

PRESBYTERIAN UNIVERSITY COLLEGE, GHANA

FACULTY OF DEVELOPMENT STUDIES

DEPARTMENT OF ENVIRONMENTAL NATURAL RESOURCES

AND MANAGEMENT



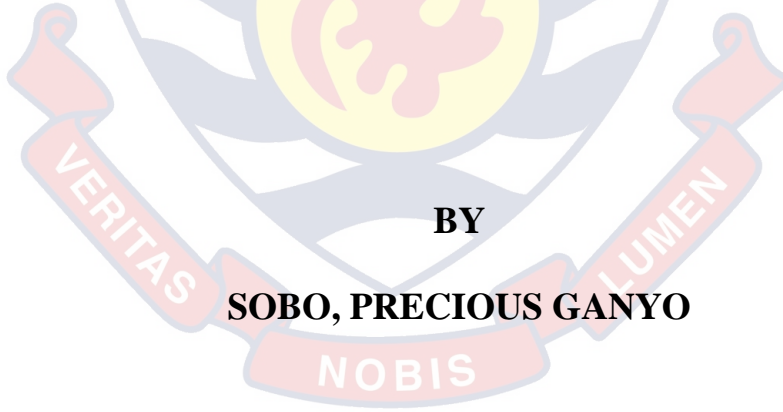
SAFETY PRACTICES OF INFORMAL WASTE

COLLECTORS IN THE GA -EAST MUNICIPALITY

BY

SOBO, PRECIOUS GANYO

NOBIS



SEPTEMBER 2019

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Dissertation submitted to the Department of Environmental and Natural Resources Management of the Faculty of Development Studies, Presbyterian University College, Ghana, in partial fulfillment of the requirements for the award of Master of Science degree in Environmental Health and Sanitation

BY
SOBO, PRECIOUS GANYO

SEPTEMBER 2019

DECLARATION

Candidate`s Declaration

I hereby declare that, except for the references to other people`s work which have been cited, this dissertation is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate`s Signature: Date:

Name: Precious Ganyo Sobo

Supervisor`s Declaration

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the Presbyterian University College, Ghana.

Supervisor`s Signature: Date:

Name; Dr. Edward Debrah Wiafe

ABSTRACT

Although considerable efforts are being made by many Governments in tackling waste-related problems, informal waste collectors are involved in solving the Ghana's sanitation issues yet the significance of their work has been neglected. This research examined the compliance of knowledge of safety practices by informal waste collectors at Ga East Municipal Assembly and determining the role played by the Environmental Health Unit of the municipality to ensure the compliances with safety practices by informal waste collectors. One Hundred (100) respondents were selected randomly within four areas (kwabenya, tiafa, dome, haasto) in the Ga-East municipality and structured questionnaires were administered. The results indicated that; for 100 respondents, 53% of them said they were prone to cholera, 39% of them said influenza. 95% of them prefer using gloves as the only Personal Protective Equipments, 95% of the informal waste collectors have never had any program with the Environmental Health Unit. It was concluded that majority (90%) of the informal waste collectors had little knowledge on the dangers that they are exposed to, also, Environmental Health Unit, have not had any interaction with the informal waste collectors because they have not registered with them. It is recommended that, the informal waste collectors are provided with collection equipment such as (PPE and tricycles) by the assembly, also, awareness program for waste workers are to be focused on in order to increase their knowledge on occupational health hazards and ergonomic principles, Finally, the Environmental Health Unit should educate the informal waste collectors of the safety practices related to the work.

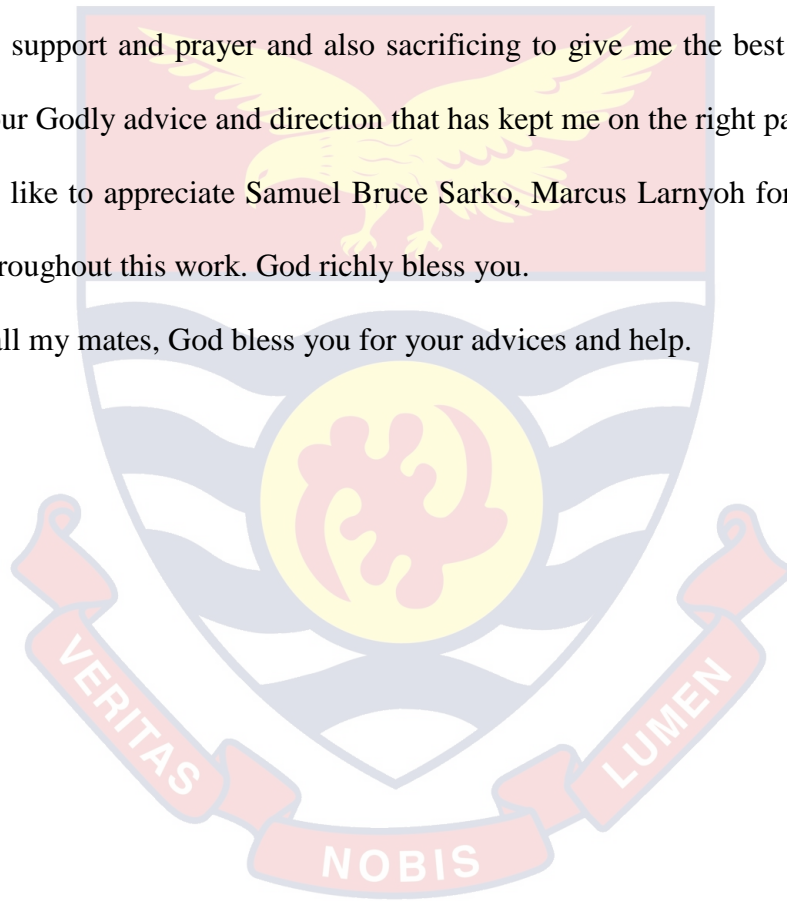
ACKNOWLEDGEMENTS

I would first thank the Almighty God for His grace that enabled me to embark on this research and for seeing me through. Indeed He who began a good work in me carried it on to completion. I am very grateful to my supervisor, Dr. Edward Debrah Wiafe whose support and guidance went a long way to bring this work into shape. God richly bless you.

I also thank my family, my late parents Mr. and Mrs. Ankudzeh and my entire family for their love, support and prayer and also sacrificing to give me the best of education. Thank you for your Godly advice and direction that has kept me on the right path. I love you all.

I will also like to appreciate Samuel Bruce Sarko, Marcus Larnyoh for their great help and support throughout this work. God richly bless you.

Lastly to all my mates, God bless you for your advices and help.



DEDICATION

I dedicate this work to my late parents Mr. and Mrs. Ankudzeh, my sisters, family members and friends.



TABLE OF CONTENTS

DECLARATION	ii
ABSTRACT	iii
ACKNOWLEDGEMENTS	iv
DEDICATION	v
CHAPTER ONE	
INTRODUCTION	1
1.1 Background to the study	1-4
1.2 Problem Statement	5
1.3 Hypothesis	5
1.4 Objectives of the study	6
1.4.1 Specific Objectives	6
1.5 Significance of the study	6
1.6 Organization of the study	7
CHAPTER TWO	
REVIEW OF RELATED LITERATURE	8
2.1 Definition of Solid Waste	8
2.2 Exposure of waste to Humans	9
2.2.1 Exposure to solid waste	10
2.3 Effect of safety on Informal waste Collectors	11
2.4 Occupational Safety Issues in Solid Waste Management	12-16
CHAPTER THREE	
RESEARCH METHODOLOGY	17

3.1 Study Area	17-19
3.2 Research Design	20
3.3 Population	20
3.4 Data Collection Instrument	20
3.5 Data Processing and Analysis	21
3.5.1 Primary Data	22
3.5.2 Secondary Data	22
3.5.3 Questionnaires	22
3.6 Data Collection Procedure	23
3.7 Ethical Consideration	23
CHAPTER FOUR	
RESULTS AND DISCUSSIONS	24
4.1 Demographic characteristics of Respondent	24
4.1.1 <i>Age categories of respondents</i>	24
4.1.2 Marital status of respondents	25
4.1.3 Educational Level of Respondent	25-26
4.2 Comparing the Role in the Family and the Number of Households of Respondent	27
Table 2: Comparing the Role in the Family and the Number of Households of Respondent	27
4.3 Knowledge of dangers that informal waste collectors are exposed to	28
4.3.1 <i>Types of sicknesses or diseases informal waste collectors are prone to</i>	28
4.4 Purposes for hand washing before eating	29-30
4.5 How hand washing is done	31-32
4.6 Number of times they take their bath	33

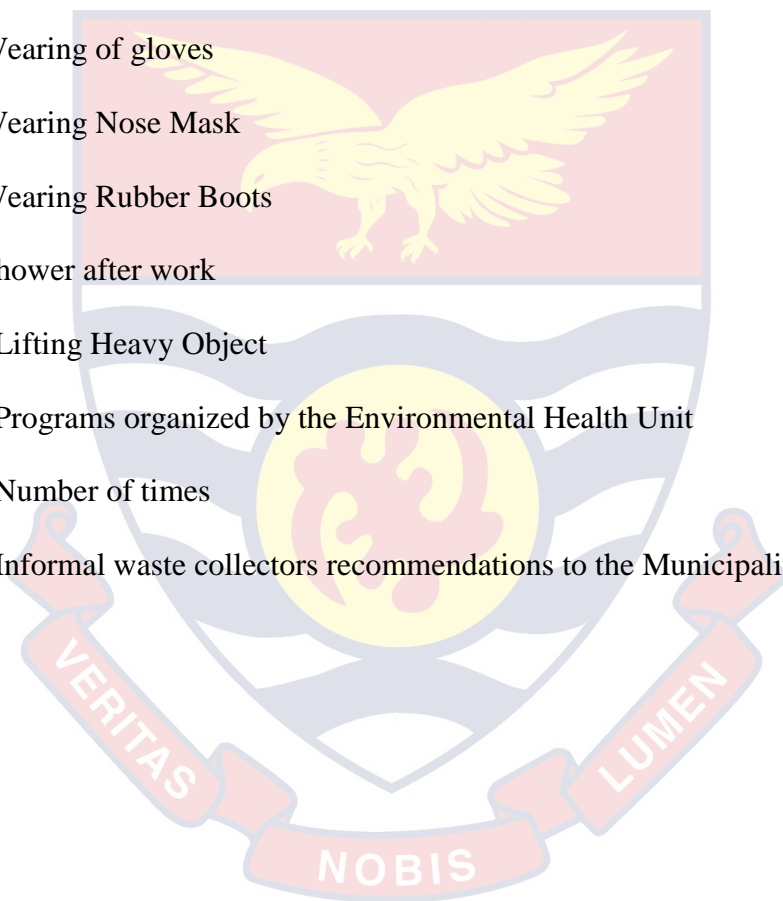
4.7 Often times they visit the Hospital for check up	34
4.8 Information regarding their waste collection activities	35-36
4.9 Access to information regarding safety issues on waste collection	37
4.10 Safety Practices by Informal waste collectors	38
4.10.1 Some consequences of being exposed to hazardous material	38-39
4.11 Type of PPEs do they use to help reduce or prevent exposure to hazardous materials.	40-41
4.13 Regular usage of PPEs	42-43
4.14 Reasons why they do not use PPEs	44
4.15 Wearing of gloves	44
4.17 Wearing Nose Mask	45
4.19 Wearing Rubber Boots	46
4.20 Shower after work	47
4.21 Lifting Heavy Objects	48
4.21 Role played by the Environmental Health Unit of the municipality to ensure compliances	49
4.21.1 Programs organized by the Environmental Health Unit	49
4.21.2 The frequency at which the program was organized	50
4.21.3 Recommendations made by the informal waste collectors	51
CHAPTER FIVE	
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	52
5.1 Summary	52-53
5.2 Conclusions	54

5.3 Recommendations	55
REFERENCES	56
APPENDIX I	63



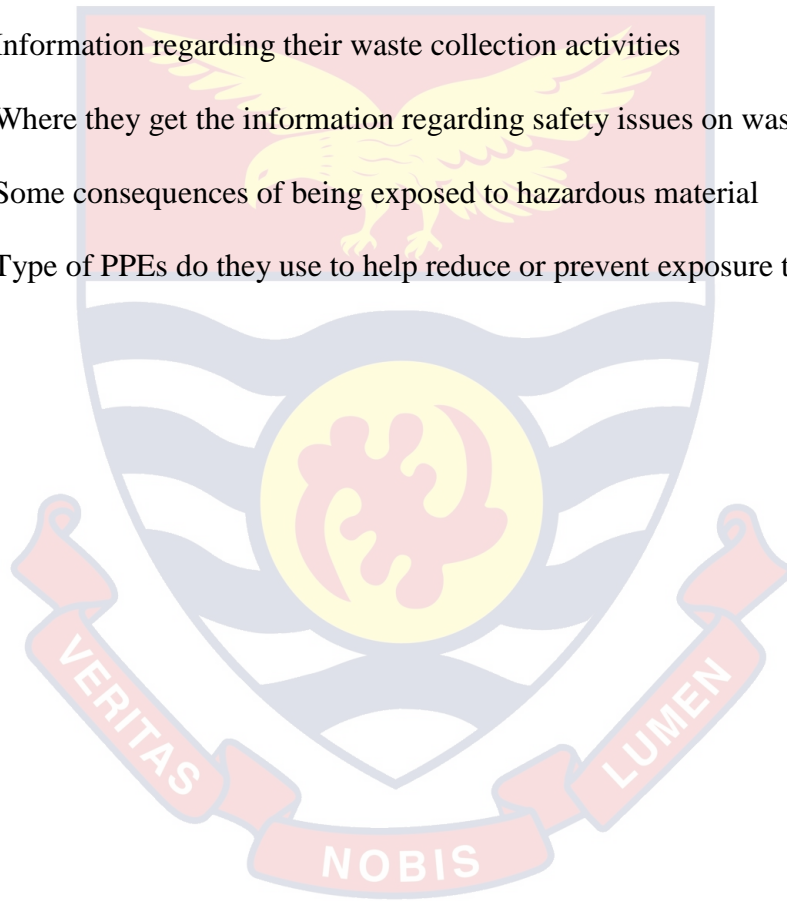
LIST OF TABLES

Table 1: Demography	26
Figure 2: Reason why they wash they wash their hands	31
Table 3: Use of PPE's	42
Table 4: How regular do they use PPE's	43
Table 5: Reasons why they do not use PPEs	44
Table 6: Wearing of gloves	45
Table 7: Wearing Nose Mask	46
Table 8: Wearing Rubber Boots	47
Table 9: Shower after work	48
Table 10: Lifting Heavy Object	49
Table 11: Programs organized by the Environmental Health Unit	50
Table 12: Number of times	50
Table 13: Informal waste collectors recommendations to the Municipality.	51



