE SECTOR		PUBLIC SECTOR	
	YES n (%)	NO n (%)	YES n (%)	NO n (%)
Training before employment	164 (63.6)	94 (36.4)	105 (82.7)	22 (17.3)
Training whiles in employment	124 (48.1)	134 (51.9)	82 (64.6)	45 (35.4)
Awareness on institutional OHS	71 (27.6)	186 (72.4)	70 (54.7)	58 (45.3)

**Figure 4.3.2 Training whiles in Employment Programs**

4.7.2 Awareness of Institutional OHS Safety Policy

Table 4.5 shows the results of respondents that were aware of their institutional health and safety policy. Majority of the respondents in the private sector (n=186; 72.4%) were unaware of their institutional health and safety policy compared to their public sector counterparts (n=70; 55.1%).

4.8 Analysis of some Measures to Promote Health and Safety

The analysis in Table 4.6 shows the training sessions and involvement in work-related accidents in the private and public sectors. Among those that had training before employment schedules, majority (n=111; 67.7%) from the

private sector had not been involved in work-related accidents before whiles in the public sector the majority (n=55; 52.4%) had involvement before. The results among those that had training before employment schedules and were involved in work-related accidents, showed a statistically significant relationship. The result showed that public sector workers who had been trained were about twice more likely to be involved in a workplace accident. The private sector participants that had training whiles in employment were in the minority (36.3%) compared to those in the public sector (n=46; 56.1%). This was statistically significant ($P < 0.05$). Again, public sector workers were about 2 times more likely to be involved in accidents as compared to private-sector workers. The results among the private sector workers on awareness of their institutional health and safety policy showed the majority (62.0%) were not involved in work-related accidents whereas in the public sector the number of people involved in the accident (50.0%) was the same as those without accidents (50%). The results showed no statistically significant difference.

Table 4.6 Assessment Involvement with Work-related Accidents and Specific Variables among the Sectors

Variables	Private Sector		Public Sector		Odds Ratio (95% CI)
	Yes n (%)	No n (%)	Yes n (%)	No n (%)	
Training before employment	53 (32.3)	111 (67.7)	55 (52.4)	50 (47.6)	2.30 (1.39, 3.81)
Training whiles in employment	45 (36.3)	79 (63.7)	46 (56.1)	36 (43.9)	2.24 (1.27, 3.96)
Awareness to institutional OHS policy	27 (38.0)	44 (62.0)	35 (50.0)	35 (50.0)	1.63 (0.83, 3.19)

4.9 Periodic Medical Screening/Check-ups

Majority of respondents (n=245; 95.3%) in the private sector had no periodical check-up compared to their public sector (n=78; 60.9%) counterparts. Greater proportion of respondents in the private (n=7; 58.3%) and public (n=43; 55.1%) often undertook their medical checkups between 1 and 3 years. Among each of them the private (n=7; 58.3%) and public (n=43; 55.1%) had their last medicals between 1 and 3 years ago. Among the private sector respondents that had medical checkups, the majority (n=8; 66.7%) paid for their bills whereas in the public sector the majority (n=74; 94.9%) had their bills paid for by their employers. 25% of the private sector workers had their medical check-ups paid off by their employers while 2.6% in the public sector paid themselves. Medical screening was compulsory for almost all the public sector workers who undertook the screening (n=71; 92.3). In the private sector medical screening was not compulsory for half of the respondents who said yes and half who said no among those who undertook the medical screening.

Tables 4.7 Summary of Medical Screening Undertaken

Variable	PRIVATE SECTOR	PUBLIC SECTOR
	NUMBER (%)	NUMBER (%)
Is there periodic medical check-ups/screening for workers?		
Yes	12 (4.7)	78 (60.9)
No	245 (95.3)	50 (39.1)
How often is the medical checkup undertaken?		
Yearly	2 (16.7)	8 (10.3)
Between 1 and 3 years	7 (58.3)	43 (55.1)
Once since being employed	3 (25)	24 (30.8)
Never	0 (0)	3 (3.8)
Last time medical screening was done for workers?		
Last year	2 (16.7)	10 (12.8)
Between 1 and 3 years Ago	4 (33.3)	32 (41.0)
Once since being employed	6 (50)	27 (34.6)
Never	0 (0)	9 (11.5)
Who pays for the cost of medical check-ups/screenings?		
Myself	8 (66.7)	2 (2.6)
My employer	3 (25.0)	74 (94.9)
Shared cost	1 (8.30)	2 (2.6)
Was medical screening for workers compulsory?		
Yes	6 (50.0)	72 (92.3)
No	6 (50.0)	6 (7.7)

4.10 Results of PPE Demanded and PPE Required

Table 4.8 indicates the results of PPE's required and PPE's provided. The highest personal protective equipment provided to participants in the private sector and in descending order are gloves (93.0%), safety boots (91.9%) and nose masks (91.9%) whereas in the public sector are nose masks (95.3%), gloves (94.5%) and safety boots (93.7%). In both sectors, respirators recorded the least PPE (private (n=10; 3.9%) and public (n=10; 7.9%).

Table 4.8 Analysis of PPE Demanded and PPE Required

PPE's	Private Sector		Public Sector	
	Provided N (%)	Required N (%)	Provided N (%)	Required N (%)
Helmet	102 (39.5)	137 (53.1)	48 (37.8%)	68 (53.5%)
Nose mask	237 (91.9)	247 (95.7)	121 (95.3%)	124 (97.6%)
Gloves	240 (93.0)	247 (95.7)	120 (94.5%)	127 (99.2%)
Safety Boots	237 (91.9)	250 (96.9)	119 (93.7%)	126 (99.2%)
Goggles	73 (28.3)	165 (64.0)	46 (36.2%)	87 (68.5%)
Safety overall	221 (85.7)	247 (95.7)	112 (88.2%)	123 (96.9%)
Respirators	10 (3.9)	39 (15.1)	10 (7.9%)	23 (18.1%)
Reflective vest	149 (57.8)	222 (86.0)	78 (61.4%)	93 (73.2%)
Rain Coat	176 (68.2)	236 (91.5)	92 (72.4%)	121 (95.3%)
Cap	30 (11.6)	61 (23.6)	18 (14.2)	22 (17.3)

4.11 Awareness of occupational health and safety at the workplace

Greater proportion (n=186; 72.4%) of the respondents in the private sector were unaware of policy guiding institutional health and safety compared to the public sector (n=70; 54.7%). Among both sectors, greater proportion of the private (67.9%) and public (64.7%) had only been told of the existence of an institutional occupational health and safety policy without seeing it. Among those who had neither seen nor been informed of the policy 25 (30.9%) and 21 (30.9%) were among the private and public sector respectively. Among the respondents that were aware of their institutional health and safety policy, majority from the private (64.8%) and public (50.9%) stated they were supposed to be given personal protective equipment. 13% of the private sector workers and 18.9% of the public sector workers stated they were to be given medical attention as part of their occupational health policy requirement. Some of the issues that motivated respondents to prevent or minimize injury include the need to prevent the cost of injury, the need to avoid chronic injury,

the need to ensure the safety of others and the need to prevent one from losing his or her job. Details shown in Table 4.9.

Table 4.9 Assessing the Awareness and Motivation to Prevent/Minimize Workplace Injury or Accident

VARIABLES	PRIVATE	PUBLIC
	NUMBER (%)	NUMBER (%)
Awareness of company/ institutional policy on workplace health and safety		
Yes	71 (27.6)	70 (54.7)
No	186 (72.4)	58 (45.3)
If yes, have you seen/been informed of it		
Yes, I have seen the document	1 (1.2)	3 (4.4)
Yes I was told it exists	55 (67.9)	44 (64.7)
No	25 (30.9)	21 (30.9)
If yes, state that policy which is concerned with health and safety		
To be given Medical attention	(13)	10 (18.9)
To be given PPE for once working	35 (64.8)	27 (50.9)
Not sure	12 (22.2)	16 (30.2)
What motivates you to prevent or minimize injury?		
Reduce/prevent the cost of injury	85 (36.3)	58 (47.5)
Avoid chronic injury	84 (35.9)	60 (49.2)
To ensure the safety of others	4 (1.7)	2 (1.6)
In order not to lose the job	61 (26.1)	2 (1.6)

4.12 Activities and Work-related Hazards Associated with various Sanitary Services

4.12.1 Work-related Hazard Associated with Sweepers

The psychological hazard with the highest average risk score among street sweepers includes being looked down upon and verbal abuse (average risk score: 10) while direct eye contact with dust, inhalation of dust and/or smoke and direct contact with infectious waste constitutes the highest biological hazards with an average risk of also 10. Among the ergonomic hazards, repetitive movement of the hand and bending for a long time recorded the

highest average risk score whereas assault by a madman, thief, etc. is the physical hazard with the highest average risk score (8). All these hazards are categorized as medium risk and therefore have acceptable risk scores which require no safety measures. Figure 4.1 shows the details.

