

PRESBYTERIAN UNIVERSITY COLLEGE, GHANA

FACULTY OF DEVELOPMENT STUDIES

DEPARTMENT OF ENVIRONMENTAL AND NATURAL RESOURCE



HYGIENE PRACTICES AMONG WASTE MANAGEMENT WORKERS AT

LA NKWANTANANG-MADINA MUNICIPALITY



BY

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NKWANTANANG-MADINA MUNICIPALITY

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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

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JANUARY, 2021

DECLARATION

Candidate's Declaration

I hereby declare that this project work 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:

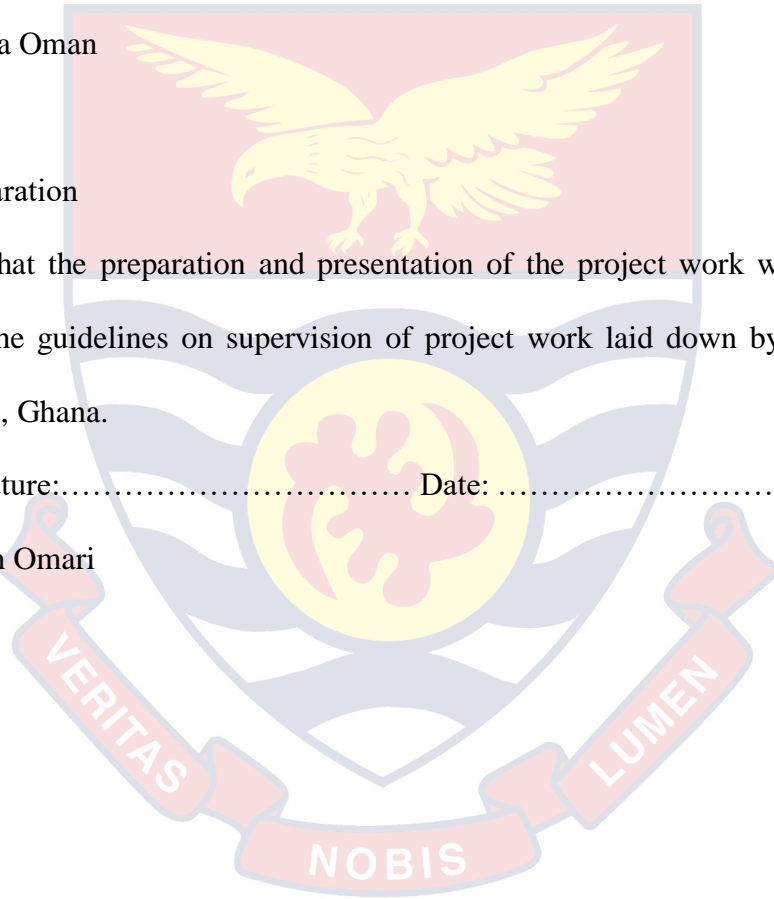
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Supervisor's Declaration

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

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

Name: Dr. Stephen Omari



ABSTRACT

Waste workers are exposed to a variety of work related hazards which may be harmful to their health. The nature of Municipal waste management practices in Ghana especially in major cities as a whole has led to the poor state of sanitation especially pollution of the environment, which is in turn, a serious human health risk. The study was carried out to identify the hygiene practices among waste management workers in municipal assembly's narrowing it down to La Nkwantanang-Madina Municipality. The study was a descriptive survey and the views of 70 respondents were sought through the administering of questionnaire. Primary and secondary sources of data collection method were used and data collected from the field was processed and analysed through the use of Statistical Product and Service Solutions (SPSS) version 16.0. The study reveals that hygiene practices among waste management workers are effective to some extent. Majority (55%) of the respondents believed that they are provided with cleaning regimes such as PPE's, uniforms, tools and training programs to enhance their knowledge on best practices pertaining to hygiene within the Municipality. 56% of the respondents confessed that they wash their hands with water only which intends affect their health status. However, 46% of respondents indicated that they last visited hospital almost a year ago which is an indication that waste management workers careless about their health status although the rate at which respondents fall ill is low. Also, the study revealed that 70% of the respondents believed that cleaning regimes provided them is of quality and effective for protection against any diseases and viruses. It can be concluded from the study that hygiene practices among waste management workers are effective to some extent. The municipal assembly through the Ministry of Sanitation should ensure PPE's, tools and all forms of logistics are provided for waste management workers to ensure their safety.

DEDICATION

To my family.



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Grateful to God almighty for bringing me this far through my education.

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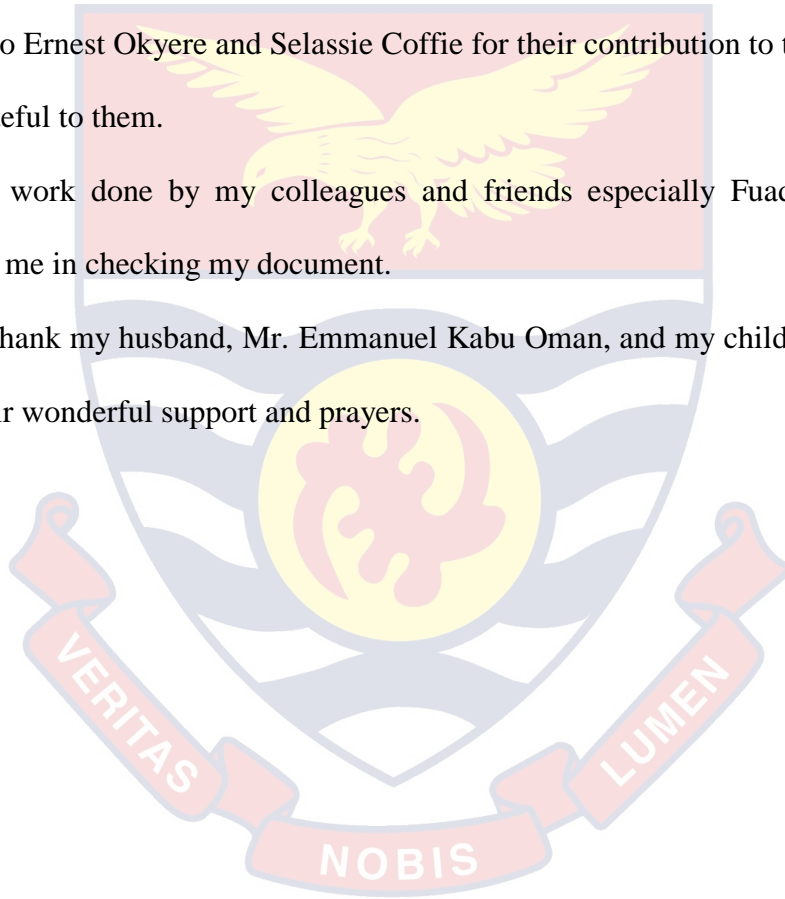


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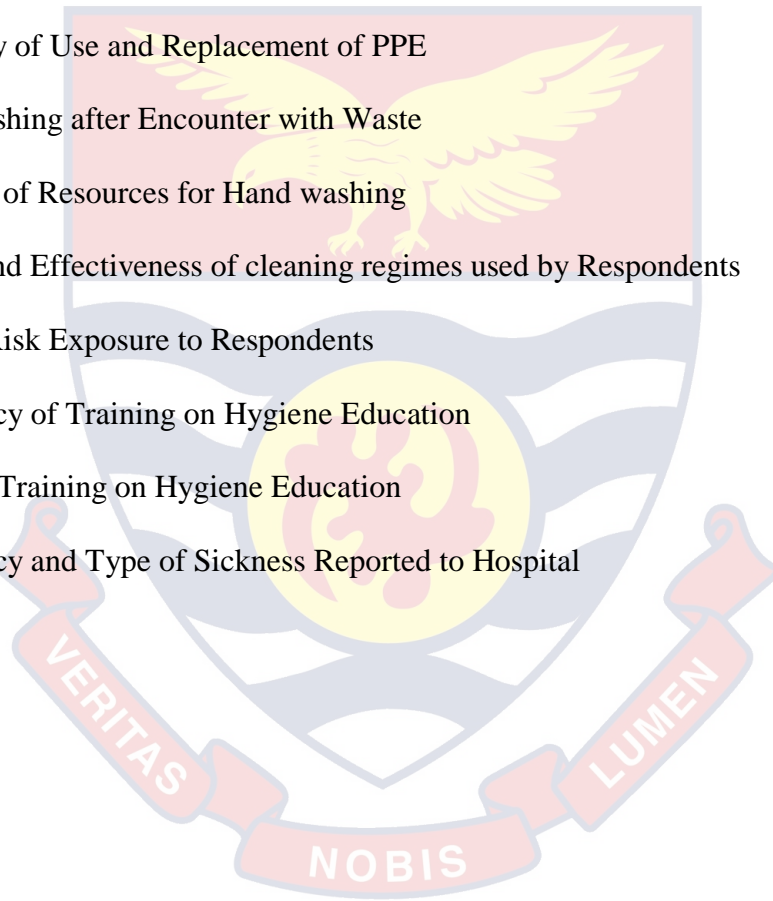
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CHAPTER ONE

INTRODUCTION

1.1 Background

Poor waste management practices are found to be one of the main contributing factors for most of diseases in developing countries (Ministry of Water and Environment (MoWE), Uganda, 2017; Schulte, Pandalai, Wulsin & Chun, 2012). Solid waste collectors play an honourable role in preserving health and hygiene in any 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, Kaur & 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 & Falade, 2012; Vimercati *et al*, 2016). Annually, they constitute average of 90 deaths per 100.000 collectors; this makes waste collection and handling 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, 2013; Ziraba, Haregu & Mberu, 2016).

Solid waste collectors in developing countries as paralleled to general residents has been found to have approximately three times more relative risk for chronic bronchitis, six times more relative risk for infectious diseases, about three and a half times more risk for respiratory disease, almost two times increased risk for hepatitis, ten times more relative risk for acute diarrhea and three times more relative risk for parasites (Abushabab, 2012). The riskiness and complexity of this problem are initiated from restricted technologies, resources, low socioeconomic status and low educational level (Mostafa, Abdel-Hamid & AlBagoury, 2015). One of the major challenges

facing both developing and developed countries is the protection of environment and human health (Scharff, 2014; Vehlow, 2015).