LIST OF FIGURES

Figure 1: Type of sickness or diseases informal waste collectors are prone to	29
Figure 2: Map of Ghana Showing Ga East	19
Figure 3: Substances used in washing their hands	32
Figure 4: Number of times they take their bath	33
Figure 5: Number of times they visit the Hospital for check up	35
Figure 6: Information regarding their waste collection activities	36
Figure 7: Where they get the information regarding safety issues on waste collection	38
Figure 8: Some consequences of being exposed to hazardous material	40
Figure 9: Type of PPEs do they use to help reduce or prevent exposure to hazardous materials	41



CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Occupational injuries contribute significantly to human and economic costs in developing countries as well as developed countries. They continue to be a serious problem affecting workers at different workplaces and industries of which informal waste collectors are not exempted. At a global scale, the International Labor Organization (ILO) estimates that 250 million work related injuries and illnesses occur every year, and 330,000 of these accidents are fatal.

In addition, annually, an estimated 160 million people worldwide have work related diseases, including respiratory and cardiovascular diseases, hearing loss, musculoskeletal and reproductive disorders as well as mental and neurological illnesses (ILO Report, 2010).

Although the statistics of occupational injuries are poorly documented in both developed and developing countries, Sub-Saharan Africa countries appear to have the greatest rate of occupational injuries (Olorunnishola, Taylor and Byrd, 2010). Amongst the occupations contributing to these problems is informal solid waste collection.

Developing and developed countries are facing increasing population growth, industrial development, financial progress and improvements which are driving the production of huge amounts of solid waste especially in the fast growing cities and urban dwellings (Shafiul and Mansoor, 2003). Ngoc and Schnitzer (2009) argued that increasing population, changing consumption patterns, economic development, changing income level, urbanization and industrialization result in increased generation of waste. Williams (2002) admits that waste generation will continue to rise.

Municipal solid waste (MSW) is composed of various discarded goods mainly left-over food, garden waste, textiles, glass, papers, metals and other spoiled goods (Rushton, 2003). The stages of generation, storage, collection, processing, transportation and disposal of waste are important stages which involve the use of human labour in conjunction with machines or equipment. Solid waste management contributes tremendously in upholding public health by reducing the risk of disease, however, the job in its nature exposes solid waste workers to high risk of fatal and nonfatal occupational accidents (Kuijer and Frings-Dresen, 2004). They are exposed to a wide array of injuries and diseases at work, emanating from collection points, during transportation of waste and at dumpsites (Cointreau, 2006). The scope of this study will mainly focus on safety practices by informal waste collectors. The increasingly complicated arena of waste management harbors significant potential for human health and safety risks. Hardoy and Satterwaite (2006) contend that, wastes not properly and adequately managed may cause serious health and environmental risks which may result in sickness, impaired health and well-being, or significant discomfort among the citizens of the community. The aim of solid waste handling is the removal of garbage to safeguard public health and welfare, as well as to prevent environmental pollution.

According to Rorgoff and Bidderman (2015), a research conducted by American National Institute for Occupational Safety and Health (NIOSH) posits that solid waste workers encountered the third highest frequencies of nonfatal injuries and illnesses compared to other occupations. Observations were linked to the fact that, the solid waste collection job has high risk. Interviews and follow-up studies conducted by Bünger, Schapper-Scheele, Hilgers and Hallier (2007), revealed that workers involved in solid waste

management have been found to experience more work-related symptoms and illnesses than other occupational groups.

In India, a clinical study on municipal solid waste workers revealed that they experienced morbidity such as respiratory diseases, skin and eye irritations as well as nail infections. The findings of the study on the work related injuries and illnesses revealed that 63.6% of the workers experienced falls, whilst 22% reported to have been involved in accidents, the prevalence of injuries was 73.2%, and 7.1% were exposed to a water borne disease. They also experienced musculoskeletal morbidities which revealed that all major joints were involved (17- 39%) (Jayakrishnan, Jeeja and Bhaskar, 2013). Another study in Ghana, at a private waste collection company revealed that solid waste workers are exposed to neck, wrist and back pain (Norman, Kretchy and Brandford, 2013). Several studies on the work related morbidity among solid waste handlers reveal that they are at risk.

Despite the significance of this job, solid waste handlers are exposed to a myriad of hazards in the course of discharging their duties. The major hazards faced by solid waste workers can be classified as chemical, biological, musculoskeletal disorders, mechanical hazards and psychosocial hazards. Amongst the injuries endured by solid waste workers are accidental injuries such as perforation wounds, lacerations, burns, and at times are deep cuts caused by scrap metal, jagged edges of cans and bins, glass cutlets or nails in waste bags. Furthermore, physical injuries also occur when refuse collectors drop heavy containers on their feet or legs (Jerie, 2016).

In addition, Jerie (2016) contends that solid waste workers sustain work related injuries such as sprains, abrasions, fractures, eye injuries and sharp back pain due to their work. Solid waste work according to the same author is associated with incidences of work related

diseases such as diarrhoea, viral hepatitis, and higher incidents of obstructive and restrictive disorders. Direct contact with infectious material also exposes solid waste handlers to biological pathogens which cause tetanus and HIV. According to Bastani, Celik, and Schubert (2014), solid waste workers are exposed to safety and health risks due to manual tasks which involve lifting heavy loads; exposure to gaseous emissions from decomposing waste such as hydrogen sulphide, organic compounds and hazardous gases released when carrying out tasks such as waste removal and disposal at the dumpsites and as whether they use the protective gears is one major issues especially with the informal waste collectors. The inhalation and or ingestion of these contaminants expose solid waste workers to respiratory illnesses. Cointreau (2006) contends that, exposure to substantial concentrations of methane, carbon monoxide and carbon dioxide in dumping areas trigger health effects such as headaches and nausea among landfill workers.

Disposal sites also expose solid waste workers to injuries incurred due to landslides, fires, and being accidentally buried.

Waste collection is a physically demanding job where labour intensive systems are common in developing countries. The tasks in waste collection include recurrent physical lifting of heavy waste-filled containers which contribute to the development of musculoskeletal disorders. As such, there are high incidences of muscular-skeletal disorders observed among solid waste workers. A survey performed in the United States of America (USA) revealed that, the majority of solid waste worker's compensation claims were related to musculoskeletal disorders related with lifting heavy refuse containers or embarking and disembarking from waste collection vehicle (Rorgoff et al., 2015). A study in Canada on the ergonomics of waste collection revealed that waste collectors lifted sixteen thousand

kilograms of waste and per day and on average they walk a distance of eleven kilometres which showed that solid waste collection involves a lot of physical exertion of which females are not likely to be found doing such jobs. In this environment, the worker has to be relatively healthy in order to perform the tasks.

1.2 Problem Statement

Informal waste collectors are found to have been helping to collect waste in Ghana, but they are mostly tempted to dump in open spaces and other unapproved areas. This mostly happens because most of them have little knowledge on the dangers that open dumping can lead to in relation to health effects.

In addition, many of them are not aware of available protections or their legal rights. In developing countries, the informal sector is vast and cuts across several different economic fields, including e-waste recycling, collection of waste and other waste management processes. Safety practices are not always considered by informal waste collectors in their line of the operations.

In the Ga East Municipality, there is apparently little or no information on the safety practices of informal waste collectors and the factors that will encourage them to practice safety precautions in the appropriate ways in conventional literature.

As a way of filling this research gap this study sought to examine safety practices of informal waste collectors.

1.3 Hypothesis

These issues identified above raise critical questions such as;

- The number of years a person works as a waste collector does not influence some consequences of being exposed to hazardous materials.
- The number of years a person works as a waste collector does not influence the sickness or illnesses he/she is exposed to.
- The level of education does not influence the use of soap in hand washing when one is engaged in waste collection business is.
- The number of years a person works as a waste collector does not influence where they get information regarding safety issues on waste collection.
- The number of years a person works as a waste collector does not influence the use of PPEs.

1.4 Objectives of the study

The main objective is to examine the compliance of knowledge of safety practices by informal waste collectors at the GEMA.

1.4.1 Specific Objectives

- To examine the knowledge of dangers that informal waste collectors are exposed to;
- To determine the safety practice by informal waste collectors;
- To determine the role played by the Environmental Health unit of the municipality to ensure the compliances with safety practices by informal waste collectors.

1.5 Significance of the study

The study seeks to ascertain informal waste collectors' knowledge on safety practices and the ability to comply with the occupational precautions concerning their work. Knowing the factors that influence the informal waste collectors to apply the precautions as it is an

important tool for guiding them in order to reduce heavy dependence on employers on the basis of their health and also government properties.

Findings of the study will also help inform employment in furtherance of identifying ways by which waste generated can be well managed from the households and clients in general perspective in order to prevent any occupational accident that would have been created.

The study will further provide policy makers with relevant up to date information from the viewpoint of safety practices which will help in the drafting of sanitation related policies that will help address the problem of safety practices by informal collectors in solid waste management at hand.

The study also serve as a basis for further research in solid waste management and sanitation which will enrich academic literature.

1.6 Organization of the study

Chapter One presents the background to the study, statement of the problem, research questions, objective of the study, specific objective and significance of the study. Chapter Two deals with the literature review to the research on how informal waste collectors will be will to apply the occupational safety guides concerning their work and literature relating to safety measures in general. Chapter Three involves the methodology used for the study while Chapter Four involves analysis of results and discussions of findings. Chapter Five presents the summary, conclusion and recommendations based on the findings of the study.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Literature review is a critical aspect of research and in order to get a better meaning from the findings of this research in relation to other similar works undertaken in the past, it is important to review the literature of other authors on the safety practices of informal waste collectors. According to Saunders, Lewis and Thornhill (2000) “the literature review forms the framework for research, as it helps to develop a good understanding and to provide insight into relevant previous research and emerging trends” and also helps to give direction to the work and to avoid reinvention of what has already been done.

2.1 Definition of Solid Waste

Solid waste may be defined as all discarded solid materials resulting from households, industrial, healthcare, constructional, agricultural, commercial, and institutional sources. Solid waste generated in a city is often referred to as municipal solid waste. In other literatures and jurisdictions this category may exclude sewage, dissolved solids in water, and industrial waste Hoornweg D, Bhada-Tata P (2012). But for this research work, no exclusions were made for the reason that in most developing countries, most of the solid waste is not sorted at source, collection, transportation and disposal points Ikiara, Karanja and Davies (2004).

E-waste is one of the fastest growing municipal waste streams. The annual growth rate is 3–5%, which is approximately three times faster than the municipal solid waste.

Globally, 50 million metric tons of e-waste is estimated to be generated in 2018 (Baldé, Wang, Kuehr, & Huisman, (2014). Thus, municipal waste in the context of developing countries may include waste that would not ordinarily be considered municipal waste. Solid

or municipal solid waste management refers to the planning, financing and implementation of programs for solid waste collection, transportation, treatment and final disposal in an environmentally and socially acceptable manner. Failure to adhere to set standards at any of the various stages constitutes “poor solid waste management” which will lead to having a lot of informal waste collectors in the municipality.

Solid waste collectors play an honorable role in preserving health and hygiene in most country. This job requires much effort to be accomplished, given the nature of the work, workplace conditions, plus predictable and unpredictable variables that track their routine (Ravindra, Kuar and Mor (2016). These collectors are exposed to physical, chemical and biological hazards in addition to multiple risk-factors and every day they face job related dangers thus they sustain high rates of occupational health-problems (Aderemi and Falade, (2012), Vimercati 2016).

2.2 Exposure of waste to Humans

Solid waste arising from human activity has become a major environmental problem causing extensive pollution, which threatens human health studies made by (Jha, Sondhi and Pansare 2003). There has been a significant increase in municipal solid waste generation in Thailand and other parts of the world over the last few decades. The increase in human population has leads to the exploitation of the natural resources daily. This is largely because of the rapid population growth and economic development studies by Singhal and Pande (2001). The quantity of municipal solid waste generated per day is approximately 39,221 tons, as reported in 2005 by the Pollution Control Department. It is expected that by 2012, this figure will have increased to 47,000 tons per day.

