FACTORS INFLUENCING CHILDHOOD DIARRHOEAL DISEASES AMONG UNDER-FIVE YEARS CHILDREN IN KANYANDA, LUWERO DISTRICT

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DECLARATION

I declare to the best of my knowledge that this work is my original work which has not been presented by any person from any University for research report and is its first time to be presented.

NAMUTEBI LYDIA KAKUNGULU

Signature.....

Date.....

APPROVAL

I have supervised the research report of Namutebi Lydia Kakungulu entitled factors that influence childhood diarrheal diseases among under-five children in Kanyanda, Luwero district and I am satisfied that it meets the submission requirements

MS. AGWANG AGNES

Signature: .....

Date: .....

DEDICATION

First I would like to thank the Lord God Almighty for the opportunity to complete this program. I take heart of gratitude to dedicate this piece of work to my pretty daughter Nagawa Tracy I also want to thank my dear loving and caring Mother Mrs. Kwagala Sarah I am also indebted to my dear husband Mr. Sserwanga Robert for his continuous love, encouragement, patience and support especially for the time I have been away for school.

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I would like to acknowledge the academic registrar Ms Evelyn Ayot for her enduring patience and motherly love especially during examination time. Many thanks to my supervisor Ms. Agwang Agnes for her continuous guidance until the research report is complete. Many thanks to my classmates for their constant friendship

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

OPERATIONAL DEFINITIONS

Prevalence	-	Is a measure of disease that allows us to determine a person's likelihood of having a disease. Therefore, the number of prevalent cases is the total number of cases of disease existing in a population. Or is the proportion of individuals in a population having a disease or characteristic
Immunity	-	It is the capability of the body to resist harmful microorganisms or viruses from entering it.
Mortality	-	is the relative incidence of death within a particular group categorized according to age or some other factor such as occupation.
Morbidity	-	Is the incidence or prevalence of a disease or of all diseases
Diarrhoea	-	Is the passage of three or more loosely stools per for the individuals

LIST OF ABBREVIATIONS

SCB	-	Statistic Center Board
WHO	-	World Health Organization
UNICEF	-	United Nation International Children's Fund
MMT	-	Morbidity-Mortality Treatment
IMCI	-	Integrated Management of Childhood Illnesses
UDHS	-	Uganda Demographic Health Survey
VAD	-	Vitamin A deficiency

ABSTRACT

Background

Diarrhea remains the leading cause of morbidity and mortality in children under 5 years old worldwide. The burden is disproportionately high among children in low- and middle-income countries. Young children are especially vulnerable to diarrheal disease and a high proportion of the deaths occur in the first 2 years of life.

Objective

The aim of the study was to access factors influencing diarrheal diseases among under-five children in Kanyanda, Luwero District

Method

A descriptive cross sectional study was employed to assess the factors influencing diarrheal diseases among under-five children in Kanyanda, Luwero District. A total of 279 care takers/mothers of children under-five years were included in this study using non probability, convenient sampling technique. A structured questionnaire was used to collect data. Data were enteredand analyzed using SPSS version 17.

Results

From the assessment done the prevalence of childhood diarrhea disease was high at 47.7%. age of the child (P=0.00), place where the child was born (P=0.044), duration of breastfeeding (P=0.00), immunization status (P=0.00), maternal age (P=0.00), number of children in the household (P=0.00), maternal education (P=0.00), maternal employment (P=0.02), type of toilets (P=0.00), adult defecation (P=0.00), presence of flies in the kitchen (P=0.00) and domestic animla near house (P=0.00) were independently associate with occurrence of childhood diarrhea.

Conclusion

The findings highlight the need for going educational, informational and improving on the socio-economic status, sanitation interventions of the respondents to address the factors of childhood diarrhea diseases in order to decrease the rate of childhood diseases among children below five years.

CHAPTER ONE

1.0 Introduction

This chapter comprise of the background of the study, statement of the problem, stud objectives, research questions, significance//justification of the study and the conceptual framework of the study.

1.1 Background to the study

Diarrhea remains the leading cause of morbidity and mortality in children under 5 years old worldwide. The burden is disproportionately high among children in low- and middle-income countries. Young children are especially vulnerable to diarrheal disease and a high proportion of the deaths occur in the first 2 years of life. Worldwide, the majority of deaths related to diarrhea take place in Africa and South Asia. Nearly half of deaths from diarrhea among young children occur in Africa where it is the largest cause of death among children under 5 years old and a major cause of childhood illness (Fisher et al, 2012).

Diarrhoea is the passage of three or more loosely stools per for the individual, it is usually a symptom of gastrointestinal infection. Diarrheal diseases can be caused by numerous pathogens and transmitted through multiple vehicles due to poor hygiene practices. Persons living in developing countries with poor access to safe water, sanitation, or hygiene infrastructure have increased risk of exposure to viral, bacterial, and parasitic pathogens that can cause diarrheal diseases (Arvelo, 2010). In Luwero district, *Enterotoxigenic E. coli, Salmonella paratyphi, Shigella spices* and virus appeared to be the most common etiological agents, however, the causes of approximately 40% of the cases are still unknown (Mwanga et al, 2008).

Diarrhoea is a major health problem. It is usually a symptom of an infection in the intestinal tract, which has a variety of causative agents including viruses, bacteria and parasites. Diarrhoeal infection spreads through the ingestion of contaminated food or drinking-water, or person-to-person as a result of poor hygiene. There are three clinical types of diarrhoea: (i) acute watery diarrhoea which lasts several hours or days and includes cholera; (ii) acute bloody diarrhoea, also called dysentery; and (iii) persistent diarrhoea that lasts 14 days or longer (Nyanteky et al, 2008)

Globally, children aged less than five years' experience on average, 3.2 episodes of diarrhea every year and consequently 1.87 million children will die from dehydration associated with diarrheal disease (Pinto et al, 2008). Of all medical conditions, diarrhea is the second leading cause of illness. Around 90% of all diarrhoea-related deaths occur in children under five years of age living in low income countries (WHO/UNICEF, 2003).