However, in developing countries the situation is more sophisticated owing to the nominal stress on safety measures or regulatory frameworks for collectors compared to strict implementation of occupational safety agencies and environmental safeguard laws in the developed countries (Cointreau, 2016). Community health nursing play a critical role in prevention of waste related hazards among waste collectors and appropriate management techniques. Moreover, increasing awareness about the health hazard of community waste, methods of handling, safe disposal of hazardous waste and increase their alertness regarding the significance of personnel protective equipment (PPE) (Hangulu & Akintola, 2017; Khoshakhlagh, Yazdaniraad, Arvan & Sarsangi, 2017). Good hygiene, however, is an important barrier to many infectious diseases, including faecal-oral diseases, and it promotes better health and well-being (Karija *et al.*, 2013).

Mengistie and Baraki (2010) posited that, the majority of the substance that is discarded is described as a waste material; however, these materials can be regarded as a potential resource. Nearly anything that is regarded as waste has some residual value for an interested person or a potential business in the community. Cunningham, Cunningham & Saigo, (2011) also asserts that waste represents a valuable resource as ground cover to reduce the effect of erosion, to produce fertilizer to nourish crops and as a source of energy. According to Cunningham *et al.* (2005), the practice of waste management should focus its attention on how to identify the value and direct it to the community. Regrettably, our process of collection and dumping of waste that is not separated at the source makes it very expensive and difficult to manage the waste collected properly. Waste that is not properly managed may cause some

health, environmental and economical problems. Water, soil and air pollution can be attributed to the poor handling of solid waste.

The difference between the developed and the developing countries is with regard to the stress on the environmental and health concerns raised by the solid waste management (Das, 2010). There is little stress on regulatory frameworks or safety standards for workers in the developing countries in contrast to strict implementation of environmental protection laws and occupational safety standards in the developed countries (Cointrau, 2016). The system of municipal solid waste collection in the developing countries continues to be mostly manual and involves a labour-intensive system. At source, the waste discharged for collection is seldom strictly segregated in plastic or metal containers and covered with lid. The waste is left on open grounds that require shovelling by hand, or left in an open cartons or baskets that require to be picked up manually. In either case, the waste awaiting collecting is open to insects, rodent vectors and scavenging animals (Cointrau, Levine, Listorti & Furedy, 2011). These unsegregated wastes may contain hazardous waste materials (defined as toxic, inflammatory, reactive, explosive or infectious and containing batteries, electronic sludge, paint and its solvent, pesticides and infectious medical waste) that predisposes waste collectors to be in direct contact with them and make them prone to significantly more adverse occupational health risks than their counterparts in developed countries (Cointrau, 2016; Cointrau *et al.*, 2011).

Municipal solid waste workers are exposed to a number of pathogens (bacteria, fungi, viruses, parasites and cysts), toxic substances, chemicals that come from the waste itself and from its decomposition, as well as vehicle exhaust fumes, noise, extreme temperatures and ultraviolet radiation (Sarkar, 2013). In low income countries solid waste collectors are likely to have a low socio-economic status and the medical problems of these workers are further

compounded by various socio-economic factors such as poverty, lack of education, poor housing conditions and poor diet. Farther more, these groups of workers are exposed directly and without adequate protection to MSW, they are more susceptible to occupational hazards (Sarkar, 2013).

All solid waste operators, both the government and privately employed, can be categorized as industry workers that are involved in waste handling and disposal; and who are at an increased health risk, especially for handlers that are careless, ignorant and do not adhere to health policies and safety rules. As a consequence, the poor handling of solid waste exposes them to potentially hazardous materials especially when exposure is on a regular and cumulative basis and more so, when a lot of them do not use appropriate protective gear; and work solely for economic survival without paying any attention to the health hazards associated with their workplace (Al Khatib, 2019; National Institute for Occupational Safety and Health (NIOSH), 2011). It has also been observed that the increasing rate of fatalities among workers can be attributed to their lack of awareness of the potential sources of occupational diseases which are numerous and also due to the poor level of compliance to occupational health regulations; hence, poor work practices (Osrisakwe, 2017; Atsumbe, Maigida, Abutu, 2013).

Lack of knowledge and lack of recognition of hand hygiene opportunities during patient care are mainly responsible for poor hand hygiene among waste management workers. Although many countries have guidelines regarding hand hygiene for waste management settings, overall compliance among waste workers remains poor (Wendt, 2011; Suchitra & Lakshmidēvi, 2016) despite hand hygiene being regarded as one of the most important elements of infection control activities (Mathur, 2011). WHO, in 2005 issued guidelines regarding specific steps and procedures to be followed during hand washing (WHO, 2010).

Despite the present concern of governments, organizations and individuals on solid waste management in Africa, it is still faced with more serious solid waste management problems with its accompanying negative health and environmental consequences, Freduah (2010). The main focus of a waste management system should be the provision of cleansing services that can help in maintaining the health and safety of the citizens and their environment. According to Cooper (2010), it is, therefore, an undeniable fact that for humans to safeguard, control and promote the environment, there must be an appropriate facility for solid waste management.

The human body provides protection against external environment pollutants to some extent. However, skin cracks and wounds can allow pathogens to enter the body. For this reason, personal hygiene is one of the most important practices in terms of protecting the body from diseases (Hossain, 2012). Hygiene is a personal matter. Hygiene practices, taught during childhood by mothers, fathers or teachers, mostly through practicing, need to be continued by the individual after childhood. Correct adoption of these habits has a direct impact on a person's future health (Hossain, 2012). Hygiene behaviour includes hand hygiene, personal care, home hygiene and food hygiene. Individual hygiene behaviours can be affected by many factors, including beliefs, values, habits, socio-economic and cultural factors, level of knowledge, personal preferences, family characteristics and physical and social characteristics of the work and living environments. Therefore, the hygiene habits of each individual differ, meaning that these habits are unique to individuals (Aiello, Coulborn, Perez & Larson, 2011; Görgülü, 2010). Godoy, Pumarola & Sierra in 2011, stated that in Spain as in other countries, among the measures to reduce the transmission of pandemic influenza and other respiratory viruses are the promotion of hand hygiene and the provision of information on respiratory and hand hygiene while Fung and Cairncross (2016) as cited by Godoy *et al.*, (2011), indicated that some of these

measures were also used to mitigate the 2003 outbreak of severe acute respiratory syndrome (SARS). Skin infections, eye infections, intestinal worms, SARS, and avian flu can also be prevented through hand washing (Godoy *et al.*, 2011). By bringing the lessons learned in social and commercial marketing to hygiene programming, the Public-Private Partnership for Hand Washing (PPPHW) aims to catalyze effective, sustainable changes in hand washing behaviour on a large scale.

The rate of waste generation in Ghana is about 0.47kg/person/day and translates to about 12,710 tons of waste per day per the current population of 27,043,093. Throughout the country, it is estimated that only about 10% of the solid waste generated are disposed of properly (Mensah and Larbi, 2005). Pacione (2005) asserts that large proportions between 30 and 50 per cent of solid waste generated by residents are not collected and disposed of properly, and these waste end up on the streets, drains and streams within the community becoming breeding grounds for disease-spreading insects. It is however important that hygiene practices of waste management workers be given considerable attention so as to avoid contamination and that diseases would not be transferred unto others. It is in line with this perspective that this study is conducted in the La-Nkwantanang Municipal Assembly of the Greater Accra Region of Ghana with the objective of assessing the hygiene practices of waste management workers.

1.2 Statement of the Problem

In Ghana, waste management is becoming a major public concern. Waste in some cities in the country is not properly handled and ends up on the streets and open areas endangering the health of the citizens and attracting vermin. The unavailability of proper sanitation facilities can delay the development of the country. The availability of the appropriate sanitation facilities is

not just a socioeconomic and developmental concern but also an issue of self-respect, human dignity and public health (Legesse, Mariam & Kloos, 2006).

Ampadu *et al.* (2006) indicated that a high percentage of workers who handle refuse, and of individuals who live near or on disposal sites, are infected with gastrointestinal parasites, worms, and related organisms; and that contamination of this kind is likely at all points where waste is handled. The same study also reported that these disease-carrying pests could transmit various pathogenic agents such as amoebic and bacillary dysenteries, typhoid fever, salmonellosis, various parasitizes, cholera, yellow fever, plague, and others. Yoda, Chirawurah and Adongo (2014) opinion that waste if not stored, collected and disposed of well poses a public health and environmental threat to society. The idea that waste is an unwanted material without any value has created bad attitudes towards the disposal of waste.

Notwithstanding, in most part of the sub-Sahara of Africa including Ghana, personnel are detailed to man communal container sites day and night. Usually, these sites are either an old dumpsite in town where people dump their waste. They make sure the place is clean and collect some token to manage the place or ensure no one dumps refuse indiscriminately around the site at such communal container sites, and personnel are believed to be at very high risk. Also compliance to WHO standard of hygiene practice have been found to be very low especially among waste management workers at the La Nkwantanang-Madina Municipal Assembly. This study was therefore conducted to assess the hygiene practices among waste management workers at La Nkwantanang-Madina Municipal Assembly and to give insight about the magnitude of the problem.

1.3 Purpose of the study

The purpose of the study was to find out if waste management workers at the La-Nkwantanang-Madina Municipality are hygiene conscious and are therefore adhering to the WHO hygiene compliance. It was hoped that the study would benefit all waste management workers through making recommendations aimed at improving hygiene compliance.

1.4 Research Objectives

The main aim of this research is to determine the health practices of waste management at La Nkwantanang-Madina Municipality.

The objectives are;

1. To examine and identify the personal cleaning regimes used in waste management at the La Nkwantanang-Madina Municipality.
2. To assess the health status of personnel at the La Nkwantanang-Madina Municipality in the management of waste.
3. To examine the quality and effectiveness of the cleaning regimes used.

1.5 Research Questions

The following research questions for the study were;

1. What are the personal cleaning regimes used in waste management at the La Nkwantanang-Madina Municipality?
2. What is the health status of personnel at the La Nkwantanang-Madina Municipality in the management of waste?
3. What are the quality and effectiveness of the cleaning regimes used?

