

**CAREGIVERS' ATTITUDES AND PRACTICES TOWARDS PREVENTION
OF DIARRHEAL DISEASES IN CHILDREN UNDER FIVE YEARS IN
KIBRA**

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DECLARATION

This research project is my original work and has not been submitted for any examination to any other university.

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This research project has been submitted for examination with my approval as the university supervisor.

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God, bless you all.

DEDICATION

I dedicate this study to my parents, with whom this study was made possible by their emotional and financial support throughout this course.

Their encouragement has made me a stronger person and may God bless them abundantly.

ABBREVIATIONS AND ACRONYMS

WHO	-	World Health Organization
NWSC	-	Nairobi Water and Sewerage Company
UNICEF	-	United Nations International Children and Education Fund
KDHS	-	Kenya Demographic and Health Survey
UN	-	United Nations
WASH	-	Wash Sanitation and Hygiene
UNDP	-	United Nations Development Programme
E.COLI	-	Escherichia coli
MDGS'	-	Millennium Development goals
MOH	-	Ministry of Health
ORT	-	Oral Rehydration Therapy
T.COLI	-	Total Caliform Bacteria
C.D.C	-	Centers for Disease Control
MCHIP	-	The Maternal and Child Health Integrated Program

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ABSTRACT

Globally in every nine deaths of children under the age of five years, one death is attributed to Diarrheal diseases, which rank as the second leading cause of death among children under the age of five. For children with HIV, Diarrhea is even more deadly; the death rate of children is eleven times higher than that without HIV. In Kenya, it is the second leading cause of morbidity with a prevalence of about 17 percent and accounts for around 21 percent of under-five child deaths (KDHS 2014). In Kibra, Diarrhea is among the highest causes of morbidity and mortality among children under the age of five years. The purpose of this study was to assess the caregiver attitude and practices towards the prevention of Diarrheal diseases in children five years. It examined the caregiver's knowledge and attitudes on the causes of Diarrhea, the caregiver's hygienic practices and the key role of water in causing Diarrhea. The study adopted the Self Efficacy Theory which states that people are capable of controlling their own practices on a given behavior. The study employed descriptive statistics to analyze a sample of 40 households using questionnaires which were administered and data translated using a cross sectional analysis for meaningful information. The study revealed caregiver attitudes and practices influenced prevention of Diarrhea, on perceived risk and causes of Diarrhea, 48 percent of the respondents acknowledge Diarrhea as the most prevalent disease in their households. Caregiver practices such as hand washing, disposal of faecal waste and hygienic behavior largely determined the risks of Diarrheal diseases. The study concludes that although Diarrhea is prevalent, it can be easily prevented by the adoption of positive attitudes as well as enhanced practices towards measures geared towards elimination of risks of Diarrheal diseases. The study recommends that caregivers in areas such as Kibra should be trained and educated on hygienic practices as well as behavior so as to avoid severe cases of diarrheal diseases.

CHAPTER ONE: INTRODUCTION

1.1 Background of Study

According to the world health organization (WHO, 2014) about 1.4 million children aged five years and below worldwide die of diarrheal illnesses that are preventable. It is approximated that about more than 80 percent of the cases are because of either poor sanitation or unclean water. Diarrhea is one of the leading killers of children in the low-income and middle-income countries. Approximately 1.9 million of these deaths is attributed to diarrheal diseases annually. This makes diarrhea a leading cause of death in children five years and below. It causes an annual mortality in 760,000 children (Gebru et.al 2014).

Diarrheal diseases constitute largely to childhood ailments and the leading cause of preventable deaths of children below five years in many developing countries. Severe diarrheal ailments are some of the main problems afflicting children world over, affecting their well-being and generating considerable demand for health services (WHO, 2010).

According to Walker et.al (2013), studies have shown that Diarrhea causes the death of over 700,000 children under the ages of five. Vulnerability to diarrheal diseases is prevalent in Africa and Asia and majority of deaths are related to these episodes. More than 80% of the reported deaths from diarrhea occur in Africa and South Asia with about 46% in Africa alone (Pickering et.al 1987). Diarrheal mortality remains high, but it is now coming down by 4 percent per year and prevalence is declining more modestly (Walker et.al 2012).

The incidence and severity of Diarrheal diseases is aggravated due to insufficient clean water, inadequate feeding practices, hygienic disposal of human waste, hand washing,

lack of access to adequate and affordable health care, poor housing conditions, could reduce the incidence of Diarrhea by 35 percent (Gerald, Keusch & Alok, 2001).

In a majority of developing countries, socio-demographic characteristics such as unavailability of sanitary facilities, poor hygienic practices and rampant use of street food contribute to the occurrences of Diarrheal disease. Results from studies countries like Ghana and Nigeria show that the occurrence of Diarrhea varies depending on the education levels of the children's mothers, indicating that diarrhea is relatively high amongst children whose mothers were illiterate. This is attributable to health education on practices such as hygiene, feeding, management of childhood illness and the function various school clubs in individual hygiene and environmental sanitation play (Oadi & Kuitunen, 2005).

Approximately 72 percent of childhood diseases are attributed to environmental factors such as poor sanitary conditions, bacteria infestation in poor drainage systems, drinking water and faecal contamination of food. The prevalence of Diarrhea among children in Nairobi's slums is about 31 percent, nearly double the occurrence rate in the other parts of Nairobi. Another major cause of high cases of cholera, dysentery, intestinal parasites and typhoid fever is faecal contamination on water in the slums. Thus, in the Kenyan slums, with overcrowding and lack of a proper drainage and sanitary system conditions have emerged that are hazardous to the health of the population. This has also escalated with the acute unavailability of water and sanitary disposal services, which forces households to collect water from a standpipe, and they dump their waste on open drains, thus increased rates of infections and constant risks of epidemic. In sub-Saharan Africa, about 40 percent of deaths occur in Africa due to the primary caregiver's poor attitudes and practices towards the appropriate prevention and management of these conditions.

In most instances, mothers who are the primary caregivers of children are forced to go work and are not at home, these results to children being left to fend themselves at a very early age or in the care of older children. Children in these slums are often found playing in places where the waste from toilets is drained, due to the poor sanitary services there is no sewer nor a place for washing their hands or available clean water to use a few times a day thus the children end up being vulnerable to diseases (USAID-MCHIP, 2014)

According to Drentea (2007), sociologists define caregivers as an unpaid workforce drawn from among family members, friends and neighbors as well as individuals affiliated with religious institutions. Thus caregiver habits influence the control and prevention of diseases from children, this starts at home, the attitudes of the caregivers also determine whether it is considered fine for their children to contract Diarrhea and if their practices are efficient in preventing the diseases, with a death of prevention practices and rights attitudes from caregivers, incidences of Diarrheal disease escalate, resulting to high morbidity, that worsens by complication such as malnutrition and dehydration (Lui, 2009). Children living in areas experiencing poor hygiene and sanitation conditions are likely to contract illness, as many Diarrheal ailments are associated with poor hygienic conditions, poor sanitation and inadequate water resources (Messias, 2001).

The right sanitation and hygiene evidently enhance the quality of life in many ways, such as drastically reduced rates of death among children, combats diseases as well as increased economic output and, hence, eradication of poverty. In Kenya, though, the most common ailments related unclean or lack of water, sanitation and hygienic conditions are cholera, typhoid and Diarrhea (Lumumba et.al 2004). Africa being a rapidly urbanizing continent, and with an estimate of more than half of the people

living in sub-Saharan Africa in the year 2030 expected to live in urban areas more than 70 percent of the urban residents live in formal settlements or slums characterized by dense populations, poor sanitation and contaminated water supplies and high-risk health implications for residents. Consequently, such slums are characterized by high incidents of a variety of problems as per the AMREF (2007) report, where women and children are reportedly the most exposed to diseases related to hygiene due to contaminated water and food. Toilets are also put up next to residential houses, furthermore they are not more than 15 meters deep and this increases the infestation of mice, flies and worms. These creatures infest the houses and kitchens and contaminate foodstuff and water. Most of the ailments prevailing in Kibra slums are results of inefficient disposal of fecal matter. This practice is a major cause of the diseases and infection in this place. Due to blocked drainages water floods and mosquitoes breed there leading to the spread of malaria and diarrhea (Darlymple et al 2002).

It is evident that the unavailability, inaccessibility and lack of maintenance of toilets are the most cited health related problems in the Nairobi Kibra slum. This is followed very closely by poor drainage systems, lack of health services and inadequate water supplies.

1.2 Problem Statement

Diarrheal disease is a major cause of child mortality and morbidity in the world, and, mostly results from contaminated food and water sources (WHO,2017). Although being a preventable disease the cases of Diarrheal illnesses continue to be on the rise and currently it is the second leading killer of children under 5 years in the world (United Nations International Children's Education Fund (UNICEF, 2008).

Approximately 4000 children still die daily because of Diarrheal illnesses in under developed countries, though largely preventable with reference to estimates by the World Health Organization (2005) whereby 88 percent of all Diarrheal, cases are caused by dirty water supplies, poor sanitation and inefficient hygiene practices. In Kenya, it is also a leading cause of childhood morbidity and mortality. The number one killer according to the United Nations Program (UNICEF) report of 1994 states that the acute respiratory illness at 19 percent followed by Diarrheal at 19 percent, perinatal at 18 percent and malaria is at 4 percent. Childhood mortality due to Diarrhea is even higher among the urban poor (Negussie and Chepgeno, 2005; United Nations, 2008). According to the World Health Organization (1990), 37 percent of all Diarrheal diseases in the world occur in sub-Saharan Africa.

In Kenya, the 1992 Ministry of Health Report rates Diarrhea as the second leading killer among children. The same report indicates that on average children in Kenya experience four episodes of Diarrhea per year. A study carried out by UNICEF in 1994 shows that the number of episodes increases to twelve bouts a year in the slums. It has been observed that caregiver attitudes towards the biomedical knowledge on causes of diarrheal diseases is very low and most of the caregivers in the slums do not fully understand what causes the disease and how to prevent it.

Some of the fundamental etiological factors that are associated with Diarrheal diseases in children include microbial agents (bacteria, viruses and parasites). These organisms are mainly transmitted through food, water and milk that human feces contaminate directly or indirectly by either hands, flies or utensils including bottle feeders. Caregiver practices greatly influence the above transmissions and how the primary caregivers approach the preparation of food and hygienic practice will determine contamination or eradication of the disease.

Slums areas are usually overcrowded and Kibra is no exception, Diarrhea has become one of the main health problems among children aged five years and below in the overcrowded slums (UNICEF, 1994).

The prevalence rates in the slums are as high as 36 percent in the slums. The living conditions in slums impose challenges in the observation of hygienic practices by the caregivers and that further predisposes children to Diarrheal diseases. The high prevalence of Diarrhea in the slums can be directly associated with the caregiver's attitudes and practices.

Therefore, this research study seeks to find out the caregiver's attitude and practices towards the control of Diarrheal ailments in children five years and below in Kibra informal settlement

1.3 Research Questions

- i. What are the causes of Diarrheal diseases in Kibra?
- ii. What are the caregiver's attitudes towards prevention of Diarrheal diseases for children under five years in Kibra?
- iii. What are the caregiver's practices in prevention of Diarrheal diseases for children under five years in Kibra?
- iv. What is the relationship between diarrheal diseases and soil ingestion?

1.4 Objective of Study

The overall objective of the study was to assess the caregiver's attitude and practices towards the prevention of Diarrheal diseases in children under than five years in Kibra

1.5 Specific objectives of the study

- i. To examine the causes of diarrhea of Diarrhea in children under five years in Kibra.
- ii. To examine the caregiver's attitude on the causes of Diarrhea in children under five years in Kibra.
- iii. To examine the caregiver's hygienic practices in children under five years.
- iv. To analyze the relationship between diarrhoea and soil ingestion.

1.6 Justification of study

The aim of the study was to assess and establish how caregiver attitudes and practices can prevent or cause occurrences of Diarrhea in children below five years. The study sought to determine the causes of Diarrhea as well as boosted preventive practices not only in Kibra but also in all slum areas around Kenya and Africa at large. In Kenyan slums and particularly Kibra, there was a need to fully understand how caregiver practices and attitudes can deter occurrences of Diarrhea or actually be a cause for its occurrence.

According to the UN MDGS 2000 and Kenya Vision 2030 on health, the country is dedicated to bringing down child mortality rates by two thirds among those under five years. Thus, this study identified the different risk factors associated with Diarrhea and how they can be eliminated. Various studies such as ones done by Population Activities (2001) estimate that waterborne diseases infect about 250 million children yearly and almost ten million lose their lives. Diarrhea is a severe challenge in Kibra. This is due to scarcity of information on health for slum dwellers. Kungu et.al (2002), found that Poor environmental settings, pathetic methods of faecal removal and high levels of poverty expose the community to Diarrheal diseases (Kungu et al, 2002).

The findings of this study will assess the caregiver's attitudes and practices, and this will provide important information for effective presentation of Diarrheal diseases in children below 5 years. The findings will also assist in refining and reinforcing existing knowledge on causes and prevention of Diarrheal diseases so as to enhance the fight against child mortality and morbidity in Kenya by providing information on prevention practices as well as providing relevant biomedical knowledge on the disease.

1.7 Definition of Key Terms

Practice - Refers to the customary, habitual, or expected procedure or way of doing of something. These includes hand washing by mothers during critical times, child feeding habits and food preparation habits.