Worldwide, Lack of access to safe water and adequate sanitation facilities is a serious problem worldwide especially in countries like Afghanistan, Somali, Zimbabwe, Zambia, and Uganda among others. It is estimated that approximately 884 million people lack access to improved water sources and 2.6 billion people do not have access to improved sanitation facilities, this leads to open defecation and the improper disposal of feces. It is estimated that in developing countries, 25% of people defecate in the open. Making diarrhoeal diseases to remain among the five top preventable killers of children under-five in developing countries. Improving domestic hygiene practices is potentially one of the most effective means of reducing the global burden of disease in children (WHO/UNICEF, 2011).

In sub-Saharan Africa, of the estimated total 10.6 million deaths among children younger than five years of age worldwide, 42 percent according to world health organization (WHO) occur in African region. Although mortality rates among these children have declined globally from 146 per 1,000 in 1970 to 79 per 1,000 in 2003 the situation in Africa is strikingly different compared with other regions of the world, African region shows the smallest reductions in mortality rates and the most marked slowing down trend (UNICEF/WHO, 2012). It is widely recognized that exposure to diarrhoea pathogens in developing countries especially in sub-Saharan African is associated with the age of the child, quality and quantity of water, availability of toilet facilities, housing conditions, level of education, household economic status, place of residence, feeding practices, and the general sanitary conditions (personal or domestic hygiene) in the vicinity of the house (Andualem, 2010).

In most developing countries, like in sub-Saharan Africa, approximately 2 million people, the vast majority of whom are under-five children, die from diarrhoea each year (a child dies every 15 seconds due to diarrhoeal in developing countries especially Africa). Nearly 90% of diarrhoea is attributed to unsafe drinking water, inadequate sanitation and poor hygiene. Diarrhea is more prevalent in the developing world due to lack of safe drinking water,

sanitation and hygiene, and poorer overall health and nutritional status, Efforts to define the underlying biological mechanisms have identified nutritional, microbiological and immunological factors to be associated with specific patterns of diarrhea morbidity and mortality, Diarrhea is a common symptom of gastrointestinal infections., Not necessary here Enteric pathogens stimulate partial immunity against repeated infection, leading to declining incidence of disease in older children and adults, While protein-energy malnutrition, in association with micronutrient deficiencies, may predispose children to persistent diarrhea and/or prolong the rate of recovery, each diarrhea episode can cause weight loss and growth retardation. (Forsberg et al, 2010).

In Uganda diarrhea kills half million under-five children annually secondary to pneumonia. Poor sanitation, lack of access to clean water supply and inadequate personal hygiene are responsible for 90% of diarrheal disease occurrence, these can be easily improved by health promotion and education (UNICEF, 2012). Diarrhoea alone kills more children than AIDS, malaria, and measles combined. Recent estimates indicate that the two week period prevalence of diarrhoea in under-five children in Uganda is approximately 24%. Morbidity-Mortality-and Treatment (MMT) surveys conducted in Uganda at various times have revealed five diarrhoeal episodes per child per year, and the two-week incidence to be 16% (WHO/UNICEF, 2010). Studies conducted in central, rural Uganda have revealed diarrhea to be one of the common causes of under-five mortality, accounting for approximately 8.4% to 27% of all deaths (USAID, 2010).

Diarrhoea is also responsible for 25% to 75% of all childhood diseases, and accounts for approximately 14% of outpatient visits and 16% hospital admissions in Uganda. In addition to excess mortality and morbidity, diarrhoea predisposes children to malnutrition, which makes them highly susceptible to other infections, and this has been found to be a major contributor to illness and death, particularly among children in Uganda. Behavioral factors associated with acute childhood diarrhoea include lack of hand-washing, poor infant and young child feeding practices, and lack of child immunizations. The objective of this study is to identify determinants of childhood diarrheal disease among children under-five in Kanyanda, Luwero District which can be modified to improve child health.

1.2 Statement of the problem

Diarrhea is one of the preventable form of morbidity and mortality especially among children below five years of age. Access to clean water, good sanitation and hygiene practices are the key in fighting diarrheal in a community. In Uganda, inspite of government effort through ministry of health to put in good preventive measures against diarrhea in children through giving sufficient essential child health care such as exclusive breast feeding, immunization, nutrition and growth monitoring and good sanitation as well as the launch of the integrated management of childhood illness (IMCI), every two weeks, one in four children in Uganda is affected by diarrhea (UDHS 2000/2001).

Diarrhea can easily treat at home or by health provider at primary care unit. But from the *Ssenyonga, 2009* found that Overall prevalence of diarrhoea in children aged 0 – 5 years was 23.8%. The prevalence varies across the country, the Northern and Eastern regions of the country had the highest prevalence of diarrhoea in children (29.3% and 26.9% respectively). Since the launch of the integrated management of childhood illness (IMCI), all the focus is on the treatment modality which include introduction of zinc tablets and other treatment modalities instead of looking into the preventive measures hence the diarrheal death still high as well as the prevalence of diarrhea among children.

If nothing is done to focus on preventive measure instead of curative ways, morbidity and mortality due to diarrhea will continued to affect more children in this area, this is because though most episodes of childhood diarrhoea are mild, acute cases can lead to significant fluid loss and dehydration, which may result in death or other severe consequences if fluids are not replaced at the first sign of diarrhea. No study on diarhhoea has been done in Kanyanda, Luwero district. It is therefore, important to find the factors that influence diarrheal diseases among under-five children in Kanyanda, Luwero District.

1.3 Objectives

1.3.1 Broad objective

To determine the factors influencing diarrheal diseases among under-five children in Kanyanda, Luwero District

1.3.2 Specific objectives

1. To establish the prevalence of diarrheal diseases among under-five children in Kanyanda, Luwero District
2. To identify the socio-economic factors that influence diarrheal diseases among under-five children in Kanyanda, Luwero District
3. To determine the environmental factors that influence diarrheal diseases among under-five children in Kanyanda, Luwero District

1.4 Research questions

1. What is the prevalence of diarrheal diseases among under-five children in Kanyanda, Luwero District?
2. What are the socio-economic factors that influence diarrheal diseases among under-five children in Kanyanda, Luwero District?
3. What are environmental factors that influence diarrheal diseases among under-five children in Kanyanda, Luwero District?