1.6 Significance of the Study

The findings of this study will be of benefit to interested stakeholders. Individuals, organizations and other stakeholders will be able to appreciate the work done by waste management workers. The Government, through this study, can derive insights into the significant role of waste management workers in managing the nation's waste and the workers awareness of the proper use of provided PPEs for their own protection. Though this project is to partially fulfill an academic requirement for the award of a master's degree, it is expected that recommendations will be provided to complement the policies by the regulatory bodies and the efforts of the municipal assembly in addressing the needs of the workers. Lastly, the findings of the study will add up to the body of knowledge in academia and therefore serve as a reference point for future researchers who want to conduct research related to occupational health and safety, environmental science and waste management.

1.7 Delimitation of the Study

The study was carried out within the Greater Accra Region precisely, La Nkwantanang-Madina Municipality. The study seeks to assess the hygiene practices of waste management workers. The reason to choose La Nkwantanang-Madina Municipal as the research study area was due to its proximity to the researcher and getting access to relevant data for the study was another motivation for choosing La Nkwantanang-Madina Municipal.

1.8 Limitations of the study

The researcher that the sampling from the target population might not be totally free from error and as such, efforts were made to minimized such errors. However, the challenging of getting respondents to answer questionnaire was a hurdle. The acceptance for entities, including the municipal assembly to provide existing data from which theories could be interpreted was a

hurdle especially since the fear of releasing vital information to political opponents or for political discourse may exist. Government directives to a business owned by the state not to release inside information or data to any other person or entity posed a threat to researching into challenging situation confronting state-owned organizations.

Transportation cost to distribute questionnaires and the reluctant posture of management to accept to answer a questionnaire with the excuse of “I am always busy” are challenging not excluding travelling risk associated with the distribution of the questionnaire. It is important to note that not much conclusive research has been done in the field of hygiene practices of health workers and its adverse effects on health and society at large. Therefore, the weight of previous research conducted was practically evaluated in order to look into the subject matter. It must also be noted that the findings of this study reflects the perceptions of the municipality involved, therefore, it can not to be assumed to be universally applicable to all organizations

1.9 Organisation of the Study

This research is organized into five chapters. Chapter One is the introduction to the topic which gives a brief background of the study, the statement of the problem, objectives of the study and the research questions. The overview of the research methodology, justification of the study and scope and limitation of the study also dealt with in chapter one. Chapter Two also reviews relevant literature on the topic. Literature and findings of earlier studies conducted on the topic were reviewed to ascertain the various gaps that exist in literature. Chapter Three also presents the methodology adopted to achieve the objectives of the study. The general description of the design of the research is explained, including the population and sampling, data analysis method and ethical consideration of the research. Chapter Four presents the analyses and the discussion of the findings of the study. This chapter systematically presents the findings that

provide answers to the main research questions. Finally, Chapter Five presents a summary of the major findings, gives conclusions and makes recommendations.



CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter presents the review of published literary works that are related to the research topic through sources such as journals, books, as well as other online sources. The chapter presents the definition and explanations of concepts associated with the research topic. Also, theories that support the study is elaborated as well as the review of studies related to hygiene practices among waste management workers. Additionally, the chapter reviews literature in the following areas, conceptual, theoretical and empirical framework and finally, the chapter is summarized.

2.2 Conceptual Framework

2.2.1 Hygiene Practices

Lack of attention to proper hygiene practices all over the world is one of the most common causes of death and illness in developing nations. WHO (2004) examined hygiene practices of drinking water in Andhra Pradesh. They concluded that diseases due to unsafe water are some of the most common causes of death in developing nations, and diarrheal disease represents 4.2% of the global burden of disease, as measured by disability adjusted life years lost. Published data on the burden of disease in the state of Andhra Pradesh shows that in both rural and urban areas, diarrheal diseases (commonly caused by faecal contamination of water) cause of over 6% of all deaths in the state (Mahapatra & Reddy, 2001). In considering the city of Hyderabad in India, specifically, epidemiological data show the highest incidence of gastroenteritis in the state. Between the years 1996–2000, there were 265 cases of gastroenteritis

per 100,000 in the Hyderabad municipal corporation area; this is more than double the incidence in any other district of Andhra Pradesh (Mahapatra & Reddy, 2011).

2.2.2 Personnel Cleaning Regimes

Personnel cleaning regimes was another factor considered in the conceptual framework of this study. The National Health Service (England) Plan, Department of Health (2000) considered the health regime practices in hospital facilities due to concern from the public media and infection control staff over perceived inadequacies in hospital cleaning (The NHS Plan, Dept. of Health, July 2000). The study established a probable link between dirty hospitals and the rising numbers of hospital-acquired infections (HAI). However, there is little evidence to be able to substantiate this at present (Dancer, 2011). Several professional bodies have published standards or audits regarding environmental cleanliness in hospitals (Auditor General, Audit Scotland, 2000; NHS Estates, 2001). Unfortunately, the mechanisms for evaluating the quality of hospital cleaning regimens are limited.

The study further assessed that quite often the only method used is visual assessment, which does not necessarily correspond with microbiological risk (Griffith, Cooper, Gilmore, Davies & Lewis, 2000; Malik, Cooper & Griffith, 2010). Hospital patients can acquire organisms from many sources, including the environment, but the extent to which the latter contributes towards HAI is largely unknown (Dancer, 2011; Talon, 2009). The difficulties in measuring cleaning efficacy are compounded by the lack of standardized methodologies and are rarely quantitative. Environmental screening usually takes place on an ad hoc basis after an outbreak, but it is patently impossible to screen the entire surface of a ward and to find the outbreak strain is not guaranteed. Furthermore, organisms still have to be transmitted to patients. As this is thought to occur via staff hands, strategies for controlling HAI are more likely to favour

improvements in hand hygiene than comprehensive screening programmes. Cost-benefit and lack of standardized methodologies might also explain the perceived reluctance of private cleaning companies to participate in screening.

There is an urgent need to overcome the challenges faced by manual cleaners (Bernstein *et al.*, 2016) and to maximize the benefit of manual cleaning efforts. A tiered approach to cleaning that is tailored to the specific needs and resources of healthcare centres would be better defined with a wider representation of the global healthcare community in published studies. Human factors will ultimately determine the quality of environmental cleaning in the hospital and will remain the patient's best defence against invisible threats from the hospital environment." Combining infection prevention and implementation science to improve cleaning Allen *et al.* (2018) sought to assess the effectiveness of an environmental hygiene bundle in terms of changes to HAI rates, cleaning performance and environmental services (EVS) workers' knowledge and attitudes. It is well understood and documented that the use of some cleaning products in the home can adversely affect the quality of the air indoors, influencing not only respiratory health but having further-reaching (and largely un-determined) adverse health outcomes. It has long been perceived that the trade-off for this polluting of the indoor environment (and the acute discomfort for the cleaner) is the eradication of dirt, germs and bacteria which are 'dangerous' to inhabitants in the longer term (Altman *et al.*, 2008). Another area where cleaning regimes are considered imperative the food processing environment. Karaaslan *et al* (2014) and Revelas (2012) considered bacterial attachment to surfaces and biofilm formation.

2.2.3 Location and Time Spent

Epidemiological studies of the short and long term effects of exposure to waste on public health have been focused on identifying any associations between residence in the vicinity and adverse effects on health (Dolk, Vrijhied, Armstrong & Bianchi, 2012). It is believed that most of the microorganisms that cause diseases are found from an uncleaned environment and to eliminate most of the contagious diseases, man as host would need to eliminate these causative agents by maintaining a clean environment. Getting dirty is a fundamental problem and for which there are few solutions (Guillermor & David, 2015).

Since the 1960s, there has been a gradual process of extending the boundaries of environmental concern, from neighborhood to nation, and now, with the concern about climate change, to the global level. However, this process is at different stages in different countries and is proceeding at different speeds. Therefore, it cannot be assumed that householders will be interested in whether their waste is dumped illegally or taken to an approved disposal site, provided that it is taken out of the immediate neighborhood.

This is often referred to as the “NIMBY” factor (Not In My Back Yard). City officials may show the same lack of concern with regard to the destination of the waste and may give solid waste management in general, a low priority. A low level of environmental awareness among the public may make it difficult to implement household segregation into two or more waste streams. This lack of awareness is often accompanied by the lack of any effective enforcement mechanism to ensure the correct use of waste storage facilities.

2.2.4 Health Status of Personnel

Researchers in the health, hospitality, manufacturing and construction industries have established that waste is potentially dangerous and may possess pathogenic agents. Some of

these pathogenic organisms are dangerous because they may be resistant to treatment and possess a high level of pathogenicity. Their improper collection and treatment will cause environmental pollution, an unpleasant smell, the growth and multiplication of insects, rodents and worms and may lead to the transmission of diseases like AIDS through injuries from syringes and needles contaminated with human blood (Askarian *et al.*, 2004).

For these reasons, the proper collection and disposal of waste is of great importance as it can decrease both direct and indirect health risks to people, as well as damage to human, flora, fauna and the environment. The participation of other organizations, such as the Ministry of Health, as well as the adoption of rules and regulations for the proper disposal of all waste, will result in minimizing these risks (Kenny & McCoach, 2013).

2.3 Hand Hygiene Practices among Waste Management Workers

For centuries, hand washing with soap and water has been considered a measure of personal hygiene but the link between hand washing and the spread of disease was only been established in the last 200 years (Allegranzi, Sax, Bengaly, Richet, Minta & Chrait, 2010). According to Pittet, *et al.*, 2012, in the mid-1800s, studies by Ignaz Semmelweis in Vienna and Oliver Wendell Holmes in Boston established that healthcare associated infections were transmitted via the hands of HCWs. In the community, hand hygiene has been acknowledged as an important measure to prevent and control infectious diseases and can significantly reduce the burden of diseases, in particular among children in developing countries (Boyce & Pittet, 2010). The spread of infections in developing countries remains a serious problem, especially in high-risk settings such as health care facilities due to lack of awareness in health care workers and compounded by “omo syndrome” (a belief that they are super clean and sterile) (Saloojee & Steehoff, 2011).