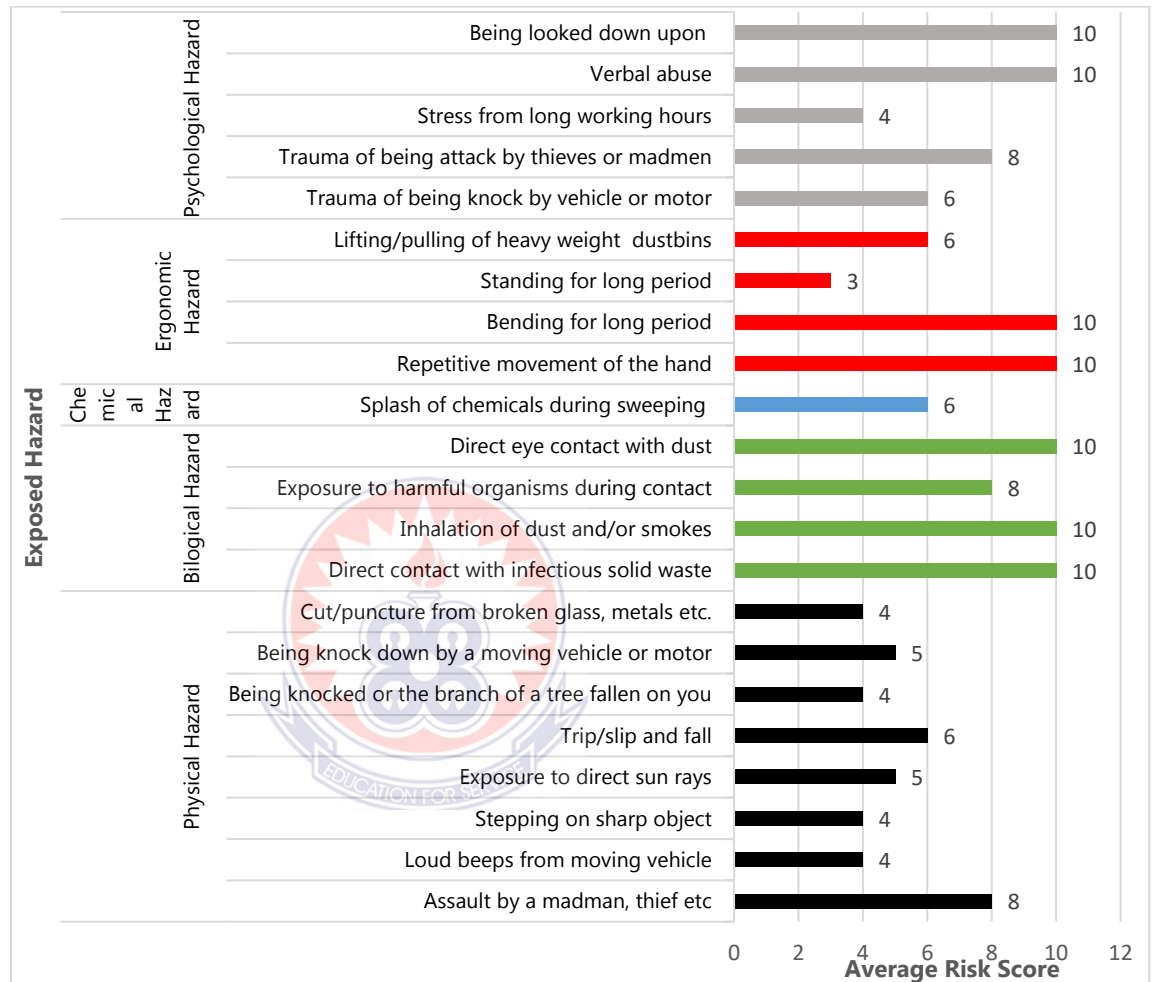


Figure 4.1: Average Risk Score of Sweepers

4.12.2 Work-related Hazard Associated with Janitors (Conservancy cleaner)

Figure 4.2 shows the risk scores of Sanitary Janitors. Among Janitors belittling is the hazard (psychological) with the highest average risk score (10) and is classified as a medium risk whereas repetitive movement of the hand and bending for long period is an ergonomic hazard with the highest average risk

score of 5 and is categorized as low risk. An average risk score of 6 represents puncture or being pierced by a sharp object (physical hazard) which is classified as a medium risk while inhalation of foul smell is a biological hazard with an average risk of 8 which also represents a medium risk. The only chemical hazard exposure to janitors is coming into contact with chemicals used in cleaning and it has an average risk score of 3 which is also a medium risk. All these hazards have acceptable risk scores which require no safety measure to be implemented.

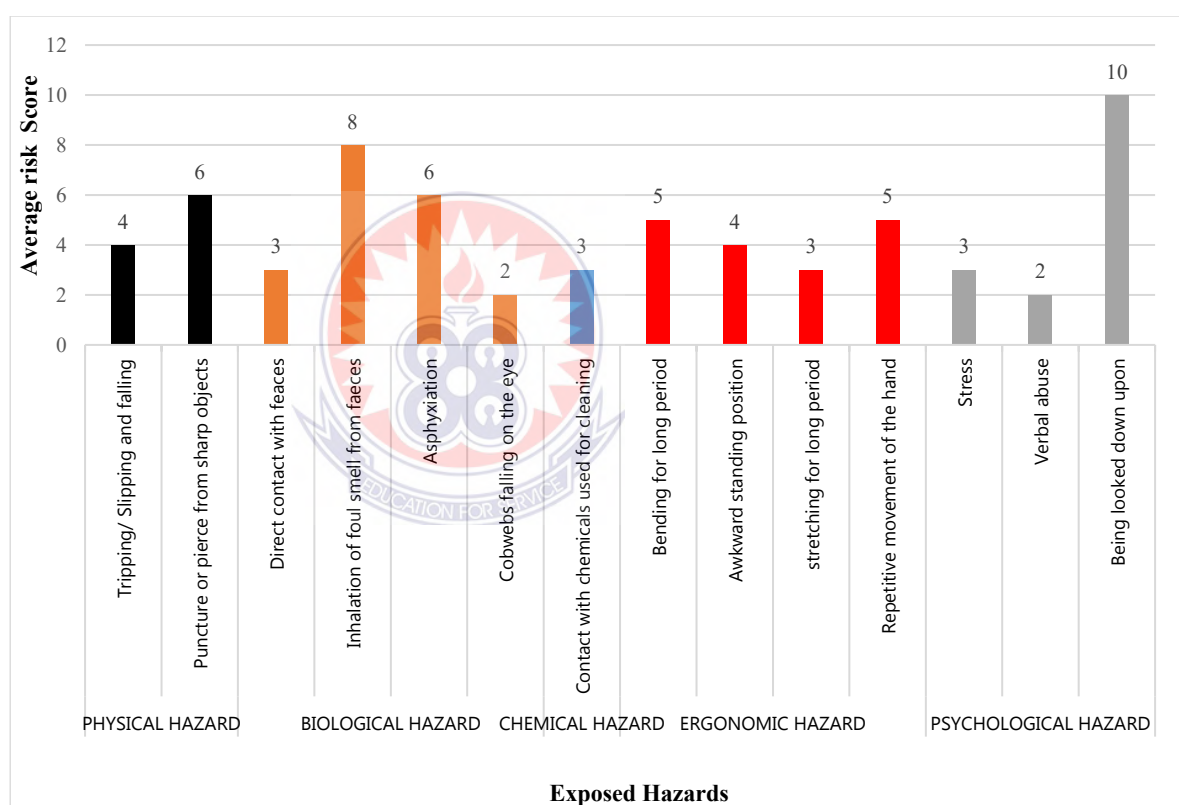


Figure 4.2: Average Risk Score of Janitors

4.12.3 Work-related Hazards Associated with Office Cleaners

Figure 4.3 shows the risk scores of Office cleaners. The highest average risk score of an office cleaner is 10 and the risk is a shock from bare wire and it is a physical hazard that represents a medium risk. The highest ergonomic hazard

is lifting of heavy materials and the average risk score is 6 which is also classified as a medium risk whereas inhalation of chemicals used for cleaning constitutes the most dominant chemical hazard with an average risk score (4) which represents a low risk. Direct contact with harmful waste is the only biological hazard exposure to office cleaners and the average risk is 4 which represent a low risk while psychological hazard like being looked down upon constitutes the highest average risk score of 4 which also represents a low risk. All these hazards have an acceptable risk that requires no safety measure.