Waste material in the air, water, and soil can be dangerous. Consequently, there has been a high incidence of illnesses, such as dysentery, typhoid, fever, enteritis, cholera, and diarrhea of which informal waste collectors are prone to, since most of them do not use the safety equipments. Indeed, it is common to find large heaps of garbage lying in a disorganized manner in and around cities due to the inability of municipal corporations to handle the large quantities of waste. Kansal (2002).

Going into the new global dispensation, the Sustainable Development Goals (SDGs), the relevance of the issue of protecting the environment and preserving health through proper solid waste management in cities has become even more pronounced. The SDG agenda advocates for reduced generation of waste, and increased reuse and recycling. It touches on SDG3 (*health lives and promote well-being*); SDG6 (*water and sanitation*); SDG11 (*making cities inclusive, safe, resilient & sustainable*) and SDG 13 (combating climate change and its impact) (SDGs) 2015. SDG 11, specifically has an indicator that relates to solid waste management: “*percentage of solid waste regularly collected and well managed*”. However, like other prior social development agendas, the challenge may be located in the operationalization and implementation United Nations Sustainable Development Goals (SDGs), (2015). In many countries in the developing world, management of solid waste is not mainstreamed, poorly funded and has always fallen below expectation (Hoornweg, Haylamicheal and Bassey 2012).

2.2.1 Exposure to solid waste

Exposure to solid waste may be obvious but may also be occult. Exposure to solid waste may take the form of bodily contact, penetrating injuries, inhalation, or ingestion. Exposure to solid waste is a function of how much solid waste is generated, how it is collected,

transported, and the proportion disposed of safely (Hoornweg, Boadi and Oguntoyinbo. 2012). It is estimated that in developing countries, waste generated per capital per day is about 0.65 kg compared to 2.2 kg in Organization for Economic Cooperation and Development (OECD) countries. The African region contributes about 5% of solid waste generated globally, 44% by OECD and 12% by Latin America and the Caribbean (Hoornweg and Bhada-Tata 2012). Solid waste collection in low income countries is less than 50% compared to about 98% in high income countries and in most cases disposal is at open dumpsites or land fill with limited organized recycling. At a higher level, risk of exposure to solid waste is influenced by presence or absence of good policies and allocation of financial resources to manage it. Categories of people exposed to solid waste range from those who generate the waste, those who collect waste it(formal and informal), such as the municipal workers, those who pick waste for a living and those living or working near disposal site such as landfills or dump sites and incinerators.

2.3 Effect of safety on Informal waste Collectors

The safety risks associated with informal sector waste collectors include occupational health risks. These were high in developing countries due to manual handling (for example, direct contact with broken glass, or paper that may have been saturated with toxic material) and a lack of protective equipment, resulting in direct contact with waste. Inhalation of bio-aerosols, and of smoke and fumes produced by the open burning of waste, can also cause health problems (Wilson et al, 2006). The most common health problems among informal collectors, undertaking routine work on collecting waste include headaches, fatigue, sprains, low back pains, shortness of breath and skin rashes.

Occupational exposure to solid waste is a constant risk waste collectors are faced with. Exposure can happen depending on the level of protective ware, knowledge of risk, standards and practices of waste sorting and equipment available to such workers Abd El-Wahab E W, et al, (2014). In many of the developing countries, municipal waste (which is a mixed bag of waste) is handled by cheaply hired workers with limited protective gear and limited appreciation of the risk involved in handling solid waste Abd El-Wahab EW, et al, (2014). Often they also have no legal protection and recourse in case of injury as their engagement terms are largely non-binding. Even where there were binding working relationships between the waste handler and employer such as the municipal councils, the challenge is that some of the effects of exposure may manifest long after the working relationship ceased to exist. The near absence of waste sorting and lack of protective wear put waste handlers at very high risk of exposure Rachiotis and Bassey (2012). This is particularly important in developing countries where solid waste is often mixed with high risk waste such as medical waste especially from small facilities being disposed of as general municipal waste Bassey, Benka-Coker and Aluyi (2006).

2.4 Occupational Safety Issues in Solid Waste Management

The handling and disposal of municipal solid waste is a growing global environmental and Public-health concern (Jayakrishnan et al 2013). The management of solid waste has contributed significantly to healthy living by curbing the danger of various water borne diseases and cholera (Kuijjer et al., 2010). Waste handling is associated with various adverse occupational safety and health effects emanating from the waste collection methods used by solid waste handlers when they perform their duty. Tevera et al., (2003) contends that more than one hundred people die every year due to diseases caused by improper handling of

household solid waste. Hardoy et al., (2001) echoed the same sentiments by revealing that diseases emanating from poor household solid waste handling present risks that can be fatal to more than 5.5 million people. In this scenario, solid waste workers are at high risk of contracting occupational diseases and injuries since their work requires them to be in direct contact with wastes composed of diverse elements including traces of medical wastes, from point of generation, collection, transportation and finally, disposal.

The exposure of solid waste workers is not only limited to hazards emanating from waste processing activities such as composting, the hazards are also dependent on factors such as the type of equipment and machinery used and the job tasks related to repair and maintenance of machinery. The risks vary from contamination by biological or gaseous agents, physical injuries related to dust, noise, extreme temperatures, poor lighting, ergonomics and painful working postures and pathogen infested waste such as syringes as well as fires.

According to the American National Institute for Occupational Safety and Health (NIOSH), solid waste workers have the third highest frequency of nonfatal injuries and illnesses compared to other occupations (Rorgoff and Bidderman, 2015). In the waste management sector, fatal accidents are almost three times higher than other occupations. Reviews on workplace hazards in this sector by Cointreau (2006) showed high accidents occurrences at work including the regulated waste management sector. Studies reported that solid waste workers had higher risk of an accident at work compared with a baseline population, and accidents occurrences in Romania were 1.3 times higher, whilst in Denmark they had 5.6 times higher chances of accidents (Kuijjer et al, 2010), to 10 times higher in the USA. A study in Northwest Ethiopia by Eskezia, Aderaw, Ahmed and Tadese (2016), revealed that

the annual prevalence of at least one occupational injury among solid waste workers was 34.3 %.

Developed countries formulated standards and legislation for handling solid waste which have seen a reduction in the occupational health impacts substantially (Eskezia et al., 2016). The implementation of these standard operation procedures in handling solid wastes in developed nations have greatly reduced the various hazards associated with pollution considerably. The solid waste handling systems in developed countries have robust legal frameworks which enforce the segregation of hazardous waste at source such that they have traceable records; they are managed separately in secured transport and disposal facilities. On the other hand, in some developing countries, segregation of medical wastes and poisonous wastes from industries, from domestic waste is not practiced, further exposing solid waste workers to a wide array of risks (Rushton, 2003). Nevertheless, such hazards are still prevalent in developing nations. Cointreau (2006) contends that work related to solid waste handling are much higher in developing countries than those in developed countries, because workers are not adequately protected. The regulatory framework and enforcement system to separate hazardous wastes are nearly absent in developing countries (Rushton, 2003).

The waste collection system in developing countries is such that discarded waste is rarely stored in closed plastic or metal containers. Another scenario is that waste is placed on the ground directly, requiring that it may be shoveled by hand exposing the solid waste worker to be in direct contact with waste and are also exposed to strenuous working conditions. In both cases, the waste storage system is accessible to insects and rodent vectors and to scavenging animals. As a result, the likelihoods of spreading of flea-borne disease

and plague by vectors such as rats is high (Jerie, 2016). Cointreau (2006) also affirms that waste handlers in less economically developed countries contacts solid waste more directly compared to their colleagues in developed countries.

Furthermore, solid waste handling in developing countries is by labor intensive method which involves carrying heavy loads which expose refuse collectors to increased risk of musculoskeletal disorders and the most common complaints by refuse collectors indicate problems with the lower back region. Yang et al.,2001 contends that other affected areas are shoulders, knees, and neck. The waste collection system requires physical strength, which are linked to numerous risk of musculoskeletal disorders (Jerie, 2016). Various types of hazards that can be correlated to waste management and these are chemical, biological, physical, sharp items, lack of proper planning and psychosocial problems. The common injuries encountered by solid waste workers include strains, cuts, lacerations, twisting and muscle sprains. Kuijer & Frings-Dresen, (2004) contend that injuries encountered by solid waste workers are related to falling from heights or slipping, struck by a sharp object, cuts by scrap metal and broken glass, or piercing object and straining of the body.

The measures for aseptic waste handling differ globally and are highly dependent on ability to provide protective equipment and the knowledge of the worker on adequate use of the personal protective equipment (PPE) (Merson, Black and Mills, 2001). Apart from limited protection, the lack of training of waste handlers contributes significantly to their risk of encountering injuries and accidents. Gonese et al., (2002) contends that lack of training at the beginning employment is a risk factor for waste workers. In addition to these, periodic medical check-up programs for all solid waste collectors should be adhered to in order to uphold their social physical and mental well-being (Tiwari, 2008). Solid waste workers are

exposed to physical injuries and musculoskeletal disorders due to inadequate use of the provided PPE.

Solid wastes workers are vulnerable in Less Economically Developed (LEDs) countries have lower socio-economic position as a result of poverty, lower educational exposure and poor standards of living. Sabde & Zodpey (2008) contends that, these groups of workers are directly exposed to hazardous waste and work without adequate personal protection.



CHAPTER THREE

RESEARCH METHODOLOGY

This chapter discusses the methodology which was used in this study. It covers the research design, population, sample and sample procedure, instruments, data collection procedure and data analysis procedure, a profile of Ga East Municipality of Greater Accra Region of Ghana.

3.1 Study Area

The study was conducted in the Ga East municipality of the Greater Accra Region. The Ga East Municipality covers a land area of 166sq km. It boarded on the west by Ga West Municipality, on the east by the Adentan municipality, the south by Accra Metropolitan Assembly and the north by the Akwapim South District (Bening, 2010). The municipality has an estimated population of 255,215 (PHC, 2010). The growth of the population is due mainly to the influences of migration inflows. The structure of the population has about 51% males and 49% females with an average household size of 6.2 (Ghana Statistical Service, 2012).

There are about 65 settlements with the Gas as the indigenes and a cluster of other ethnic groups within the municipality. Out of the 65 settlements, there are some notable urban and peri-urban communities (Bening, 2010). The Ga east municipality has Abokobi as its capital. Some of the communities in the Ga East Municipality include, Madina, Dome, Taifa, Haatso, Kwabenya, Oyarifa, Ashongman, Pantang, Otinibi, Danfa, to mention but a few. The Ga East Municipality has several economic opportunities such as industry, service, commerce, and agriculture activities. The market centers play a major role in making these opportunities a reality. Two market centers stand out in the Ga east municipality when it

comes to bettering the life of the people in the municipality. One problem that confronts the smooth operation at these market centres is the issue of poor sanitation of which malaria continues to be the most reported disease at the Out-Patient Department (OPD) of facilities in the Ga east municipality.

There are 39 health facilities in the Ga East Municipality, two government polyclinics at Madina, two health centres and a Community Based Health Planning (CHPS) compound, special hospital at Pantang which has become a general hospital for only OPD cases. Dome and Taifa sub- municipality do not have any government health facilities and are challenged with few number of private health facilities. Diarrhea and malaria continue to be most reported diseases in the private facilities and an endemic Lymphatic Filariasis (Elephantiasis) within the area (DMH- MOH, 2012).

Farming is the major economic activity for about 55% of the economically active population. About 70% of the rural population depends on agriculture as their main source of livelihood with about 95% of them being small holders. The major agriculture activities include crop production: cassava, maize. Livestock production: rabbits, pig, sheep, goats and poultry. Among the wide range of vegetables produced are peppers, cabbages, tomatoes, okras, garden eggs just to mention but a few (DFA-MOFA, 2010). Alternative livelihood activities in the area include mushroom, snail production, grass cutter rearing, rabbit and poultry farming. These initiatives have become crucial as arable agricultural lands for farming activities are gradually being turned into communities due to urbanization.