Hands play a major role in the transmission of infection in healthcare setting and the importance of hand hygiene in the control of infection cannot be overemphasized (Jumaa, 2004). Appropriate hand hygiene can minimize micro-organisms acquired on the hands during daily duties (WHO, 2006). Hand hygiene, defined as the act of washing one's hands with soap and water, or disinfecting them with an antiseptic agent, has been recognized as the single most effective and cost-effective means of preventing hospital acquired infection, as well as an effective means of preventing illness in the community that may lead to hospitalization (Allengranzi *et al.*, 2010). Despite this, many studies have documented that compliance with hand hygiene recommendations in healthcare settings is consistently less than 50% (Pettit *et al.*, 2012). Intensive education programs have been associated with modest improvements in hand hygiene and dramatic reductions in rates of hospital-acquired infections (Allengranzi *et al.*, 2009).

However, few programs have documented continuing success. According to Collins & Hampton (2015), hand hygiene should be considered before invasive procedures, after contact with contaminated devices or materials, and with high risk, infectious patients. Moreover, Kampf & Loffler (2010) claim that hand hygiene should be advocated before beginning work, at the end of work, and after visiting the rest room (toilet). However, Canham (2011) argues that hand hygiene requirements depend on the type of procedure, the degree of contamination and the persistence of antimicrobial action on the skin. Even when nurses spend a longer time on hand hygiene, their technique is often poor compared to other HCWs in terms of leaving large areas unwashed effectively, i.e. wrists, thumbs, nail beds and between fingers.

Compliance with hand hygiene protocols among healthcare workers in the hospital is recognized as one of the most important means of preventing hospital acquired infections

(Longtin, Sax, Allegranzi, Schneider & Pittet, 2011). Nosocomial bloodstream infections are in part caused by horizontal transmission of commensals or pathogens due to inappropriate hygiene practices (Kampf and Kramer, 2004). Various sources have reported poor compliance among healthcare professionals (Pittet *et al.*, 2010), Therefore, the most effective strategy to decrease nosocomial bloodstream infections is to improve hand hygiene practices (Kampf and Kramer, 2004; Lam *et al.*, 2004; Yildirim *et al.*, 2008).

Adequate hand hygiene (HH) is regarded as the most effective single measure to prevent healthcare-associated infections (Pittet Hugonnet & Harbarth, 2012), and despite several recommendations and guidelines on adequate HH being available (Pittet *et al.*, 2012 and WHO, 2009), observed compliance rates (CRs) in medical staff still remain low (Momen & Fernie, 2010; Maxfield & Dull, 2011) and have been regarded by public health authorities as unacceptably poor (Day, 2007 and WHO, 2009). Worrisomely, most investigations found even lower compliance in physicians than in nurses.

2.4 Theoretical Framework

Waste management namely, collection, storage, transport, sorting and processing and disposal is an issue of social concern owing to its environmental impacts and effects on public health. In fact, waste management activities are carried out according to procedures that can have various negative effects on the environment and potentially on human health (Vimercati, 2016). They pose risks resulting from the emissions or release of hazardous, chemical agents and biological agents from the types of exposure of these agents and from the susceptibility of the populations exposed to them (Vimercti *et al.*, 2016).

2.5 Empirical Framework

Some researchers have identified the main relationship between public health and improper solid waste management (WHO, 1993). The research work indicated that the majority of households disposed of their solid wastes into an open dump, open-pit or by burning, thereby polluting the environment. The findings are similar to a survey conducted by SNNPR, Ethiopia (2000), where 67% of households disposed of waste in the open (Ministry of water resources, Ethiopia. 2003). The above findings are similar to a study conducted in Haramaya Woreda in 2003, indicating that open disposal of refuse and faeces was practised in about 93.4% of the households (Fetene & Donald, 2011).

A study by Mengistie and Baraki (2010) confirmed utilizing solid waste for different purpose rather than to dump it for no use has many advantages. This study indicated that a large number 376 (85.6%), of households, use solid waste as manure. However, this was done with no composite operations. It would be more effective if they were supported by appropriate composting techniques. Mengistie and Baraki (2010) finding was higher when compared to the finding of 2000 welfare monitoring survey conducted in Ethiopia. The finding showed 45.6% of the household waste in the rural areas, and 5.5% in the urban areas were utilized as manure in garden and fields (Ministry of water resources, Ethiopia. 2003). Mengistie and Baraki (2010) however recommended that the onsite separation and use of waste for different benefits should be encouraged; but with the precaution of its proper treatment and handling.

A cost-effective measure not only against diarrheal diseases but also for the prevention of acute respiratory infections is hand washing with soap. Episodes of diarrhoea are reduced: 36 percent through sanitation improvement and 48 percent through hand washing with soap. In the current report, the majority of 379 (85.9 percent) respondents said they regularly wash their

hands after handling solid waste. But, only 193 of them (50.9%) reported using soap or ash to clean their hands. The prevalence of water-borne diseases, especially diarrhoea, is found to be very high in communities where latrine use is poor. The current study found that only 156 (36.4 percent) of the households surveyed had latrine access. There was no set place for defaecation in the remaining households. It was noticed that they were using the backyard or bush for defecation. The result is in line with an analysis carried out in India (2007) in which there was no access to the toilet for 69.1% of households. According to the Joint WHO and UNICEF Global Water Supply and Sanitation Assessment 2010 Survey, however, the present finding is relatively higher compared to Ethiopia's coverage, which is 12 percent. Of those households that had latrines, most use conventional pit latrines, 143 (91.7 percent), which may provide a favourable place for flies to breed unless the hole is properly covered and kept clean.

Human faeces on the floor and wall of many of the latrines and within the compound were also found in this research. This could result in communicable enteric diseases that affect the inhabitants and the general population. After toilet use, the availability of hand washing facilities near the latrines allows users to wash their hands. This research, however, showed that only 13 (8.3 percent) of the households had latrines.

There was no set place for defecation in the remaining households. It was noticed that they were using the backyard or bush for defecation. The result is consistent with a study conducted in India (2007) in which no toilet access was available for 69.1 percent of households. According to the Joint WHO and UNICEF Global Water Supply and Sanitation Assessment 2010 Survey, however, the present finding is relatively higher compared to Ethiopia's coverage, which is 12 percent. From the households with Latrine; most, 143 (91.7 percent), use conventional pit latrines that may create a favourable atmosphere for breeding flies unless the hole is properly

covered and kept clean. Human faeces on the floor and wall of many of the latrines and within the compound were also found in this research. This could result in communicable enteric diseases that affect the inhabitants and the general population. The availability of hand washing facilities in the vicinity of the latrines facilitates users to clean their hands after they use the bathroom. However, only 13 (8.3 percent) of the households with latrines had hand washing facilities near the latrines, this study found. After using the toilet (or after defecation), hand washing with soap is of utmost importance in reducing diarrhoea and other parasitic diseases (9). The study showed that after defecation, only 8 (5.1 per cent) of households with latrines wash their hands. The educational status of households is significantly correlated with this ($P < 0.01$). Even then, three recorded using only water to wash their hands, which is not an efficient means of eliminating dirt and pathogenic microorganisms.

Approximately 0.76 million tons of municipal solid waste (MSW) per day was generated by urban areas in Asia in 1998, which is projected to increase to 1.8 million tons by 2025. In 1998 alone, China produced 0.14 billion tons of MSW (Pokhrel and Viraraghavan, 2005). Because of its vital position in the conservation of the environment and public health, achieving effective and reliable urban solid waste management should be a priority for cities in developing countries to keep pace with the requirements of rapid economic development and continuing population growth (Marchand, 2010). Macao is a China Special Administrative Region (SAR) with small quantities of natural resources and limited waste disposal space available. In the last few decades, the quantity of solid waste produced and handled in Macao, as well as the average daily waste generated per capita, has increased. Being a small and densely populated city with a warm and humid climate (land area of 27.3 km²; population of 448,495; an average annual temperature of 23 C and average daily humidity of 78 percent) (Department of Statistics and

Census, 2003a), Macao faces significant environmental and logistical challenges in terms of environmental and administrative problems.



CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents a brief description of the study area. It also presents the methods to be used in the data collection, the sampling technique and the procedures to be used for the data analysis which constitutes the research methodology. Basically this section is a presentation of how the research will be conducted.

3.1 Study Area

The study was conducted at the La Nkwantanang Madina Municipal Assembly (LaNMMA). The La Nkwantanang Madina Municipal Assembly (LaNMMA) was established by Legislative instrument (L.I.) 2131 and inaugurated in June 2012. The La Nkwantanang-Madina Municipal Assembly (LaNMMA) is one of the 29 Assemblies in the Greater Accra Region of Ghana. Madina is the capital of the Municipality. The Municipality has two Zonal Councils (Madina Zonal Council and Oyarifa Zonal Council) and 23 major settlements. The main rural communities include Oyarifa, Teiman, Ayimensa, Danfa, Otinibi and Pantang.

LaNMMA shares boundaries with Akwapim South District Assembly to the North, Kpone Katamanso Municipal Assembly to the North-East; Ga East Municipal Assembly to the West, Adentan Municipal Assembly to the East and Ayawaso West Municipal Assembly to the South. The La Nkwantanang Madina Municipality is one of the 16 Metropolitan, Municipal and District Assemblies in the region and was created in 2012 as part of the newly created Assemblies aimed at deepening decentralization and bringing development to the door step of citizens. It was carved out of the Ga East Municipality (Population and housing census, 2010). The assembly has nine (9) Electoral Areas namely, Adenta West, Danfa, La Nkwantanang,

Madina West, North Legon, Oyarifa, Pantang, Social Welfare, and Tataana. The Municipality covers a total land area/Space of 70.887 sq. km.

The La Nkwantanang-Madina Municipal Assembly is a mainly urban Municipality with pockets of rural settlements which are quickly developing into peri-urban settlements. Some of the major urban areas include Madina, North Legon, Social Welfare Institute area, Akatsi Abor, Okataban and La Nkwantanang. Madina has developed into the bustling Central Business District of the Municipality with major commercial activities.