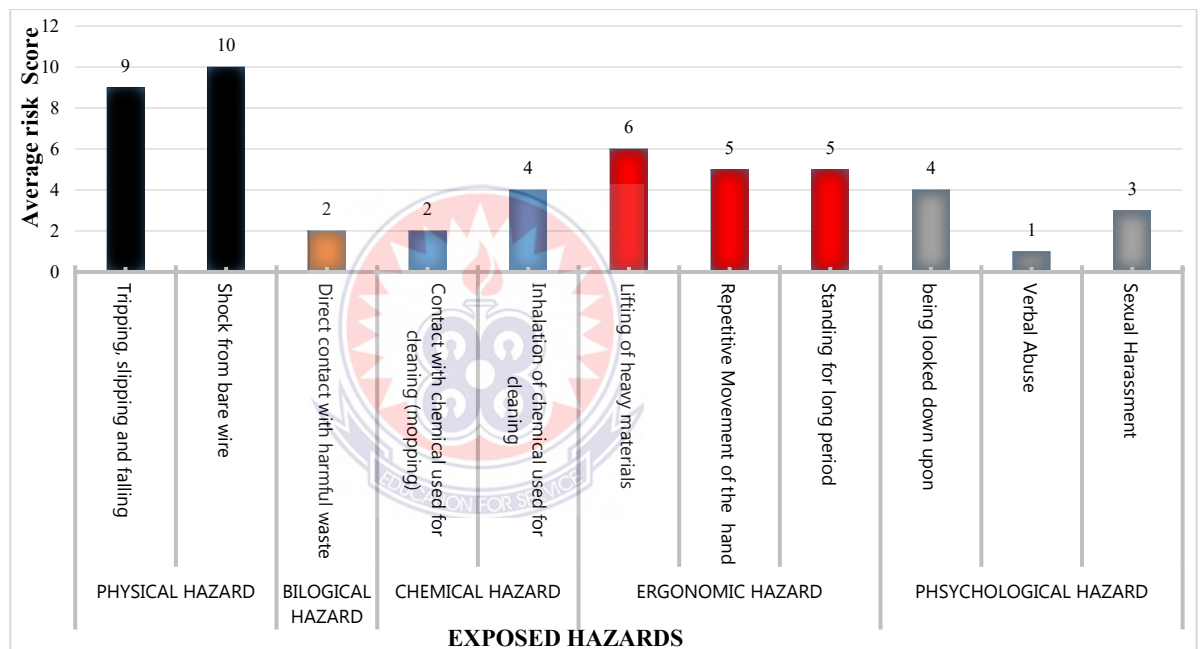


Figure 4.3: Average Risk Score of Office Cleaners

4.12.4 Work-related Hazard Associated with Fumigators

The highest risk score of 10 constitutes hazards like awkward standing posture when carrying a machine at the back (Ergonomic hazard) and being bitten by rodents and other harmful organisms when fumigating (Biological hazard) which are all medium risk. The highest average risk of 6 represents a medium risk for tripping, slipping or/and falling (physical hazard). Verbal abuse from

passers (psychological hazard) and inhalation or egestion of chemicals while in use (chemical hazard) constitutes some of the dominant hazards with an average risk of 3 and 6 which represents low and medium risk respectively. All the hazards exposed to fumigators have an acceptable risk that requires no safety measure. Details are shown in Figure 4.4.

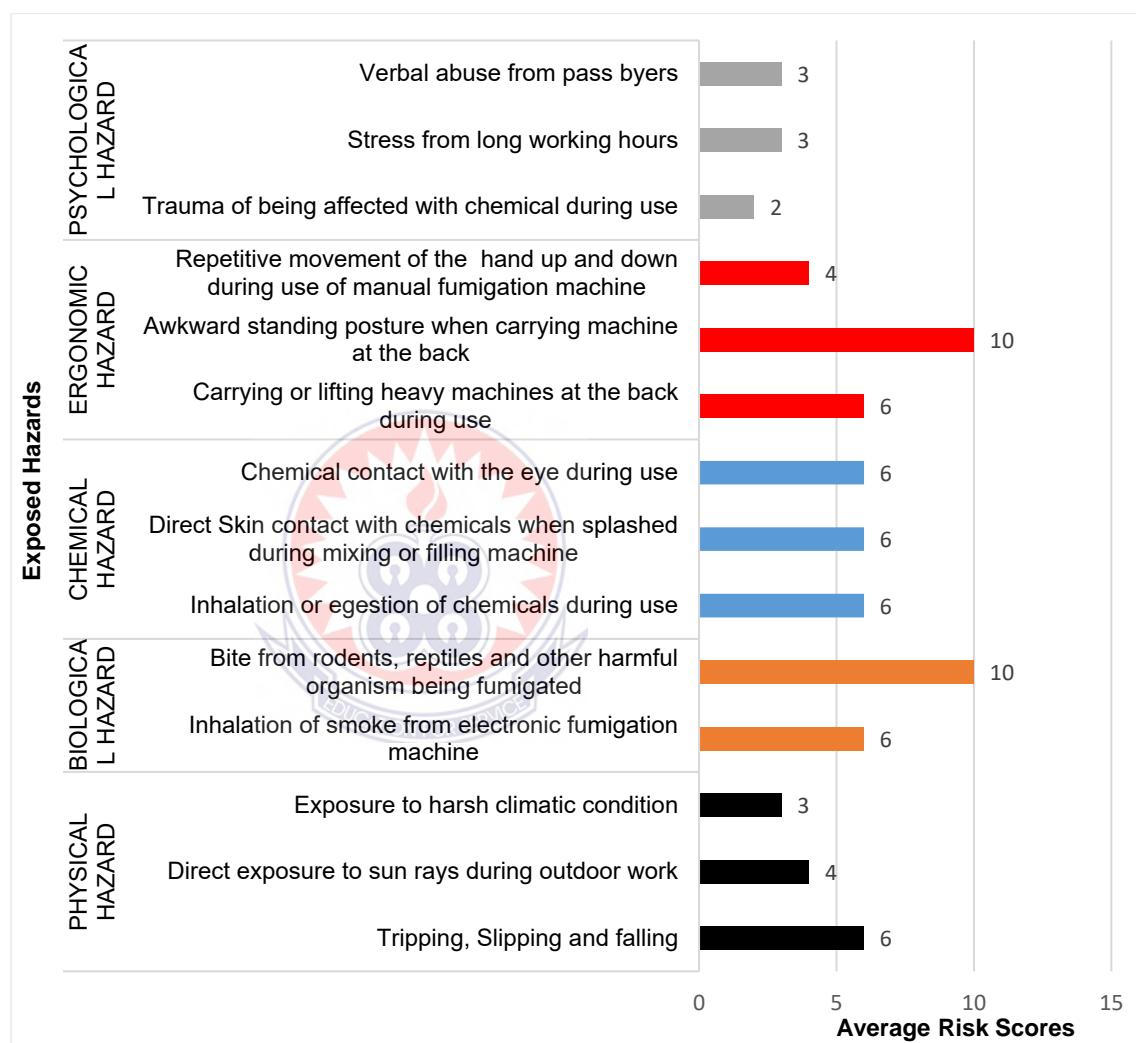


Figure 4.4 Average Risk Score of Fumigators

4.12.5 Work-related Hazard Associated with Informal Solid Waste Collectors

Figure 4.5 shows the results of the highest average risk scores of Informal Solid Waste Collectors. Among the Informal Solid Waste Collectors, slipping,

tripping and/or falling from the back of a tricycle is a physical hazard with an average risk of 12 and is classified as a high risk whereas the highest average risk of 10 constitutes a psychological hazard like being looked down upon which is medium risk. Six (6) is the highest risk score for an ergonomic hazard like dragging heavy dustbins without wheels while a biological hazard like inhalation of dust is with an average risk score of 8 which are all medium risk. All the hazards have an acceptable value score except tripping, slipping and/or falling which value score is unacceptable.