A MAP OF THE STUDY AREA

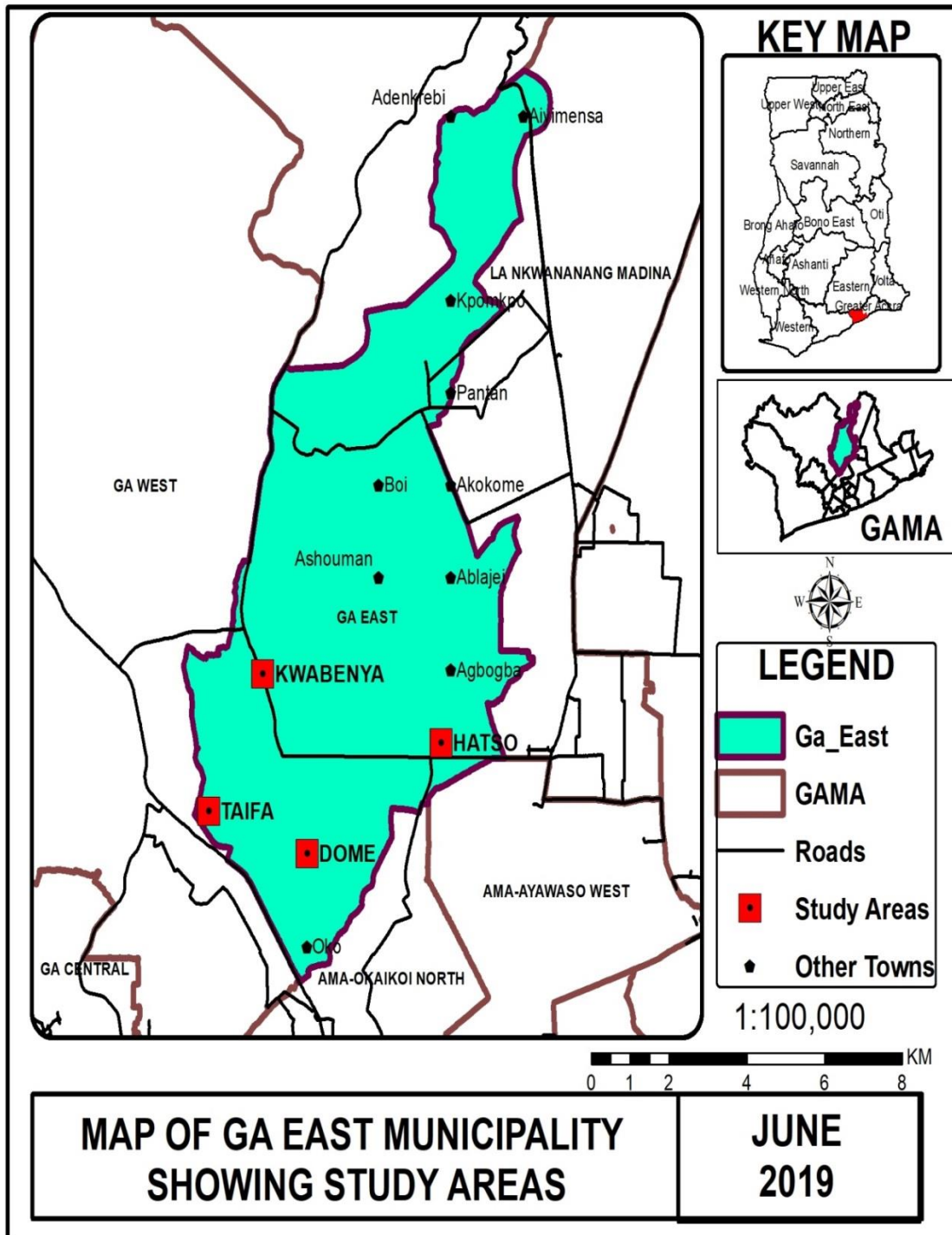


Figure 1: Map of Ghana Showing Ga East
Source: Ga East Municipal Assembly, 2019

3.2 Research Design

The main research design employed for this study is the descriptive survey as it seeks to examine the safety practices by informal waste collectors in the Municipality. Descriptive survey design is appropriate because it is useful in establishing the nature of existing situation and current conditions and also in analyzing such situation and current conditions.

In descriptive survey Best and Kahn (2002) asserted that descriptive survey describes and interprets 'what is'. It is concerned with the conditions or relationships that exist, opinions that are held, processes that are going on, effects that are evident or trends developing. It is primarily concerned with the presents, past event and also relates to current conditions (Best and Kahn, 2002).

3.3 Population

A population in research terms is the entire group of elements a researcher wants to study (Bachman and Schutt, 2008). The targeted population of the study will be the informal waste collectors who have dependents and above 15 years made up of either sex. This will involve respondents who have been collecting the waste from various homes with their tricycles. It is expected that the respondents will have the needed knowledge regarding the subject under investigation and be able to provide responses that will help to answer the research questions. The study population is made up of 100 respondents.

3.4 Data Collection Instrument

The instrument that will be used for data collection is questionnaire to the informal waste collectors. The questionnaire will be an adapted questionnaire from a perception measuring instrument. Some part of the questionnaire employed for the study was made up of a four

level Likert scale item eliciting responses ranging from strongly disagree to strongly agree. Respondents were required to respond by ticking the appropriate level regarding statements on the Likert scale. The questionnaire was made up of thirty-one (31) items. Section A (which contained seven (7) question items) solicited information on the demographic characteristics of the respondents. Section B (which comprised seven (7) question items) sought for information from the respondents on knowledge of dangers that they are exposed to. Section C (which comprised ten (10) question items) gathered responses on the safety practices by the informal waste collectors. Section D (which comprised of seven (7) question items) gathered responses on role played by the Environmental Health Unit of the Municipality to ensure compliance.

The questionnaire is considered for the study because it is also appropriate for survey work and also affords the respondents adequate time to give well thought out answers (Kothari, 2004). The questionnaire can however produce the emotion for which responses were ascertained, a shortfall for the use of a questionnaire.

3.5 Data Processing and Analysis

The Statistical Package for Service Solution (SPSS) version 20 software aided in the management and analysis of the gathered data. The field data were assembled and organized in order to use only complete questionnaires. The responses were entered into the Statistical Package for the Service Solution (SPSS) version 20 software. The analysis of data was based on the research questions. Information under each were interpreted and explained in line with how it contributes to the study. The study will be in presented the findings of the analysis in tables and figures.

3.5.1 Primary Data

Primary source of data consists of first – hand data sources. Primary data source include data collected through questionnaires, interviews (structured, semi – structure and unstructured), observations, discussions, etc. (Amin, 2005). Questionnaires were used in the study.

3.5.2 Secondary Data

Secondary data comprise of data not obtained from original source. Such data could be classified into internal and external data. Internal data relates to secondary data acquired from within an organization whilst external data consist of secondary data acquired from outside an organization. The research used both types of secondary data for its analysis. The collections of secondary data will allow the study to verify some primary data and improve on the scope and generalization of the research.

3.5.3 Questionnaires

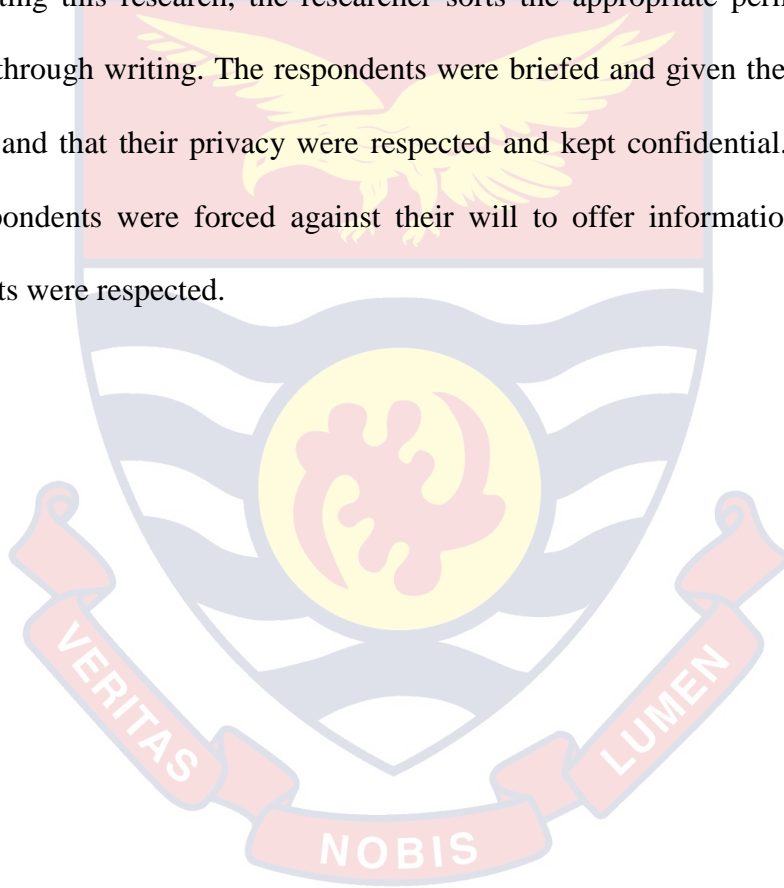
These are prepared in a way to acquire information for the study. Yin (2005) suggests that a questionnaire allows for standardization in data taking and also allows for accurate statistical measurements of responses in other to arrive at a credible result. The first part presents a biographical data of the respondents which includes age and gender. The second part of the questionnaire consists of the objectives of the study with seven or more items under each research questions. The key elements of the questionnaire emphasize on the safety practices of informal waste collectors. (Appendix 1)

3.6 Data Collection Procedure

The questionnaires were given to the respondents to answer within a period of 15 minutes. Respondents helped to locate other informal waste collectors in the municipality in answering the questionnaires.

3.7 Ethical Consideration

In conducting this research, the researcher sorts the appropriate permission from District assembly through writing. The respondents were briefed and given their free consent to the responses and that their privacy were respected and kept confidential. There was no point when respondents were forced against their will to offer information. The views of the respondents were respected.



CHAPTER FOUR

RESULTS AND DISCUSSIONS

This chapter presents the main findings of the research. The results are presented using tables and charts which summarize the responses from the respondents to whom the questionnaires were administered to in The Ga- East municipality. The analysis of the issues of concern precedes the tables. The issues are grouped under specific topics based on the specific objectives of the study and the demographic characteristics of the respondents. Findings from the study have been discussed in line with other research findings conducted by other researchers.

4.1 Demographic characteristics of Respondent

4.1.1 Age categories of respondents

From table 1, those with the ages between 21-25 were 39 percent with the knowledge that those youth had to live an independent life and therefore would have to find a source of income to take care of themselves, those within the ages of 15-20 and 26-30 had 26 percent since most of them at this stage said they have to get themselves involved in the job to enable them set up their own small businesses thus with those within 26-30, and with those in between 15-20 stated that they had start to job in order to search for a better one, since after SHS, they are not really taking care for in the family, also 6 percent who were 36 and above stated that some of them had to stop they previous work since it was not fencing them enough money to look after their family since this was helping them to get daily income which was also better than their previous work, finally, those within 31-35 said they

had to get themselves some money since farming activities were not helping them any longer since they had to buy a lot of fertilizers to help with better produce.

4.1.2 Marital status of respondents

Marital status , 71 percent out of 100 percent were single, this shows that, a lot of them were looking for jobs that will fence some money to take care of themselves, 13 percent of them were married of which they stated that they had to do the job to be able to get some daily income, also, 8 percent were cohabiting and they were involved in it to be able to pay some bills since he was leaving with the opposite sex, 5 percent were divorced for some various reasons which can not be stated, finally, 3 percent of them were widowers and have to get of some money to look after the family.

4.1.3 Educational Level of Respondent

From table above, 51 percent of the respondents completed JHS of which they could not further their education again due to obtained results and financial constrains, 20 percent of them ended in Primary and SHS, those of them who stopped at the Primary Stages stated that due to going to the farms at times before going to school was their mean reason for ending there, and those who could get to the SHS level, some stated they had to drop out of school at Form 2 due to fees issues and others had completed but no money to further and some of them were also doing it to get some money for up keep when they resume school.

Table 1: Demography

	Frequency	Percentage
Age		
15-20	26	26
21-25	39	39
26-30	26	26
31-35	3	3
35 and above	6	6
Total	100	100
Marital Status		
Married	13	13
Cohabiting	8	8
Single	71	71
Divorced	5	5
Widowers	3	3
Total	100	100
Educational Status		
Illiterate	1	1
Primary	20	20
JHS	51	51
SHS	20	20
Technical	8	8
Total	100	100

Source: Field Survey, June 2019

4.2 Comparing the Role in the Family and the Number of Households of Respondent

Dependency rate will always push a lot of people to find some work to do in order to make the necessary provisions, and the (table 2) shows respondents who, were family heads had 5 household number between 2-5, some had 4 between 6-10, those who were bread winners 4ki86 household number between 2-5, and 12 between 6-10, and also those who were neither family heads nor bread winners but had people they were supporting and between 2-5 had 5 household and 2 between 6-10, and those taking care of themselves were 26 in number.