MAP OF LA - NKWANTANANG MUNICIPAL

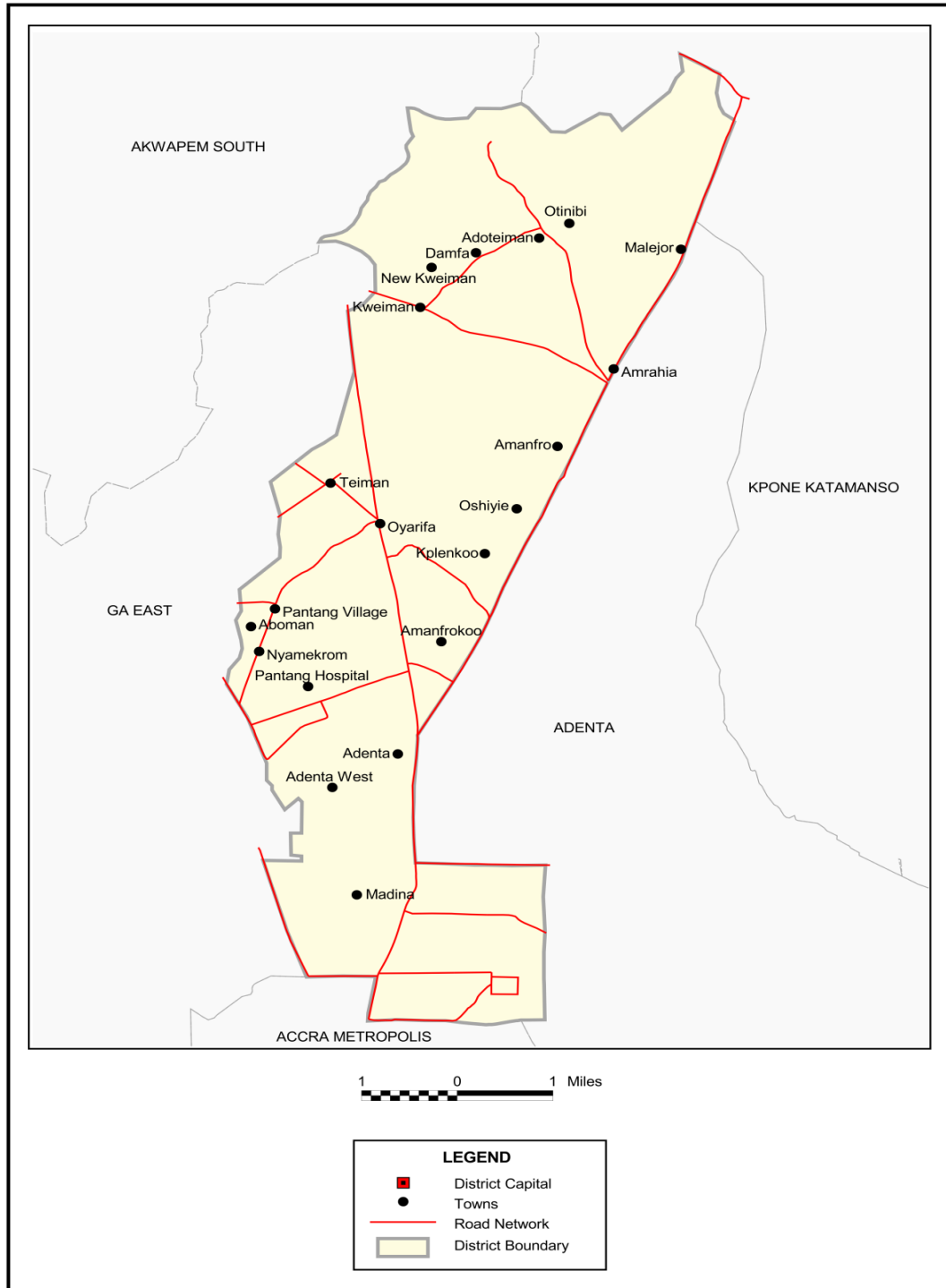


Figure 1: Map of La-Nkwantanang Municipal Assembly

Source: Ghana Statistical Service

3.1.1 Location and size

The La Nkwantanang Madina Municipality lies within Latitude: 5° 40' 59.99" North and Longitude: 0° 09' 60.00" East and is located in the Greater Accra Region. The La Nkwantanang - Madina Municipality is located at the northern part of the Greater Accra Region. It covers a total land surface area of 70.887 square kilometers. It is bordered on the West by the Ga East Municipal, on the East by the Adentan Municipal, the South by Accra Metropolitan Area and the North by the Akwapim South District. La Nkwantanang Madina Municipality is generally urban (84 percent).

3.1.2 Economic Activities

The main economic activities in the La Nkwantanang Madina Municipality are commerce, agriculture, services and manufacturing. Trading is one of the main economic activities in the Municipality with the Madina market as the main trading centre. It generates employment and revenue to the people in the Municipality. There are many manufacturing industries in the Municipality. They include the Nkulenu Industry, Mechanical Lloyd, Royal Aluminum Company, Special Ice Water Company, Voltic Water Bottling among others. The items produced include food processing, packaging and fabrication. The services sector covers areas such as financial institutions, hospitality, personal care and beauty, telecommunications, graphic design, food services and professional services among others. This sector employs large numbers of skilled people and it is one of the rapidly growing sectors of the Municipal economy. There is also a constructional industry in the Municipality engaged in businesses such as block factories, stone quarrying and the sale of building materials in addition to the provision of skills such as masonry, carpentry, tiling and many other associated skilled jobs in the industry.

3.1.3 Agricultural Activities

The major agricultural activities are farming and livestock rearing. The crops include cereals, tubers and vegetables. Livestock and poultry farmers can be found at Teiman, Ayimensa, Pantang and Oyarifa. There are quite a number of agro-processing establishments in the Municipality. These include the Nkulenu Industries located in Madina, which process vegetables and fruits on a large scale. Gari processing is predominant at Teiman. Alternative livelihood activities include mushroom and snail production and the rearing of grass cutters and rabbits. The Municipality is linked by road to other parts of Accra and the rest of the country. Commercial transportation by vehicles, taxis and others provide employment for drivers and mechanics. There are a number of business associations in the Municipality, which include market women's associations, drivers associations, farmer groups, dressmakers and beauticians associations. The housing stock of La Nkwantanang Madina Municipality is 13,647 representing 2.9 percent of the total number of houses in the Greater Accra Region. The average number of persons per house is 3.9. The most widely method of solid waste disposal is through collection (67.9%). About one in ten households (11.3%) burning their solid waste, while one out of hundred indiscriminately dispose their solid waste" (Population and housing census, 2010).

3.2 Research Design

This is the conceptual structure within which research is conducted. It constitutes the blueprint for the collection sorting, editing, coding, measurement and analysis of data. According to Creswell (2009), a research design answered research questions suitably through a coherent plan of information needed to be collected and analyzed. A choice of particular research design deemed suitable, most explicitly address the research questions as well as expressing causal correlation among variables.

This research study has adopted a suitable and appropriate design for the study, the “Onion model” which was propounded by Saunders et al. (2009). There are six layers of the Onion which specifically categorized philosophy as the outer shell or envelope to the techniques or instruments at the central point. The Onion model has asserted to the fact that the philosophy controls and influences all the other choices as the researcher approaches the central point. This study lies in the positivist domain; the Onion model was followed to select the appropriate but suitable appraisal for the research.

3.3 Target Population

According to Burns and Grove (1993), a population is defined as all elements such as individuals, objects and events that meet the sample criteria for inclusion in a study.

The population for this research was the waste management workers of La Nkwantanang-Madina municipality. It worth mentioning that truck janitor, truck drivers, street sweepers, office cleaners, communal container site attendant etc. were few designations that constitute the target population of the establishments under investigation.

3.4 Type and Sources of Data

Data was gathered from different sources to get a complete understanding of the case. Data collection was grouped into three namely; primary, secondary, and interviews. The field work started in May 2020 and ended July 2020 lasting a period of two months. The focus of the study was to study the activities of waste management workers in terms of their hygiene practices in the LANMMA municipality.

3.5 Sample Size

The estimated population of the study is 150 sanitation workers, and a sample size of 65 respondents which included other sub metros under investigation was selected.

The importance of sample size in research work cannot be over-emphasized. This was supported by Tong, (2007), who opined that sample size significantly influences the model fitness. This research has adopted descriptive analysis as the main analytical approaches for the data analysis.

The approval and significant of the use of an appropriate sample size had been proposed many times for effective results towards model testing Kenny and McCoach, (2003). Interestingly, there is some school of thought which said that when small sample size is to be used, consideration of the characteristic of the model under study should be considered, keeping in mind the quality of the results and the aim of the study to be achieved.

3.6 Data Collection

There are several methods of collecting data, especially in the survey study. They are questionnaire, observation, interview method, through schedules and other methods which includes warranty cards, distributor audits, and pantry audits, consumer panels, using mechanical devices, projective techniques and content analysis. Since the researcher is using a deductive approach or quantitative approach to this research, addition to the careful study of the research questions and the aim of this research, the researcher is left with no option than to use a questionnaire to collect the data. Questionnaires were used in the collection of the data for the research.

Questionnaires were widely used in the distribution of structured numerical data for respondents to answer according to the instructions given to them. The objectives for the questionnaires were to obtain information on their knowledge on the hygiene practices among waste management workers at La-Nkwantanang Municipal Assembly.

3.6.1 Design of Questionnaire

This research question was design based on the problem statement and the knowledge gap that this research is to be filled supported by relevant literature. The questionnaire dealt with the general information on respondents and their views on hygiene practices among waste management workers at La-Nkwantanang Municipal Assembly. The first sets of the questionnaire were to seek information about demography of the respondents (sex, age, educational level, years of experience and number of years working in the organization). The second part of the questionnaire relates to Personal cleaning regimes used, followed by the health status of workers and the last section was to examine the effectiveness of the cleaning Regimes.

3.7 Sampling Procedure

Sampling is a key component of any empirical investigation and involves several considerations. The aim of most investigations is to obtain information about a population. A sample or census is taken for analysis. This study employed a simple random sampling technique for the study. Simple Random Sampling technique was used to select the respondents from the municipality. The lottery system was thus used where each respondent had equal chances of being selected.

3.7.1 Primary Data Collection- Survey questionnaire

The primary data collection comprised the use of structured questionnaire to obtain data from the waste management workers from the Municipal Assembly. This data provided information on the waste generation, disposal and the socio-economic background of respondents. Information such as age of respondents, educational levels, marital status, where do you handle waste, what kind of PPEs are provided and how often are the PPEs replaced was obtained. Samples of the questionnaire are provided under Appendix.