1.5 Significance of the Study/ Justification

This study will in a long run help the ministry of health, stakeholders and the general public in working towards preventive measure instead of focusing on curative measures as a say goes “prevention in better than cure” through provision of safe water, maintaining hygiene and health education

Diarrhea in a preventable illness. This research will therefore help to provide information and mobilized the community to improve on their sanitation

It is essential to motivate and create awareness in the community at an early stage itself therefore the study finding will be of use to explore these. This study finding would therefore help the policy makers on how to implement policy that would allow the people practice good hygiene and live a clean sanitation which prevent the route of transmission of diarrhea

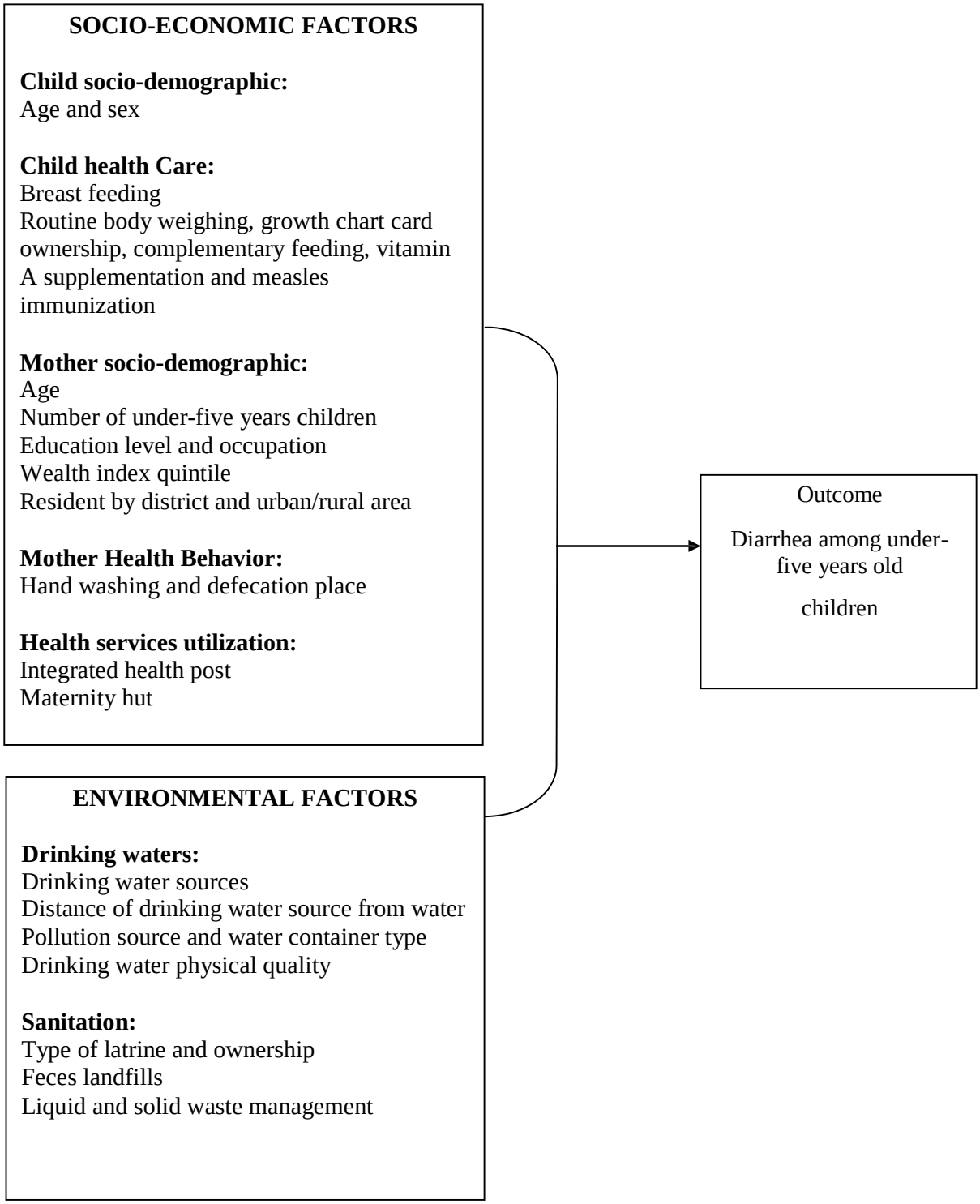
Proper hygiene is a self-directed behaviors and this study will find the present situation of practice related to hygiene. The outcome of research may help in program formulation for concerned people and organizations to make aware and incorporate community members in hygiene practice activity

The study finding will provide information to government and communities to build upon popular and effective measure to prevent diarrheal diseases among under-five children since they are the most affected.

The study finding will help in further research on related topics by providing literature

1.6 Conceptual framework

Figure 1: Conceptual framework



CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

The chapter presents the issues that have been explored and a detailed literature search has been conducted and the relevant literature review from books, articles, internet among others

2.1 Prevalence

Diarrheal diseases account for nearly 20% of deaths in children 0-4 years of age, with 49% of these deaths attributable to acute watery diarrhea. The child mortality rate in Ethiopia in 2007 was 199 per 1,000 births, and approximately one of every five deaths every year in Ethiopia is due to diarrhea disease (Rishi, 2010). Childhood mortality exceeds 14% during the first 5 years of life, and more than 50% of these recorded deaths are associated with diarrhea. In rural northeast Brazil 22/1000 children less than 1 year of age die of diarrhea1 diseases and attack rates of diarrhea are higher in urban poor than among rural poor. Children living in urban slums in northeastern Brazil describe rates of 14 to I6 diarrhea1 episodes per child per year (Siegel, 1996)

According to Prohmmo et al, (2006)in a study to determine factors associated with the incidence of childhood diarrhea and household management during the diarrhea episodes found that 63 of the 271 children (23.2%) developed diarrhea, and there were 79 episodes of diarrhea, lasting an average of 2 days, during the 3 months reference period. About 65% of the cases occurred in children under the age of 12 months.