Attitudes - An attitude is "a relatively enduring organization of beliefs, feelings, and behavioral tendencies towards socially significant objects, groups, events or symbols" (Hogg & Vaughan 2005).

Caregiver - in this context refers to person taking care of the child under five years and in this project the mother was considered

Child mortality - The probability of dying between the first and fifth birthdays.

Demographic factors - refers to the factors associated with family size, population density, age, gender and other population dynamics that may affect children healthy.

Diarrhoea - referred to the passing of three or more loose or liquid stool.

Diarrhoea pathogens - An infectious agent, a germ, microbe or micro-organism such as a virus or bacterium that cause diarrhoea

Access to source of water - in this context means households having access to water facilities either in the dwelling or located within convenient distance of less than 100 metres from the dwelling and were well maintained

Household - Refers to a person or group of persons who reside in the same homestead and normally share food and other amenities and answerable to the same household head (KPHC, 2009)

Dependent variable - incidences of diarrhoea morbidity among children under five years of age

Independent variables - includes the socio economic, demographic, household and community environmental and behavioural confounding factors

Infant mortality rate - The probability of dying between birth and exactly one year of age, expressed per 1000 live births.

Informal urban settlement – A settlement usually found on the periphery of cities and big towns characterized by lack of proper sanitation, safe water supply, unhygienic streets and lack of other basic human necessities.

Morbidity - Morbidity is an incidence of ill health. It is measured in various ways often by the probability that a randomly selected individual in a population at some date and location would become seriously ill in some period of time.

Socio-economic factors - These are the social factors that affects daily activities of a human being. They include the level of education of the child caretakers, source of livelihood and the amount of income per household or per child caretaker

Under- five mortality rate - The probability of dying between birth and exactly five years of age, expressed per 1000 live births

1.8 Scope and Limitations of the Study

This study was conducted in Kibra which is an informal settlement located in Nairobi. The study dwelt specifically on households located in the area and that are directly affected by childhood diarrhoea thus the study was limited in both scope and methodology. By examining the children under five years old, the study limited itself in terms of its study population. This is notwithstanding the fact that diarrhoea affects other parts of the population as well. The study employed quantitative research methodology which limited its access to personal information that could inform the study. The study was also limited to the environmentally related household and a few socio-economic factors despite the fact factors that may influence the prevalence of diarrhoea. Kibera being one of the largest slums in Nairobi posed the problem of insecurity. The researcher was to use the minimum time possible in the study area due to high insecurity. The security personnel that were available were part of the youth which claimed to be the vigilant group in the area and charged very expensively to take the researcher around. Accessibility of Kibra also posed a challenge as the streets were impassable due to poor drainage of house hold wastes and sewage all over. Unwillingness of the respondents to co-operate even after a thorough introduction and explanation of the purpose of the study, the researcher faced difficulties in eliciting responses from some of the interviewers who could deliberately refuse to cooperate and others could ask for a fee in order to fill the questionnaire. Majority of the working mothers were available very late in the evenings which posed a big threat for the researcher to visit the study area late in the evening because of insecurity. Lastly just like any other research, this study required a lot of time and financial resources in terms of travelling, paying research assistants, enhancing security, printing and photocopying, and internet charges.

CHAPTER TWO: LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

This chapter will focus on literature concerning Diarrheal diseases, causes and prevention. It starts by reviewing literature done globally, then narrowing down to Africa and finally discussing literature about Diarrhea in Kenya and provides insight on the caregiver attitudes and practices towards the disease.

2.2 Overview of Diarrhea

Diarrheal ailments are a major cause of child mortality and morbidity globally and mainly occurs due to contamination of water sources and food. Across the globe, around 780 million people do not have access to water for domestic use, while 2.5 billion lack good sanitation. Diarrhea that result from infection is prevalent throughout third world countries. Children below five years old suffer on average three episodes of Diarrhea each year, which deprive the children the food necessary for their growth. Ideally, Diarrhea is the main source of malnutrition and malnourished children mostly get sick from Diarrhea (WHO, 2013). Diarrheal ailments account for a ninth of child deaths globally, making it a major cause of deaths in children below five years.

For the children affected by HIV, Diarrhea is more severe; their mortality rate is eleven times higher compared to children who are not HIV infected (Hutton G, Haller L, Bartram J, 2007). Diarrhea is characterized by the passing of loose stool three times or more in a day. Severe Diarrhea is common in slum areas and it normally lasts one or two days and goes away without any medication. However, Chronic Diarrhea lasts for at least one month and is a symptom of a chronic disease, which may be continue, or come and go. Diarrhea of any duration causes severe dehydration. Thus, leading to lack of enough fluids in the body and causes electrolytes or chemicals in salts, potassium,

sodium, and chloride not to work properly (Ramaswamy K, Jacobson K. (2001). Severe Diarrhea is normally caused by a viral, parasitic or bacterial infection whilst chronic Diarrhea is associated with functional disorder like intestinal disease or irritable bowel syndrome.

2.2.1 Diarrhea Causes and Prevention

The major causes of Diarrhea are as follows; contaminated food or water bacterial infections, which include several kinds of bacteria consumed through. These bacteria include Shigella, Campylobacter, Salmonella and Escherichia coli (E. coli). Viral infections that can also cause Diarrhea including cytomegalovirus, norovirus, rotavirus, herpes simplex virus and viral hepatitis. Infection with the rotavirus usually causes acute Diarrhea among children while Rotavirus Diarrhea causes problems in digesting lactose for one month or more. Thirdly, parasites find their way into the body through contaminated food or drink and settle inside the digestive system. These parasites are the ones that cause Diarrhea and they include Giardia lamblia, Entamoebahistolytica, and Cryptosporidium. Others cause functional bowel disorders, food intolerances, intestinal diseases and sensitivities and by reaction to medicines such as antacids containing magnesium, cancer drugs, antibiotics, etc. (NIDDK, 2014).

Notwithstanding the burden of Diarrhea, much is known about the prevention and treatment of Diarrheal diseases. Research conducted on the same area recently suggest a decline in the child mortality rates in developed countries such as the USA in the early twentieth century are because of water quality improvement (Cutler & Miller, 2005). Provision of clean water infrastructure is not feasible in developing countries. This has led some to argue for prioritizing point-of-use means like chemical disinfectants.

These have been proved to effectively reduce Diarrhea occurrence; digging boreholes and building many cheap wells result in rapid increase of water supply. This enables communities to wash utensils more frequently, themselves and their clothes but the sources are more susceptible to contamination. Enhanced hand-washing practices as well as water treatment require adoption of voluntary behavioral change. However, there is no concrete evidence whether such changes in behavior can persist into the future.

2.2.2 Diarrhea in Africa

According to the WHO, in Africa, South of the Sahara, an average of 644,000 people died from Diarrhea in 2012. This accounted for 6.7 percent of all the reported deaths. Most deaths from Diarrhea affect children below 2 years living in Africa, South of the Sahara and South Asia. However, an effort is being made to reverse this situation. From 2000 to 2013, the number of children under five who died from Diarrhea decreased by more than 50 percent from over 1.2 million to less than 0.6 million. Many children could be saved by basic interventions in regards to clean drinking water, sanitation and hygiene (WASH) to prevent Diarrhea, and the widespread use of zinc supplementation and oral rehydration salts (ORS) during episodes of Diarrhea (UNICEF, 2013).

Adazu et al. (2005) found that Diarrhea remains the third leading cause of childhood mortality. Kibra lies geographically on an altitude of 1,670 meters above sea level, 50 degrees east and longitude 1 degree, latitude 36 degrees, 17 degrees south about 140km south of equator is Kenya's biggest informal settlement. The emergence of Kibra can be attributed to the rapid growth of Kenya's city of Nairobi and it is resident one quarter of the city's population. The name 'Kibra' is a Nubian word whose meaning is 'forest.' (Karanja et al., 2002).

Kibra has nine official villages which include; Soweto, Kianda, Kisumu Ndogo, Lainisaba, Silanga, Lindi, Makini and Mashimoni. The size of a normal home is nine square meters, which is shared by five inhabitants for every dwelling, and services such as clean water and sanitation are very scarce. For every fifty to five hundred people, there is only one pit latrine thus the 'flying toilets' phenomena. Due to the prevalent water shortages residents depend on boreholes, piped water and the dirty Nairobi River. Water for domestic use is distributed using plastic pipes laid alongside sewage trenches (Karanja et al., 2002).

A majority of the people living in poor urban areas such as Kibra are often characterized by overpopulation and congestion resulting into limited space per person, and the inhabitation of many different families. Averagely five people share one room. This is where cooking, sleeping and living happens. The dwellings are built on dangerous and unsuitable locations for a human habitation; for instance, near places where disposal of waste take place.

Toilets are also built near houses and are hardly deep enough thus breeding of mice, worms and flies. These creatures get into the homes where they contaminate food and water. Toilets emit bad smell due to poor and unplanned construction, lack of or insufficient cleaning and poor ventilation that attracts insects, which spread diseases through contamination of food and water. Where toilets are not located near to the houses, the residents use plastic bags as toilets. These bags after use; they throw them in trenches along the roads or as far away as possible. They are also thrown on the rooftops, where they attract flies. Those thrown in trenches block the drainage systems and those that burst from pressure on impact mess the environment. Some of them land in open water systems and are washed away into open water bodies. When it rains, the excrement is often washed into people's living rooms. Children go to swim in

contaminated water and this leads to such infection as skin disorders, typhoid, malaria, Diarrhea and many more (UNDP, 2006).

Most of the ailments in the Kibra slums are from poor toilet habits. This is the cause of diseases and infections in the area. Stagnant water occasioned by blocked drainage system offers mosquitoes breeding environment leading to the spread of malaria and typhoid (Dalrymple et al. 2002). It can be observed that the unavailability, inaccessibility and lack of well-maintained toilets as commonly cited health related problems in Kibra slums. Poor drainage and lack of water supplies and poor health services are also cited. According to a report by AMREF (2007), women and children form the worst affected category of inhabitants by infections related to poor hygienic conditions during rainy seasons when water systems are contaminated.

It is also notable that most of the slum dwellers have to contend with unemployment and high levels of poverty, thus they run small informal businesses to eke a living. These include roasting maize, hawking wares, selling food openly, etc. The methods used to prepare food are usually unhygienic and in most cases, the food is cooked on the roadside where dust, sewages, flies and all manner of dirt is around them. This kind of food is affordable and inhabitants tend to ignore the hygienic measures needed to be carried out when it is being prepared. This leads to the spread of Diarrhea now and again. The poor drainage system makes slums muddy and impassable when it rains.

This results to consequences such as an increase in places for mosquitoes breeding, filth and foul smell and illnesses like Diarrhea. Sheth and Obrah (2004) found that due to failure to wash hands with soap before handling food, feeding on leftover foods and dirty food storage surroundings pose the chief causes of Diarrhea among children.

Diarrheal diseases are a key threat to the health of the inhabitants of Kibra slums, due to the bad environment (WHO, 2008).

Thus, it is of essence to observe that the failure to ensure proper prevention practices and right attitudes towards this Diarrheal disease leads to numerous consequences for children living in this informal settlement. However, reduction of these instances can be achieved by practicing preventive measures as well as getting more knowledge on the causes of Diarrhea as well as positive and preventive attitudes.

2.3 Caregiver Attitude and Hygienic Practices

2.3.1 Caregiver Attitudes

Hygiene is referred to as cleanliness or conditions meant to support or preserve good health. If a community does not promote hygienic conditions, it will be at risk of infections and illnesses. Good housing conditions, improved environment are the necessary elements for the fight against infectious diseases (Greene, 2001.)

Mahasneh and Sawsa (2001) found that diminished resources, like water, lead to poor hygiene levels; this is because toilets cannot be mopped and there is no enough water to shower. Caregiver attitude and hygienic practices are significant in prevention of Diarrhea in children below five years. In order to attain good and healthy communities, basic practices by caregivers, which are based on proper sanitation, proper hygienic practices during food preparation, planned disposal of faecal matter and washing of hands are essential. If caregivers are informed and poses a positive attitude, risk factors for Diarrhea, morbidity and mortality of children five years and below will be lowered with significant decrease in Diarrhea incidences.

Primary caregivers, in this case 'parents' contribute largely to the diseases that the children contract in Kibra slums, largely due to their ignorance towards preventative

measures. Caregivers have the cardinal responsibility to positively influence the health care system in a community. They act as educators to the children on preventative practices. Primary caregivers should be informed on practices such as those of contagious diseases, which can easily be controlled through cooking food; boiling water and practicing washing of hands with soap to help get rid of germs. Due to a lack of information, caregivers may directly or indirectly have their children contract Diarrheal diseases. Despite the dangers of Diarrhea, up to 66.7% of the cases among children can be avoided through the provision of readily available and cheap hygiene solutions and availability of clean water and sanitation. However, poor and tender lives get lost even when this is a preventable problem (EHP, 2004).

The attitude that the primary caregiver has on perceived risk on the causes of Diarrhea in their children has a major role to play in the prevention of the Diarrhea diseases. This can be attributed to what extent does the caregiver think that their young children are in danger of contracting Diarrhea. If the caregiver assesses the risk and views to be high, the more likely they will be willing to embrace preventative measures, and adopt safe and hygiene practices.