3.7.2 Designing the Questionnaire

The questionnaire was designed to address the following concerns;

- Examine the personal cleaning regimes used by waste management workers.
- Ascertain the health status of workers.
- Determine the effectiveness of the cleaning regimes used.

3.7.3 Secondary data collection

Secondary data was obtained from published work related to the study.

3.7.4 Sampling technique

The stratified random sampling technique was used in the selection of the respondent. The researcher randomly selected 3 out of every 10 waste management workers gathered.

3.8 Data Analysis

Questionnaire was checked for errors before entry into Data base where by summary statistics sheet was analyzed using SPSS statistical software, version 16.0 and Microsoft Excel. Results were presented in the form of frequency tables and charts.

3.9 Ethical Issue

Respondents were vividly assured of confidentiality and the use of their views for the purpose of academic only. Pre-testing of the instruments was carried out by the researcher with municipal waste management institutions under investigation. Before the pre-testing exercise, respondents were taken through technicalities of the exercise and were told that writing of names is optional. The researcher briefed the respondents to either choose to answer the question or not. Alternatives were provided to either use names or none of the two. Eventually, respondents were reassured that the data collected will not be used for any other exercise than the purpose of academic only.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.0 Introduction

This chapter is divided into sections with section one concentrating on the background information of the respondents and section two followed by socio-demographic information, the health status of workers,, etc.

4.1 Socio-demographic Information of Respondents

It is essential for the background information of all participants to be outlined in order to give a general background to the persons that were involved in the study.

4.1.1 Age of Respondents

The ages of respondents as shown in Table 1, shows that large majority of the respondents representing 38% fall within the ages of 31-40, 20 of the respondents representing 28% fall within the age category of 41-50 years, 14 of the respondents also representing 20% fall within the age category of 21-30 years while 8 of the respondents representing 12% fall within the age category of 51-60 years with 1 respondent representing 2% being 61 years and above.

Table 1: Age of Respondents

Age	Frequency	Percent (%)
21-30	14	20
31-40	27	38
41-50	20	28
51-60	8	12
61 and above	1	2
Total	70	100

Source: Field data, 2020

4.1.2 Sex of Respondents

Table 2 shows the gender of respondents which clearly shows female dominance of 54% as against 46% of their male counterparts. This encouraging because of the constant call to have more female in the formal sector of employment.

Table 2: Sex of Respondents

Sex	Frequency	Percent (%)
Female	18	54
Male	32	46
Total	70	100

Source: Field data, 2020

4.1.3 Educational Level of Respondents

Table 3 also depicts the educational level of respondents with MSLC being the dominance level of education, followed by JHS and those without any qualification. This reflects the fact that the nature of this work does not require any higher qualification or expertise. This contradicts the result of McGuckin, Storr, Longtin, Allegranzi & Pittet (2011) who argues that the high level of knowledge on hand washing by the waste management workers is not unexpected by virtue of their educational background. The results of McGuckin, *et al* (2011) study shows that hand washing was independent from level of education, meaning, it is all about priorities and behaviour change.

Table 3: Education Level of Respondents

Age	Frequency	Percent (%)
MSLC	24	34.3
JHS	21	30
SHS	2	2.9
Diploma	2	2.9
None	21	30
Total	70	100

Source: Field data, 2020

4.2 Respondents Exposure and Handling of Waste

When respondents were asked about when they exposed to waste and how they handle waste, Table 4 shows that majority of the respondents constituting 42% are exposed to waste when they sweep on the streets within the municipality, 14% of the respondents also believe that they handle and are exposed to waste when they are in a truck as janitors and communal container site as cleaners respectively, 12% of the respondents were of the opinion that they are exposed to waste when they are in their offices while 10% believe that they are exposed to waste when they are collecting wastes on the streets with 8% also of the opinion that they are exposed to waste when they are in a truck as drivers. These groups of workers are highly exposed to waste and they are critical to this study.

Table 4: Respondents Exposure and Handling of Waste

Response	Frequency	Percent (%)
Sweeping on the street	29	42
In a truck as a janitor	10	14
Communal container site	10	14
Office	9	12
Collection on the street	7	10
In a truck as a driver	5	8
Total	70	100

Source: Field data, 2020

4.3 Wearing of Personal Protective Equipment

Majority of respondents constituting 55% claimed that they do not always wear PPE's during working period. 45% also indicated that they wear their PPE's and the type of PPE's available to them includes, hand gloves, uniforms, nose masks etc. This as shown in Table 5 indicates that some respondents sometimes chooses to wear their PPE's with no serious supervision by top management to adherence of the use of PPE's.

Table 5: Wearing of Personal Protective Equipment

Response	Frequency	Percent (%)
No	38	55
Yes	32	45
Total	70	100

Source: Field data, 2020

4.4 Frequency of Use and Replacement of PPE

The study showed that respondents used a number of PPE's to protect themselves against any diseases as well as viruses. Uniforms and hand gloves was dominant PPE's used by the respondents. Yuan, Dembry, Higa, Fu & Wang (2012) stated that resource gaps can limit improvements in hand hygiene practices whereas waste management workers both appreciated and understood the importance of hand hygiene and the recommended practices. However, it was revealed from the study that majority of the respondents representing 64% believe that the PPE's are used and replaced once in every years, 17 of the respondents representing 24% also indicated that they are not provided with PPE's and therefore neither do they use and replace PPE's while 12% agreed that they use and replace their PPE's once every months. This as shown in Table 6 indicates that the PPE's provided by management to waste workers is not really encouraging and therefore should be provided with enough PPE's. A respondent when further interrogated said: "I have been using this hand gloves for close to a year now and management are not even bothered to replace it for me despite the various complaints I have made together with my team" (Mr. Mensah, 16th October 2020).

Table 6: Frequency of Use and Replacement of PPE

Frequency of use and replacement	Frequency	Percent (%)
Once in a year	45	64
Not provided	17	24
Once every six months	8	12
Total	70	100

Source: Field data, 2020

4.5 Hand Washing after Encounter with Waste

It was revealed from the study that respondents were quite conscious about washing their hands immediately after coming into contact waste. The study as shown in Table 7 indicated that majority of the respondents representing 56% wash their hands with water only, 24% of the respondents wash their hands with soap and water while 10% also washed their hands with sanitizer with 8% who didn't wash their hands immediately after coming into contact with waste during the study. This confirms a report by Pittet *et al* (2010), hand hygiene was significantly improved when HCWs used alcohol-based product rather than using antiseptic detergent to clean their hands.

Table 7: Hand Washing after Encounter with Waste

Response	Frequency	Percent (%)
Water only	39	56
With soap and water	18	24
Sanitizer	7	12
Nothing	6	8
Total	70	100

Source: Field data, 2020

4.6 Provision of Resources for Hand washing

The availability of resources and equipments to waste management workers is crucial to ensuring safe hand hygiene practices which reduces infections both among health workers and patients as well. It was revealed from the study that the provision of resources for effective hand washing was quite inadequate as majority of the respondents representing 72% were of the opinion that they usually buy water in order to perform any hand washing, 18% agreed that they

were provided with water and soap while 10% preferred to use sanitizer to clean their hands. This finding shows that most organizations including waste management organizations have not been well retooled to combat the corona virus to protect their workers. The finding as indicated in Table 8 also disagrees with the finding of Hlabano (2015) that revealed that Health Care Workers (HCWs) reported that the location of hand hygiene equipment hinders them from practicing hand hygiene; this proves that the proximity of the hand hygiene equipment is crucial in good hand hygiene practices. A respondent said:

“In fact considering the nature of our work, the resources and equipments provided to us is really not enough especially within this Covid 19 period...we therefore need more resources.....”
(Settor, 16th October 2020)

Table 8: Provision of Resources for Hand washing

Hand washing resources	Frequency	Percent (%)
Buy water to wash	50	72
Provided water and soap	13	18
Use sanitizer	7	10
Total	70	100

Source: Field data, 2020

4.7 Quality and Effectiveness of cleaning regimes used by Respondents

The study as shown in Table 9 revealed that majority of the respondents representing 70% believe that the cleaning regimes provided them by management is of quality and effective for protection against any diseases and viruses while 30% of the respondents disagreed that the cleaning regimes provided them by management not of quality and effective in dealing with diseases and viruses in the course of their duties.

However, some of the cleaning regimes used by the respondents included gloves, uniform, nose marks and safety boots.

Table 9: Quality and Effectiveness of cleaning regimes used by Respondents

Response	Frequency	Percent (%)
Yes	48	70
No	22	30
Total	70	100

Source: Field data, 2020

4.8 Health Risk Exposure to Respondents

The spread of infections in developing countries remains a serious problem, especially in high-risk settings such as waste management companies due to lack of awareness among waste management workers (Saloojee & Steehoff, 2011). Table 10 shows that waste management workers are exposed to different ranges of foul smell. 39 of the respondents representing 56% were of the opinion that they are exposed to a high risk of foul smell, 25 of the respondents representing 34% also agreed that they are exposed to a medium risk of foul smell while 6 of the respondents representing 10% were of the opinion that they experience low foul smell. This indicates respondents are exposed to a number of foul smells which has a serious impact of their health thereby reducing productivity at the work place.

Table 10: Health Risk Exposure to Respondents

Level of smell	Frequency	Percent (%)
High foul smell	39	56
Medium foul smell	25	34
Low foul smell	6	10
Total	70	100

Source: Field data, 2020

4.9 Frequency of Training on Hygiene Education

Several researchers (Amoran & Onwube, 2013; Claassens *et al.*, 2013; Friday *et al.*, 2012) have shown that training on hygiene education enhances compliance with infection control measures and helps reinforce the importance of these infection control measures. Wasswa *et al.*, (2015) showed that in-service training enhances compliance with infection control measures and found that regular training helps to remind waste management workers of the importance of infection control measures. Waste facilities and organizations should provide continuous education and training on infection control to all staff (Wasswa *et al.*, 2015). It was revealed from the study as indicated in Table 11 that 36 of the respondents representing 52% were of the opinion that they received training on hygiene education once in a year while 27 of respondents representing 38% never received any hygiene education with 7 of the respondents also representing 10% agreed that they received training on hygiene education for about 6 months now. This shows that the frequency of training on hygiene education is not quite encouraging considering the nature of work of respondents. Further interrogations revealed that those who have not undergone any training on hygiene education are new recruits.