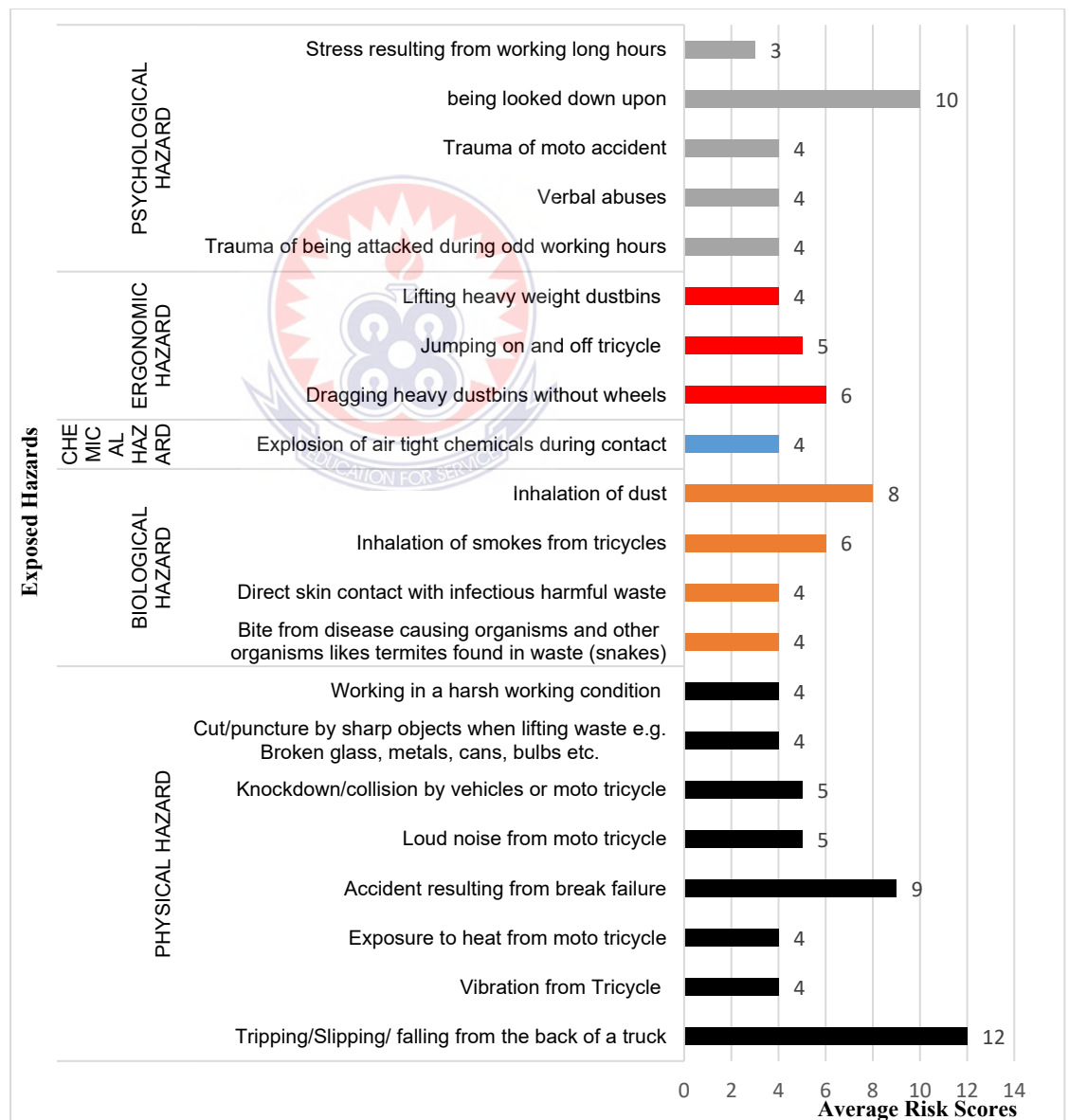


Figure 4.5 Average Risk Score of Informal Solid Waste Collectors

4.12.6 Work-related Hazard Associated with Formal Solid Waste Collectors

Figure 4.6 shows the highest average risk scores of formal solid waste collectors. Some of the hazards with the highest average risk of formal solid waste collectors is 10 representing medium risk. This constitutes hazards like belittling (psychological hazard), lifting or pulling heavy dustbins (ergonomic hazard) and inhalation of harmful waste materials (biological hazard). A physical hazard like tripping, slipping or/and falling from the back of a truck has an average risk score of 8 which represents a medium risk. All these hazards have acceptable risk scores and therefore require no safety measure.

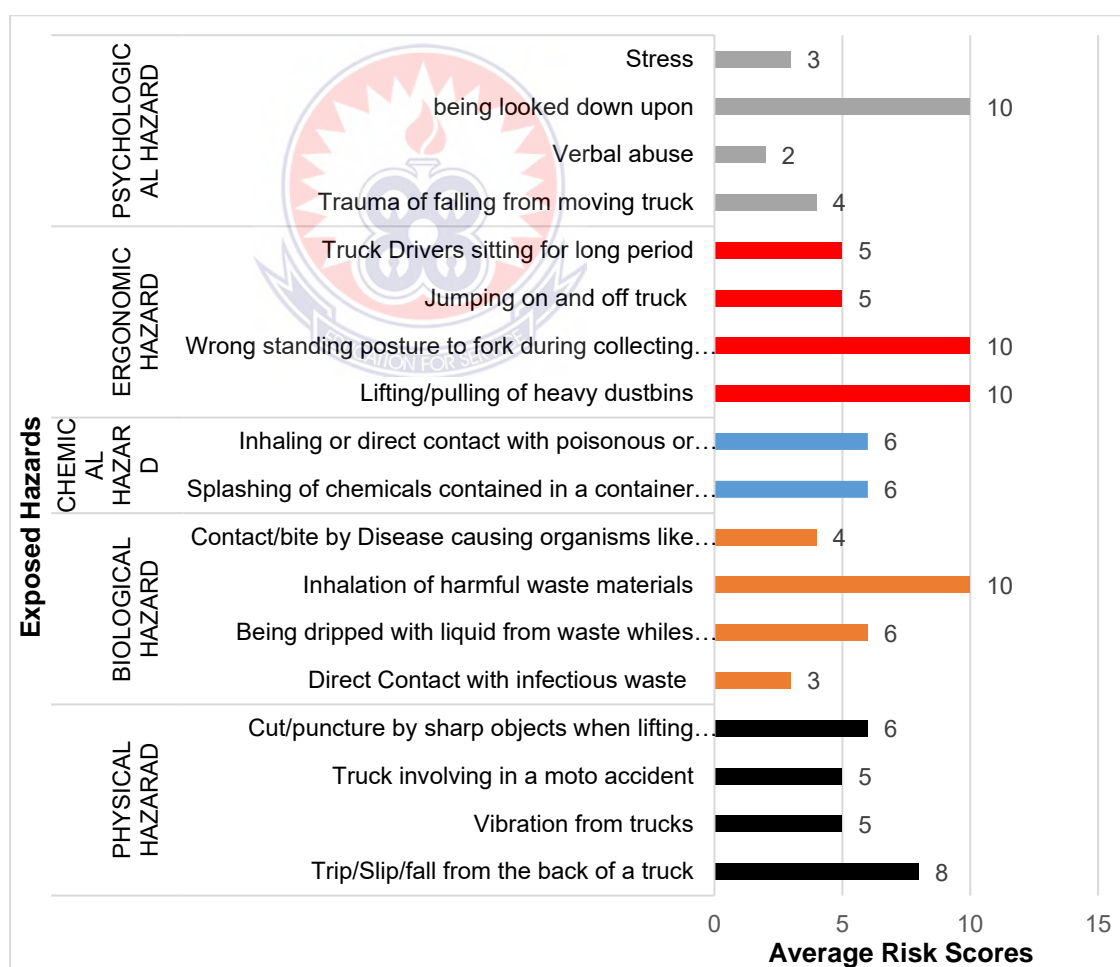


Figure 4.6 Average Risk Score of Formal Solid Waste Collectors

4.12.7 Work-related Hazard Associated with Toilet Emptiers

Among toilet emptiers, asphyxiation is the highest biological hazard with an average risk score of 15 which represents a high risk. The trauma of falling into a deep tank (average risk score of 8 represents a medium risk) constitutes one of the psychological hazards whereas repetitive movement of the hand constitutes one of the highest physical hazards with an average risk score of 8 and represents a medium risk. Slab falling and hitting the toe is a physical hazard with an average risk score of 6 which also represents a medium risk. Except for asphyxiation which has a high average risk score and therefore recommends a safety measure, all the other hazards have an acceptable risk and require no safety measure. Details are shown in Figure 4.7

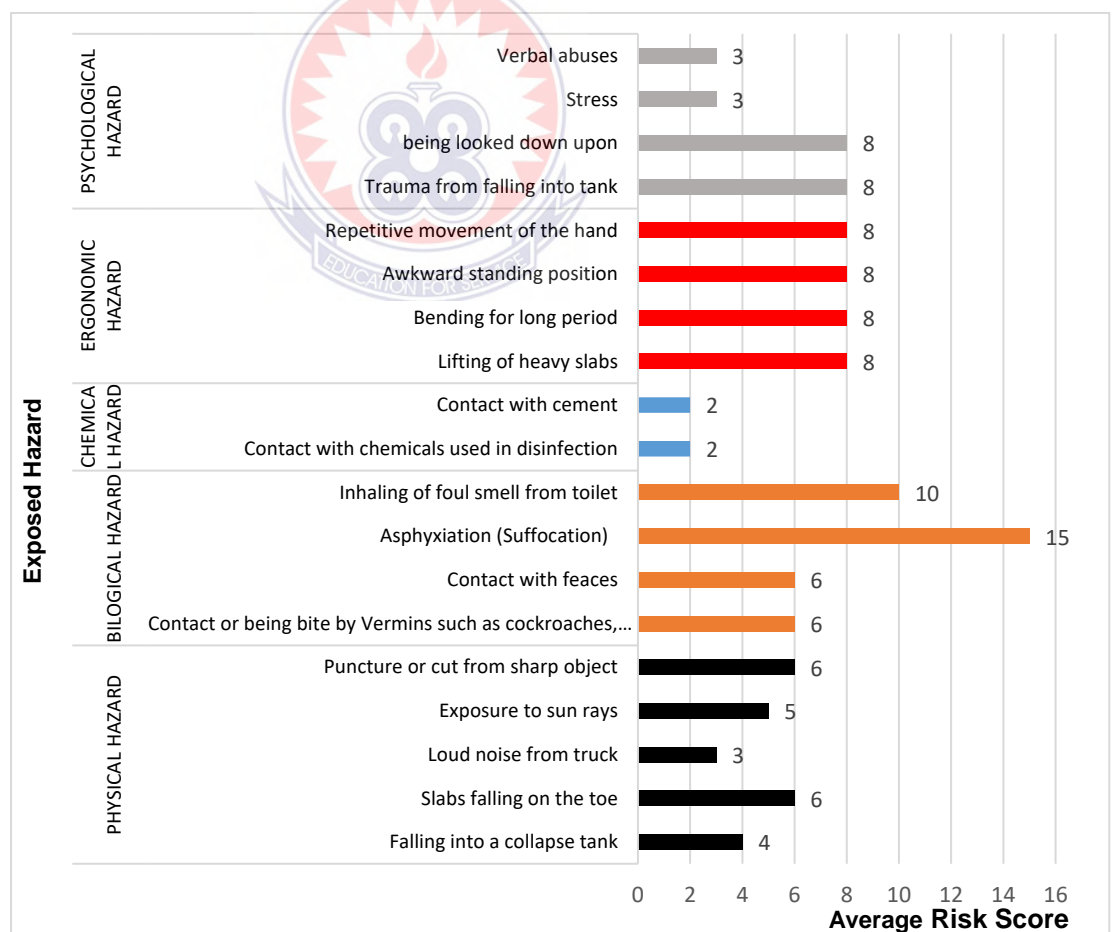


Figure 4.7: Average Risk scores of Toilet Emptiers

4.12.8 Work-related Hazard Associated with Health Facility Workers

Figure 4.8 shows the average risk score of sanitary health facility workers. The highest risk (average risk score 12) hazard for health facility workers constitutes direct contact with infectious waste materials (represents high risk) and this is a biological hazard. This is followed by being little (9) which is a psychological hazard and represents a medium risk. The highest average risk score of 8 constitutes cut or puncture from a sharp object (physical hazards) and is a medium risk while contact with chemicals from pharmaceutical waste constitutes the highest average risk score (8) of chemical hazards which is also a medium risk. Lifting heavy-weight objects is an ergonomic hazard and have an average risk score of 6 which is also classified as a medium risk. Based on the risk description Table, all the hazards exposed to health facility workers are acceptable risks except contact with an infectious waste (biological hazard) which recommends a safety measure to be implemented.