The caregiver's attitude on perceived severity of Diarrhea on their children also poses a concern. In that if the severity is serious and therefore a dangerous matter, their caregiver will seek all available preventive measures against contracting Diarrhea, thus the relationship between the conceived severity and performance of the health-improving behaviors will be positive so as to maintain good health of the children. Biomedical knowledge on the causes of Diarrhea among children constitutes a significant measure against contracting of Diarrhea in that the occurrence of beliefs attributing children's Diarrhea to mystical causes like; breaking of norms or witchcraft. There are also some beliefs that explain children's Diarrhea through arguments that are

seemingly biomedical but show on closer observation to be attributed to biomedical causes, which are correlative and not causative like; teething, sunken fontanel, etc.

If the caregivers are strongly opinionated on mystical or, even false biomedical causes of Diarrhea, they are not likely to take or effective any action on the contrary. Following this concept of self-efficacy as propagated by Bandura (1982), a caregiver may underrate her own persuasion on her child's health. Experiencing apathy and being unable to manage events, a parent may abandon the health-enhancing behavior known from biomedicine. Additionally, the parent may associate the occurrence of Diarrhea to biomedical reasons which are not causal and therefore, erroneous. This may occasion the taking of sub-optimal measures to cure or prevent incidence of the ailment. Thus, the caregivers should be informed on Diarrhea diseases so as to properly institute correct biomedical measures for children's Diarrhea incidents.

Finally yet importantly, on the caregiver's attitude, the social norms on proper management of water and the main role of dirty water in causing children's Diarrhea should also be greatly understood. This entails the relation between perceived pressures to treat water by the immediate social environment that is the family and the attendant social pressure to hygiene behavior. The more it becomes a habit to purify water, the more individuals are likely to indulge in and perpetuate health-improving behaviors and safe hygiene practices.

2.3.2 Caregiver Practices

Caregiver practice towards Diarrhea include; washing of hands, quality of drinking water or raw water, disposal of faecal waste, hygiene behavior and cleanliness of household. Recent reviews on data from similar studies show that a 42 percent-47 percent reduction in Diarrhea that occurs if washing of hands with soap and water is embraced in the homes. Thus, the promotion of hand washing and its interventions have

the potential to reduce deaths resulting from Diarrheal diseases (Curtis & Cairneross, 2003).

In many instances, Diarrheal illnesses are spread through person-to-person interaction or by faecal-oral routes. On a number of times, it is by way of contaminated hands, where many Diarrheal sickness-causing microbes, like typhoid and cholera are spread. Removal of bacteria, parasites, and viruses from the hands can simply be achieved through the adoption of proper hand washing amongst the persons in the community. Hand washing is at the core of disease prevention in many parts of the world. However, availability of soap and water to communities is insufficient in a number of developing countries. This limitation is one of many challenges to good hygienic practices in these countries. To effectively introduce and maintain hand-washing interventions in the community there should be proper education and promotion of enduring behavior change, both in appropriate social and cultural contexts. From past studies, it has been noted that for children, hands washing can be an entertaining activity. The activity is simple even for the very young children to adapt the practice (Jamieson et al. 2006).

As caregivers, the parents can assist to keep their children healthy through teaching and training them good hand washing techniques. This hand washing practice equips everyone with the chance to get involved in own healthcare. Once children have learnt how to wash their hands well, they will always do so and encourage their parents and siblings as well to wash hands (O'Reilly C et al. 2006). Handwashing education in the community should be provided as it limits the number of people that fall ill with Diarrhea by 31 percent (Exempt R et al. 2008). Hand washing also reduces Diarrheal sickness in individuals with weak immunity by 58 percent (Huang & Zhou, 2007).

Practices such as garbage collection and maintaining cleanliness and hygiene conditions around surroundings enhance the prevention of diseases and infections. Poor

environmental surrounding conditions also constitute to low levels in quality of health. (WHO, 1997). The United Nation Habitat (2006) defines sanitation and hygiene challenge in slum areas in terms of poor fundamental services leading to lack of access to sanitation amenities or clean water sources. This phenomenon is due to the deficiency in waste collection initiatives, poor infrastructure, a poor drainage system and the absence of power supply, poor and inadequate housing facilities built in slums, unsuitable due to the following conditions; straw roofs, earthen floors, mud and plaster. Unavailability of essential services, open sewers, the unplanned dumping of waste, lack of pathways and polluted habitats, lead to unhealthy surviving conditions. Houses have been put up in dangerous locations, and they present unsuitable conditions for human habitation; for instance, near waste dumping sites.

Poverty and financial status are considered with certain exceptions, as a major feature of the slums. They affect slums surroundings. Sparsely populated areas are deemed to have high risks of crime and many other forms of social disharmony. Awareness and access to sanitation and hygiene behaviors reduce child mortality.

The quality of environmental hygiene reduces mostly due to inadequate waste disposal mechanism, dense population, improper planning and other unbecoming human behavior. Communities living in such an environment are likely to suffer diarrheal ailments. Many of the diseases that afflict them are associated with limited water resources, poor sanitation and bad hygiene (Messias, 2001). Unfavorable sanitation conditions are a risk to the environment and water sources. This is because they cause bacterial contamination. Untreated water and raw sewage reach the water sources, thereby contaminating of water, which results in Diarrhea diseases.

2.4 Association between caregiver attitudes/practices and prevention of Diarrhea

The caregivers perceived risk on causes of Diarrhea illnesses, biomedical knowledge on the causes of Diarrhea as well as the social norms on correct way of handling water and the role of unpurified water in causing young children's Diarrhea plays a vital part in the prevention of Diarrheal ailments. Findings from a study by Merge and Alemayehu (2015), show that the occurrence of Diarrhea to be very high and that the knowledge of caregivers on the imagined cause, appreciation of danger signs, control, and management of Diarrhea to be inadequate. The knowledge of mothers was found to be essential for reducing occurrence of Diarrhea for under-five year old children and gaps existing among mothers in understanding management of diarrhea needs to be addressed by proper information, education and communication activities.

Thus, if the primary caregivers encompass positive attitudes as well as the right knowledge on the causes of Diarrhea, they can adequately prevent Diarrhea from contracting their families. The caregiver practices such their awareness and knowledge on hand washing acts as a measure against Diarrhea. Caregivers, who know the importance of washing hands before preparing meals and before feeding the young children, stand a better chance of preventing contracting of Diarrhea.

Though washing of hands is also affected by unavailability of adequate clean water, due to this the washing of hands is not always possible. Washing aims at decontaminating the hands and control cross transmission of diarrheal-causing pathogens (Gurjeet, 2013). The quality of water source for domestic use in this case determines whether water is contaminated or not.

Piped water is considered a safe source but in slums, it might be contaminated due to breakage of pipes especially where pipes are laid along sewer lines.

In rural areas with low-income populations, source-based water quality initiatives can include the provision of protected groundwater from the wells, springs and boreholes or rainwater that is a viable option to surface sources like; rivers, lakes, etc. Improvements such as this most of the time lead to adequate supply and access to water with the increase of the frequency and volume of water as well as the reduction of the time used in fetching water resulting in accrued gains in health, economic and social welfare of the people (Hutton, 2013).

Water vendors and kiosks may also pollute water when drawing and supplying water for domestic use. The containers used are rarely cleaned and can store germs that cause Diarrhea especially to children under five years. Households that use this water for domestic purposes get Diarrhea more often due to many pollutants found in it. The disposal of fecal waste is also critical to prevention of Diarrhea in that when households' wastes is poorly disposed. Such that if it is dumped in the open near the homesteads, the stench emitted attract pests like houseflies, which transmit microorganism likely to transmit diseases. Houseflies may contaminate water and food, which contribute to Diarrhea in children five years and below because of disease like cholera. Faecal matter may also be disposed in open environment especially where toilets facilities are inaccessible especially at night. Baby diapers are also poorly disposed increasing chances of contaminating Diarrhea pathogen (Muriithi, 2014).

Hygiene behavior also such as sharing of toilet facilities is a major cause of Diarrhea in that shared toilets are never cleaned regularly and quite often neglected. When these toilet facilities are not well maintained, they may contribute to acute Diarrhea of children below five years especially when they and their mothers visit these toilets and fail to wash their hands after and before feeding. The

fecal matter in the surrounding environment may contaminate drinking water, which may increase the incidence of Diarrhea. Cleanliness of Household is also a major concern whereby households dump waste openly, as well as where the toilets are built near houses and are of poor structure thus causing foul smell, flies, and breeding of rats, which enter the houses and contaminate food. Open sewers, careless waste management, polluted environments and lack of pathways result in hazardous and unhealthy living conditions (Muriithi, 2014). Thus, it is of essence that the primary caregivers put effort in ensuring a clean household as well as its surroundings to eliminate causes of Diarrhea.

2.5 Theoretical Framework

Bobbie (2003) has defined theory to mean systematic account for observations, which relate to a given facet of life. A number of theories in preventive health awareness and education seek to answer the basic question why individuals act in the manner they do. More importantly, theories can be used to appreciate and envisage how and why individuals alter their behaviors from unfavorable to favorable ones.

Philips (1991) state that for the desire to effect change in behaviors to reduce the risk of future illness should be based upon theoretical models that identify predictors of behavioral change. Several theories are modeled to focus on the importance of socio-cognitive variables in preventive health and such theoretical models that are relevant to childhood Diarrhea as well as knowledge and practices among caregivers in the context of this study will include Self-efficacy theory (Bandura, 1986).

2.5.1 Self - Efficacy Theory

Self-efficacy theory in this study has been adopted because it promotes the belief that people are capable of controlling their own practices on a given behavior (Bandura,

1986). According to Schwarzer (1992) self-efficacy refers to the belief that one can effectively accomplish a given task.

Taylor (2003) observed that individuals will most likely embrace certain practices if they believe in their ability to execute those practices successfully. Thus, self-efficacy can be viewed as self-assurance towards an engagement. In general, people tend to engage in tasks they will be victorious in doing, and are inclined to exert more effort to those activities and behaviors they think they can accomplish successfully. An individual who believes, for instance, that it is possible to stop a given contra-indicated health actions. Self – efficacy is incredibly effective, since it influences certain effective behavior control. If caregivers can manage Diarrhea illnesses and do it quite often and effectively, it will then mean that they enjoy high efficacy. Based on this, therefore, the theory of self-efficacy remains the theory of choice to ascertain the management and control of childhood Diarrhea by caregivers. Therefore, in summary this is the theory to anchor this study project.

2.6 Empirical Review

A cross sectional survey to ascertain the incidence and risk factors that are related to diarrhea in children five years and below in Laini-Saba Village of Kibra Slum, Nairobi, was carried out and the findings showed that Diarrhea is a grievous health problem there. There are inadequate health information people can access in the slums. Unfavorable environmental factors, unfavorable feces disposal methods and poverty expose the residents to diarrhea diseases (Kungu et al. 2002).

A study conducted in Nairobi's Korogocho slums on the risk factors influencing diarrheal prevalence among children aged five years and below in informal urban

dwellings established that washing of hands by the caregivers is statistically crucial in the reduction of diarrhea occurrence among childhood (Muriithi 2014).

Another study on water purification and hygiene practices in urban slums in Kenya “impact on childhood diarrhea and influence of beliefs”, concluded that behavioral aspects are important compared to environmental ones in regard to the prevalence of diarrhea among children. Caregivers can protect children’s health issues through the provision of purified water and by embracing good hygiene behavior. This is important because environmental aspects like cleanliness at the home environment and clean water, both of which largely go beyond the control of many homesteads, are unimportant (Graf et al. 2008).

A study conducted on enhancing Diarrhea control and management aspects among the settled communities and recently those resettled in Cuanzasul, Angola established that Diarrhea is a widespread and severe health phenomenon in the area. The local community has identified five different types of symptoms of Diarrhea and they are as follows: Diarrhea with vomiting, watery Diarrhea, Diarrhea with mucous, Diarrhea with blood, creamy texture and Diarrhea of a pasty (Save the Children and The John Hopkins University, 1998).

The faecal-oral course of communication of Diarrhea has not been understood and is reflected in poor feces disposal methods, water safety and hand washing practices.