Another study by Caruso et al, (2010) on maternal behavior and experience, care access, and agency as determinants of child diarrhea in Bolivia, using 2003 Bolivia Demographic and Health Survey to create indices of three maternal dimensions using principal components analysis: behavior and experience, access to care, and agency. total of 4 383 women who had children less than 5 years old were included in the final sample and 25.0% of mothers reported that their most recent born child had experienced an episode of diarrhea in the 2 weeks before the survey.

Similarly, Rishi, (2010) stated that diarrheal diseases account for nearly 20% of deaths in children 0-4 years of age, with 49% of these deaths attributable to acute watery diarrhea. The

child mortality rate in Ethiopia in 2007 was 199 per 1,000 births, and approximately one of every five deaths every year in Ethiopia is due to diarrhea disease.

In their study on community based cross-sectional study carried out in April 2013 to assess the prevalence and determinants of childhood diarrhea among graduated households in rural area of Shebedino district, Southern Ethiopia, using a multi -stage sampling to reach household and systematic random sampling technique was used to select 769 graduated households that had at least one under-five children. The study revealed that prevalence of childhood diarrhea was found to be 19.6 %, the study therefore concluded that the Prevalence of childhood diarrhea was high (Alemu et al., 2013).

According to Mekashaet et al, (2013) in a community based, cross-sectional study carried out to identify the determinants and describe the extent of diarrhoeal diseases among under-five children in urban Ethiopia, Six hundred and five children under the age of five years were selected by random sampling. There were 142 children with diarrheal diseases in selected households, incidence at diarrheal diseases was 5.48 episodes per child per year. The incidence of persistent diarrhoea was 7.75%. About 24.5% of the acute diarrheal diseases (ADD) culminated to persistent diarrhea. The study concluded that incidence of diarrheal diseases and the progression to persistent diarrhea are very high.

A community-based cross- sectional study by Mengistie et al, (2013) was conducted among 1456 randomly selected households with at least one child under 5 years of age using questionnaire and an observational check list were used for collecting information on socio-economic characteristics, environmental hygiene and behavioral practices, and occurrence of diarrhea among children under 5 years of age; The two-week prevalence of diarrhea among children under 5 years of age was 22.5%. Shikur et al, (2014) in his community based cross-sectional study conducted in Arba Minch District using structured questionnaire by trained data collectors to identify predictors of diarrhea, the prevalence of diarrhea among under-five children was found at 30.5%.

Teklemichael et al, (2014) on his community based cross-sectional study in 2012 at Sheko district using multi-stage sampling technique, 275 model and 550 non-model households that had at least one under-five children were selected, the study revealed two weeks diarrhoea

prevalence in under-five children among health extension model and non-model households were 6.4% and 25.5%, respectively.

A cross-sectional survey conducted by Diouf et al, (2014) among 551 rural households in northwestern Burundi to determine the prevalence of and factors associated with diarrhoea in children under five years of age which revealed that total of 903 children were enrolled. The overall diarrhoea prevalence was 32.6%, which was very high

An observational study Kijakazi et al, (2014) to determine the prevalence of diarrhea among under-fives and assess knowledge on causes of diarrhea among adults in Mkuranga district Tanzania. The prevalence of diarrhea in children below the age of five years as reported by heads of households was 6.1% and most affected were children in age groups 12 – 17 and 18 – 23 months (11.6% and 15.8% respectively). The rate of diarrhea incidence was 1 episode per 10 children per week. The mean duration of diarrhea illness was 1.7 days.

Ssenyonga et al, (2009)in his cross-sectional study using the 2000/2001 Uganda Demographic and Health Survey (UDHS) dataset using Information was derived from the women's questionnaire done on sampled mothers aged 15 – 49 years and with living children aged 0 – 5 years. The Overall prevalence of diarrhoea in children aged 0 – 5 years was 23.8%. The Northern and Eastern regions of the country had the highest prevalence of diarrhoea in children (29.3% and 26.9% respectively). According to results of the UDHS 2000/2001, every two weeks, one in four children in Uganda is affected by diarrhea.

2.2 Socio-Economic Factors

2.2.1 Age and gender of the child

A prospective cohort, community-based study by José et al, (2007) was performed in two peri-urban slums of Salvador, Brazil. Eighty four children younger than 40 months were randomly selected and visited every other day for one year. During the surveillance period, 232 diarrhea episodes were identified, resulting in an incidence rate of 2.8 episodes/child/year. In average (mean value of 84 children), each child suffered 11.1 days of diarrhea per year, yielding an average duration of 3.9 days per episode. The highest incidence rates were found among children under one year old. Early weaning, male sex, malnutrition, having a mother younger than 25 years or who considered her child malnourished, missed

immunizations and previous pneumonia were associated factors for suffering diarrheal episodes.

A Population-based cross-sectional survey by Amugsi et al, (2015) conducted among sample of 2,790 children aged 0-59 months, drawn from the Ghana Demographic and Health Surveys, The mothers reported whether their children under age 5 had been ill diarrhea with the presence of blood or mucus in the stool, in the 2 weeks preceding the survey, Children in the 6-11, 12-23, and 24-59 months age groups had, respectively, 3.48, 4.57, and 1.93 increased odds of getting diarrhoea infection compared to those in the youngest age category (0-5). Children who were not breastfeeding had higher odds of childhood diarrhoea compared to those who were breastfeeding. Compared to children who were living in households without co-wives, children who were living in households with co-wives had 1.74 increased odds of diarrhoea.

A cases study by Gebremariam et al, (2006) to determine diarrheal morbidity among young children in Eritrea; the effect of environmental and socio-economic factors using data from demographic and health survey showed that environmental and socio-economic condition of the populations were significant predictors of diarrheal morbidity, the study found important association of diarrheal morbidity with age and number of children; particularly with high prevalence of diarhhoeal at the age of weaning and households with large number of children.