Table 2: Comparing the Role in the Family and the Number of Households of Respondent

Role in Family	Number of households		
	2-5	6-10	None
Head of family	5	4	0
Bread winner	46	12	0
None of the above	5	2	26
Total	56	18	26

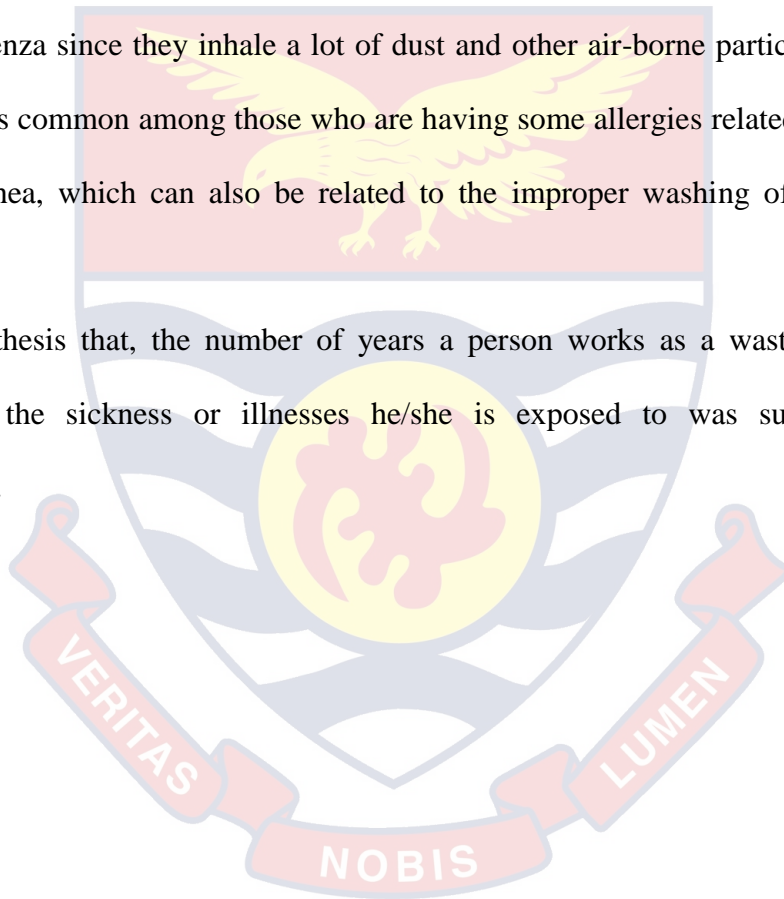
Source: Field Survey June, 2019

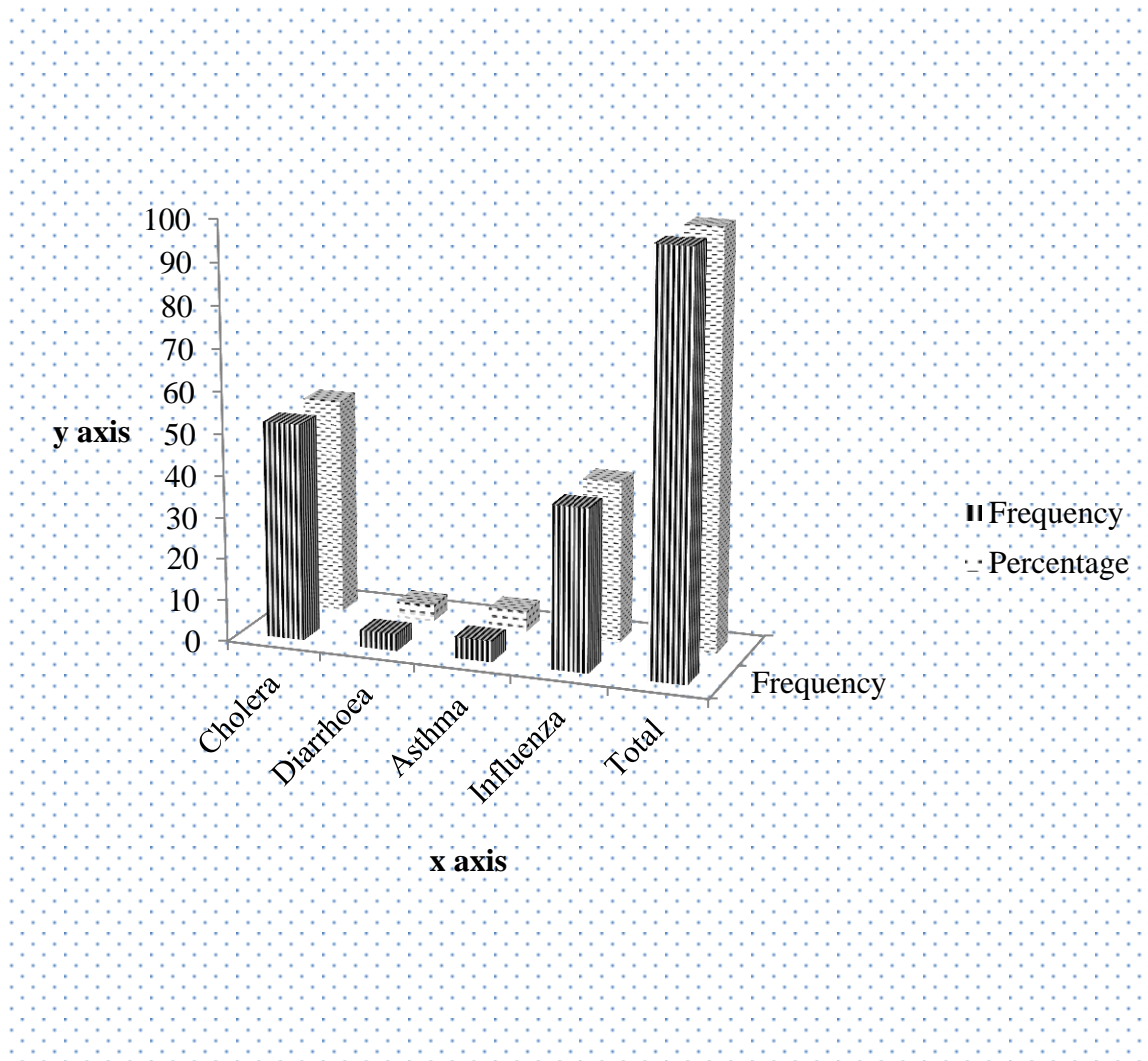
4.3 Knowledge of dangers that informal waste collectors are exposed to

4.3.1 Types of sicknesses or diseases informal waste collectors are prone to

The study checked on the knowledge of dangers informal waste collectors that concerns some diseases that they are prone to in relation to their work and it was found that, out of 100 respondent, 52% of them said they were prone to cholera due to the fact that they do not always wash their hands before eating especially when they are at work, 39% of them said influenza since they inhale a lot of dust and other air-borne particles, 5% said Asthma of which is common among those who are having some allergies related to that, 4% of them said diarrhea, which can also be related to the improper washing of hands as shown in (figure 1).

The hypothesis that, the number of years a person works as a waste collector does not influence the sickness or illnesses he/she is exposed to was supported ($X^2=81.169$ $P.=0.005$).





Source: Field Survey, June, 2019

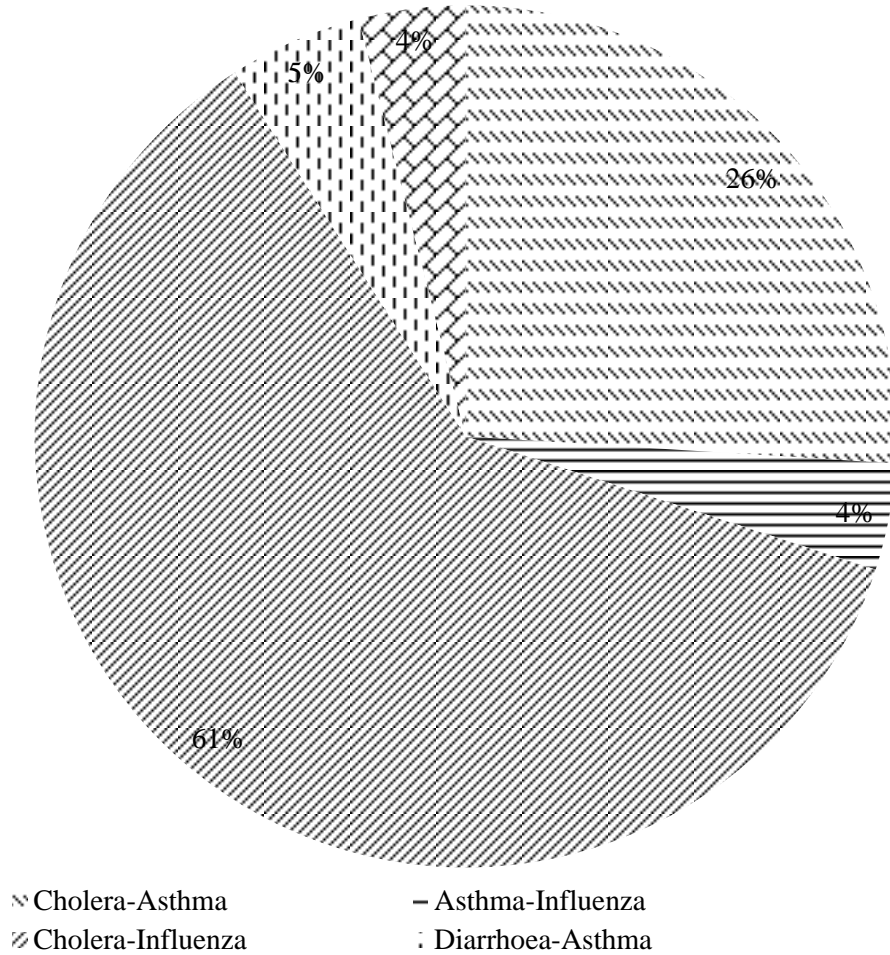
Figure 1: Type of sickness or diseases informal waste collectors are prone to

4.4 Purposes for hand washing before eating

Hand washing especially with soap is a healthy practice which helps to kill most bacterium that everyone is prone to regardless of the type of work. 61% of the informal waste collectors, stated that cholera –Influenza were the main reasons why they wash their hands, 26% of the total number stated cholera-Asthma were the reason why they washed their hands, 5% of the population also said Diarrhoea-Asthma were their reasons why they wash

their hands, 4% of them said for they do that to prevent both Asthma-Influenza and Influenza-Diarrhea.





Source: Field Survey, June 2019

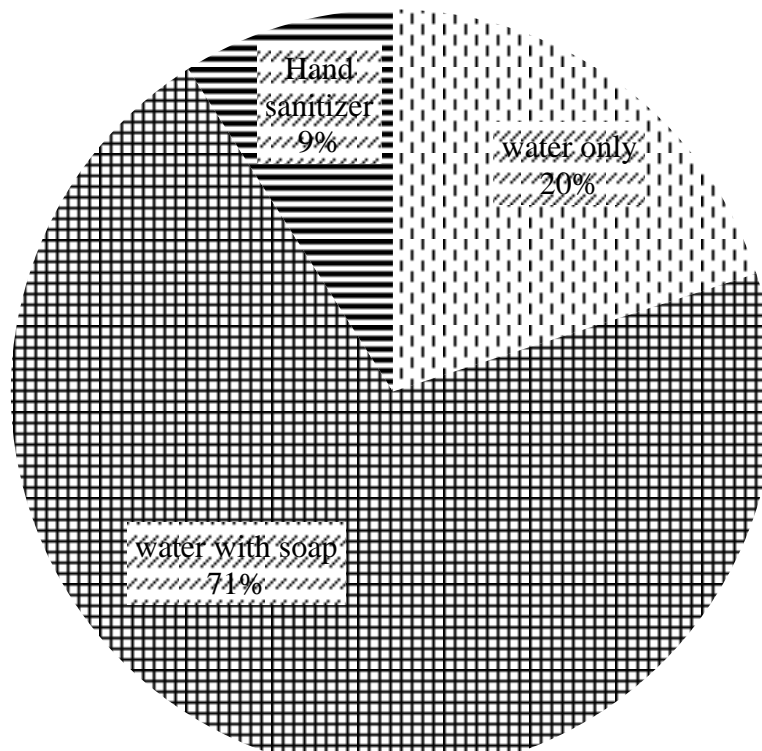
Figure 2: Reason why they wash they wash their hands

4.5 How hand washing is done

Proper hand washing can not be done without soap and water alone does not kill the germs that we are exposed to in our day to day activities and from the research made, 71% of respondents said they wash their hands with water and soap because they did not want to contract any sickness, whiles 20% of them said they use only water in washing their hands

because they are very hungry, 9% of them said they use hand sanitizer to kill the bacterium on their hands before they eat.

The hypothesis that, the level of education does not influence the use of soap in hand washing when one is engaged in waste collection business is reject ($X^2=27.027$; $P.=0.001$).



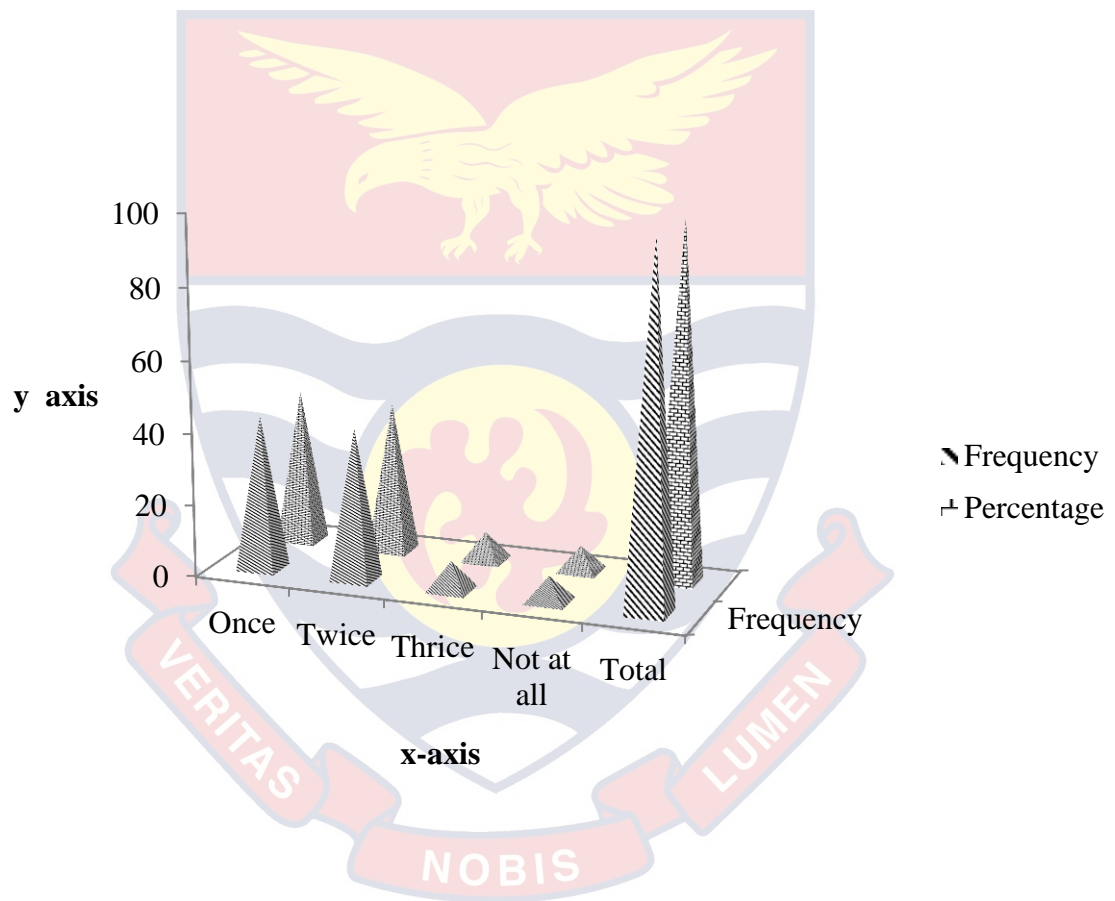
Hand Sanitizer 9%,water only 20%, Water with soap 71%

Source: Field Survey, June, 2019

Figure 3: Substances used in washing their hands

4.6 Number of times they take their bath

On healthy practices, bathing is an important exercise that need to be considered, 43% of respondents said they take their bath once in a day since they only take their bath after work, while 42% of them said twice in a day, only 8% of them said thrice and 7% of them said not at all and such people can easily be prone to a lot of sicknesses.