A conceptual framework is based on what the researcher conceptualizes as the relationship between different variables in a study. The Self-Efficacy Theory was used in the study where H1 Self efficacy influences prevention or non-prevention of Diarrheal diseases. Self-efficacy is the independent variable. The dependent variable is childhood Diarrhea. The above shows the relationship between attitude, practices and self-efficacy and how it leads to prevention and non-prevention that lead to childhood

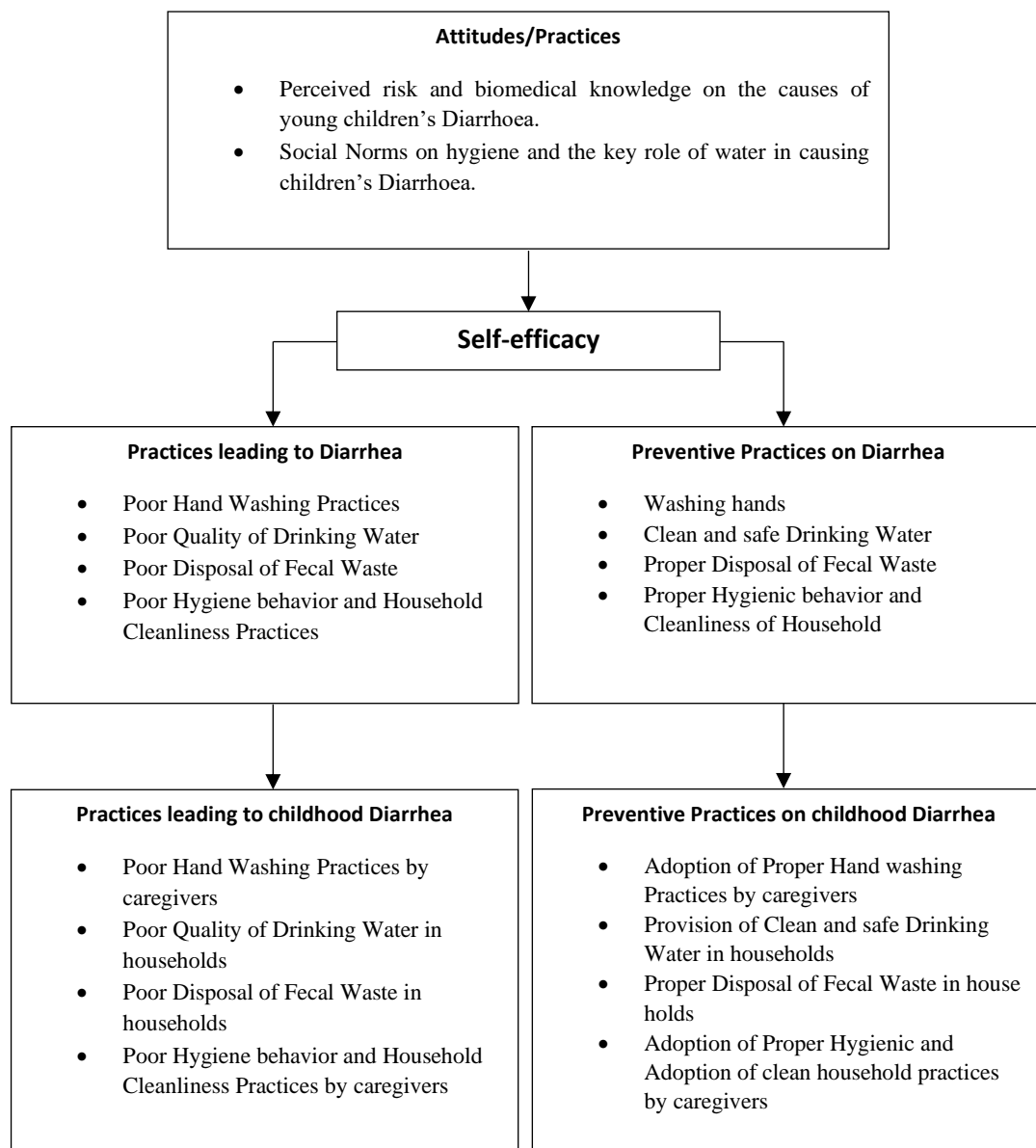
Diarrhea. The operational framework used in this study has been operationalized so that attitude and self-efficacy can be used to explain why people do some things. Self-efficacy is a result of various factors like, information and persuasion and thus tends to influence one's behavior.

The intermediate factors include perception and the level of awareness about general health practices in the slum e.g. if a mother believes that after using a dirty pit latrine there is no need in washing her hands with soap before breastfeeding her child. We can see that she has a high self-efficacy that has led her to practice a non-preventive practice that may lead to childhood Diarrhea or no Diarrhea in this case if it does not affect the child and will continue with the attitude in regard under any civic education because she is persuaded there is nothing wrong in what she does thus continue to practice it.

2.7 Conceptual Framework

The variables used to assess the caregiver attitudes and practices towards the prevention of Diarrhea in children of five years and below were selected according to the conceptual framework in figure 2.1 below. The framework proposed a group of two variables considered as causes of Diarrheal diseases in children of five years and below. The first group of variables was the perceived risk, biomedical knowledge on the cause of children's Diarrhea, which included comprised the first set of variables, and the second set of variables was related to the social norms on hygiene and the key role of water in causing children's Diarrhea. The two groups of variables gave an explanation to the various practices that caused Diarrhea including lack of good hand washing practices, poor quality of drinking water, poor disposal of fecal waste, poor hygiene behavior and household cleanliness. Thus, identifying and suggesting appropriate preventive practices that may be adopted to ensure Diarrheal diseases do not occur in the children under five years.

Figure 2. 1 Conceptual Framework



2.8 Summary of Literature Review

Viewed globally, improving children health in the past fifty years has gained momentum. However, success and failure has been experienced in equal measure. These has encouraged researchers in epidemiological patterns of diseases; Diarrhea included.

Diarrhea diseases among children are very common and are associated with considerable morbidity and very highly mortality primarily in developing countries (UNICEF, 1998). In developing countries, diseases associated with poverty, illiteracy, malnutrition, low level of personal and general hygiene and overcrowding. According to World Health Organization (WHO 1990), 37 percent of all Diarrhea diseases worldwide occur in Sub-Sahara Africa. The survival of children in the slums is threatened by environmental factors, that impact on the infectious agents resulting into higher transmission of Diarrhea diseases.

Though there has been a wide variety of literature on the Diarrhea, its causes, treatment and prevention, a dearth of literature exists on the caregiver's attitudes and practices in regard to the prevention of the Diarrhea diseases. In Kenya and particularly Kibra informal settlements there is a major gap in research given the number of people accommodates compared to other areas in the country.

The research interest in the past mainly focuses on Diarrhea diseases in terms of treatment and causes but occasionally neglects the roles that the inhabitants play in the prevention of the disease itself. This study is therefore important because it will generate empirical data and information that will largely show how the caregiver's attitudes and practices are essential in prevention of Diarrhea diseases. It will provide information on understanding and creating awareness on the right attitudes and practices for promotion of good health and prevention of Diarrhea.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology adopted in the study to gather data. The subsequent sections including, the research design, the target population of the study, sample design and data collection instruments will be discussed.

3.2 Description of Study Area

This study was carried out in Makina, Sarangombe, and Lindi wards of Kibra, the largest urban slum in Nairobi, Kenya. Purposive sampling was used to select slum compounds (clusters of households with shared common areas and often shared toilets and water sources) that were in different wards and different areas within a ward to increase the variation in sanitation, drainage, and solid waste infrastructure for compounds included in this study. Within each compound, households with children under 5 years of age were purposively selected for study inclusion, approached for informed consent, and household interviews were conducted with the primary caregiver to obtain information about household demographics, attitudes and practices. A total of 54 children (aged 3 months to <5 years) from 40 households were included in this study from 16 compounds.

The average size of a makeshift house here is 12ft by 12ft with earth walls, a corrugated iron roof with earth or concrete floor. The cost of rent is about KES 700 per Month. These makeshift houses often will be occupied by up to 8 or more with many sleeping on the floor (NCSS, 2012). The area was picked for the study because it has a number of factors that are related to Diarrheal diseases including poor habitat, lack of clean

water and sewage facilities as well as low levels of biomedical knowledge on perceived risk of Diarrheal diseases in children age five and below.

3.3 Research Design

A survey research design was adopted which involved sampling three out of nine wards based on demographic factors and purposively selecting the 40 households in the pre-determined compounds to collect data from primary caregivers of children aged five years. These wards included Makina, Sarangombe, and Lindi. The questions asked in the questionnaires were based on the research variables to illicit responses that could be analyzed to measure the study objectives and test the null hypothesis.

A descriptive study design to assess the caregiver attitudes and practices towards prevention of diarrheal diseases in children aged under than five years in Kibra slum. The research used the study design because it helps to provide answers to questions of what, who, when, how and where (Cooper and Schindler, 2008) and on this topic, it assesses how caregiver attitudes and practices contribute to the deterrence of diarrheal diseases.

The design was appropriate because the study relied on an interactive research design using questionnaires to gather data. The design made it possible for the researcher gather data from the accessible population and used both quantitative and qualitative measures using a semi-structured questionnaire to collect the data. Data used in this study was primary and secondary. Primary data was generated as firsthand information from the field work while secondary data was generated from secondary sources like books, journals, articles, academic thesis and projects.

3.4 Target Population

The target population was primary caregivers with children five years old or less in a household. The caregivers were persons responsible for children during the time the research study was being conducted and mostly included mothers but also fathers and guardians. According to Amélie and Sophie (2011), the total number of households in Kibra is roughly 17045 and the sample population was drawn from nine official villages in Kibra. The sample size was 40 respondents proportionately distributed across nine villages of Kibra.

3.5 Sample Design

Cohen and Morisson (1994), define a sample as a subject of the population, which the researcher intends to generalize findings from. Sampling is the practice of gathering information on a population through the examination of only a part it (Kothari, 2003).

The study employed purposive sample, also referred to as a judgmental which is a type of nonprobability sample. The main objective of the purposive sample is to produce a sample that can be logically assumed to be representative of the population. The study targeted three villages out of the nine identified villages of Kibra making it about 30% of the villages as sampling all the nine villages was not feasible. In the three villages of Makina, Sarangombe and Lindi, homogeneous sampling was employed to select 40 households with similar traits such households with children under five years of age, income status, location and knowledge to diseases. These enabled the study to collect data easily and according to the research questions. The respondents were also identified to be the primary caregiver and further selected based on their availability and consent to be interviewed.

3.6 Data Collection

Data was gathered directly from the 40 households through interviews. Barker (2010) indicates that an interview refer to a technique used to gain an understanding of the reasons underlying and motivating people's attitudes, behavior or preferences. He states that this technique has an advantage in enabling a serious approach by respondents; this enables the capture of accurate information, attaining of good response rate and immediate in-depth question as well as room for clarification in study areas.

A semi-structured questionnaire was physically administered to primary caregivers of children aged less than five years to facilitate proper understanding of the questions. The questionnaire contained items linked to the variables of the study as indicated in the research questions. These variables were: caregiver attitude, caregiver practices, biomedical knowledge on illnesses, sources of water and soil ingestion by the children. This helped determine consistency by utilizing certain questions in assessing attitudes of respondents towards prevention of diarrhea. The researcher also made observations of the community and household environment to reinforce data collected through questionnaires. The questions were structured to collect data on the perceived determinants of diarrhoea such as water source accessibility, quality, hygienic behaviors, hand washing practices and the socio-economic determinant such as level of education and sources of income of the primary caregivers. General observation was done to support data collected from the questionnaires.

Secondary data was generated from secondary sources like books, journals, articles, academic thesis and projects to support primary sources.

3.7 Data Analysis

The primary data from the questionnaire was cleaned of any errors and omissions and then coded for compilation in excel. The raw data was extracted from the questionnaires by entering the results in an excel sheet for subsequent statistical analysis. Presentation of data was portrayed in frequency tables for descriptive analysis to enable clarity in understanding the findings. The descriptive statistical analysis was used to compute frequency, percentages, and mean of the findings of this study. The findings were presented using tables, and reported statements. A simple opinion poll was also used to measure attitudes of the primary caregivers. This allowed the respondents to express their feelings by selecting the best option that supports their opinion towards the identified attitudes. Opinion scales are conducted by soliciting opinions from a sample and then extrapolating those results to make predictions about the opinions of an entire population. To interpret the objectives of this study, the findings were presented using frequency tables to indicate the distribution percentage of how caregiver attitude and practices contributed to diarrheal diseases in children five years old and below. The data was also subjected to further analysis using chi square statistics techniques. The Chi square technique was used to test the relationship between childhood diarrhea and soil ingestion.

3.8 Ethical Consideration

Before the interview was carried out, consent was first sought from the primary caregivers. After getting the consent for the interviews the researcher proceeded to conduct the interviews. The aim of this research study was explained in writing and verbal to all respondents, they were assured of their anonymity, and full confidentiality was promised to them.

CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

The chapter presents and discusses findings from 40 questionnaires completed by caregivers of five-year-old children and below in Kibra Slums in Nairobi County. The purpose of the study was to assess the caregiver's attitude and practices towards prevention of Diarrhea diseases in children under 5 years in Kibra.

4.2 Demographic Information of Respondents

This section covered the respondent's age, gender, marital status, highest educational level and family monthly income. The individual data of respondents helped to contextualize the study findings and the formulation of suitable recommendations.

4.2.1 Respondents Ages

The study sought to investigate the ages of the caregivers to ascertain the relationship between their age and the quality of parenting. Majority of those studied were in the category of 19-28 years representing 52.5 percent while those between 29-38 years comprised of 35 percent. The others were above 39 years at 10 percent and below 18 years were 2.5 percent respectively. From the ages above it clearly shows that the respondents were fit and mature to take care of children. This confirms the findings of a study done by Mirowsky (2015) a sociologist from the University Texas – Austin, that the best age to give birth is in one's late teens or early twenties are the "best biologically" due to limited birth defects unlike older ones who have higher systolic blood pressure, high glucose, poorer health and poor morbidity thus rendering them unable to keep up with the younger mom though the older mums have an advantage when it comes to being more emotionally psychologically and financially secure.