Figure 4.8 Average Risk Score of Health Facility Workers

4.13 Analysis of the hazards exposure of sanitary services

Table 4.10 shows the results of the types of hazards, Average Hazards Score and the Total Average risk scores of each category of hazard. Among the services provided by sanitary workers sweepers (32.8) and janitors (22) constitute the section with the highest and lowest total risk scores respectively. Also, Biological hazards recorded the most dominant (9.5) average hazard score among the sweepers.

Table 4.10 Results on the Total Average Scores of Hazards

Types of sanitation services	Types of Hazards	Average Hazards Score	Total Average Risk scores	Highest risk and types of Hazard
Sweepers	Physical	5	32.8	Biological Hazards
	Chemical	6		
	Biological	9.5		
	Psychological	7.6		
	Ergonomic	4.8		
Janitors	Physical	5	22	Physical and Psychological hazards
	Chemical	3		
	Biological	4.7		
	Psychological	5		
	Ergonomic	4.2		
Office cleaners	Physical	9.5	22.5	Physical Hazards
	Chemical	2		
	Biological	2		
	Psychological	2.7		
	Ergonomic	5.3		
Fumigators	Physical	4.3	27.7	Biological Hazards
	Chemical	6		
	Biological	8		
	Psychological	2.7		
	Ergonomic	6.7		
Informal Solid waste collectors	Physical	5.9	25.4	Physical Hazards
	Chemical	4		
	Biological	5.5		
	Psychological	5		
	Ergonomic	5		
Formal Solid waste	Physical	6	30	Ergonomic Hazards
	Chemical	6		

Types of sanitation services	Types of Hazards	Average Hazards Score	Total Average Risk scores	Highest risk and types of Hazard
collectors	Biological	5.8		
	Psychological	4.8		
	Ergonomic	7.5		
Toilet emptiers	Physical	4.8	29.5	Biological Hazards
	Chemical	2		
	Biological	9.3		
	Psychological	5.5		
	Ergonomic	8		
Health facility workers	Physical	5.3	29.8	Biological Hazards
	Chemical	5.5		
	Biological	8		
	Psychological	5		
	Ergonomic	6		



CHAPTER FIVE

5.0 DISCUSSION

5.1 Characteristics of Respondents

5.1.1 Socio-demographic Characteristics of Respondents

The gender of the overall study respondents in both sectors recorded a little over half as females. This supports the study of Gebremedhin (2016) that reports sanitation work as female-dominated. However, fewer proportion of the private sector workers were females compared to males in the public sector. The greater number of males than females in the public sector supports studies that have implicated male dominance in high-risk jobs such as mining, construction and others (Abrahamsson & Johansson, 2021; Overå, 2017; Salinas & Romani, 2014). In the private sector most and least were in the age bracket 46 years and above and 25 years and below respectively while in the public sector the most and least were those in the age bracket 36-45 and 26-35 respectively. The presence of very few youths involved in the current study is inconsistent with Kuffour (2020) where the majority of his respondents were youth. Also, the age range of those in the private sector is consistent with Salve & Chokhandre (2016) that the majority of their study respondents were less than 30 years. The current results support literature that argues that African youth have only taste for formal sector jobs and therefore refuse to be employed in low esteemed jobs like construction, sanitation etc., that have low remuneration and precarious working conditions (ILO, 2015; Venatus & Agnes, 2010). In both sectors, the majority of the respondents were married and had a family size of 4-5 while the least were those who had no children.

In terms of marriage and family size, this study is consistent with Poku (2021) where the majority of his study participants were those married and had a family size of about 5. The majority in both sectors had at most basic school education and this may have been influenced by the free compulsory universal basic education (FCUBE) introduced in 1995 aimed at making education universal and available to all by the year 2005 (Akyeampong, 2009). The majority of participants in both sectors were permanent employees while the least in the private and public sectors were casual and part-time workers respectively. This is consistent with Starovoytova (2018) where the majority of respondents were permanent employees with only one job and this may be construed to mean they were okay with their work in the sanitation industry. According to the study, 8 in 10 private-sector workers earned below GHC300 as compared to the public sector where none earned that amount. This means many in the private sector earned below the daily minimum wage of GHC12.53 assuming if they reported 25 days in the month (papayaglobal, 2022). However, the majority of about a quarter in the public sector earned between GHC301 to 599, followed by those that earned between GHC600 to 999 and then followed by those that earned GHC1501 and above. Interpretation based on the monthly earnings among the two sectors showed that public sector workers had better monthly income than private-sector workers. This supports the joint work of the ILO, WHO, WaterAid and World Bank (2019), on the fact that public sector workers have good working conditions of a stable and better monthly income than private-sector workers. Also, the earnings in the private sector were similar to Poku (2021) and Blewusi (2019). A little over half in the public sector had previous working

experience as compared to the private where more than half had no previous working experience. In the current study, the majority of the respondents in both sectors had part-time jobs and this may be due to dissatisfaction with salary levels. In both sectors, the number of participants reduced with long years of experience and this is consistent with the pilot study in Wuhan, China by Gong *et al* 2013.

5.1.2 Socio-demographic Characteristics and Involvement in Work-related Accidents in the Private and Public Sector

In this section, participants from the private and public sectors were interrogated to find out whether they have ever been involved in accidents. The responses showed that a little over half of the female respondents in the private sector were involved in work-related accidents while in the public sector about eight in ten of the males had involvement in accidents. The results among the private and public sectors found a statistically significant relationship between gender and involvement in work-related accidents. This is inconsistent with Poku (2021) where gender and injury had no statistically significant relationship. Among both sectors, the age of those 36 years and above recorded the highest accident cases, however, majority of almost three quarters were those in the private. The results of involvement in work-related accidents increased with growth among the private sector. The results found a statistically significant relationship with the working sector. The findings of this study are consistent with pieces of literature that report that the aged and children are those likely to be involved in work-related accidents (Herbert & Landrigan, 2000; Mock *et al.*, 2005). Among both sectors, majority of those

involved in work-related accidents constituted those married or may have ever been married before like those divorced, separated, and widowed. The results of those involved in work-related accidents in both sectors recorded were in the minority (Public Sector). Marital status and involvement in work-related accidents had no statistically significant relationship with the working sector. Many studies appreciate sanitary workers as mostly married, however, almost none has been able to find an association between marital status and accidents at the workplace (Blewusi, 2019; Salve & Chokhandre, 2016; Starovoytova, 2018). Among both sectors, majority of respondents that had been involved in work-related accidents are those with 5 children and below.

Results among the private and public sectors found no statistically significant relationship between the involvement of work-related accidents and the number of dependents. Majority of respondents in both sectors had at most basic school education and this may have been influenced by the free compulsory basic education (FCUBE) introduced in 1995 aimed at making education universal and available to all by the year 2005 (Akyeampong, 2009). Yet, the level of education among both sectors had no statistical relationship with work-related accidents and this is inconsistent with Das (2009) and Poku (2021). Again, the employment status and involvement in work-related accidents found no statistically significant relationship with the working sector. The records of those involved in work-related accidents had those with permanent employment status as majority in both sectors. Yet, the private sector had more permanent employees involved in accidents than those in the public sector. In the present study, almost a quarter in both the private and public sectors classified their work as part-time which denotes that

they did not like their job as sanitary workers (Starovoytova, 2018). In both sectors, the majority of the private sector workers with salaries GHC599 and below recorded the highest accident cases. Again, the cases in each sector showed that the private sector workers had majority and minority that earned GHC599 and below and GHC600 and above involved in workplace accidents respectively. This in actual sense means that accidents reduced with higher income earning among the private sector. Conversely, in the case of the public sector workers, the majority of those involved in accidents earned monthly income of GHC600 and above which can also be construed to mean that accidents increased with higher income earning. The monthly income and accidents at the workplace had a statistically significant relationship with the working environment. This result is inconsistent with the study of Gong (2013) where the monthly income of sanitation workers had no association with two weeks of self-reported illness.

The majority involved in work-related accidents in the private sector had worked elsewhere while the majority of those involved in work-related accidents in the public sectors had no previous work experience elsewhere. The years of experience in current job and involvement in work-related accidents among both sectors reduced with years of experience. Therefore, respondents that had spent ten and less years of working experience in current job among both sectors were more involved in workplace accidents than those with more than ten years of experience. The results of work experience either in current job or job elsewhere among the private and public sectors found no statistically significant relationship with the working sector. This results is inconsistent with Salve & Chokhandre (2016) where the years of experience

had significant association with workplace accidents. In the current study, the majority of both the private and public respondents involved in work-related accidents had almost two quarters with part-time jobs, which could be due to dissatisfaction with salary levels.