A Cross-sectional study using the 2008/2009 Uganda Demographic and Health Survey (UDHS) dataset using Information was derived from the women's questionnaire done on sampled mothers aged 15 – 49 years and with living children aged 0 – 5 years. The study revealed that Independent determinants of diarrhoea were: age-group below two years, Northern and Eastern regions of residence, and children with history of fever in the two weeks preceding survey. Mother attaining secondary or higher level of education, covered well or borehole as source of drinking water, and duration of breastfeeding less than six months, were found protective factors. The factors concluded that Factors associated with increased diarrhea include: age-group one to two years, children living in Eastern and Northern parts of the country, and children who had fever within those two weeks. Factors associated with reduced diarrhoea incidence include: mother's education level higher than primary school, covered well or borehole as family source of drinking water, and duration of breastfeeding less than six months (Ssenyonga et al, 2009)

2.2.2 Breast feeding

Availability of safe water, reliable sewage disposal facilities, and good hand washing practices are essential in efforts to reduce diarrhea morbidity in developing countries, and are important for safe formula feeding or when exclusive breastfeeding with early weaning are practiced (Arvelo, 2010). During outbreak of diarrhea, children with diarrhea were significantly less likely than children without diarrhea to be breastfed before developing diarrhea (Arvelo, 2010). Another study by Rishi, (2010) found that Children who were breastfed and not completely weaned had half the risk of developing diarrhea than children who were not breastfed and not completely weaned. Further analysis revealed that children, aged 1-6 months, who were breastfed and not completely weaned, had a lower risk of acute diarrhea, with the same trend for children aged 13-24 months. However, children, aged 7-12 months, who were breastfed had a higher risk of diarrhea.

Breastfeeding is practiced almost universally in Indonesia, with 95% of under-five year old children having been breastfed for some period of time. However, only 44% of babies are put to the breast within one hour of birth (as recommended), and a total of 62% of babies have begun breastfeeding within the first day after birth. The overall median duration of breastfeeding is 22.3 months. But, exclusive breastfeeding is not widely practiced in Indonesia. Despite the government's recommendation that infants receive breast milk exclusively through the first 6 months of life, only 48% of infants under-two months of age are exclusively breastfed. At age 4 to 5 months, just 18% percent of infants are receiving breast milk only, without complementary foods. Overall, less than one in three infants under age 6 months (32%) was breastfed exclusively. This is lower than the level of exclusive breastfeeding reported in the 2002-2003 IDHS (40%). Male children, children of uneducated mothers and of mothers with secondary or higher education, and children in the highest wealth quintile have the lowest median duration of any breastfeeding, compared with other children (SCB, 2007).

A community based cross-sectional study by Alemu et al, (2013) carried out in April 2013 to assess the prevalence and determinants of childhood diarrhea among graduated households in rural area of Shebedino district, Southern Ethiopia, using a multi -stage sampling to reach household and systematic random sampling technique was used to select 769 graduated households that had at least one under-five children stated that having two or more under five

children, history of maternal diarrheal morbidity, mode of feeding by cup, and malnutrition were determinants of childhood diarrhea.

2.2.3 Routine child health monitoring

In general, the prevalence of under nutrition among under-five children in Banten Province is 14.1%, and is above the boundary condition is considered serious (10%). All children in the district in Banten province is in serious condition according to the nutritional status indicator weight /height with under nutrition prevalence above 10%. Even the two districts (Lebak and Tangerang City) prevalence above 15% (Health Research and Development Board, 2008).
A higher prevalence of diarrhea was identified in children aged over 6 months and in those who had no immunization or follow-up cards in Saudi Arabia (Ahmed et al., 2002). In Indonesia, basic immunization coverage (BCG, Polio 3, DPT 3, Hepatitis B 3 and Measles) in Banten Province is still low, complete immunization (26.1%), incomplete immunization (60.0%) and did not get immunization (13.9%), it was below the national target (80.5%). Lebak Regency is the area with the lowest basic immunization coverage in Banten Province with did not get immunization 23.8% (Health Research and Development Board, 2008).

The frequency weighting in the past 6 months of under-five children are grouped into weighed = 4 times, weighed 1-3 times and never weighed. Under-five children weighed in Banten province was 41.4 percent and who never weighed 21.9%. Growth chart card ownership is higher in families living in urban areas (28.7%) than in rural areas (15.1%). There is a tendency that growth chart card ownership higher in the age group 6-11 months (41.7%) and declined sharply in the older age group (Health Research and Development Board, 2008).

According toMekashaet al, (2013) lack of complete immunization, attack of measles and acute respiratory infections (ARI) in the previous two weeks were found to be significantly associated with occurrence of diarrhoeal disease; however, only ARI was retained in the logistic regression analysis.

A community based cross-sectional study in 2012 at Sheko district. It was stated that Micronutrient deficiency has serious consequences for childhood morbidity and mortality. Vitamin A is an essential micronutrient for the immune system. Severe vitamin A deficiency (VAD) can cause eye damage. VAD can also increase the severity of infections such as

measles and diarrheal diseases in children and can slow recovery from illness. Periodic dosing (usually every six months) of vitamin A supplements is one method of ensuring that children at risk do not develop VAD. Sufficient supply of vitamin A through diet or supplementation has an important role in preventing morbidity and mortality in children in developing countries (Glasziou P. P. and Mackerras., 2012)

Longi et al., (2007) carried out a research to find the mechanism of vitamin A on diarrhea prevention. Vitamin A supplementation can reduce diarrhea and respiratory infection maybe because of the effect of immune response regulation. There is interrelationships between the immune system and some micronutrients (vitamins A, E, B6 and B12, folic acid, Fe, Zn and Se). Optimization of micronutrient supply improves immune competence (Ströhle, A. and Hahn, A., 2009). Those vitamin and minerals have role in supporting the body's natural defense system and restoring resistance to infections by enhancing the three levels of immunity: epithelial barriers, immune cells and antibody. The immune system protects the body against pathogens and cancer cells, thereby protecting it against infections and diseases. Low levels of vitamins, minerals and trace elements may suppress immunity, predisposing individuals to infections, which in turn worsen the nutritional status, leading to a vicious cycle. Supplying the deficient micronutrients with the diet can re-establish immune function (Maggini. et. al., 2008).