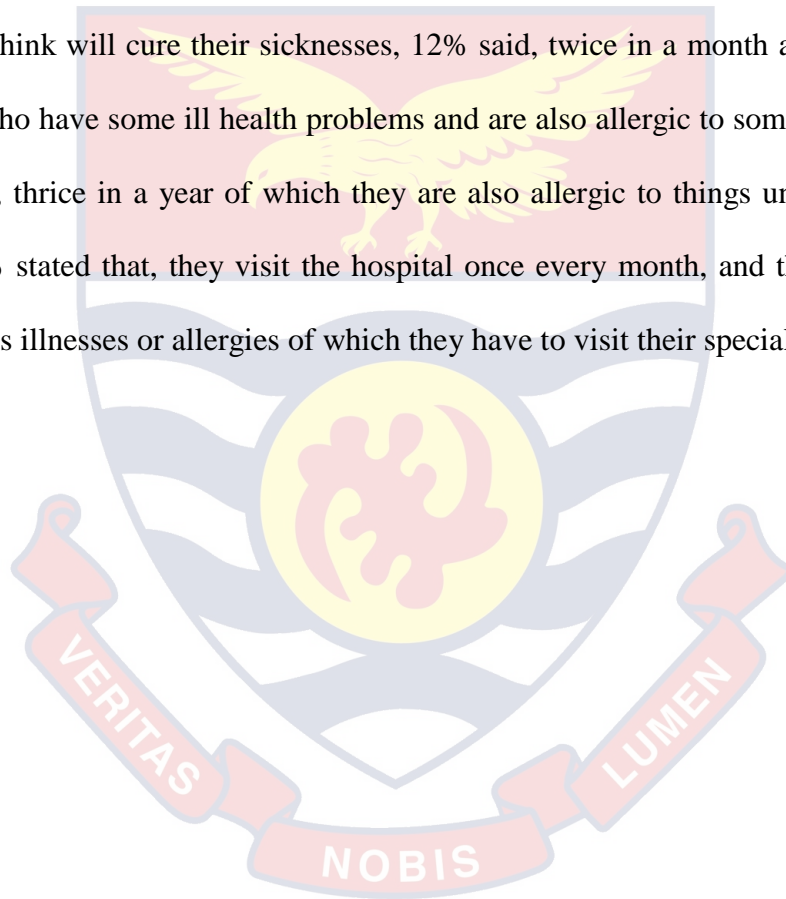


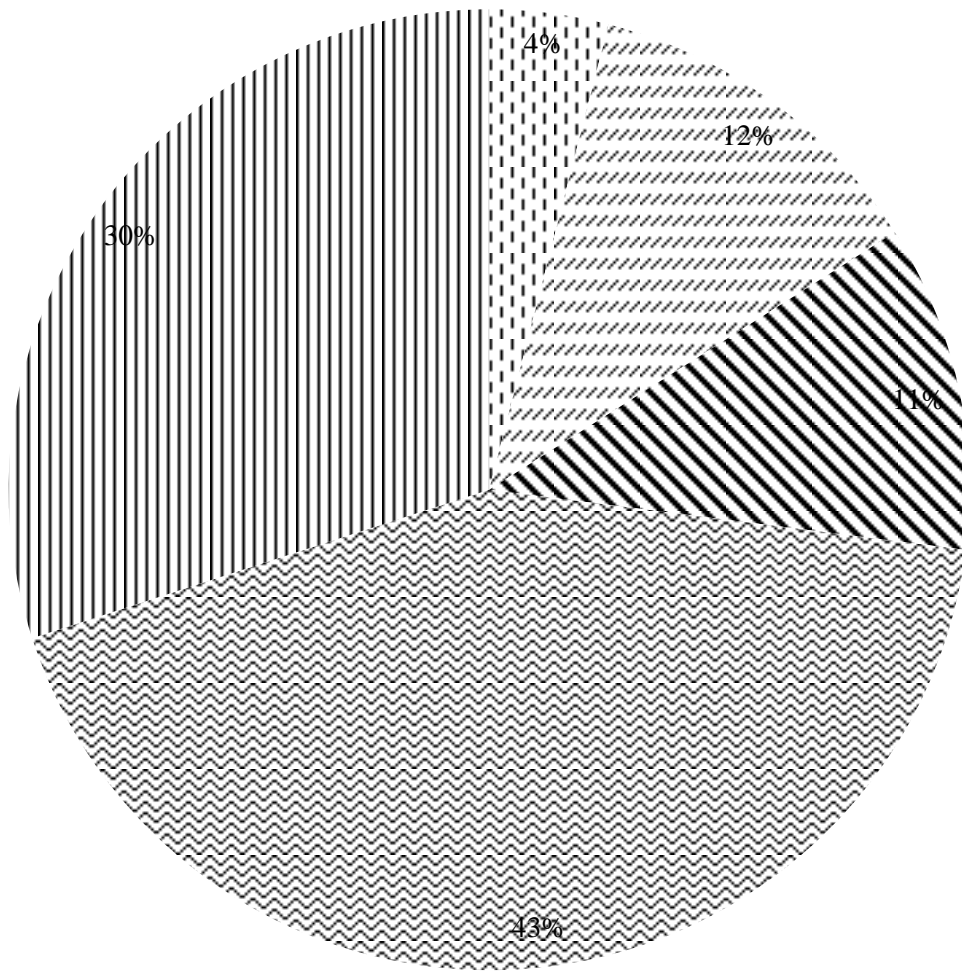
Source: Field Survey, June, 2019.

Figure 4: Number of times they take their bath

4.7 Often times they visit the Hospital for check up

Every work has its own occupational health related sicknesses of which constant visit to the hospital is advisable and it was found out that, 43% said, they visit the hospital as and when they are sick and this means when the sickness is mostly beyond their control thus after they are done with self-medication, 30% of them said they have never been to the hospital before this is because they do not have the means to do so or because they prefer buying medicines that they think will cure their sicknesses, 12% said, twice in a month and that is with some of them who have some ill health problems and are also allergic to some things, also 11% of them said, thrice in a year of which they are also allergic to things unknown to them, and finally 4% stated that, they visit the hospital once every month, and this were people who had serious illnesses or allergies of which they have to visit their specialist often.





Once a month Twice a month thrice a year As and when am sick Never

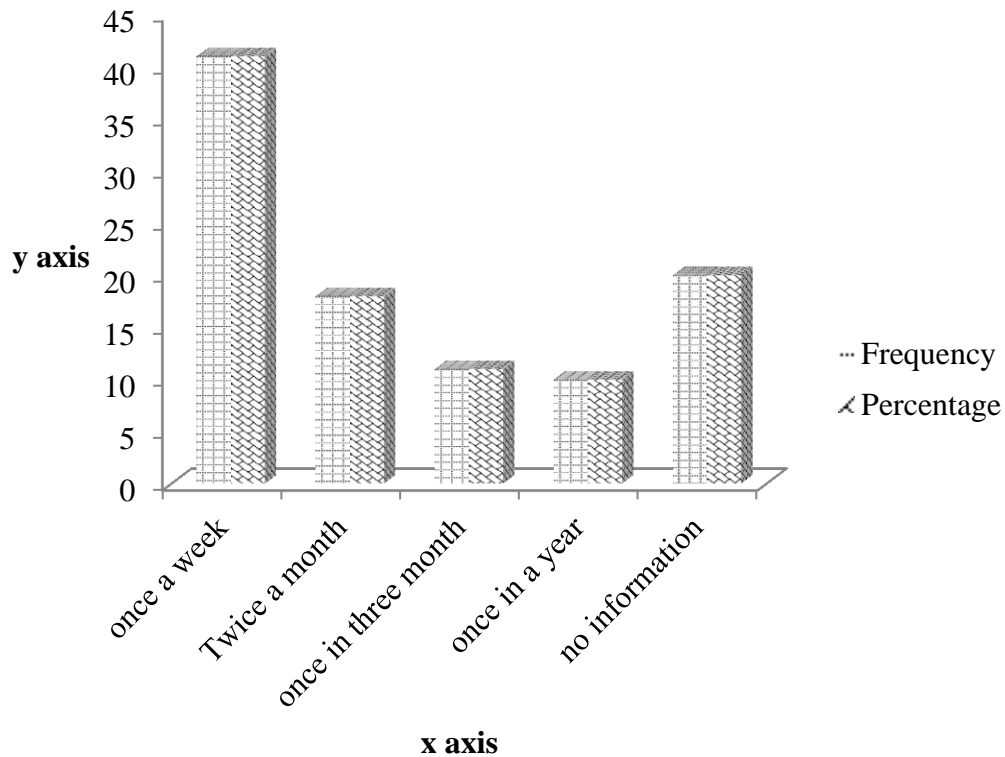
Source: Field Survey, June, 2019

Figure 5: Number of times they visit the Hospital for check up

4.8 Information regarding their waste collection activities

There is the need to have much information regarding every work and safety of the type of work should not be left out and information concerning waste collection activities should be known by all waste collectors, out of the 100 respondents, 41% of them were receiving

information once a week of which is mainly from the tricycle owner concerning the employees safety measures, 20% of them said they do not receive any information at all this is neither from their bosses or from anyone, also 18% stated that, they receive information roughly like twice in a month of which is mostly from their colleague’s who are also in the same business but probably staying at different areas, also 11% stated they receive information once in three month which is mostly from their customers that they serve, while 10% of them said they recall they receive information roughly once in a year also source from friends and customers.



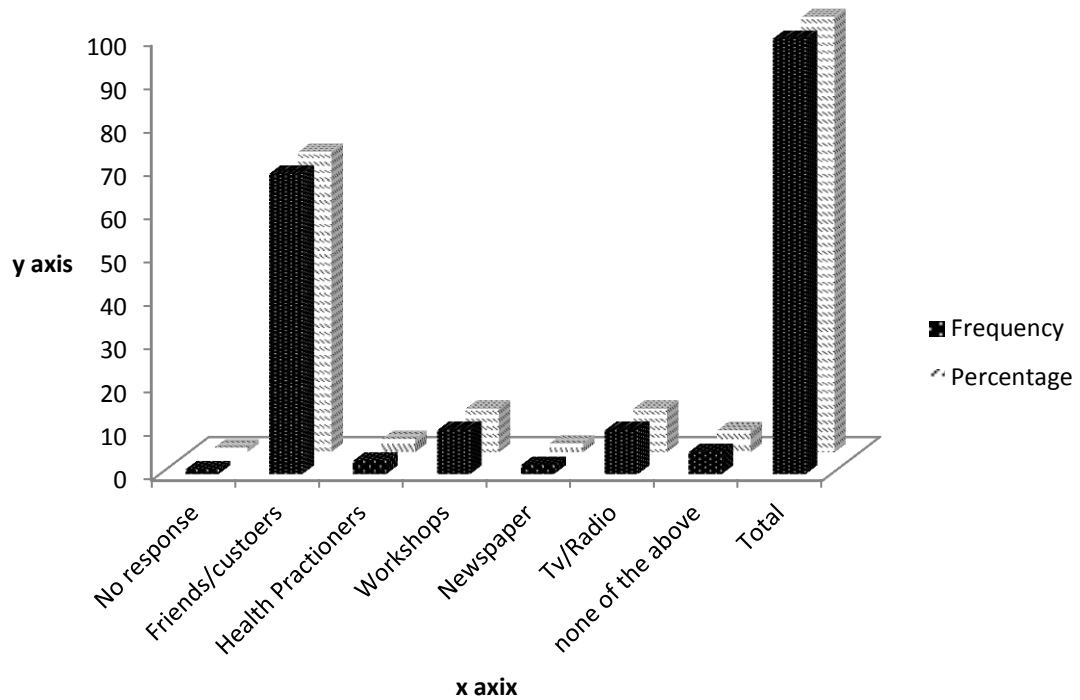
Source: Field Survey, June, 2019

Figure 6: Information regarding their waste collection activities

4.9 Access to information regarding safety issues on waste collection

Receiving information concerning one's work makes the person cautious of most things pertaining to the work, and it was noted that 69% of the total respondents receives information from friends/customers because they are those they easily have in contact with most often, 10% said they had it from the some meetings they attended in their formal place of stay before moving to their current place now and also another 10% from tv/radio of which are mostly referring to formal waste collectors but of which they are all the same, 5% of them stated none of the above options, while 3% stated information from health practitioners thus when they visit the hospital for any ill health challenge, also 2% stated that, they had it from newspaper since some had some higher level of education of which they can read and write to express themselves a bit, finally 1% of them were not able to respond to that particular question.