5.2 Work-Related Hazards among Sanitary Workers Employed in Public and Private Institutions

The primary goal of occupational health and safety is to protect against incidents of accidents, illnesses, and diseases at the workplace. Several studies have reported a high prevalence of injuries and diseases associated with sanitary workers as compared to the other working populations. One main objective of this study was to identify work-related hazards among sanitary workers in the private and public sectors in Kumasi. The results of those that were involved in work-related accidents in both sectors constitute almost half of the total (385) study population. The percentage of the total accidents in both the public and private sectors is far lower than what was recorded among solid waste collectors in Ablekuma Sub-Metro Assembly (Ayaaba, 2014). The result in the private sector showed a little over half involved in work-related accidents as compared to the public sector which had a little over two-thirds, hence private-sector workers had twice the odds of involving in a work-related accident than public-sector workers. This simply means a public sector worker is twice likely to be involved in a work-related accident as compared to a private-sector worker. The prevalence of accidents in the sanitation industry is seen to be common and this has been revealed in several studies like Kuffour (2020a), Ayaaba (2014) and as far back in a study by Person (1922) on waste

in industries. Thus, the cause of the accident could be due to non-compliance with basic safety procedures by sanitary workers or, the inadequate provision of basic PPE's by employers. The results indicating incidents of work-related accidents in the current study are quite substantial and this reveals why sanitary workers are at risk for several occupational hazards as compared to the other working sectors (Garrido *et al.*, 2015; Gong *et al.*, 2013). Also, in the study of sanitary and construction workers by Meinel (1994), the incidence of work-related accidents and illnesses was found to be high among sanitary workers than in construction workers and this had an impact on their attendance since members often reported injuries and illnesses.

The accidents described by public and private sector workers in the current study include being punctured or pricked by an object, cut or scratched by a sharp object, tripping, slipping or/and falling, crashing with or by a vehicle, wall, etc., animal bite and Knock from an object. However, non except tripping, slipping and/ or falling found a statistically significant relationship with the private and public sectors. Hence, a sanitation worker in the private sector is twice less likely to experience a trip, slip or/and fall than a sanitation worker in the public sector. These commonly described accidents are also cited in pieces of literature like Ayaaba (2014), Das (2009), Jerie (2016) and Salve & Bansod (2016) which studies occupational health and safety in the sanitation industry. Among both sectors, the three most described accidents were puncture or being pricked by an object, trip, slip or/and fall and then cut or scratch by an object. In the study by Das (2008), the presence of supervisors to enforce rules and regulations increased compliance which as result helped

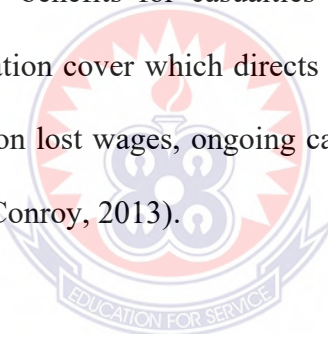
to reduce the occurrence of accidents among the participants. Contrary to this study, the presence of supervisors in the case of accidents in both the private and public sector workers was significantly insignificant which could also be a factor in the accidents at the workplace.

The results of participants in exposure to ailments recorded the following Respiratory Infections, Skin Diseases, Musculoskeletal issues, Gastro-Intestinal Infections, Hearing Loss and Eye Problems. This meant that diseases and ailments among the private and public workers were not dependent on the working sector of respondents. The high prevalence of the musculoskeletal issue in the current study is similar to Salve *et al* (2016) where nine out of ten sanitary workers reported a similar disease which was due to the nature of work (Salve & Chokhandre, 2016).

5.3 Healthcare Intervention following Work-related Accidents

When the respondents were asked about their mode of health care in the case of common illnesses, more than half in the public sector said that they sought medical attention from either the clinic or hospital whereas more than three quarters of those in the private sector resorted to self-medication. It was only less than a quarter from both sides who were not sure of their mode of health care and because of that either used self-medication or visited the clinic. The case of most in the private sector not enjoying healthcare benefits is almost close to the study of Mock *et al.* (2005) where nearly one-fourth involved in severe injury did not receive formal healthcare which affected the output of the workers. Almost nine in every ten private sector sanitary workers had to pay for their medical expenses while among the public sector sanitary

workers, more than half had their bills paid for by their employers. However, about one-third of the public sector workers still had to pay for their bills. The cost incurred for treatment by participants had the majority not paid for in both sectors. However, almost half of the public sector workers had a refund of medical expenses as compared to the private sector which had less than ten percent. According to some of the respondents in the public sector, the refund for their medical expenses was only occasional and this was dependent on the type of accident. The fact that basic healthcare is not given to participants involved in casualties contradicts the 2003 Act 651 of the labour law (Osei-Boateng & Ampratwum, 2011). Again, the situation where workers were not paid the necessary benefits for casualties at the workplace contradicts the standard compensation cover which directs that employees shall benefit from medical expenses on lost wages, ongoing care costs, and others when injured at the workplace (Conroy, 2013).



5.4 Intervention against Diseases and Illnesses

Considering that the public sector footed the medical screening bill for most of its employees, there was higher participation in periodic medical screening/checkups as opposed to private-sector employees which had a considerably very low number. The majority of respondents in both sectors had their medical screening between one to three years followed by those who had done it only once. The results of the last time screening were done for the majority of the private sector workers was when they had been employed whiles among the public sector was between one and three years ago. Medical screening was however compulsory for the majority of public sector workers

as compared to the private sector workers. The case where screening is done for employees is consistent with the hazardous biological agent that suggests that medical attention should be provided to anyone who has an exposure to hazard (Safety, 2011). As also recorded in the study by Monney *et al* (2014) on occupational health and safety practices among vehicle repair artisans, the need for a medical screening was important since it gives a fair understanding of the health situation of an individual.

5.5 Health and Safety Measures Instituted to Protect Sanitary Workers

The risk of health hazards among sanitary workers is further complicated by exposure to hazards without proper safety measures. One specific objective of this study was to assess health and safety measures available to protect sanitary workers and the import was to assess their effectiveness. Hence, the various sessions of training, knowledge on institution OHS policy, and the use of personal protective equipment constitute the health and safety measures used to assess respondents. The results of private sector respondents involved in training before employment schedules showed six in ten respondents as compared to the public sector which had about eight in ten respondents. The training of respondents while in employment among the private sector had less than half while in the public sector had about two thirds. The record of the sessions of training in the current study is higher than what was recorded (two in ten) among participants in Addis Ababa by Bogale (2012). Both sessions of training recorded the following programs work-related issues (how work is done); Safety practices (protection against injuries, accidents, and illnesses); administrative issues (administrative procedures and how reporting

of issues should be done); work ethics (how an individual should carry his or self) and pension Issues (how one should prepare for life after work). This result aligns with Gong *et al* (2013) where the absence of training while in employment predisposed sanitary workers to self-reported arthritis. The result showed that sanitary workers in the public sector that had training were twice more likely to be involved in accidents than private-sector workers. Thus, it could be inferred that private sector sanitary workers that had training on safety practices, work ethics, etc. before or during employment schedules were twice less likely to experience work-related accidents than public sector workers with similar training. In the study of Kuffour (2020) on occupational health and safety challenges facing sanitary workers in the Sekyere Central district in Ghana, training on safety and other programs were very useful in curtailing occupational health and safety issues at the workplace. In the study of awareness about occupational hazards of medical laboratory technicians, Rajan (2013) suggested that there should be various training on health and safety. This according to Krause *et al.* (1999) is an effective instrument to change the behavior of workers in occupational health and safety issues.

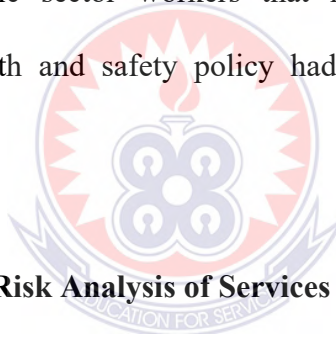
During the interrogation of respondents on PPE's required and PPE provided, respondents from both sectors indicated the following; helmet, nose mask, gloves, safety boots, goggles, safety overall, respirators, reflective vest, raincoat, and cap. However, the provision (supply) and required (demand) of personal protective equipment in both sectors were not met which means there was a shortage in the supply of personal protective equipment. Although in the current study there was a shortage in the falls of PPE's, results on domestic waste collectors in Hebron, Bethlehem had a majority not being provided with

PPE's for use (Milhem, 2004). In the current study, the highest recorded personal protective equipment in both sectors were gloves, nose masks and safety. In the Hierarchy control pyramid, the option for PPE's are the least in the safety pyramid but yet they are preferred by the majority as a tool for reducing occupational health and safety issues because of their cost and availability (Butch de Castro, 2003). Also, the study by Kuffour (2020), Monney *et al* (2014), and Ahmed & Fouad (2018) have all emphasized so much on why there is the need to make accessible basic PPE's since it contributes significantly to reducing work-related accidents.