2.2.4 Age of the mother

A study to determine risk factors for diarrhea, among 1,314 children from Guinea-Bissau by weekly diarrhea recall interviews, male sex, being weaned from breast milk, not being looked after by the mother, head of the household being <30 years old, eating cold leftovers, and drinking water from an unprotected public water supply were significantly associated with diarrhea. In breastfed children, only three variables were associated with diarrhea, including prior diarrhea, male sex, and not being looked after by the mother. Among weaned children, six variables delineated increased rates of diarrhea, including unprotected public water supply, eating of cold leftovers, and lack of maternal education. Major determinants of persistent diarrhea included weaning, lack of maternal education, and having pigs in the home. It is concluded that, in addition to the promotion of breastfeeding, important interventions against diarrhea include improvements in water supply, hygiene, and food handling. However, because of effect modification by breastfeeding, the largest effects of these interventions will probably be among weaned children (Kare Molbak et al, 2006).

Melo et al, (2008) stated that maternal socio demographic factors have been associated with the risk of diarrhea in children. Children with young mothers have increased incidence or prevalence of diarrhea. Although childhood mortality continues to decline slowly, or has leveled off in some groups, one in three births in Indonesia has an elevated mortality risk that is avoidable. These include births in which the mother is too young (under age 18) or too old (age 35 or older), the birth interval is too short (less than two years), or the mother has had too many prior births (three or more) (SCB, 2007).

Mother's age at birth can affect a child's chances of survival. It shows that neonatal mortality rates and infant mortality rates exhibit the expected U-shaped relationship with mother's age high for women in the young age groups, low for women in the middle age groups, and high for women in the older age groups. For example, the infant mortality rate for women under age 20 when they gave birth is 56 deaths per 1,000 live births. The rate decreases for women who gave birth at age 20-29 years and 30-39 (32 and 42 deaths per 1,000 live births, respectively), and then rises to 59 deaths per 1,000 live births for women who gave birth at age 40-49 years. The higher rates for younger and older women may be related to biological factors that lead to complications during pregnancy and delivery (SCB, 2007)

2.2.5 Number of under-five years children

A study by Mihrete et al, (2014) aimed at identifying determinant factors of diarrhea in under-five children in Benishangul Gumuz Regional State, western Ethiopia, a total of 925 under five children were selected. The study further explained that having more than two under five children, higher birth order and the age of children were found to be the risk factors for childhood diarrhea after adjusting for other variables.

2.2.6 Maternal education level and occupation

An observational case-control study conducted between at Bustamante Hospital for Children in Kingston where convenience sampling was used and data were collected by face-to-face interviews with two groups of caregivers of children under 5 years of age. The study stated that maternal education was significantly associated with diarrhea (Bachrach et al, 2012)

Olatunde et al, (2014) in a multilevel multinomial logistic regression analysis was applied to Demographic and Health Survey data conducted in 11 countries in sub-Saharan Africa. The

unit of analysis were the 12,988 caregivers of children who were reported to have had diarrhoea two weeks prior to the survey period revealed that indicated that higher level of education of both the caregiver and that of the partner, as well as caregivers occupation were associated with selection of medical centre, pharmacies and home care as compared to no treatment. In contrast, caregiver's partners' occupation was negatively associated with selection medical centre and home care for managing diarrhoea. In addition, a low-level of neighbourhood socio-economic disadvantage was significantly associated with selection of both medical centre and pharmacy stores and medicine vendors

A study by Mihrete et al, (2014) aimed at identifying determinant factors of diarrhea in under-five children in Benishangul Gumuz Regional State, western Ethiopia, a total of 925 under five children were selected. The study stated that mothers with primary education and above protected their children against diarrhea better than mothers with no education. The study further explained that low level of maternal education, having more than two under five children, higher birth order and the age of children were found to be the risk factors for childhood diarrhea after adjusting for other variables.

A community based cross-sectional study Shikur et al, (2014) was conducted in Arba Minch District using structured questionnaire by trained data collectors to identify predictors of diarrhea the negative binomial regression model was used to predict and control the effect of confounders. In the study the prevalence of diarrhea was high was was significantly associated with maternal education level, age of the child and personal hygiene practices. This study showed children whose mothers did not attend any formal education were 89% more likely to develop diarrhea compared to their counterparts. Similarly, children's being in age category 6-23 months and mothers' poor hand washing practice were found predictors of diarrhea. The study also showed that, out of 180 mothers whose child had got diarrhea, about 31% of mothers could not give anything to manage the diarrhea.

Prohmmo et al, 2006) study to determine which factors are associated with the incidence of child diarrhea and household management during the diarrhea episodes, a case study was carried out in 2 villages in Khonkaen province, Thailand, and mother's education seemed to have a positive association with the incidence of diarrhea. The appropriate preventive health behaviors of mothers appeared to have no influence on the incidence of diarrhea. Whether

households used rain water or other sources for drinking, the incidence of diarrhea in children was not different.

Education is a key determinant of the lifestyle and status an individual enjoys in a society. Studies have consistently shown that educational attainment has a strong effect on reproductive behavior, contraceptive use, fertility, infant and child mortality, morbidity, and attitudes and awareness related to family health and hygiene. Mother's educational attainment is inversely related to childhood mortality levels; children of less educated mothers generally have higher mortality rates than those born to more educated mothers. For instance, the infant mortality rate for children whose mothers had no education is 73 deaths per 1,000 live births, compared with 24 deaths per 1,000 live births for children whose mothers have secondary or higher education. Also it shows a wide gap in infant and childhood mortality rates between children whose mothers have the lowest and highest education levels (SCB, 2007).

2.2.7 Wealth index (Income level)

Another study Caruso et al, (2010) on maternal behavior and experience, care access, and agency as determinants of child diarrhea in Bolivia, using elected from the 2003 Bolivia Demographic and Health Survey to create indices of three maternal dimensions using principal components analysis: behavior and experience, access to care, and agency. Mothers with high levels of maternal agency or of high economic status were significantly less likely to report their child experienced an episode of diarrhea than women of low levels. Women with primary education were significantly more likely to report that their child experienced diarrhea than women with no education.