The hypothesis that, the number of years a person works as a waste collector does not influence where they get information regarding safety issues on waste collection was rejected ($X^2=38.386$; $P=0.032$).



Source: Field Survey, June, 2019

Figure 7: Where they get the information regarding safety issues on waste collection

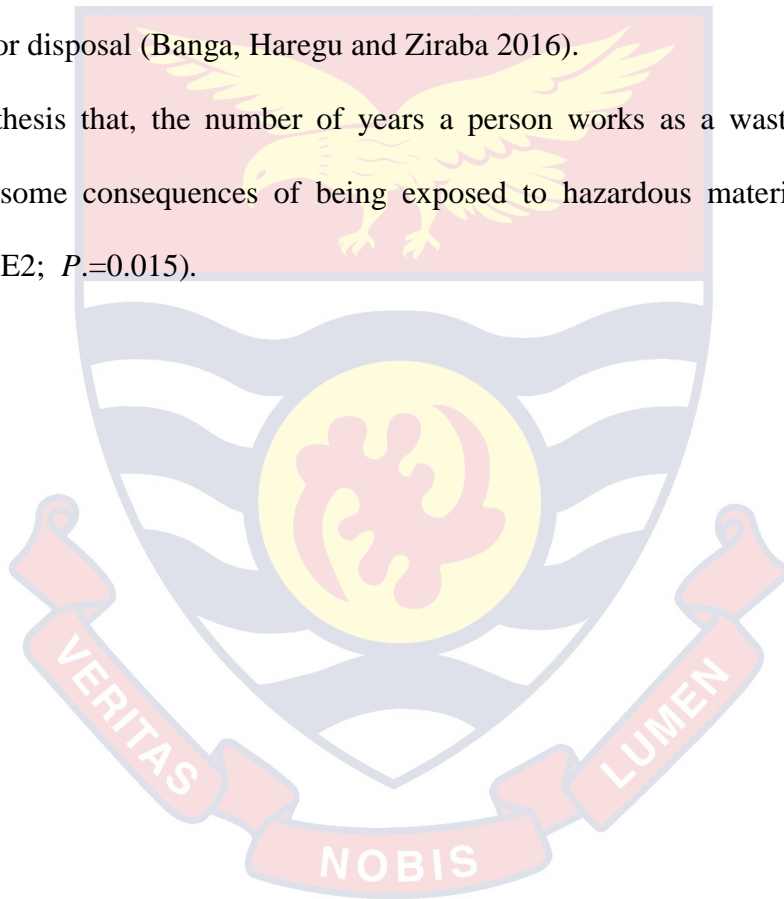
4.10 Safety Practices by Informal waste collectors

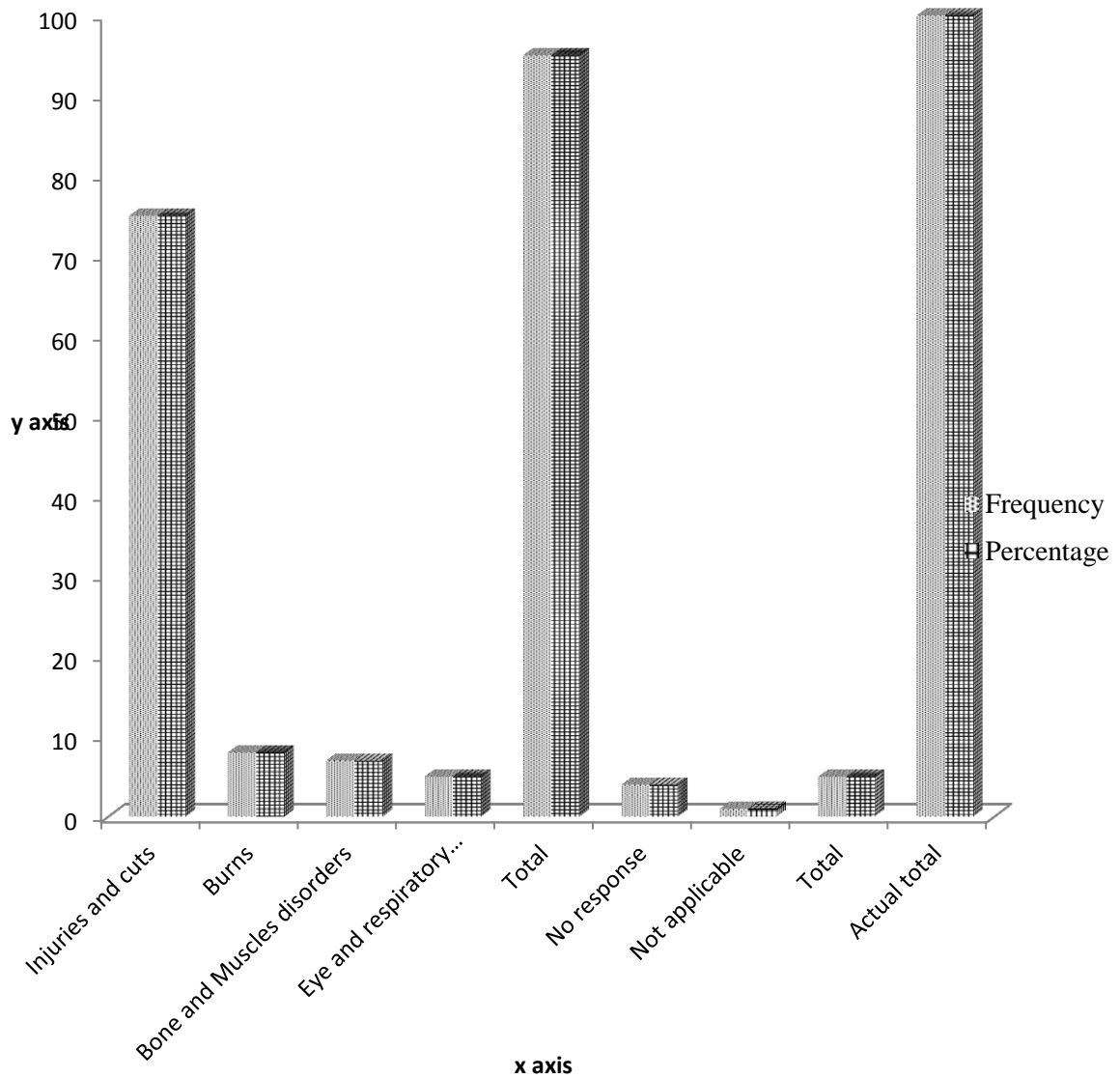
4.10.1 Some consequences of being exposed to hazardous material

In relation to this research, the informal waste collectors are exposed to a lot of hazardous substances of which most of them are not provided with a safety equipment, as done for the formal waste collectors, and it was found that 75% of the respondents stated injuries and cuts were some of the consequences of being exposed to such waste, 8% said of them stated

burns, while 7% of them stated bones and muscles disorders, while 5% said eye and respiratory infections, 4% of them did not respond to the question, finally with the remaining 1% only of them gave answers that were not applicable. Annually, they constitute an average of 90 deaths per 100,000 collectors; this makes waste collection and handling a riskier occupation compared with other jobs. Hazards occur at any step in the process of waste management started from collection at homes, during transportation and ended at the sites of recycling or disposal (Banga, Haregu and Ziraba 2016).

The hypothesis that, the number of years a person works as a waste collector does not influence some consequences of being exposed to hazardous materials, was rejected as ($X^2=1.157E2$; $P.=0.015$).





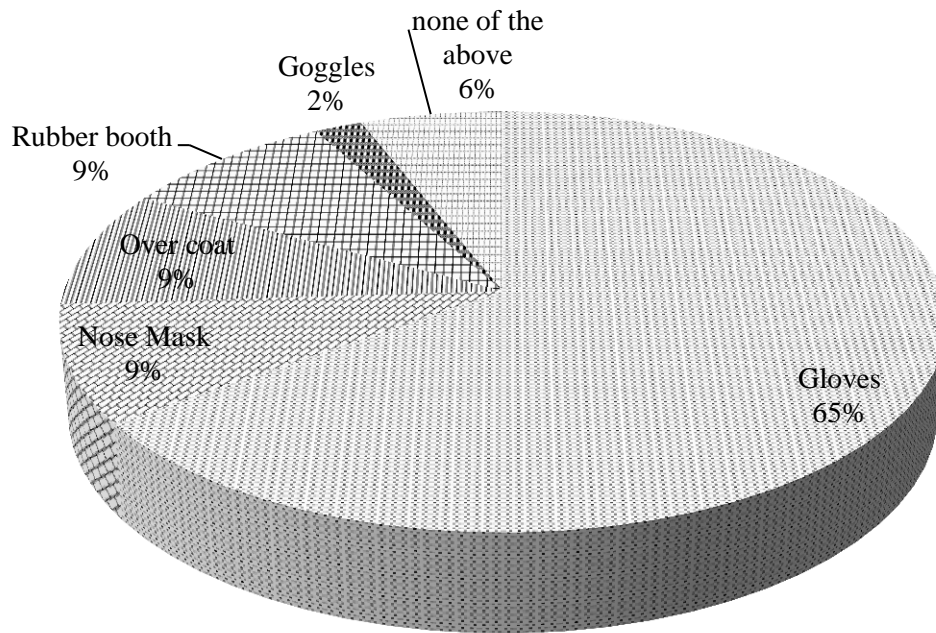
Source: Field Survey, June, 2019

Figure 8: Some consequences of being exposed to hazardous material

4.11 Type of PPEs do they use to help reduce or prevent exposure to hazardous materials.

Personal Protective Equipment's (PPEs) are needed at all work places to help prevent and reduce the severity of an accident occurrence at work places and this PPEs makes working comfortable even at proposed danger areas at the work place, this helped the researcher to

find out the types of PPEs that the informal waste collectors use to prevent or reduce exposure to hazardous materials or substances, and it was found that, 65% of the respondents, wear gloves to prevent their exposure to hazardous waste which shows that, most of them prefer the use of the gloves to any other PPE's, 9% of them uses nose mask to help prevent or reduce the smell from the waste, also 9% the respondents uses over coat to prevent any spillage of such waste, another 9% of them uses rubber booth to prevent any spillage on the floor from harming their foot, 6% of them also chose none of the options, and only 2% stated they use goggles during the collection.



None of the above 6%, Goggles 2%, Rubberboot 9%, Oven Coat 9%, NoseMask 9%,Gloves 65%

Source: Field Survey, June, 2019

Figure 9: Type of PPEs do they use to help reduce or prevent exposure to hazardous materials

4.12 Usage of PPEs

Most workers at various work places do not like to use PPE's due to the number of years they have been doing that job, and do not really feel comfortable using them, it was found out that, 93% out of the respondents said Yes to the question of which most of them preferred using gloves than any other PPE's, while only 7% of them said No to the question.

The hypothesis that, the number of years a person works as a waste collector does not influence the use of PPE's, was rejected ($X^2=24.987$; $P=0.095$).

Table 3: Use of PPE's

Options	Frequency	Percentage
Yes	93	93
No	7	7
Total	100	100

Source: Field Survey, June, 2019

4.13 Regular usage of PPEs

The regularity of the usage of PPEs helps to prevent and reduce accidents which can occur within any particular period of time unknown to a worker and upon finding out the number of informal waste collectors how regular they use the PPEs, it was found that, 53% respondents said they use the PPEs always thus whenever they are going to collect waste, while 24% stated, that they use it as and when is needed indicating that, this categories of people only uses it when they think they will be at risk when collecting waste, 9% also said

they remember to use it at least once in a week, while 6% stated twice in a week, 4% answers were not applicable to this particular question, and also 2% did not respond to the question and finally 2% stated they never use PPE's during working hours.

Table 4: How regular do they use PPE's

Periods	Frequency	Percentage
Once in a week	9	9
Twice in a week	6	6
As and when is needed	24	24
Always	53	53
Never	2	2
Total	94	94
No response	2	2
Not applicable	4	4
Total	6	6
Actual Total	100	100

Source: Field Survey, June, 2019

4.14 Reasons why they do not use PPEs

The uncomfortable nature of PPEs makes some worker to have excuses to not to use them and it was found that 88% of the respondent did not provide an answer to this question because it was not applicable to the question, also 6% of them did not also provide their reasons for not using the PPEs and another 6% stated, they were not having money to purchase some of the PPEs.

Table 5: Reasons why they do not use PPEs

Reasons	Frequency	Percentage
Because I do not have money	6	6
no response	6	6
Not applicable	88	88
Total	94	94
Actual total	100	100

Source: field Survey, June, 2019

4.15 Wearing of gloves

Wearing gloves at work places especially in handling waste and other harmful substances that can easily cause problems so then it is needed to be worn to help prevent any consequences, and from the research made, 41% of them stated they strongly agree with the

wearing of gloves since it can reduce or prevent infectious or injuries to your hands, also 35% of them agreed to the usage of gloves, 11% neither agree nor disagree to the usage of gloves to prevent or reduce infectious or injuries to the hands, also 8% of them disagreed with that submission, and finally 4% had a strong disagreement on that fact.