Table 4. 1 Ages of respondents

Ages	Frequency	Percentage (%)
Below 18 Years	1	2.5
19-28 Years	21	52.5
29-38 Years	14	35
Above 39 Years	4	10
Total	40	100

4.2.2 Gender of Respondents

On the gender of the respondents, the study findings reveals that majority, 97.5% of the respondents were female respondents and the remaining 2.5 percent were male respondents. This result shows that the majorities of the caregivers were female. The results above could be an indication of African patriarchy and traditional role assignment where women spend more time with children. In a study done by Yaremko and Lawson 2007, the responsibility of taking care of the children lies with the mothers. In many traditional African societies, a man's world is at his workplace while that of the woman's is at the home tending to household chores childbearing and caregiving, particularly for example the Samburu society, where male patriarchy is common women's role in this area is building houses and supplementing all the other needs by a herd of cattle given to them by the husbands and their second role is childbearing, looking after the homestead, household chores and caregiving roles. During the study, most women interviewed were housewives and few engaged in micro enterprises these shows that male patriarchy is yet to end.

Some women still depend on their husbands for everything they need. The findings revealed that most men are the breadwinners in Kibra slum.

Table 4. 2 Gender of Respondents

	Frequency	Percentage (%)
Male	1	2.5
Female	39	97.5
Total	40	100

4.2.3 Marital Status of Respondents

As seen in table 4.3 below, the majority of the respondents (80 percent) were married. The remaining 20 percent of the respondents were not married. These results show that most of the households were made up of a full family unit. A study found out that married couples underwent economic difficulties more than cohabiting parents that had little education and earned low income. Married couples are more likely to put together their income, husbands clock longer working hours hence, earning more and married families receive generous assistance from their friends and the whole community. McLanahan, Sara Sandefur. & Gary (1994) found that children living with single parents were more likely to suffer health problems than the ones in a married set up. According to Ghasemi et al. (2013) argued mothers more often than not, are the primary care givers who manage and treat under five children with Diarrhea in their households.

Table 4. 3 Marital Status of Respondents

Marital Status	Frequency	Percent (%)
Yes	32	80
No	8	20
Total	40	100

4.2.4 Highest Educational Qualification

Table 4. 4 Educational Qualification of Female Respondents

Educational Qualification	Frequency	Percent
Primary Level	17	42.5
Secondary	19	47.5
College Level	3	7.5
None	1	2.5
Total	40	100

The study sought to establish the level of the caregiver's level of education and how it affects the health of the child. The results showed 47.5 percent were secondary school and the remaining 42.5 percent were primary level. 7.5 percent of the respondents were of college level and 2.5 percent had no education at all.

A study by Husain and Smith (1999), noted a strong association between mother's educational status and incidences of childhood Diarrhea this showed that children with mothers with a high school level of education and above, were 60 percent under likely to suffer Diarrhea than children of illiterate women, from this study it can be seen that majority of the women had primary thus the children are prone to Diarrhea.

According to Case, Lubotsky (2002) found out that an increase in the level of education gives access to skilled work with higher income to be used to take care of health matters and to cushion the impact of severe health shocks and that the parents long term income is important to the child's health.

4.2.5 Spouse Educational Qualification for Household head

Table 4.5 Spouse Educational Level

Educational Qualification	Frequency	Percentage (%)
Primary Level	20	63
Secondary Education	8	25
College Education and above	4	13
Total	32	100

According to table 4.5 above, the study reveals that majority of the respondent's spouses had attained primary education at 63 percent, 25 percent had attained primary education, 13 percent had attained college education. Even though the literacy levels in Kenya are high, a gender perspective reveals that the male have better education than female as is in the case above. The United Nations Development Programme (UNDP, 1998) published a report that there existed a negative relationship between education and poverty this is because the degree of education of individuals/families the likelihood of poverty declines.

These findings relate to the study on why most households do not practice safe hygiene practices due to lack of further training that will have an impact on knowledge attitude and belief system.

The United Nations Habitat (UN, 2015) indicated that as a guideline, individuals with no schooling may be considered illiterate and those who attended grade five of primary school may be clarified as illiterate, however lack of further training and education may impact on their knowledge, on how to perceive and manage child illness.

4.2.5 Household Source of Income

Table 4. 6 Source of Income

Source of Income	Frequency	Percentage (%)
Self-employed	21	52.5
Contract job	16	40
Domestic worker	3	7.5
Total	40	100

The respondents were asked to state their household sources of income. From various income generating activities, and grouped under self-employed/own business, contract job domestic worker, day labour part time or on all job and mechanic. It is clear from table 4.5 above in regard to economic activities, majority 52.5% respondents were self-employed/ own businesses, while 40 percent are on a contract job. The study also reveals that the remaining 7.5 percent of the respondents are domestic workers. Research has shown that most slum dwellers have poor access to gainful employment. In the case of women slum-dwellers, the only way out of joblessness and poverty is through domestic labour and self-employment in micro-enterprises. Minnit et al. (2006) found out that women engage in businesses simply as a way of overcoming poverty, and given barriers into the formal labour market entry.

From the findings, it reveals that most of the women did not have a reliable source of income because they were roadside vendors who sold food, washed clothes and others had no job at all. While majority of the men worked in the informal sector and seldom worked in the formal sector in casual jobs with daily short-term engagements. The health selection theory provides how a people's health influences their income.

Ill health among community members prevent them from undertaking paid employment. This reduces their income and in children, it may affect the educational outcome, which will most likely affect their chances of employment and earning potential.

According to Kwachi et.al. (2010) argues that good education also helps one have good health-promoting behavior. On education, adults with higher level of education are unlikely to indulge in risky behavior, such as drinking and smoking and are likely to have the behavior relating to diet and exercise. The importance of resources for cognitive ability and social integration offers more opportunities for one to learn a lot concerning health matters and their risks either in the form of health education or offering individuals literacy lessons to draw from later on in life. Child under-nutrition is an aspect of malnutrition and this is highly prevalent among those living in low- and middle-income countries.

According to (Black et.al, 2008), the income and education of the parents is strongly related to child education, cognition, nutrition and health. Therefore, it leads to intergenerational transition.

Hoddinat et al. (2011) established the evidence that under nutrition at age under than three years old has a severe effect on a number of outcomes in adults including cognitive skills, schooling, economic status and wages.

From the findings, we see many of the respondents are receiving very little income that is not sufficient to meet their needs thus are faced with many problems.

4.2.6 Monthly Income

Table 4. 7 Monthly Income

Monthly Income	Frequency	Percent
Under than 5000	7	17.5
5001-10000	17	42.5
10001-15000	10	25
15001-20000	4	10
20001-25000	1	2.5
Above 25001	1	2.5
Total	40	100

Findings of the study indicate most households had a monthly income of 5,001-10,000 shillings were 42.5 percent whereby 25 percent earned between 10001-15,000. 17.5 percent earned 0-5,000 shillings; 10 percent earned between 15,001-20,000.2.5 percent earn between 20,001-25,000 while 2.5 percent earned between 25,001-30,000 a month. At the time of the study the dollar was exchanged at a rate of 99 shillings against the US dollar. As indicated in the table 4.7 above the number of households that earned between 0-15,000 shillings were about 67.5 percent combined. In Nairobi, the capital city of Kenya 73 percent of slum residents falls below the poverty line. Thus, income becomes a major determinant of household expenditure as it dictates how much money can be spent in a certain period and it indicates the poverty prevalence in Kibra slum is not only alarming but also very high; this contributes negatively to the health of the children. Research by Tollman and Khan (2000) indicated the concentration of poverty in informal settlements coupled with limited public resources also make children in Sub-Saharan African countries particularly vulnerable to infectious diseases.

Due to high inflation rates, Kibra residents have opted to buy food items in the “Kadogo Economy” meaning a low unit economy where the sale of goods is done in very small

and affordable quantities. This results to consuming according to the amount of money you available. A study carried out in Kibra in 2010 where a respondent was given Ksh.100 by a researcher and she was able to shop for food, here she bought cooking oil at Ksh. 20, maize flour at Ksh.10, 20 spoons of sugar at Ksh.15 the same with tealeaves and rice and still had a balance of Ksh 40 for sukumawiki and tomatoes and onions, currently all these prices have doubled making them skip some meals in a day so as to be able to put one meal on the table due to skyrocketing of essential household commodities due to high inflation levels. This money cannot sustain the family since they have to buy water at Ksh.20 a jerry can each day, pay for the toilet, bathroom when one calculates not all their income can meet all these expenses even the most basic of commodities (John O, 2010).

Table 4. 8 Number of Persons per Household

No. of Persons	Frequency	Percentage (%)
Less than 3	8	20
4 to 6	19	47.5
7 to 9	7	17.5
Above 9	6	15
Total	40	100

The study sought to establish the relationship of crowding in the households and its effects on their children. In the study, the household size included mother, father and children. From table 4.8 it is shown that 47.5% of the respondents indicated they had between 4-6 members in their households and another 17.5 percent indicated they had between 7-9 members, it emerged that about 20 percent had under than 3 people living in their households and 15 percent who had above 9 people in the household. This Shows that the houses in the slums are overcrowded thus, affecting children’s wellbeing in a number of ways. Edward et al. (1994) found that overcrowded households

negatively affects mood and behavior of children and they have a higher probability to catch illnesses, that can affect their daily activities and interrupt their learning. As shown from the findings above most households were crowded considering their houses were four by four in size. According to the United Nations Habitat, report (2003) informal settlements worldwide are characterized by single dwellings that accommodate five or more people and which are also used for cooking, sleeping and other domestic activities. Furthermore, it defines overcrowding in these settlements as households in excess of three occupants per room.

The World Health Organization (WHO) established standards concerning floor space are as outlined here. A baby below 12 months is not affected and children between one to ten years are considered as half a unit. Overcrowding is deemed to exist if two individuals not husband and wife are made to sleep in one room.

4.3 Caregiver’s attitude towards prevention of Diarrhea diseases

Table 4.9 Perceived Causes of Diarrhea

Question A: What do you perceive as the cause of diarrhea in your child under five years?							
Response	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Average	
1. Sewage Contact	1	1	0	13	25	4.5	
2. Contaminated food	12	8	0	8	12	3.0	
3. Contaminated water	8	14	3	7	8	2.8	
4. Dirty environment	20	2	1	8	9	2.6	

According to table 4.9 Above the study reveals that most of the respondents perceived sewage contact as the cause of Diarrhea in their children with an average of 4.5, while an average of 3.0 perceived contaminated food as the cause of diarrhea, an average of 2.8 of the respondents indicated that contaminated water was the cause of Diarrhea and

an average of 2.6 of the respondents indicated that the dirty environment caused diarrhea.

The Kenya, Ministry of Health report for 1992 rates Diarrhea as second most leading killer of children. This report also states that on average, Kenyan children experience four episodes of Diarrhea every year. In a study carried out by UNICEF in the year 1994, it says that the number of incidents of diarrhea increase to twelve bouts per annum in the slums in slums.

4.3.1 Biomedical knowledge of the illnesses of children under 4 years

According to the table 4.10 the study reveals that when respondents were asked which illness was common in their households and an average of 3.8 of the respondents stated it was Diarrhea, an average of 3.4 of the respondents stated it was common flu, an average of 3.6 stated it was malaria, an average of 1.8 stated it was pneumonia and an average of 2.4 of the respondents stated it was fever that was common in their households. Thus, it was noted that Diarrhea was one of the most common diseases in the households of the respondents.

Table 4.10 Common illnesses in Households

Question B: What do you perceive as the most common illness in your household?							
Response	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Average	
1. Diarrhea	4	8	0	9	19	3.8	
2. Common Flu	6	9	2	10	13	3.4	
3. Malaria	5	7	1	12	15	3.6	
4. Pneumonia	22	12	0	4	2	1.8	
5. Fever	15	12	0	8	5	2.4	

Table: 4.11 Common Illnesses among Children Under 5 Years

Question C: What do you perceive as the most common illness in your children under 5 years?							
Response		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Average
1. Diarrhea		3	5	0	4	28	4.2
2. Common Flu		5	4	0	10	21	4.0
3. Malaria		6	7	0	17	10	3.5
4. Pneumonia		3	18	10	4	5	2.8
5. Fever		4	12	3	16	5	3.2

The respondents were further asked what illness their children suffered from table 4.11, it was noted that an average of 4.2 of the respondents indicated that their children suffered from Diarrhea, an average of 4.0 of the respondents stated it was common flu, an average of 3.5 of the respondents stated it was malaria, an average of 2.8 of the respondents identified pneumonia as a common illness among their children and an average of 3.2 of the respondents stated that fever was a common illness among their children.

Diarrhea stood out as one of the most prevalent disease amongst the children in the respondents' households. The United Nations International Children's Fund (UNICEF 1994) states that Diarrhea is a crucial health problem among children under five years in the overpopulated slums.

4.3.2 Sources of Water

Table 4.12 What source of water do you think is the safest?

Question D: What do you perceive as the Safest Source of Water?							
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Average
1. Public Tap		0	3	0	7	30	4.6
2. Water vendor		17	4	5	6	8	2.6
3. Water tank		8	6	8	13	5	3.0
4. Well		19	15	0	4	2	1.9

According to table 4.12, the study reveals that an average of 4.6 of the respondents perceived water from public taps as the safe for drinking, an average of 2.6 of the respondents stated that water from water vendors was safest for drinking, an average of 3.0 of the respondents stated that water from water tanks was safe for drinking and the an average of 1.9 of the respondents stated that water from wells was safe for drinking. From the findings above, the respondents stated they believed that the water is safe from the source while others indicated that they did not have the time and resources to treat water. With the deficiency of the hygienic and better means of disposal of human feces, enough distribution of clean and safe water for drinking, and recommended food hygiene, eradication of cholera is a mirage in Kibra (WHO, 2000).