5.6 Analysis of the Involvement in Injuries and Awareness of Institutional OHS Documents

When queried about the knowledge of respondents on awareness of institutional health and safety documents, more than half in the public sector had awareness as compared to the private sector where about two-thirds were unaware. About two-thirds among both sectors had only been told of the existence of the institutional occupational health and safety policy without necessarily seeing it while those who had no idea of it constituted one-third of the respondents. The respondents among both sectors that had seen their institutional occupational health and safety policy document constituted less than five percent. The level of unawareness among the majority of private-sector workers can be compared to the study by Ahire & Bhalerao (2017) where the majority of sanitary workers were observed to lack awareness of the use of PPE's which had an effect on the health and safety at the workplace. On what was entailed in their policy document, the majority in both sectors stated

that their institutional policy required them to get PPE's for their work, yet, the results on PPE's provided differed greatly from PPE's requested. Hence, this may be a major factor in accidents at the workplace. The results revealing the number of participants and their awareness of institutional health and safety policy corresponds with studies like Gong *et al* (2013) and Ahire & Bhalerao (2017) which found that sanitary workers have inadequate knowledge or information on matters relating to occupational health and safety. Moreover, the non-existence of a national health and safety policy document also contributes to the unawareness of participants since there are no clear guidelines on when and how to educate workers. This meant that private and public sector workers that had sensitization to institutional occupational health and safety policy had equal exposure to occupational accidents.



5.7 Summary of Risk Analysis of Services Provided by Sanitary Workers

The risk scoring system indicated an average risk score of 1 to 11 (acceptable risk) among many of the activities sanitary workers provide. However, informal solid waste collectors and toilet emptiers reported hazards (tripping, slipping and/or falling from the back of a truck and asphyxiation respectively) with high average risk scores of 12 and 15 respectively. Based on the risk description Table, these risk scores from 12 to 15 require safety management. The results of the total average hazards score analysis indicated the highest exposure to hazards as biological hazards and this is among sanitation sweepers. The findings however showed that sweepers constitute the service with the highest total average risk score of 32.8, followed by formal solid

waste collectors. This contradicts studies that mention other sanitary services either than sweepers as having the most dangerous job (Blewusi, 2019; Shafik *et al.*, 2019).



CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATION

6.1 Conclusion

6.1.1 Accidents and Illnesses among the Private and Public Sectors

The study findings showed a high prevalence of accidents and injuries among sanitary workers. About half (43%) of sanitary workers have been involved in work-related accidents and about 9 in 10 of these accidents were in the absence of workplace supervisors in both sectors. Majority of work-related accidents were in the public sector. Although many accidents were described by the sanitary workers, none except tripping, slipping and/or falling had a statistically significant association with the private and public sectors ($p < 0.05$). The results found that sanitary workers in the public sector were twice more likely to experience tripping, slipping or/and falling than private-sector workers (OR = 2.13).

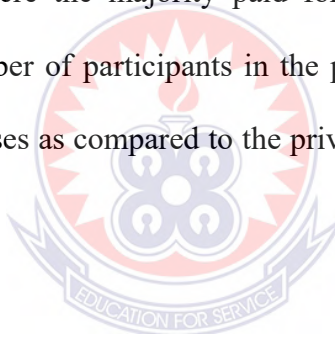
The two topmost illnesses identified among sanitary workers in both sectors were respiratory infections and musculoskeletal disorders. However, none was found to be statistically significant in the working sector.

6.1.2 Safety Measures Available to Sanitation Workers

In both sectors, participants that had training and involvement in work-related accidents comparatively were lower among the private sector workers than in the public sector workers.

The results showed that the private sector worker were twice less likely to be involved in work-related accidents as compared to their counterparts in the public sector. In the case of those that had sensitization on institutional occupational health and safety policy and were involved in accidents, the results found no association with the working sector.

The mode of healthcare for those involved in work-related accidents had the majority in the private sector using self-medication as compared to the public sector that benefited from formal healthcare (clinic/hospital). Again, many in the public sector had their bills paid by their employers as compared to the private sector where the majority paid for their bills. In addition, quite a considerable number of participants in the public sector were given a refund on medical expenses as compared to the private sector where the majority was not given refunds.



The study also revealed a significant shortage of PPEs in both the public and private sectors. PPEs such as helmets, gloves, safety boots, safety overalls, raincoats, reflectors, etc. supplied to sanitary workers were significantly lower than the quantity demanded by sanitary workers. This inadequacy was construed to further increase the risk of exposure to work-related hazards.

6.1.3 Results of the Risk Scoring System

The findings of the risk score analysis showed Toilet emptiers and Informal solid waste collectors with highest risk score of 15 and 12 on Suffocation whiles in a tank and tripping, slipping, or/and falling from the back of truck

respectively. Again, Sanitation sweepers constituted the service with the highest Total Average risk score of 32.8

6.2 RECOMMENDATION

The current study findings have established the occupational hazards exposure and the challenges private and public sanitation workers face, it is based on this the following recommendation is being made to maintain health and safety.

- Similar studies in this area should be conducted across major cities in Ghana to know the national nature of the problem to drive the need for a national OHS policy
- The content of training in future studies should be looked at and analyzed
- The study of risk scores in future studies should not be based on perceived risk scores of respondents but on experts' advice.

6.3 Areas for Future Studies

This current study has established risk scores among all categories of sanitation workers. Future studies can be based on the risk checklist to assess exposure to diseases that need much focus in research.

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APPENDICES

APPENDIX A

QUESTIONNAIRES

Questionnaire for a face-to-face interview with sanitary workers

I am Awuah, Joseph Agyeman a student studying MPhil. Environmental and Occupational Health programme. I am conducting research on occupational health and safety practices among personnel (public and private) in the sanitation sector in Ghana. I appreciate your support to participate in this study in a few minutes and all information is strictly confidential and anonymized and will be mainly for academic purposes analysis.

Please do you agree to participate in the study and thank you for your support?

Yes, the participant consented

Code	Question	Responses
<i>Socio-demographic characteristics</i>		
1.1	Gender of respondent	<input type="checkbox"/> Male - 1 <input type="checkbox"/> Female - 2
1.2	Age of respondent	
1.3	Marital status	<input type="checkbox"/> Single - 1 <input type="checkbox"/> Married – 2 <input type="checkbox"/> Divorced - 3 <input type="checkbox"/> Separated - 4 <input type="checkbox"/> Widowed – 5
1.4	Number of children/dependents	
1.5	Level of education	<input type="checkbox"/> No formal Education - 1 <input type="checkbox"/> Primary/JSS - 2 <input type="checkbox"/> Senior High School – 3 <input type="checkbox"/> Post-secondary but not tertiary <input type="checkbox"/> Tertiary Education - 4
1.6	What is your employment Status	<input type="checkbox"/> Casual - 1 <input type="checkbox"/> Permanent - 2 <input type="checkbox"/> Part time – 3
1.7	Current monthly income (in Ghana cedis)	
1.8a	Have you worked elsewhere before?	<input type="checkbox"/> Yes – 1 <input type="checkbox"/> No - 2

- 1.8b** If Yes, for how long did you work there (in years)
- 1.9a** Do you have any other job apart from this? Yes – 1
 No 2
- 1.9b** If Yes, what other job do you have?

Specific work activities and experience

- 2.1** How long have you been in service here (in years)?
- 2.2** How many days in the week do you work?
- 2.3** How long does it take you to perform your daily duties (in hours)?

Prior experience with work-related accidents, common illnesses, and intervention

- 3.1a** Have you been involved in any work-related accidents? Yes -1
 No – 2
- 3.1b** If Yes, how many times have you been involved in work-related accidents?
- 3.1c** If Yes, briefly describe the accident(s)?
- 3.2** Were any of the accidents in the presence of a supervisor? Yes – 1
 No – 2
- 3.3** In the event of a work-related accident(s), how did you or do you get healthcare? Self-medication - 1
 Clinic/Hospital - 2
 Other (specify).....- 3
- 3.4** Who pays for the cost of treatment? Employer Sometimes - 1
 Employer Always -2
 Self Financing Always – 3
 Other (specify)... ..- 4
- 3.5** Do you get a refund for medical expenses on work-related injuries/casualties/accidents? Yes – 1
 No – 2
 Sometimes - 3
 It depends – 4
 Other (specify).....- 5
- 3.6** What illness do you normally experience due to your job roles? Respiratory infection – 1
 Skin diseases – 2
 Muskoloskeletal issues- 3
 Gastro intestinal infections - 4
 Hearing losses - 5
 Eye problems - 6
 Other (specify).....-7
- 3.7** Do you have a valid NHIS Card? Yes (confirmed) – 1
 Yes (reported) - 2
 No – 3

- 3.8 In the case of the accident(s), was it [] Yes – 1
 mandatory for you to visit a health care [] No – 2
 facility?
- 3.9 Whose responsibility is it to pay for [] myself – 1
 medical expenses? [] my employer - 2
 [] Shared cost – 3
 [] Other
 (specify).....- 4