Table 11: Frequency of Training on Hygiene Education

Frequency of training	Frequency	Percent (%)
Once in a year	36	52
None	27	38
6 months	7	10
Total	70	100

Source: Field data, 2020

4.10 Type of Training on Hygiene Education

Constance training on a particular issue has proven to be impactful not only to the trainee but to the surrounding environment as a whole. The study showed that 56% of the respondents have had training on hand washing, 34% of the respondents were of the opinion that most of the training they have had is on personal care while 6% of the respondents agreed that the training they have had is mostly on sweeping skills with 4% of the respondents also of the opinion that the training they have had is mostly on how to be safe on the road in the course of their duty. The finding as shown on Table 12 indicates that the training provided to waste management workers is not limited to one aspect but quite balanced to cover everything on their wellbeing as a waste worker.

Table 12: Type of Training on Hygiene Education

Type of training	Frequency	Percent (%)
Hand washing	39	56
Personal care	24	34
Sweeping skills	4	6
Safety on the road	3	4
Total	70	100

Source: Field data, 2020

4.11 Frequency and Type of Sickness Reported to Hospital

Majority of respondents constituting 46% indicates that they last visited hospital one year ago while the least representing 12% agreed that they last visited the hospital about 2 weeks now. Averagely it can be said that every respondents have had to visit hospitals for different medical purposes. 30 of the respondents representing 42% visited the hospital due to headache, 26 of the respondents representing 36% visited the hospital due to other sickness while 6 of the respondents representing 10% were of the opinion that they visited the hospital due to skin rashes and injury they had respectively with a respondent representing 2% also reporting that he/she visited the hospital due to vomiting. This finding as shown in Table 13 indicates that respondents reported to the hospital with various complaints of sickness related to their work.

Table 13: Frequency and Type of Sickness Reported to Hospital

Type of sickness	Frequency	Percent (%)
Headache	30	42
Other	26	36
Skin rashes	6	10
Injury	6	10
Vomiting	1	2
Total	70	100

Source: Field data, 2020

4.12 Discussion of Results

The study's respondents show female dominance of 54% as against 45% of their male counterparts. This is encouraging because of the constant call to have more female in the formal sector of employment. The ages of respondents also shows that large majority of respondents fall within the ages of 31 - 40 followed by 41-50 with 28%. Educational level of respondents shows that MSLC dominate all levels of education followed by JHS and those without any qualification. This reflects the fact that the nature of the work they do does not require any higher qualification or academics. However, exact places where respondents undertake their cleaning activities included sweeping on the street followed by 15% who are janitor truck drivers and communal container site cleaners. These groups of workers are highly exposed to waste and they are critical to this study. Responding to issues on the usage of PPE's majority of respondents constituting 55% claimed that they do not always wear PPE's during working period. 45% also indicated that they wear their PPE's and the type of PPE's available to them

includes, hand gloves, uniforms, nose masks etc. this indicates that some respondents sometimes chooses to wear their PPE's with no serious supervision to adherence of the use of PPE's.

The study also reveals that uniforms and other PPE's are replaced once in every year. Others also indicated that they receive it every six months while 23% said Uniforms are not provided at all. Again on the issue of water provision, water for hand washing recorded 67% for respondents who do buy water to wash their hands due to their location away from their work stations. 20% get access to free water and soap to wash their hands due to their closeness to the work station. With regards to the level of smell respondents are exposed to majority constituting 58% are exposed to high level foul smell with 37% medium foul smell and 1% low foul smell. The low level of knowledge of hand hygiene among waste management workers in the current study was attributed to their workload and nature of their work, where they are required to work under severe pressure, and often missing the opportunity to comply to hand hygiene. Also, observational studies have found that administrative staff tend to have better hand hygiene practices than waste collectors (Lau Chun Ling, 2012).

The nature of training programs organized for respondents also shows that 55% of respondents do go for training on hygiene in the areas of hand washing, personal care, safety on the road etc. Respondents constituting 65% when asked whether they have a place for cleaning after work indicated 'No' while 28% affirmed positive. This is due to the location of respondents as some field officers do not return to the work premises but rather go home after field work. Again respondents close to work stations easily get access to water and other cleaning aids to wash themselves. According to the results of the study, waste workers indicated that it was not easy to access hand washing resources, which is therefore a bad contributing factor to good hand washing practices. Sax et al (2007) affirmed that lack of products of hand washing does hamper

waste management workers from practicing hand hygiene. Hand hygiene resources have many barriers to proper hand hygiene (HH). There is therefore evidence that the resources/ hand washing commodities were available but mostly used by administrative staff while hand washing practices remained poor among waste collectors due to other factors like attitudes and priorities.

Averagely it can be said that every respondents have had to visit hospitals for different medical purposes such as headache, vomiting, vomiting, skin rashes etc. Tools to work included shovel, rake, brooms, truck and brush. The highest available tools were broom, shovel, truck and brush. This shows that respondents have access to some form of tools to work with if not all.

On respondents response to whether the use of PPE's protect them from disease. 65% as against 35% of the respondents agrees to the fact that PPE'S protect them from diseases and further agreed that to the fact that PPE's provided by the company to work with for their protection are enough with 45% disagreeing. On the contrary majority of respondents disagreed to the fact that cleaning agent for disinfection after work were not given while 15% indicates that they do get access to disinfectant to clean themselves. The study however shows that La Nkwatanang municipality provides for their workers PPE's and other protective facilities although not adequate and thus more has to be done to ensure the safety and full protection of their sanitation workers. Again the municipality needs to step up in making sure their field workers are made to follow safety protocols and to wear their PPE's all the time.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

From the analysis and data collected, the following discussions, conclusion and recommendations were made. The responses were based on the objectives of the study. It sought to evaluate hygiene practices among waste management workers in La Nkwantanang-Madina Municipality.

5.2 Summary

The study sought to evaluate hygiene practices among waste management workers in La Nkwantanang-Madina Municipality. To achieve the objectives of the study, questionnaires were widely used. The objectives for the questionnaires were to obtain information on their knowledge on the hygiene practices among waste management workers at La Nkwantanang-Madina Municipal Assembly. The research question was design based on the problem statement and the knowledge gap that this research sought to achieve supported by relevant literature. The questionnaire dealt with the general information on respondents and their views on hygiene practices among waste management workers at La-Nkwantanang Municipal Assembly. The first sets of the questionnaire were to seek information about demography of the respondents (sex, age, educational level, years of experience and number of years working in the organization). The second part of the questionnaire relates to Personal cleaning regimes used, followed by health status of workers and the last section was to examine the effectiveness of the cleaning Regimes. The analysis was conducted using Statistical Package for the Social Sciences (SPSS) version 20. Respondents were vividly assured of confidentiality and the use of their views for the

purpose of academic only. Pre-testing of the instruments was carried out by the researcher with municipal waste management institutions under investigation.

To achieve the objectives of the study, the study gathered data quantitatively using a descriptive approach where an estimated population of 150 waste workers and a sample size of 65 respondents which included other municipalities under investigation were selected.

The findings of the study show that:

Objectives 1: To identify the cleaning regimes adopted in waste management at the La Nkwantanang-Madina Municipality.

The study found that, major cleaning activities included sweeping and collection of waste on the street. Truck drivers and janitors (truck assistant), communal container site cleaners, sweepers and riders are the various group of workers who are highly exposed to waste and their reliance on the usage of PPE's was encouraging with majority of respondents indicating that, they wear their PPE's and the type of PPE's available to them included, hand gloves, uniforms, nose masks etc. This indicates that some respondents sometimes chooses to wear their PPE's with no serious supervision to adherence of the use of PPE's. The study also reveals that uniforms and other PPE's are replaced once in every year. Others also indicated that they receive it every six months.

Again on the issue of water provision, water with soap for hand washing was available for respondents to wash their hands others do buy water to wash their hands due to their location away from their work stations. With regards to the level of smell, respondents are exposed to high level of foul smell. The nature of training programs organized for respondents also shows that, respondents do go for training on hygiene in the areas of hand washing, personal care, safety on the road etc.

Objective 2: To determine how cleaning regimes ensures good health status of waste management personnel at the La Nkwantanang- Madina Municipality.

The study shows that, there are tools provided to aid respondents to work with which prevents direct contact with filth hence reducing the risk at which municipal waste workers contract diseases and these tools included shovel, rake, brooms, truck and brush. Again, the nature of training programs organized for respondents was another means to keep them abreast with hygiene practices too in the areas of hand washing, personal care, safety on the road etc. this was essential in minimizing disease contraction.

Finally, information to ascertain whether respondents visit hospitals regularly due to the nature of their work showed that, majority of respondents constituting 45% indicated that, they last visited hospital one year ago. Last quarter visit to the hospital recorded 18% followed by 2 months 17%, 4 weeks 17% and 2 weeks 11% respectively. Averagely, it could be deduced that, every respondents have had to visit hospitals for different medical purposes such as headache, vomiting, skin rashes etc. though the results doesn't show a higher percentage of hospital visitation but more can be than to reduce the rate at which respondents falls ill.

Objective 3: To ascertain effectiveness of the cleaning regimes used at the La-Nkwantanang Municipal.

Respondent's response to whether the use of PPE's protect them from disease shows that, 65% as against 35% of the respondents agreed to the fact that PPE'S protect them from diseases.

The study also shows that, 55% of respondents agreed to the fact that, PPE's provided by the company to work with for their protection are enough although 45% disagreed. This shows that there is more to be done to ensure that adequate PPE.s and disinfectant are provided to ensure full protection of waste management workers.

5.3 Conclusion

The nature of municipal waste management practices in Ghana especially in major cities as a whole has led to poor state of sanitation especially pollution of the environment, contamination of both surface and ground water which is in turn, a serious human health risk. The study was carried out to identify the hygiene practices among waste management workers in municipal assembly's narrowing it down to La Nkwantanang-Madina Municipality. It can be concluded from the study that hygiene practices among waste management workers are effective to some extent. It is also concluded that cleaning regimes such as PPE's, uniforms, tools and training programs are provided to waste management workers to enhance their knowledge on best practices pertaining to hygiene within the Municipality and at the same time maintaining good personal hygiene.