Table 4.13 Should drinking water be treated?

Question E:	Yes	Percentage	No	Percentage
1. Should Drinking water be treated?	40	100	0	0

The respondents were also asked if they thought drinking water should be treated and the study indicated 100% of the respondents were in agreement as shown in table 4.13 above, most water pipes in Kibra are exposed above ground and they are made of plastic, which are extremely fragile and easy to manipulate. These pipes crack or break quite often - either inadvertently due to traffic or advertently by competitors -, letting seepage of raw sewage into clean drinking water. This has been reflected in the public health data of infant mortality rates and bloody diarrheaz infection rates in Kibra which are more than three times the average of the whole of Nairobi (UNDP 2006).

4.3.3 Caregiver’s practices towards prevention of Diarrhea diseases

Table 4.14 Primary Source of Water

Source	Frequency	Percentage
Public Tap	30	75
Water Vendor	3	8
Water Tank	5	13
Well	2	5

The study sought to investigate what the respondents thought about the quality of raw water and drinking water in their households. According to table 4.14 above, the findings show that 75 percent of the respondents indicated that they fetched it from a public tap, 8 percent indicated they got it from water vendors, 13 percent got it from water tanks and the remaining 5 percent got it from wells.

Among the slum residents in Nairobi County, about 15% of them have yard taps and in-house water connection respectively (Gulyani & Talukdar, 2009; 200). This shows that over 80% of urban slum residents in Nairobi County still have a problem to access to improved water sources. In August 2008, the Nairobi Newspaper Standard Digital News reported that water in informal urban settlements was selling for Ksh 15 to 30 per a 20 liters jerrycan (Standard, 2008). Water and Sanitation Programs Report estimated that urban slum residents pay higher water prices than the average prices in Kenya and the highest prices could be about double European (WSP. 2005:6).

Although the Nairobi informal settlements have water connections from the City Council, the maintenance of pipes is not done properly the pipes burst, sometimes stolen and old pipes leak. Many residents in slums have limited clean water for bathing and often use dirty and polluted river water (UN Habitat, 2006:10).

Majority of the respondents at 75 percent used the public tap and most of them described it as the safest because it was being provided by the Nairobi and sewerage company and was treated, from the lab results of the tap water very few water taps had

contamination of the thermotolerant coliforms caused by fecal contamination. The informal status of slum habitats in Kenya hinder government services delivery to them. This has contributed to the poor living there being denied services like safer and clean drinking water and good sanitation. The findings of this study propose that tap water – supplied by the county government - was clean and safe for use according to WHO guidelines (1996).

The 8 percent that bought their water from water vendors, described it as extremely expensive, could not trust the source of the water, and most described it as not being safe, on further laboratory analysis the water in the jerry cans tested positive to E. coli or thermotolerant coliform bacteria. The World Health Organization (WHO) guidelines indicate that the bacteria should never be detected in clean water intended for drinking.

The 13 percent that used water tanks described it as not being safe because most of the vendors tapped their water from underground water pipes that were illegal and were exposed to faecal contamination because of their closeness to pit latrines.

The remaining 5 percent relied on wells as their primary sources of water and they described it as not safe. It was noted that the distance between the domestic water wells and latrines was short and almost 40 percent of the latrines were 15 meters from the wells and less. This enhances the risk of contaminating water points because coliforms move from the latrines to the water sources. There is need for enough lateral separation between the two to reduce the chances of fecal pollution of the ground water. (ARGOSS, 2001).

Table 4.15 How long does it take to reach water source

Duration (Min)	Frequency	Percentage (%)
Less than 10	28	70
10-20	7	17.5
20-30	3	7.5
More than 30	2	5
Total	40	100

From the finding on table 4.14 above the respondents were asked the amount of time it took them to reach the water source, 70% indicated it took them less than 10 minutes, 17.5 percent indicated it took them 10 to 20 minutes, 7.5% indicated it took them 20 to 30 minutes, while the remaining 5% indicated it took them more than 30 minutes. This shows that most of the respondents did not have water within their compounds and took a lot of time in queuing to get water.

Many households in the third world countries, mostly in the sub-Saharan Africa lack access to piped water. According to the United Nations. The Millennium Development Goals Report 2014 in New York stated that limited availability of clean water can also reduce the amount used for hygiene in the household, which reflected in our study the way most households were dirty. The World Health Organization Joint Monitoring Program on water and sanitation indicates, “Access to clean water means its source is less than a kilometer away from its place of use and it is possible obtain at least 20 liters for a very member in households per day”. This is not the case in Kibra slum because the one jerry can of 20 liter’s is used for the entire household for the whole day.

Table 4.16 Hand Washing Hygienic Practices

Response	Frequency	Percentage
After using Toilet	40	100
Before preparing food	38	95
Before Eating	34	85
After Eating	40	100
Before feeding children	20	50

As per table 4.15 above the respondents were asked if they washed their hands after using the toilet and all of them indicated that they do.

They were further asked if they cleaned their hands before preparing food and 95% of the respondents agreed that they did while 5 percent did not. They were also asked if they washed their hands before eating 85 percent of said yes while 5 percent indicated they rarely do it. The 2000 UNICEF survey (UNICEF 2002) has reported information about hand washing (UNICEF, April 2010) practices.

During the study, hand-wash samples were collected from both the mother and the children to check for contamination. It is well documented that self-reports of hand-washing behavior are not a reliable indicator of actual hand-washing practices (Cousens, Kantai et al.1996). However, the reports are useful in determining the people's knowledge about when hand washing should occur.

Table 4.17 Use of Soap in Hand Washing

Response	Frequency	Percentage
Use Soap and water	28	70
Use Water Only	12	30
Total	40	100

When asked if they used soap to wash their hands, 70 percent of the respondents indicated they only used water while 30 percent indicated that they do not use soap. In summary, the responses indicated that the care giver attitudes and practices greatly influenced the determinants the prevention of Diarrhea in their households. The different attitudes and practices that were present in the households show that the caregiver was greatly the main determinant on enabling prevention of Diarrhea diseases from their children under four years old from the above tables, it notable that the respondents felt that the different attitudes and practices affected their children's health to a large extent in general. Thus, it can be concluded that the caregiver's attitudes can prevent Diarrhea from children under four years.

The relevance of washing hands was first demonstrated in a 2003 by Curtis and Cairncross opine that a community engaging in hand washing interventions reduced by 47% the risk of contracting Diarrhea. Hand washing with soap has been identified as one of the most cost-efficient ways to reduce the global burden of disease according to the World Bank (2006). Hand hygiene has the potential for interventions to save many lives worldwide, however, behavior change is not easy as seen from the table above. The Baseline Survey of Awareness of "Facts for Life" showed that up to two thirds of interviewees are aware that after defecation they need to wash their hands with soap. But unfortunately, the reality is that only about 9% actually do so. (UNICEF, April 2010). Among WASH interventions, one of the most effective is hand-washing with soap at three critical times after defecation, contact with feces, before preparing food, before eating.

4.4 Relationship between Diarrhea and Soil Ingestion (Chi-Square)

The respondents were asked if they had seen their children ingesting soil, 50 percent of the respondents stated they had seen their children ingesting soil while another 50

percent also indicated that they did not see their children ingesting soil. The respondents were also asked how many of their children had diarrhoea after soil ingestion.

Table 4.18 Soil Ingestion

Response	Frequency	percentage
Ingestion of Soil	20	50%
No ingestion of soil	20	50%
Total	40	100

As per table 4.18 below 50 percent of the respondent’s children had diarrhoea after soil ingestion while another 50 percent did not have diarrhea after soil ingestion (Bauza, et al., 2015) did research in Kibra on how soil ingestion and diarrhea relate. It suggests that the ingestion of soil can transmit diarrhoeal diseases in an urban setting. It was observed that soil ingestion was most frequent for children in the 6-24-month age group and the prevalence decreased with increased age.

Table 4.19 Analysis of Soil Ingestion and Dirrhea

Response	Frequency	Percentage
Diarrhoea after soil ingestion	20	50%
No diarrhoea after soil ingestion	20	50%
Total	40	100

The independent chi square test was used to find out if there was a relationship between soil ingestion and Diarrhea. A chi-square test is used in social research to either test goodness of fit or test independence. The chi-square test was applied to determine how diarrhea and soil ingestion relate.

$$\chi_c^2 = \sum \frac{(O_i - E_i)^2}{E_i} \quad \text{HO: There is a relationship between soil ingestion and Diarrhea}$$

H1: There is no relationship between soil ingestion and diarrhea.

Significance levels = 0.05

Response	Soil Ingestion	No Soil Ingestion	Total
No Diarrhea	22	3	27
Diarrhea	9	4	13
Total	33	7	40

Expected Value = Row Total * Column Total ÷ N

	Soil Ingestion	No Soil Ingestion
No Diarrhea	22 * 33 ÷ 40 = 22.28	27 * 7 ÷ 40 = 4.72
Diarrhea	13 * 33 ÷ 40 = 10.7	13 * 7 ÷ 40 = 2.3

$$\chi^2 = \sum (O - E)$$

O	E	(O-E)	(O-E) ²	(O-E) ² /N
24	22	2	4	4 ÷ 22 = 0.18
3	5	-2	4	4 ÷ 5 = 0.8
9	11	-2	4	4 ÷ 11 = 0.36
4	2	2	4	4 ÷ 2 = 2.0
			16	Total=3.341

Chi square value $\chi^2 = 3.341$

The degree of Freedom = (r-1) (c-1) Significance Level (SL) = 3.341

Degrees of freedom = (2-1) (2-1) = 1

The table value of χ^2 3.341 is less than the table value for 1 degree of freedom at 0.05% level of significance is 3.841. We can conclude that soil ingestion and diarrhea are not related or associated. Thus, we accept the hypothesis indicating that no relationship exists between diarrhea and soil ingestion.

From the chi square, we found that the cells were less than five thus the fishers test was used.

4.5 Fisher Exact Test

Fisher's Exact Test is a statistical significance test employed in the analysis of contingency tables. Although in practice, it is applied when sample sizes are not large, it can be used for all sizes. Named after its inventor, Ronald Fisher, it is one of a class of exact tests. It has been named so because the importance of the deviation from a null hypothesis (for example, P-value) can be calculated exactly, instead of relying on an approximation which becomes exact in the limit as sample sizes grow to infinity, as happens with many statistical tests.

	Column 1	Column 2	Row Total
Row 1	22	3	25
Row 2	9	4	11
Column Total	31	7	38

Calculate the probability (p)

$$p = \frac{(a + b)! (c + d)! (a + c)! (b + d)!}{a! b! c! d! n!}$$

$$p = \frac{(22 + 3)! (9 + 4)! (22 + 9)! (3 + 4)!}{22! 3! 9! 4! 38!}$$

Calculate a! = 22!

$$22! = 22 \times 21 \times 20 \times 19 \times 18 \times 17 \times 16 \times 15 \times 14 \times 13 \times 12 \times 11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$$

$$22! = 1.1240007277776E+21$$

Calculate b! = 3!

$$3! = 3 \times 2 \times 1$$

$$3! = 6$$

Calculate c! = 9!

$$9! = 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$$

$$9! = 362880$$

Calculate d! = 4!

$$4! = 4 \times 3 \times 2 \times 1$$

$$4! = 24$$

Calculate n! = 38!

$$38! = 38 \times 37 \times 36 \times 35 \times 34 \times 33 \times 32 \times 31 \times 30 \times 29 \times 28 \times 27 \times 26 \times 25 \times 24 \times 23 \times 22 \times 21 \times 20 \times 19 \times 18 \times 17 \times 16 \times 15 \times 14 \times 13 \times 12 \times 11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$$

$$38! = 5.230226174666E+44$$

Calculate (a + b)! = 25!

$$25! = 25 \times 24 \times 23 \times 22 \times 21 \times 20 \times 19 \times 18 \times 17 \times 16 \times 15 \times 14 \times 13 \times 12 \times 11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$$

$$25! = 1.5511210043331E+25$$

Calculate (c + d)! = 13!

$$13! = 13 \times 12 \times 11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$$

$$13! = 6227020800$$

Calculate (a + c)! = 31!

$$31! = 31 \times 30 \times 29 \times 28 \times 27 \times 26 \times 25 \times 24 \times 23 \times 22 \times 21 \times 20 \times 19 \times 18 \times 17 \times 16 \times 15 \times 14 \times 13 \times 12 \times 11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$$

$$31! = 8.2228386541779E+33$$

Calculate (b + d)! = 7!

$$7! = 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$$


$$7! = 5040$$

$$p = \frac{(1.5511210043331E+25) (6227020800) (8.2228386541779E+33) (5040)!}{(1.1240007277776E+21) (6) (362880) (24) (5.230226174666E+44)}$$

$$p = \frac{4.0029328098204E+72}{3.0719389973081E+73}$$

$$p = 0.13030638998131$$

The lesser the value of p, the better the evidence for which to reject the null hypothesis.