Measures to protect against occupational health and safety risks

- 4.1a Were you trained on your job before you [] Yes – 1
 started your employment schedules? [] No - 2
- 4.1b If yes, what was the training about?
- 4.2a Have you ever been trained in your job? [] Yes – 1
 [] No – 2
- 4.2b If Yes, when was the last training done?
- 4.2c If yes, what was the training about?
- 4.4a Is there periodic medical [] Yes – 1
 checkups/screening for workers? [] No – 2
- 4.4b If yes, how often is the medical checkup [] Yearly
 undertaken? [] between 1 and 3 years
 [] only once since being
 employed
 [] Never
- 4.4c If Yes, when was the last medical [] One year ago
 screening done for workers? [] between 1 and 3 years
 [] only once since being
 employed
 [] Never
- 4.5 Who pays for the cost of medical [] myself – 1
 checkups/screenings? [] my employer - 2
 [] Shared cost – 3
 [] Other
 (specify).....- 4
- 4.6 Is it compulsory to do the medical [] Yes - 1
 screening? [] No – 2
- 4.7 What **PPE** **Reason(s)**
 PPE do
 you
 require
 for your
 work
 based on [] Helmet – 1
 your [] Nose mask - 2
 activities [] Gloves - 3
 and Why? [] Safety Boots - 4
 [] Goggles - 5
 [] Safety overall - 6
 [] Respirators - 7
 [] Reflective vest - 8

- Rain Coat - 9
 Others (specify)....- 10
- 4.8 Which of these have you been provided with?
 - Helmet - 1
 - Nose mask - 2
 - Gloves - 3
 - Safety Boots - 4
 - Goggles - 5
 - Safety overall - 6
 - Respirators – 7
 - Reflective vest - 8
 - Rain Coat - 9
 - Others (specify).....
- 4.9 Are you aware of your company/institution’s policy on workplace health and safety?
 - Yes – 1
 - No – 2
- 4.9a If yes, have you seen/been informed of it before?
 - Yes, I have seen the documented – 1
 - Yes, I was told it exists – 2
 - No – 3
- 4.9c If Yes, kindly say anything you know about the policy that concerns your health and safety here?
- 4.10 What motivates you to prevent or minimize accidents/injuries at the workplace as much as possible?

Occupational hazards among sanitary workers (Physical hazard, Chemical hazard, Biological hazard, Psychosocial hazard, Ergonomic hazard)

5.1a Describe the four (4) main activities you undertake at your current job here?

- 1.
- 2.
- 3.
- 4.

5.1b List the main work-related hazards associated with each activity.

Type of Service:.....

Date:.....

No.	ACTIVITIES (5.1a)	Main HAZARD (SPECIFIC HAZARD) (5.1b)	PROBABILITY (that it does happen)	IMPACT (level of harm if it happens)	RISK (seriousness of hazard)
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APPENDIX B

RISK SCORE TABLE

ACTIVITY	TYPE OF HAZARDS	COMMON HAZARDS	SCORES		
			Probability	Impact	Risk
Sweepers	Physical hazards	Loud beeps from moving vehicle	4	1	4
		Stepping on a sharp object	2	2	4
		Exposure to direct sun rays	5	1	5
		Trip/slip and fall	2	1	2
		Being knockdown by a moving vehicle or motor	1	5	5
		Cut/puncture from broken glass, metals, etc.	2	2	4
		Biological Hazards	Direct contact with waste	5	2
	Inhalation of dust and/or smokes	5	2	10	
	Exposure to infectious organisms during contact	4	2	8	
	Chemical Hazards	Splash of chemicals during sweeping	2	3	6
	Ergonomic Hazards	Repetitive movement of the hand	5	2	10
		Overlong bending	5	2	10
		Overlong standing	3	1	3
		Lifting/pulling of heavy-weight dustbins	3	2	6
	Psychological Hazards	Trauma of being knocked by a vehicle or motor	3	2	6
		Trauma from being attacked by thieves or madmen	4	2	8
		Assault by madmen, thieves, etc. for working odd hours	2	4	8
		Stress from long working hours	4	1	4

		Verbal abuse	5	2	10
		Demean	5	2	10
Formal Solid Waste Collectors	Physical Hazards	Tripping/Slipping from the back of a truck	3	2	6
		Vibration from trucks	5	1	5
		knockdown/collision into truck	1	5	5
		Cut/punctured by sharp objects when lifting waste e.g. Broken glass, metals, cans, bulbs, etc.	2	3	6
		Biological Hazards	Direct Contact with waste food debris, dead animals, hospital waste, etc.	3	1
		Inhalation of harmful waste materials	5	2	10
		Contact/bite by Disease-causing organisms like rodents, snakes	1	4	4
	Chemical Hazards	Splashing of chemicals contained in a container during truck compressing	2	3	6
Ergonomic Hazard		Lifting/pulling of heavy dustbins	5	2	10
		Wrong standing posture to fork waste on the ground	5	2	10
		Jumping on and off the truck	5	1	5
Psychological Hazards		Trauma of falling from a moving truck	2	2	4
		Verbal abuse	2	1	2
		Demean	5	2	10
		Stress	3	1	3
Janitors	Physical Hazard	Tripping/ Slipping and falling	2	2	4
	Biological hazard	Direct contact with feaces	3	1	3
		Inhalation of feaces smell	3	2	6
		Cobwebs falling on the eye	2	1	2

	Chemical Hazard	Contact with chemicals used for cleaning	3	1	3
	Ergonomic Hazard	Overlong bending	5	1	5
		Awkward standing position	4	1	4
		Overlong stretching	3	1	3
		Repetitive movement of the hand	5	1	5
	Psychological Hazards	Stress	3	1	3
		Verbal abuse	2	1	2
		Demean	5	2	10
Informal Solid Waste Collectors	Physical Hazard	Tripping/Slipping from the back of a truck	3	4	12
		Vibration from Tricycle	4	1	4
		Collision of tricycle	1	4	4
		Knockdown by vehicles or motor tricycles	1	5	5
		Cut/puncture by sharp objects when lifting waste e.g. Broken glass, metals, cans, bulbs, etc.	2	2	4
		Working in harsh working conditions	4	1	4
	Biological Hazard	Bite from disease-causing organisms found in waste	1	4	4
		Direct skin contact with harmful solid waste	4	1	4
		Splashing of liquid while pouring from dustbins	3	1	3
		Inhalation of smokes from tricycles	3	2	6
		Inhalation of dust	2	2	4
	Chemical Hazard	Explosion of air-tight chemicals during contact	2	2	4
		Inhalation of chemicals found in waste being collected	3	2	6

	Ergonomic Hazard	Dragging heavy dustbins without wheels	3	2	6
		Lifting heavy-weight dustbins	4	2	4
	Psychological Hazards	Trauma of being attacked during odd working hours	2	2	4
		Verbal abuses	4	1	4
		Stress resulting from working long hours	3	1	3
Toilet empties and Sewer line rehabilitation	Physical Hazard	Falling into a collapsed tank	1	4	4
		Slabs falling on the toe	2	3	6
		Puncture or cut from a sharp object	2	3	6
	Biological Hazard	Contact with Vermins from cockroaches, mice, rats, etc.	2	3	6
		Inhaling foul smell from toilet	5	2	10
		Asphyxiation	5	3	15
	Chemical Hazard	Contact with chemicals used in disinfection	2	1	2
	Ergonomic Hazard	Lifting of heavy slabs	4	2	8
		Overlong bending	4	2	8
		Awkward standing position	4	2	8
	Repetitive movement of the hand	4	2	8	
	Psychological Hazards	Trauma from falling into a tank	2	4	8
		Demean	4	2	8
		Verbal abuses	3	1	3
Fumigators	Physical Hazard	Tripping, Slipping and falling	2	3	6
		Direct exposure to sun rays during outdoor work	4	1	4
		Exposure to harsh climatic conditions	3	1	3
	Biological Hazard	Bite from rodents, reptiles and other harmful organisms being fumigated	2	4	6
	Chemical Hazard	Inhalation or egestion of chemicals during use	5	2	10
		Inhalation of smoke from electronic	3	2	6

		fumigation machine			
		Direct Skin contact with chemicals when splashed during mixing or filling machine	3	2	6
		Contact with the eye during use	2	3	6
Health facility works	Ergonomic Hazard	Carrying or lifting heavy machines at the back during use	3	2	6
		Awkward standing posture when carrying machine at the back	3	2	6
		Repetitive movement of the hand up and down during use of manual fumigation machine	5	2	10
	Psychological Hazards	Trauma of being affected by a chemical during use	2	2	4
		Stress from long working hours	2	1	2
		Verbal abuse from pass Byers	3	1	3
	Physical Hazards	Tripping, slipping and/or falling	2	2	4
		Falling from high surfaces	2	4	8
	Biological Hazards	Direct contact with solid waste materials (pharmaceutical chemicals)	3	4	12
		Contact with liquid waste	3	2	6
		Inhalation of airborne pathogens	2	2	4
	Chemical Hazards	Contact with chemicals used for mopping	3	1	3
	Ergonomic Hazard	Lifting heavy-weight objects	3	2	6
	Psychological Hazards	Stress from working long hours	3	1	3
		Verbal abuse	3	1	3
Demean		3	3	9	

Office Cleaners	Physical Hazards	Tripping, slipping and falling	3	3	9
		Shock from bare wire	2	5	10
	Biological Hazard	Direct contact with harmful waste	2	1	2
	Chemical Hazard	Contact with the chemical used for mopping	2	1	2
		Inhalation of chemical used for cleaning	2	2	4
	Ergonomic Hazard	Lifting of heavy materials	3	2	6
		Repetitive movement of the hand	5	1	5
		Overlong standing	5	1	5
	Psychological Hazards	Demean	3	2	6
		Verbal Abuse	3	2	6
Sexual Harassment		1	3	3	