Teklemichael et al, 2014) in a multi-stage sampling technique study 275 model and 550 non-model households that had at least one under-five children were selected, the study revealed that level of diarrheal disease variation was well explained by maternal education, income, personal hygiene and the effect of health extension programme. The independent predictors of childhood diarrhoea revealed in the study were being mothers can't read and write, monthly family income earn less than 650 Birr, mothers hand washing not practice at critical time, not soap use for hand washing, and being non-model families for the health extension programme.

2.2.8 Resident by district and urban/rural area

A study examines the relative contribution of household, demographic and maternal characteristics to the incidence of diarrhea in young Kenyan children. Data from the Kenya Demographic and Health Survey 2008-09 was used with a total of 3838 women included in the study. The measure of diarrhea in children was derived from woman's questionnaire. The study revealed that residence of mother are more likely to influence childhood diarrhea (Mbugua et al, 2014)

2.2.9 Hand washing and defecation place

A hospital-based case-control study was carried out by Bui Viet Hung, 2006 where a case was defined as a child less than 5 years of age having three or more loose, liquid, or watery stools or at least one bloody loose stool within the last 24 hours. Accordingly, all cases admitted to Dong Anh Hospital between July and December 2005 which fulfilled the inclusion criteria were recruited into the study. Controls were non-diarrheal patients matched for sex and age. Face-to-face interviews based on the questionnaire were conducted with mothers on the day of admission, a total of 600 study subjects, including 200 cases and 400 controls, were recruited into the study. Cases were mostly children less than 24 months of age. The number of boys was higher than girls in nearly all age groups; factors that independently associated with the diarrhea included the child having sibling(s); irregular latrine cleaning; latrine-sharing among more than 5 people; irregular hand washing by mothers after going to toilet); no hand washing by mothers before feeding children; unsafe storage of food for later use; irregular kitchen cleaning; and infrequent cleaning/emptying of storage container before refilling it with fresh water.

A study carried out by Oloruntoba et al, (2014) to determine the hygiene and sanitation risk factors predisposing U-5C to diarrhoea in Ibadan, Nigeria. Two hundred and twenty pairs of children, matched on age, were recruited as cases and controls over a period of 5 months in Ibadan using, the study found that diarrhea was significantly higher among children whose mothers did not wash hands with soap before food preparation, before feeding their children and after leaving the toilet. Factors significantly associated with diarrhoea were: poor water handling, presence of clogged drainage near the house and breeding places for flies. The mean risk score among cases and controls from the sanitary inspection of drinking water

sources were 5.4 and 3.2) and household storage containers were 2.4 and 1.2 ($p<0.05$) respectively

Many diseases are easily transmitted through contaminated foods or from hand to mouth. Hand washing minimizes the transmission of both enteric (fecal) and respiratory pathogens. In the 2007 IDHS, respondents were asked whether they washed their hands before preparing meals for their family. The women reported that they washed their hands before preparing the meal for their family the last time 97%. There are almost no variations in hand washing practices by background characteristics (SCB, 2007).

Black, (2008) stated that household conditions, individual status, age, education level of fathers and parents' habit of hand washing before taking care of the child were major factors affecting the incidence of diarrhea. Hand washing after contact with feces and before contact with food can reduce rates of diarrhea among the under-fives by 42–47%. Factors found to be crudely associated ($p<0.05$ significance) with the occurrence of any hand washing activity after mother or child defecation were mother's ethnicity, mother's education, income of the household's highest earner, knowledge of the key times for hand washing, awareness of the benefits of vitamin A, disgust sensitivity, the child care index, where defecation occurred, and percentage of time the mother spent with the infant (Scott, 2007). The parents who did not report washing their own hands after using the toilet or latrine were more likely to develop diarrhea than children of parents who did report washing their own hands. It is well known that hand washing interventions plus provision of soap can reduce the incidence of diarrhea by up to 53% in developing world settings (Arvelo, 2010).

2.2.10 Integrated health post

Integrated health post is the health services include child growth monitoring, immunizations, management and treatment of diarrhea and other childhood diseases, information, education and communication on family planning, and treatment of illnesses. The information on the child includes birth weight, monthly weight, and type and dates of immunizations. Finally, information about the child's immunizations is recorded in a registration book maintained by the field administrator of vaccines. Even though most mothers are aware of the importance of keeping the health card/book at home for their records, to be able to monitor their child's growth and keep track of immunizations, not all keep these documents for their records. Furthermore, not all infants receive postnatal care and therefore not all have a health card.

Overall, 51% of children 12-23 months were fully immunized. Sixty-seven percent of children age 12-23 months received immunization against measles and 11% children 12-23 months did not receive any vaccinations at all (SCB, 2007).

2.3 Environmental Factors

2.3.1 Drinking water sources and water uses

A baseline survey was carried out in July 2006 by Masangwi et al, 2008) on diarrhoea risks, water sources and use, sanitation and hygiene practices were investigated as a Scotland Chikwawa Health Initiative (SCHI), the findings showed that children from households that use private taps were less likely to have suffered diarrhoea than those that use public taps. Those where each member uses own basin or running water on a taps for washing hands were less likely to have suffered diarrhoea than those that use cups to pour water from containers.

A study by Kamal, et al, (2011) aimed at estimating the incidence of preventable infectious diseases or associated symptoms among young children in Bangladesh and also determine the factors affecting, a total of 7550 children aged below 5 years during the survey from mothers aged between 12 and 49 years are the participants of the study. In general, younger children were more likely to suffer from multiple health conditions than their older counterparts. Children belonging to households classified as poor or middle faced greater risk of illness than those from well-off households. A combination of source and treatment practices of drinking water showed a significant impact on incidence of childhood morbidity. Children from households using untreated non-piped water were 85.8% more likely to suffer from comorbidity than those who treat their piped drinking water. However, we observed that water treatment alone has no impact unless the water itself was sourced from a pipe.