The P value in our case is less than 50 thus the test indicates that there is no relationship between soil ingestion and childhood diarrhea. As a matter of caution, the p-value should not be applied as an sign of the strength of the relationship between categorical variables. Moreover, the test is either significant or not. The p-value is responsive to sample size thus in this case where the sample size was small, we conclude that there may be a relationship between diarrhea and soil ingestion 

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the findings, conclusions and recommendations of the study. It also shows the limitations of the study as well as the suggestions for further research.

5.2 Summary of findings

The objective of the study was to assess the caregiver's attitude and practices towards the prevention of Diarrheal diseases in children under than five years in Kibra Slums. The study showed that all of the 40 administered questionnaires were fully completed by the identified respondents. The findings revealed that 52.5 percent of the respondents were of 19 to 28 years of age, while 35 percent were of 29 to 38 years of age, 10 percent were above 39 years and the remaining 2.5 percent were below 18 years of age, this clearly showed that the respondents were fit to make mature decisions on taking care of their children.

The study also revealed that 97.5% of the respondents were female while only 2.5 percent were men. This response indicated that the majority respondents were made of women who are the primary care givers in the slum. The study also revealed that 80% of the respondents were married and the remaining 20 percent were not married. The study also established that 47.5 percent of the respondents had secondary level education and above, closely followed by 42.5 percent who were primary school level and 7.5 percent had college level education and 2.5 percent had no educational background. It was also established that the 50 percent of the spouses (husbands) had secondary level education, 40 percent had primary level education and below and the remaining 10 percent had college education level and above.

The study showed that most of the respondents were self-employed and made up 52.5 percent of the respondents, 40 percent of the respondents were on contractual jobs and the remaining 7.5 percent were domestic workers.

From the results the study showed that majority of the respondents made a monthly income of between 5001 to 10000 shillings and made up 42.5 percent of the respondents, and 25 percent made between 10001 to 15000 shillings, 17.5 percent made under than 5000 shillings and the remaining 15 percent made above 15001 shillings.

The study also showed that most households had 4 to 6 members at 47.5 percent of the sample, closely followed by 20 percent who had under than 3 members, 17.5 percent had 7 to 9 members and the remaining 15 percent had more than 9 members in their households.

The study also established that there were various caregiver attitudes and practices that were vital in the preventing Diarrheal diseases among children under than five years in the slum. These attitudes included the attitudes on perceived risks and causes of Diarrhea, biomedical knowledge of illnesses of children under than five years. On a scale of 1-5 where one was the lowest and 5 highest in agreement, an average of 4.5 perceived sewage contact as a cause diarrhea, an average of 3.0 perceived contaminated food as a cause of diarrhea, while on the lower side an average of 2.8 perceived contaminated water as a cause of diarrhea and an average of 2.6 perceived dirty environment a s a cause of diarrhea. The findings showed that an average of 3.8 of the respondents perceived diarrhea as a common illness in their household, an average of 3.4 of the respondents perceived common flu as a common illness, an average of 3.6 of the respondents perceived malaria as a common illness, an average of 1.8 of the respondents perceived pneumonia as a common illness while an average of 1.8 of the respondents perceived fever as a common illness in their households. The respondents

also perceived common illnesses among children under five years which include; diarrhea at an average of 4.2, common flu at an average of 4.0, malaria at an average of 3.5, pneumonia at an average of 2.8 and lastly fever at an average of 3.2.

The study also showed what the caregivers perceived as the safest source of water; public taps at an average of 4.6, water tanks at an average of 2.6 water vendors at an average of 3.0 and lastly wells at an average of 1.9. Majority (75 percent) of the respondents stated public tap as their primary source of water, 8 percent stated they got it from water vendors, 13 percent got it from water tanks and the remaining 5 percent got it from wells. All the respondents were in agreement that drinking water should be treated.

The study also showed that 70 percent of the respondents took less than 10 minutes to arrive at the water source, 17.5 percent of the caregivers took 10 to 20 minutes to arrive at the water source, 7.5 percent to 20 to 30 minutes to reach the water source and 5 percent took more than 30 minutes to arrive at the water source.

The study showed that 100 percent of the respondents washed their hands after using the toilet, 95 percent also indicated they washed their hands before preparing food, 85 percent washed their hands before eating, all the respondents indicated they cleaned their hands after eating, 50 percent indicated that they washed their hands before feeding the children. They were then asked if they used soap and water to wash their hands and 70 percent of the respondents indicated that they only use water while 30 percent only use water and soap. This supports a research done by Curtis et al, 2003) on Myanmar experience in sanitation and hygiene advocacy observed that washing of hands with soap as a protective measure. The Centers for Disease Control and Prevention, MED et al. (1999) assert that failure to wash hands with soap contribute to almost 50 percent of all food borne illness outbreaks. From past studies, it has been

noted that for children, washing of hands with soap can be fun and an entertaining activity and it is simple for them to understand the practice (Jamieson et al. 2006).

As caregivers, parents are able to help keep their children healthy by equipping them with good hand washing techniques, reminding them to wash their hands and by doing it with them. This hand washing practice gives all of them a chance to participate in taking care of their own health. Once children take charge of the washing of their hands they will often do so and also encourage their parents and siblings as well to wash hands (O'Reilly C et al. 2006). It is also of essence that hand-washing practice in the community is provided as it will help in the reduction of the number of those who are likely to fall sick with Diarrhea by almost 31 percent (Ejemot R et al. 2008). Hand washing further reduces Diarrheal illnesses in people with low immune systems by 58 percent (Huang & Zhou, 2007).

The study also showed that 50 percent of the respondents indicated they saw their children ingest soil. It also showed that 50 percent of the respondents indicated their children suffered from diarrhea after ingesting soil. The study also showed that there may be a relationship between diarrhea and soil ingestion.

5.3 Conclusions

From the findings, the age of the child presents risk for childhood Diarrhea for children under five is higher than from the other children above five. In the households visited at least each child Diarrhea before or during the study. During our field observation, most pit latrines were either full or depleted and its environs littered with feces, number of people sharing the same toilet yet they did not have a constant supply of water was huge and this could easily lead to the spread of diseases. These findings were largely consistent with childhood Diarrhea reports from United Nations International Children Fund (UNICEF 2008) which observed the association between lack of

clean water for domestic use, poor sanitation, and poor hygienic practices to childhood Diarrhea. The study found that a majority of the people who live in Kibra slums are the urban poor. According to Akunga (2009), many people live in slums areas and other informal settlements which lack sanitation and hygiene services essential for the health of children. The findings also support other studies that there is a relationship between water quality available and how generally the level of hygiene in household affects exposure to Diarrhea pathogens (Teran,1991). The study revealed that the identified attitudes and practices greatly impacted on the levels of prevention of diseases in children under than five years.

5.4 Recommendations of Study

The residents of Kibra should be educated on proper disposal of solid waste that was a major contributor to Diarrhea diseases in children below five years.

Health programs that target mothers and caregivers immediately after birth should be introduced to educate them on how to properly take care of children against Diarrhea so as to ensure that the caregiver attitudes are aligned towards prevention of diarrheal diseases in their households as well as equip them with biomedical knowledge on how to properly detect and treat the diseases.

Residents in Kibra should be trained and educated on proper methods of emptying and cleaning their water containers and how to safely store water as well as proper sanitation practices.

5.5 Limitations of Study

Many limitations were encountered. Given the tight schedule of the women who were domestic workers and small-scale traders they were usually busy and needed to take time off to answer questions from the questionnaires.

This challenge was overcome by us sending our field guides to place appointments with the identified respondents a day before. The other challenge was that some of the respondents could not communicate in Kiswahili or English thus need for a translator who spoke to them in their local dialect as well as the environment in Kibra in regards to sanitation due to their poor garbage and Faecal disposal thus one had to endure the stench and avoid stepping on them that led to the use of boots.

5.6 Suggestions for further Research

The study suggests that further research be carried out to establish whether lack of clean water and inadequate access to water has an impact on Diarrhea among the children under five years.

Further research should be carried out on how one's level of income in Kibra contributes to childhood Diarrhea. Considering the areas lack of constant water supply in the study area. It was observed that their self-efficacy determines different practices for each household and thus their outcome can be either positive or negative in regards to hygiene.

Further research should be carried out on how storage of water leads water leads to Diarrhea. When household water was tested at the lab it was found to be contaminated, water samples were found to have both E.coli and T.coli bacteria were detected. Water from the water tanks and boreholes, vendors were found to be safe but water stored in the house containers was found to be contaminated thus there was a problem with the storage at the household level though most of the respondents claimed that they covered it. A number of research works have reported recurring variations in water quality. Research carried out in Kenya by Muhammed and Morrison (1975) has shown higher microbial counts in the water sources during wet seasons or after rainfall compared to the dry season. The findings of this research study were consistent with a study done in

Ghana by Blum et.al (1987) in which suggestions that the risk of contaminating water is normally higher in water stored in containers than in taps as a result of poor storage and mishandling was observed.

REFERENCES

- Adazu K, Lindblade KA, Rosen DH et al. (2005) “*Health and demographic surveillance in rural western Kenya: a platform for evaluating interventions to reduce morbidity and mortality from infectious diseases.*” *American Journal of Tropical Medicine and Hygiene* 73, 1151–1158
- Akunga, Daniel and Nyagetiria (2009). *Estimating Burden of Diarrhea associated with water Sanitation and hygiene among the under-fives in Residential environs of Nairobi Kenya*. PHD Thesis, Kenyatta University.
- Amélie Desgropes, Sophie Taupin(2011).*Kibra: The Biggest Slum in Africa?* Les Cahiers de l’Afrique de l’Est.pp.23-34.
- Bandura, A. (1982). “The assessment and predictive generality of self-percepts of efficacy.” *Journal of Behavior Therapy and Experimental Psychiatry*, 13, 195-199
- Barker, J. (2010). “*Critical appraisal and qualitative research.*”Evidence-based practice for nurses & healthcare professionals. Los Angeles: SAGE pp. 78-90.
- Bauza, V., Madadi, V., Ocharo, R. M., Nguyen, T. H. & Guest, J. S. Microbial source tracking using 16S rRNA amplicon sequencing identifies evidence of widespread contamination from young children’s feces in an urban slum of Nairobi, Kenya (submitted). (2020).
- Blum D, Feachem G, Huttly A. et al. (1987) “*The effects of distance and season on the use of boreholes in northeastern Imo State, Nigeria.*” *Journal of Tropical Medicine and Hygiene*.

- Case, Anne, Lubotsky and Paxson. (2002). *"Economic Status and Health in Childhood: The Origins of the Gradient."* American Economic Review.
- Cohen, L. and Manion, L. (1994). *"Research Methods in Education (fourth edition)."* London: Routledge.
- Cooper, C. R., & Schindler, P. S. (2008). *"Business research methods (10 ed.)."* Boston: McGraw-Hill.
- Curtis, V. and Cairneross, S. (2003). *Effects of washing hands with soap on Diarrhea risk in the community: A systematic review, lancet infectious diseases.* London: Pubmed.
- Cutler, M. & Miller, G. (2005) *"The Role of Public Health Improvements in Health Advances: The Twentieth-Century United States."* Demography, vol. 42 no. 1, 2005, pp. 1-22.
- David M, and Miller G. (2005). *"The Role of Public Health improvements in Health Advances: The twentieth –century United States."* Demography February,42.1,PP.1-22.
- Dalrymple, L. Dodoo, F. N. Ducci, M. E. Jitta J, Bikaako, W. J. Khadiagala, G. M. HisWorship Kizito, J. S. Nderingo, R. R. Nganda,B. M. Opolot, S. J. Prosser, W. Desai, S.Perry, M. J. (2004). *"Tracking Gender-Based Human Rights Violations in Post-warKosovo."* American Journal of Public Health94 (8): 1304-1307.

- Diouf, K., Tabatabai, P., Rudolph, J., & Marx, M. (2014). “*Diarrhea prevalence in children under five years of age in rural Burundi: an assessment of social and behavioural factors at the household level.*” *Global Health Action*, 7, 10.3402/gha.v7.24895. <http://doi.org/10.3402/gha.v7.24895>
- Ejemot-Nwadiaro I, Ehiri E, Meremikwu M and Critchley A (2012). “*Hand washing for preventing Diarrhea*”. Cochrane Database of Systematic Reviews 2008.
- EDC. (2010). *Epidemiology and disease control. A report on surveillance of communicable diseases available at NCC. Nairobi: PH.D.*
- Gebru, T., Taha, M. and Kassahun, W. (2014) “*Risk Factors of Diarrheal Disease in Under-Five Children among Health Extension Model and Non-Model Families in Sheko District Rural Community, Southwest Ethiopia: Comparative Cross-Sectional Study.*” *BMC Public Health*, 14, 395
- ARGOSS. Guidelines for Assessing the Risk to Groundwater from On-site Sanitation. Kampala Workshop proceedings, 2001.
- Graf, Jürg&Meierhofer, Regula &Wegelin, Martin &Mosler, Hans-Joachim. (2008). “*Water disinfection and hygiene behaviour in an urban slum in Kenya: Impact on childhood Diarrhea and influence of beliefs.*” *International journal of environmental health research*. 18. 335-55. 10.1080/09603120801966050.
- Greene W. (2001). “*Personal hygiene and life expectancy improvements since 1850: historic and epidemiologic associations.*” *American Journal on Infect Control* (4):203-6.