Table 6: Wearing of gloves

Indications	Frequency	Percentage
Strongly agree	41	41
Agree	35	35
Neither agree nor Disagree	11	11
Disagree	8	8
Strongly disagree	4	4
Total	100	100

Source: Field Survey, June, 2019

4.17 Wearing Nose Mask

Wearing nose mask prevent the inhalation of harmful substances into our systems of which can lead to respiratory illnesses and from the research made, it was found out that, 50% of the respondents stated that, they strongly agree to the wearing of nose mask since it prevent /reduces exposure to the inhalation of harmful substances or gases, 27% of them agree to it and 11% of them neither agree nor disagree with that submission, also 7% disagreed with

that fact and the remaining 5% strongly disagree with the wearing of nose mask to prevent inhalation of harmful substances or gases.

Table 7: Wearing Nose Mask

Indications	Frequency	Percentage
strongly agree	50	50
Agree	27	27
neither agree nor disagree	11	11
Disagree	7	7
strongly disagree	5	5
Total	100	100

Source: Field Survey, June, 2019

4.19 Wearing Rubber Boots

Rubber boots help reduce/prevent injuries on the foot and as a waste collector, there is the need to wear them always and in with reference to, Jerie (2016) contends that solid waste workers sustain work related injuries such as sprains, abrasions, fractures, deep on other parts of their bodies, eye injuries and sharp back pain due to their work. it was found out that, 62% of the respondent stated, that they strongly agree with the wearing of rubber boots to prevent/reduce injury to the feet, 19% of them agree on that, 9% of them also neither agree nor disagree with submission, 5% of them disagree with it, another 5% of the also strongly disagree with the wearing of rubber boots can prevent/reduce injury to the feet

Table 8: Wearing Rubber Boots

Indications	Frequency	Percentage
Strongly agree	62	62
Agree	19	19
neither agree or disagree	9	9
Disagree	5	5
strongly disagree	5	5
Total	100	100

Source: Field Survey, June, 2019

4.20 Shower after work

There is always some relief after taking some shower after a day's work and since informal waste collectors are exposed to a lot of dirty and polluted substances of which can easily cause some ill health, the results found from the research made indicated that, 52% of the respondent strongly agree with having their shower after work prevent /reduces incidence of disease contraction, 30% of them also agreed to that submission, while 8% of them strongly disagree, 5% of them neither agree nor disagree, and the remaining 5% disagree with the shower after work.

Table 9: Shower after work

Indications	Frequency	Percentage
Strongly agree	52	52
Agree	30	30
Neither agree nor Disagree	5	5
Strongly Disagree	8	8
Disagree	5	5
Total	100	100

Source: Field Survey, June, 2019

4.21 Lifting Heavy Objects

In occupation hazards, lifting of heavy objects is one of the dangerous problems that most worker have a long period of working, and from the research made, 70% of the respondent confirmed they strongly agreed to the submission that, lifting heavy objects affect your spine after a long period of time, 20% of them also agree to it, while 5% of them are strongly disagree with the submission, and 4% of them neither agree nor disagree, and only 1% disagree with that.

Table 10: Lifting Heavy Object

Indications	Frequency	Percentage
strongly agree	70	70
Agree	20	20
neither agree or disagree	4	4
Disagree	1	1
strongly disagree	5	5
Total	100	100

Source: Field Survey, June, 2019

4.21 Role played by the Environmental Health Unit of the municipality to ensure compliances

4.21.1 Programs organized by the Environmental Health Unit

There is the need for programs to especially help train people or add up to their knowledge, and it was found that, 95% of the respondent stated that they have never had any program with the municipality since they started collecting waste, of which from the unit members, they do not organize such because they are not registered with the municipality, 4% of them stated that, they had health safety education from them, but those who had this opportunity were those who have relocated to the municipality, only 1% of them said they had health screening also in their formal municipality.

Table 11: Programs organized by the Environmental Health Unit

Programs	Frequency	Percentage
Health screening	1	1
Heath safety education	4	4
Never	95	95
Total	100	100

Source: Field Survey, June, 2019

4.21.2 The frequency at which the program was organized

The frequency at which programs were organized for informal waste collectors within the municipality, shows that, 99% of the respondent had never had any program organized by the municipality, and only 1% of them said they have been to the program twice in a year and that was in their formal municipality before they relocated.

Table 12: Number of times

Number of times	Frequency	Percentage
twice a year	1	1
Never	99	99
Total	100	100

Source: Field Survey, June, 2019

4.21.3 Recommendations made by the informal waste collectors

Recommendations are made to help make provisions for things that were absent and the informal waste collectors recommended some things that they need and it was found that, 57% of the respondent recommended they were in need of PPE's which will help them in their daily work and their safety measures, 21% of them also stated that they were in need of waste transportation and tools/equipment/material, while 20% of them also recommended for regular education on safety concerning their work, 2% of them chose all the above.

Table 13: Informal waste collectors recommendations to the Municipality.

Options	Frequency	Percentage
Regular education	20	20
provision PPES	57	57
Waste transportation and tools/equipment/material	21	21
all the above	2	2
Total	100	100

Source: Field Survey, June, 2019

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

This research examined the compliance of knowledge of safety practices by informal waste collectors at the Ga East Municipal Assembly as the main objective of the research, and the others include; examining the knowledge of dangers that informal waste collectors are exposed to, determining the safety practice by informal waste collectors and finally determining the role played by the Environmental Health Unit of the Municipality to ensure the compliances with safety practices by informal waste collectors. One Hundred (100) respondents was used and it was between four areas within the Municipality, as they were selected randomly and purposively respectively. A structured questionnaire was administered to them and SPSS was used to analyze the data.

The results indicated that the out of 100 respondents from the four areas, 52% of them said they were prone to cholera due to the fact that they do not always wash their hands before eating especially when they are at work, 39% of them said influenza since they inhale a lot of dust and other air-borne particles, out of 100 who responded to that particular question. Most of them had little knowledge of the diseases they are prone to and they were preventing themselves from the sicknesses that they know to be prone to. With reference to the data collected, out of the 100 43% said, they visit the hospital as and when they are sick and this means when the sickness is mostly beyond their control thus after they are done with self-medication, 30% of them said they have never been to the hospital before this is because they do not have the means to do so or because they prefer buying medicines that they think will cure their sicknesses and this shows how they are not aware of sicknesses

and the dangers they are exposed to when they do the self-medication, Also, 65% of the respondents, wear gloves to prevent their exposure to hazardous waste which shows that, most of them prefer the use of the gloves to any other PPE's. With regards to those who uses PPE's, 93% out of the respondents said Yes to the question of which most of them preferred using gloves than any other PPE's.

Also with regards to the types of programs that the Environmental Health Unit organizes for informal waste collectors and it was found that, 95% of the respondent stated that they have never had any program with the municipality since they started collecting waste, of which from the unit members, they do not organize such because they are not registered with the municipality.

Some hypotheses were done to determine the if it supported or rejected in respect to the questions of the objectives The hypothesis that, the number of years a person works as a waste collector does not influence the sickness or illnesses he/she is exposed to was supported ($X^2=81.169$; $P.=0.005$).

The hypothesis that, the level of education does not influence the use of soap in hand washing when one is engaged in waste collection business is reject ($X^2=27.027$; $P.=0.001$).

The hypothesis that, the number of years a person works as a waste collector does not influence where they get information regarding safety issues on waste collection was rejected ($X^2=38.386$; $P=0.032$).

The hypothesis that, the number of years a person works as a waste collector does not influence some consequences of being exposed to hazardous materials, was rejected ($X^2=1.157E2$; $P.=0.015$).

The hypothesis that, the number of years a person works as a waste collector does not influence the use of PPE's, was rejected ($X^2=24.987$; $P.=0.095$).

5.2 Conclusions

From the results of the studies, it was concluded as follow:

- It was noticed that majority of the informal waste collectors had little knowledge on the dangers that they exposed to. Only few of them knew the dangers that they are exposed to, as in not washing their hands with water and soap can lead to the contraction of cholera and other related illness especially when they are working. Also they hardly get information regarding their work.
- In accordance with the safety practices of the informal waste collectors, majority of them knew some little consequences of being exposed to hazardous waste and normally uses gloves for virtually every safety precaution since that is what they can afford and also think it is the only necessary PPE's. Only a few strongly agree with the importance of gloves, nose mask, rubber boot, showing after work and lifting of heavy objects as PPE's materials and some other practices.
- Furthermore, Environmental Health Unit of the municipality have not had any interaction with the informal waste collectors basically because they have not registered with the municipality. This has caused the municipality not to organize any program concerning safety practices to the informal waste collectors even though they are helping out to solve sanitation issues in the municipality.

5.3 Recommendations

The people are and will be willing to attend any program and workshops organized by the Environmental Health Unit to help them feel comfortable doing their jobs as informal waste collectors. Below are some recommendations which can help us achieve this.

- Since those involved in this waste collection activities are helping to solve the rate at which some households dump in drainage systems and unauthorized places within the municipality, it will be best when they are registered by the assembly and continue with their collection activity or better still help them join other waste companies in Ghana and also help them have further knowledge on their safety through education during workshops.
- The informal waste collectors are willing to help clean the nation, if only they are provided with collection equipment's such as (PPE's and tricycles) they will do work hand in hand to help reduce waste problems in the country.
- Awareness programs for waste workers need to be focused to increase their knowledge on occupational health hazards and ergonomic principles.
- Periodic training regarding wearing of internationally recommended personal protective dressing should be enforced for making the protection of skin, eyes and respiratory airway.

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APPENDIX I

PRESBYTERIAN UNIVERSITY COLLEGE, GHANA

MSc. ENVIRONMENTAL HEALTH AND SANITATION

QUESTIONNAIRE

I wish to ask for 20 minutes of your time to complete this questionnaire for studying the willingness of households to pay for waste management services. You are kindly requested to answer the questions as honestly as you can. Your contribution will be very much appreciated and you are also assured of anonymity and confidentiality of information given for this study.

INSTRUCTIONS

The following questions are to be answered by ticking a or b and by filling the spaces provided and ticking some boxes.

SECTION A

1. Gender a. Male b. Female
2. Age a. 15-20 b. 21-25 c. 26-30 d. 31-35 e. 36 and above
3. Marital Status a. Married b. Cohabiting
 c. Single d. Divorced e. Widowed
4. Educational Status a. Illiterate b. Primary c. JHS d. SHS
 e. Technical f. Vocational
5. What is your role in the family? a. Head of family b. Bread winner
6. Number of households a. 2-5 b. 6-10
7. How long have you been collecting waste?

SECTION B: Knowledge level of dangers that they are exposed to.

8. Which type of sicknesses or diseases do you think you are prone to?
 - a. Cholera
 - b. Diarrhoea
 - c. Asthma
 - d. Influenza
9. Why do you wash your hands before eating? To prevent the following
 - a. Cholera-Asthma
 - b. Asthma-Influenza
 - c. Cholera-Influenza
 - d. Diarrhoea-Asthma
10. What do you use in washing your hands?
 - a. Water only
 - b. Water with soap
 - c. Hand Sanitizer
11. How many times do you take your bath in a day?
 - a. Once
 - b. Twice
 - c. Thrice
 - d. Not at all
12. How often do you go for check up at the hospital?
 - a. Once a month
 - b. Twice a month
 - c. Thrice a year
 - d. As and when am sick
13. How often do you get information regarding your waste collection activities?
 - a. Once in a week
 - b. Twice a month
 - c. Once in three months
 - d. Once in a year
 - e. No information
14. Where do you get information regarding safety issue on waste collection?
 - a. Friends
 - b. Health Practitioners
 - c. Workshops
 - d. Newspapers
 - e. Tv/radio

SECTION C: Safety practices by informal waste collectors

15. What are some of the consequences of being exposed to hazardous material?
 - a. Injuries and cuts
 - b. Burns
 - c. Bone and muscle disorders
 - d. Eye and Respiratory infections

16. Which type of PPE's do you use to help reduce or prevents exposure to hazardous material?

- a. Gloves b. Nose mask c. Over coat d. Rubber boot e. Googles

17. Do you use PPE's ?

- a. Yes b. No

18. How regular do you use PPE's?

- a. Once in a month b. Twice in a month c. As and when needed d. Always

19. Why don't you use PPE's ?

.....

.....

The following are safety practices observed by informal waste collectors. Please indicate your agreement or disagreement on the questions below.

	Strongly agree	Agree	Either agree or disagree	Disagree	Strongly disagree
20. Wearing gloves can prevent/reduce infections or injuries to your hand					
21. Wearing nose mask can prevent/reduce exposure to the inhalation of harmful substances or gases.					

22. Wearing rubber boots can prevent/reduce injury to the feet.					
23. Having shower after work prevent/reduce incidence of disease contraction.					
24. Lifting heavy objects affect your spine after a long period of time.					

SECTION D: Role played by the Environmental Health unit of the municipality to ensure the compliances

25. Which type of programs does the Environmental Health Unit of the municipality organize for you? a. Health Screening b. Health/Safety education c. Others specify.....

26. How often do they organize such programs? a. Once in a month b. Twice in a month
c. Twice a year d. Never

27. How do you participate in the programs?
.....
.....
.....

28. What are some of the issues that are tackled during the programe?

- a. Waste Handle b. Waste Disposal c. Waste Transportation

29. What has been the impact of the programs to you?

.....

.....

30. How much money do you pay for attending such programs?

- a. GHC 2 b. GHC5 c. GHC10 d. Nothing

31. What else will you recommend that the unit does for you?

- a. Regular education b. Provision of PPE's c. Waste transportation and tools/equipment/material