Based on the results of the study, it's concluded that majority of the waste management workers care less about their health status as they rarely visit the hospital. Although widely preached and recognized by waste management workers and the public that hygiene is paramount in preventing diseases and transmission of pathogens, adherence to practice is difficult. Future studies should focus on the difficult adherence of waste managers as well as health workers in complying with hygiene.

5.4 Recommendations

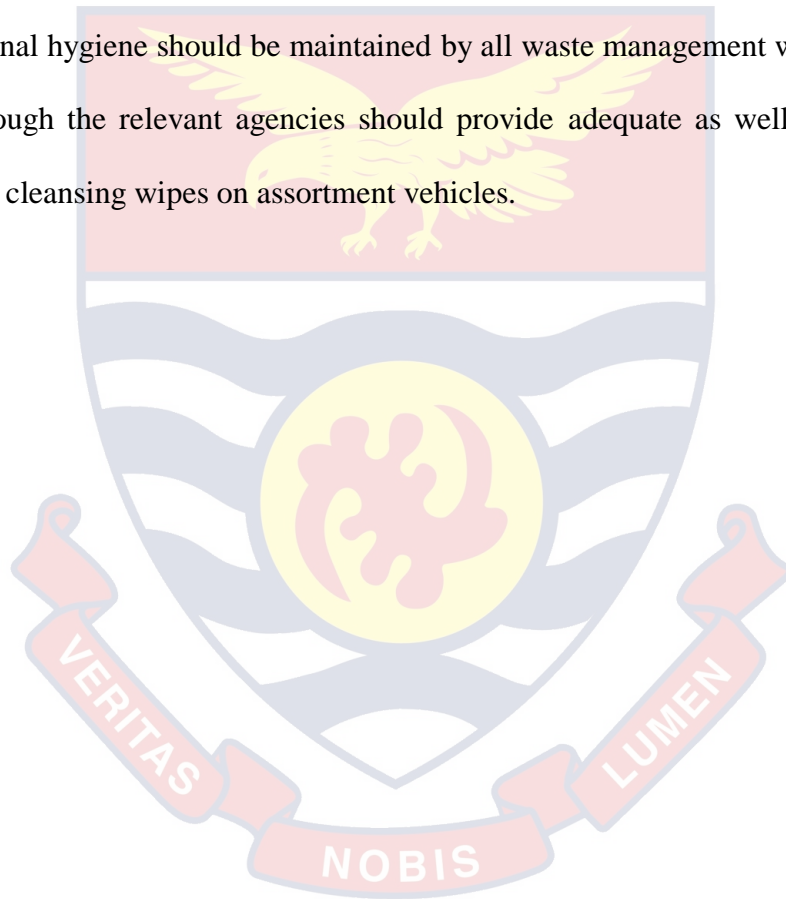
The study recommends the following based on the key findings of the study:

1. The assembly should ensure that all protocols concerning hygiene practices are adhered to among waste management workers especially within this era of covid 19. This can be done by organizing frequent education on personal hygiene.

2. The Municipal assembly through the Ministry of Sanitation should ensure PPE's, tools and all forms of logistics are provided for waste management workers to ensure their safety.

3. The Environmental Health Department of the Assembly through the Ghana Health Service (GHS) must frequently undertake regular health checks for waste management workers to enable them know their health status at all times. Health experts should advice waste management workers to frequently visit the hospital for regular check-up of their health status.

4. Effective personal hygiene should be maintained by all waste management workers. Therefore the assembly through the relevant agencies should provide adequate as well as delicate soap, towels or perhaps cleansing wipes on assortment vehicles.



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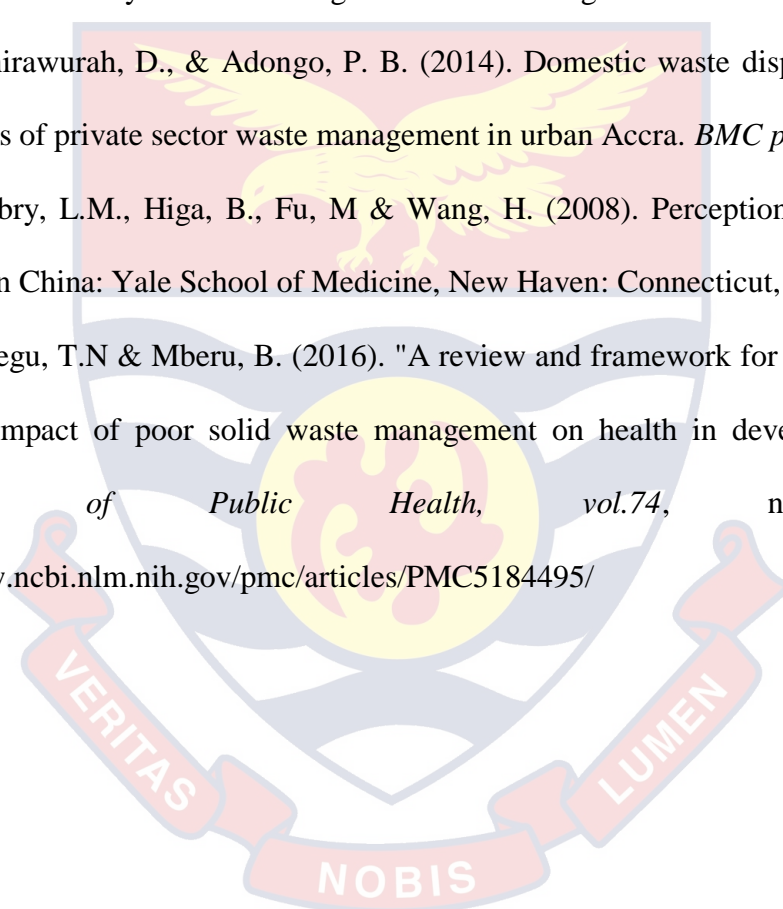
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APPENDIX

QUESTIONNAIRE

PRESBYTERIAN UNIVERSITY COLLEGE, GHANA

FACULTY OF DEVELOPMENT STUDIES

DEPARTMENT OF ENVIRONMENTAL AND NATURAL RESOURCES

MANAGEMENT

Topic: Hygiene practices among waste management workers in La Nkwantanang-Madina Municipality.

This study is being undertaken for academic purposes and any information given will be treated with the highest degree of confidentiality.

Questions may be answered by ticking [✓] against the response(s) that best suits your opinion or filling the space where appropriate.

Thank you for your participation.

SECTION A: RESPONDENT'S PROFILE

1. Sex of respondent Male Female

2. Please mark your age group in the appropriate box

21 31 41 51-60

61 above

3. Educational level

MSLC JHS SHS DIPLOMA DEGREE MASTERS

NONE Others, please Specify

4. Married Y N

SECTION B: PERSONAL CLEANING REGIMES USED

5. Where do you handle the waste?

- A. Sweeping on the street B. In a truck as a driver C. In a truck as a janitor D. Communal Container site E. Collection of waste on the street

6. Do you always wear Personal Protective Equipment (PPE's)? A. Yes B. No

7. What kind of PPE's are provided for you?

- A. Uniforms B. Hand gloves C. Nose mask D. Protective shoes E. all listed

8. How often are your uniforms replaced for you?

- A. Once in a year B. once every six months C. once every three months D. not provided E.

Others (specify)

9. How often are your gloves replaced?

- A. once very week B. once bi weekly C. once every month D. not provided E. others specify

10. How often are your nose mask replaced?

- A. once every week B. once every month C. once every three months D. not provided at all

11. By what means do you protect yourself from direct contact with the waste?

- A. Protective gloves B. Nose mask C. Protective Uniforms D. Shoes E. All listed

12. How do you wash your hands after the encounter with the waste?

- A. use only water B. hand washing with soap and water C. use of sanitizers D. don't use anything at all

13. What provision is available to wash your hands after work?

- A. use of provided water and soap B. buys water to wash hands C. use of sanitizer

14. Whiles at work, if you handle waste directly, how do you pause to drink water?

A. takes off the gloves and drink water B. wash hands before drinking water C. drinks water with the gloves on D. use sanitizer

15. Do you pick public transport back home after work? A. Yes B. No

SECTION C: Health status of workers

16. What level of smell do you experience from the waste?

A. High foul smell, B Medium foul smell, C. Low foul smell

17. Where is the location of your dumping container?

A. By a market, B. By a public toilet, C. At a school, D. Isolated place

18. What training have you been given on personal hygiene while working?

A. Hand washing B. Personal care C. Safety on the road D. Sweeping skills

19 How many times do you attend training program in a year?

A every three months B. every six months C once in a year D. none

20. Do you have a place for cleaning after work? A. Yes B. No

21. When was the last time you went to the hospital?

A. two weeks B. Four weeks ago C. Last month D. Last quarter E. Last year

22. What sickness took you to the hospital?

A. Headache B. Vomiting C. Skin rashes D. Injury

23. What sickness were you diagnosed off

A. Cholera B. Malaria C. Typhoid

24. What tools are available for you to use at work?

A. Shovel B. Rake/Fork C. Ali brooms D. Truck

Section D. Effectiveness of the cleaning Regimes.

25. Do you think the use of PPE's protect you from disease A. Yes B. No

26. Which of the PPE's do you think it protects you greatly?

A. Uniforms B. Gloves C. Nose masks D. Safety shoes

27. The PPE that most protects you, why often do you think it should be received?

A. Uniform; once a year, every six months, none

B. Gloves; once every month, once every week

C. Nose cover; once every day, once a week, none

D. Safety boots. Once every year, once every 6 months,

E. Not at all

28. How many set of PPE's have you been provided for work?

A.3 B. 2 C.1 D. None

29. Do you have sets of PPE's for work A. Yes B. No

30. With the PPE's you have, do you think it's enough to prevent disease

A. Yes B. No

31. The provision for handwashing, do you think it is protective enough A. Yes B. No

32. Are you provided cleaning agents for disinfection after work?

A. Yes B. No

33. Which company do you work for?

Please specify.....