- Gurjeet S, Urhekar D (2013). *“Effects of hand wash agents: prevent the laboratory associated infections.”* International Journal of Medical Research & Health Sciences. 2013;2(3):564–8.
- Hoddinott, J., J. Maluccio, J. R. Behrman Graf, J. M., Montagnino, B. A., Hueckel, R., & McPherson, M. L. (2008). *“Children with new tracheostomies: Planning for family education and common impediments to discharge.”* Pediatric Pulmonology, 43,788–794.
- Huang B, Zhou J. (2007). *“Effect of intensive handwashing in the prevention of Diarrheal illness among patients with AIDS: a randomized controlled study.”* Journal of Medical Microbiology.
- Hutton G, Haller L, Bartram J (2007). *“Estimating the costs and health benefits of water and sanitation improvements at global level.”* J Water Health 5(4):467-80.
- Jamieson D, Breman J, Meashan R et al (2006). *“Disease Control Priorities in Developing Countries.”* Second Edition. The world Bank Group, Washington DC.
- John Oywa (2011). *Every coin counts in slum ‘kadogo’ economy.* Published Thu, February 11th 2010 at 00:00.
<https://www.standardmedia.co.ke/article/2000002984/every-coin-counts-in-slum-kadogo-economy>
- K. Oadi and M. Kuitunen, (2005). *“Childhood diarrheal morbidity in the Accra Metropolitan Area, Ghana: socio-economic, environmental and behavioral risk determinants,”* Journal of Health and Population in Developing Countries.

- Karanja, J. Wambari, E. Okumu, D. Odhiambo, E. Karuri, I. Muthwi, S. M. Kibe, M. Osawa, N and Osaki, Y. (2002) “*Community-based research by team. A study of awareness of malaria among Kibra population: Implication for community based intervention.*” *Bulletin of National Institute of Public Health* 51 :(1) 51-55.
- Kawachi, I., N. E. Adler, and W. H. Dow. 2010. “*Money, schooling, and health: Mechanisms and causal evidence.*” *Annals of the New York Academy of Science* 1186:56-68.
- Kung'u, W. N., Musau, P. M., Ochieng, A., Wachira, E. G., Omol, R. T. A. and Rakwar, J. (2002). “*Diarrhea prevalence and risk factors in slums.*” *Journal of the National Institute of Public Health*, 51: 73-76.
- Mahasneh, S. M. (2001). “*Health perceptions and health behaviours of poor Jordanian women.*” *Journal of Advanced Nursing* 36(1): 58-68
- USAID-MCHIP (2014). “*Handwashing Knowledge, Attitudes, and Practices in Korogocho (Nairobi) and Bondo (Nyanza)*”. Jhpiego Corporation.
- Merga, N., & Alemayehu, T. (2015). “*Knowledge, Perception, and Management Skills of Mothers with Under-five Children about Diarrheal Disease in Indigenous and Resettlement Communities in Assosa District, Western Ethiopia.*” *Journal of Health, Population, and Nutrition*, 33(1), 20–30.
- Mirowsky, John, and Catherine E. Ross. 2015. “*Education, Health, and the Default American Lifestyle.*” *Journal of Health and Social Behavior* 56(3): 297-306.

- Muhammed SL, Morrison SM (1975). "*Water quality in Kiambu District, Kenya.*" East African Med. J. 52: 269-276.
- Muriithi D (2014). "*Risk Factors Influencing Diarrheal Occurrence among Children Under Five Years Old In Informal Urban Settlements: A Case Study of Korogocho, in Nairobi County, Kenya.*" Research Project Paper University of Nairobi.
- O. Boadi, K & Kuitunen, Markku. (2005). "*Childhood diarrheal morbidity in the Accra Metropolitan Area, Ghana: Socio-economic, environmental and behavioral risk determinants.*" Journal of Health & Population in Developing Countries.
- O'Reilly E, Freeman C, Ravani M, Migele J, Mwaki A, Ayalo M, Ombeki S, Hoekstra M, and Quick R. (2006). "*The impact of a school-based safe water and hygiene programme on knowledge and practices of students and their parents*" Nyanza Province, western Kenya, Epidemiol Infect. PubMed.
- Pickering H, Hayes R, Tomkins A, Carson D, and Dunn D. (1987). "*Alternative measures of Diarrheal morbidity and their association with social and environmental factors in urban children in The Gambia.*" Transactions of the Royal Society of Tropical Medicine and Hygiene.
- R. Martorell, P. Melgar, A. R. Quisumbing, M. Ramirez-Zea, R. D. Stein, and K. M. Yount. (2011). "*The Consequences of Early Childhood Growth Failure over the Life Course.*" IFPRI Discussion Paper 01073. International Food Policy Research Institute, Washington, DC.

Ramaswamy K, and Jacobson K. (2001). *“Infectious Diarrhea in children”*.
Gastroenterology Clinics of North America; 30:611–24

Robert E Black, Lindsay H Allen, Zulfiqar A Bhutta, Laura E Caulfield, Mercedes de Onis, Majid Ezzati, Colin Mathers, Juan Rivera (2008). “Maternal and child under nutrition: global and regional exposures and health consequence.”
Maternal and Child Undernutrition 1.Lancet

Ross E and Wu Chia-ling. (1995) *“The Links between Education and Health.”*
American Sociological Review.

Ross E, Mirowsky J, Goldsteen K. (1990). *“The Impact of the Family on Health: The Decade in Review.”* Journal of Marriage and the Family.

Save the Children and The John Hopkins University (1998). *“Improving Diarrhea Prevention and Management Practices among Settled Populations and Recently Resettled Displaced Persons in Cuanza Sul, Angola: A Report of Research Conducted by Save the Children and The Johns Hopkins University with Proposed Interventions.”* http://www.jhsph.edu/research/centers-and-institutes/center-for-refugee-and-disaster-response/publications_tools/publications/_pdf/Angola/study_introduction.PDF
(assessed April 2015)

Sheth M, Obrah M. (2004). *“Diarrhea prevention through food safety education.”*
Indian Journal of Pediatrics;71(10):879-82.PMID:15531827

- Stelmach RD, Clasen T. (2015). “*Household water quantity and health: a systematic review.*” *International Journal of Environmental Research and Public Health.* 2015;12(6):5954–74. [PMC free article][PubMed]
- T. Gerald, O. Keusch, and B. Alok, (2001). “*Disease Control Priorities in Developing Countries*”. World Bank, Washington, DC, USA.
- Teran, M. M. (1991) Early Feeding Patterns and Children’s Health in Mexico. DHS World Conference, August 5-7, 1991 Proceedings Vol. I . Washington D. C.
- Hutton; Haller and Bartram (2007). “*Global cost benefit analysis of water supply and sanitation interventions*”. *Journal of water and health.*
- Walker L, Perin J, Aryee J, Boschi-Pinto C and Black E. (2012). *Diarrhea incidence in low- and middle-income countries in 1990 and 2010: a systematic review.* *BMC public health.*
- Walker, Rudan and Liu et al. (2013). “*Global burden of childhood pneumonia and Diarrhea,*” *The Lancet.*
- WHO. (2000). “*Global water supply and sanitation assessment year 2000 report.*” Geneva: WHO
- WHO (2010). “*Diarrhoea incidences in low and middle income.*” Geneva: WHO.
- WHO (1990). “*Impact of improvement of water supply on reduction of Diarrhea*” Geneva: WHO.
- UNICEF/WHO (2009) “*Diarrhea: Why children are still dying and what can be done.*” UNICEF/WHO.

World Health Organization. Guidelines for Drinking Water Quality, Second edition,
Vol. 2. Geneva: WHO; 1996

UNICEF (2006). “*Water, Sanitation and Hygiene. Children and water global statistics*”
Switzerland: UNICEF.

UNICEF/WHO (2008). “*Water, sanitation and hygiene.*” New York: UNICEF/WHO.

UN. (2000). United Nations millennium declaration. New York: United Nations

UNDP Annual Report 2006: Global partnership for development

Yaremko S. and Lawson K. (2007) “*Gender Internalization of expressive Traits and expectations of parenting*”. Sex roles.

APPENDENCES

Appendix 1: Questionnaire

Section A: General Information

For each of the questions below please pick one response

Question 1: Age of Respondent

- | | |
|-------------------|--------------------------|
| 1. Below 18 years | <input type="checkbox"/> |
| 2. 19-28 years | <input type="checkbox"/> |
| 3. 29-38 years | <input type="checkbox"/> |
| 4. Above 38 years | <input type="checkbox"/> |
-

Question 2: Gender of Respondent

- | | |
|-----------|--------------------------|
| 1. Male | <input type="checkbox"/> |
| 2. Female | <input type="checkbox"/> |
-

Question 3: Marital Status

- | | |
|------------|--------------------------|
| 1. Married | <input type="checkbox"/> |
| 2. Single | <input type="checkbox"/> |
-

Question 4: Highest Educational Level

- | | |
|----------------------|--------------------------|
| 1. Primary and below | <input type="checkbox"/> |
| 2. Secondary | <input type="checkbox"/> |
| 3. College and above | <input type="checkbox"/> |
-

Question 5: Source of Income

- | | |
|--------------------|--------------------------|
| 1. Self Employed | <input type="checkbox"/> |
| 2. Contractual Job | <input type="checkbox"/> |
| 3. Domestic Work | <input type="checkbox"/> |
-

Question 6: Monthly Income (Ksh.)

- | | | | |
|-------------------|--------------------------|-------------|--------------------------|
| 1. Less Than 5000 | <input type="checkbox"/> | 15001-20000 | <input type="checkbox"/> |
| 2. 5001-10000 | <input type="checkbox"/> | 20001-25000 | <input type="checkbox"/> |
| 3. 10001-15000 | <input type="checkbox"/> | Above 25001 | <input type="checkbox"/> |
-

Question 7: No. of Persons per Household

- | | |
|----------------|--------------------------|
| 1. 3 and below | <input type="checkbox"/> |
| 2. Between 4-6 | <input type="checkbox"/> |
| 3. Between 7-9 | <input type="checkbox"/> |
| 4. Above 9 | <input type="checkbox"/> |
-

Section B: Attitudes and Practices towards prevention of diarrhea diseases

For each of the questions below circle the response that best characterizes how you feel about each statement, where: *1=Strongly Disagree, 2=Disagree, 3= Neutral, 4=Agree, 5= Strongly Agree*

Question 1: What do you perceive as the cause of diarrhea?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Sewage Contact	1	2	3	4	5
2. Contaminated food	1	2	3	4	5
3. Contaminated water	1	2	3	4	5
4. Dirty environment	1	2	3	4	5

Question 2: What is the common illness in your household?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Diarrhea	1	2	3	4	5
2. Common Flu	1	2	3	4	5
3. Malaria	1	2	3	4	5
4. Pneumonia	1	2	3	4	5
5. Fever	1	2	3	4	5

Question 3: What is the common illness in children under 5 years?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Diarrhea	1	2	3	4	5
2. Common Flu	1	2	3	4	5
3. Malaria	1	2	3	4	5
4. Pneumonia	1	2	3	4	5
5. Fever	1	2	3	4	5

Question 4: What is the safest source of water?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Public Tap	1	2	3	4	5
2. Water vendor	1	2	3	4	5
3. Water tank	1	2	3	4	5
4. Well	1	2	3	4	5

Question 5: Should drinking water be treated?	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	2	3	4	5

Section C: Sources of Water and their role in in children's diarrhea

For each of the questions below please pick one response

Question 1: What is your primary source of water?

- | | |
|-----------------|--------------------------|
| 1. Public Tap | <input type="checkbox"/> |
| 2. Water Vendor | <input type="checkbox"/> |
| 3. Water Tank | <input type="checkbox"/> |
| 4. Well | <input type="checkbox"/> |
-

Question 2: How long does it take to access source of water?

- | | |
|-----------------|--------------------------|
| 1. Less than 10 | <input type="checkbox"/> |
| 2. 10-20 | <input type="checkbox"/> |
| 3. 20-30 | <input type="checkbox"/> |
| 4. More than 30 | <input type="checkbox"/> |
-

Question 3: How long does it take to access source of water?

- | | |
|-----------------|--------------------------|
| 1. Less than 10 | <input type="checkbox"/> |
| 2. 10-20 | <input type="checkbox"/> |
| 3. 20-30 | <input type="checkbox"/> |
| 4. More than 30 | <input type="checkbox"/> |
-

Section D: Hand Washing and Hygienic Practices

For each of the questions below please pick one response

Question 1: How often do you wash your hands?

- | | |
|--------------------------|--------------------------|
| 1. After using Toilet | <input type="checkbox"/> |
| 2. Before preparing food | <input type="checkbox"/> |
| 3. Before Eating | <input type="checkbox"/> |
| 4. After Eating | <input type="checkbox"/> |
-

Question 2: Do you use soap to wash your hands?

- | | |
|-----------------------|--------------------------|
| 1. Use Soap and water | <input type="checkbox"/> |
| 2. Use Water Only | <input type="checkbox"/> |
-

Section E: Diarrhea and Soil Ingestion

For each of the questions below please pick one response

Question 1: Do your children ingest soil around the household?

- | | |
|--------|--------------------------|
| 1. Yes | <input type="checkbox"/> |
| 2. No | <input type="checkbox"/> |
-

Question 2: Do your children get diarrhea after soil ingestion?

- | | |
|--------|--------------------------|
| 1. Yes | <input type="checkbox"/> |
| 2. No | <input type="checkbox"/> |
-