A cross-sectional survey was conducted among 551 rural households in northwestern Burundi to determine the prevalence of and factors associated with diarrhoea in children under five years of age in rural Burundi, Diarrhoea was associated with factors such as the mother’s age being less than 25 and the conviction that diarrhoea could not be prevented.. Forty-six per cent of households collected drinking water from improved water sources and only 3% had access to improved sanitation. The study found a lower prevalence of diarrhoea in children whose primary caretakers received hygiene education (17.9%), boiled water prior to its utilisation (19.4%). (Diouf et al, 2014).

A Community based, cross-sectional study carried out by Mekashaet al, (2013) to identify the determinants and describe the extent of diarrhoeal diseases among under-five children in urban Ethiopia, Six hundred and five children under the age of five years were selected by random sampling. Well source of water were found to be significantly associated with occurrence of diarrhoeal disease; however, well water were retained in the logistic regression analysis. Many of the socio-environmental factors did not appear as significant determinants independently.

2.3.2 Pollution source and water container type

According to Arvelo, 2010) households that stored water in containers with a narrow nozzle were less likely to develop diarrhea than households that stored water in containers with wide nozzles and the children who developed diarrhea were more likely to have lived in households that stored drinking water. Wide-mouth buckets, which are easily contaminated by hands or utensils, were the most commonly reported storage vessel for household drinking water.

A study Kwasi et al., (2005) on childhood diarrheal morbidity in the Accra Metropolitan Area, Ghana: socio-economic, environmental and behavioral risk determinants. The results indicate that the household economic status of the mother are significant determinants of diarrhea. There is a significant association between diarrhea morbidity and access to water and sanitation facilities, hygiene practices, flies infestation and the regular consumption of street food. Integrated child health intervention programs including provision of facilities, maternal hygiene education and environmental health awareness have to be strongly implemented in order to reduce the high incidence of childhood diarrhea.

2.3.3 Drinking water physical quality

A study by Komarulzaman et al, (2014) to examine the effects of drinking water and sanitation facilities on diarrhoea incidence among children under five, while controlling for risk factors at household and community level using nationally representative data from two waves (2007 and 2012) of the Indonesian Demographic and Health Survey. Interactions were studied between the water and sanitation variables and other risk factors to assess the role of the context and the findings found that piped water, child age and sex, household wealth, living in an urban area, environmental hygiene, health status and health facilities to be negatively associated with diarrhoea incidence. Water treatment, and mother's education were not significantly associated with diarrhoea. An interaction analysis showed that the

protective effects of piped water and sanitation are more important when conditions within the communities are poor.

Studies have shown that unsafe water, sanitation and hygiene remain major causes of mortality and morbidity in the world through infectious disease with estimated deaths of about 1.7million per annum. Nine out of ten deaths are amongst children and almost all are in developing countries. In the poorest countries and neighborhoods, unsanitary living conditions account for at least half of the total burden of ill health. The water and sanitation-related health burden for children under the age of five in Africa, for instance, is up to 240 times higher than that of high-income nations (Noreen, 2002). The physical characteristics of the dwelling in which a household lives are important determinants of the health status of household members, especially children (SCB, 2007).

A study by Akungah et al, (2010) to quantify the burden of childhood diarrhea morbidity and mortality of the under five children in Nairobi city using household data and hospital records. The results a revealed that the microbiological quality of water in ISLI and HDLI residential environs was generally poor due to poor water handling practices and poor sanitary conditions within the surroundings. Overall, household water storage showed a significantly higher contamination (33.2%) than household tap water supplies (4.7%).These factors influence a higher childhood diarrhea burden observed in this study for diarrhea the study identified a distinct pattern of childhood morbidity. The diarrhea patterns observed emphasized the role of socioeconomic, educational, water supply and sanitation factors on diarrhea morbidity and mortality in Nairobi study area. Some of the most important factors that contributed to diarrhea morbidity were parental education, household water consumption rates household income and access to sanitation facilities

2.3.4 Type of latrine, ownership and disposal of human waste

A baseline survey was carried out in July 2006 by Masangwi et al, 2008) on diarrhoea risks, water sources and use, sanitation and hygiene practices were investigated as a Scotland Chikwawa Health Initiative (SCHI), the findings showed that children from households with no toilet facilities were more likely to have suffered from diarrhoea than those who own such facilities. Another study by Teklemichael et al, 2014) employed multi-stage sampling technique to select 275 model and 550 non-model households that had at least one under-five children, the study revealed that level of diarrheal disease variation was well explained by

maternal education, income, personal hygiene, waste disposal system and the effect of health extension programme. The independent predictors of childhood diarrhoea revealed in the study improper refuse disposal and being non-model families for the health extension programme.

A community based unmatched case-control study supplemented with Focus Group Discussions (FGDs) was employed in rural kebeles (neighborhoods) of the district. The study revealed that the occurrence of diarrhoea was significantly associated with lack of latrine ownership, lack of home-based water treatment, lack of improved water sources and consumption of left-over food.

A study by Mihrete et al, (2014) aimed at identifying determinant factors of diarrhea in under-five children in Benishangul Gumuz Regional State, western Ethiopia, a total of 925 under five children were selected. The study stated that under poor environmental conditions, absence of toilet facility, improper child stool disposal methods was found to be the risk factors for childhood diarrhea. When toilet facility was stratified by maternal education, it showed that children of mothers who had no education were the most vulnerable in the absence of toilet facilities (Mihrete et al, 2014).

More than half the population in the province of Banten (67.4%) claimed to defecate in the toilet. However, if observed by district/city, the variations in the rates are quite striking. Percentage of people who behave good bowel habit highest in Tangerang City (98.4%) and Cilegon (84.0%), it showed that almost 100% of the population already have a latrine, while the lowest percentage is in Lebak (41.5%). Correct behavior in hand washing, generally still less owned by residents of the province of Banten. Only 24% of the population has hand washing correctly (Health Research and Development Board, 2008).

2.3.5 Liquid and solid waste management

According to Mengistie et al, (2013) improper refuse disposal practices, lack of hand washing facilities, living in rural area, the presence of two or more siblings in a household, and age of the child were the major risk factors for diarrhea. This study also demonstrated that diarrhea morbidity was relatively high among children under 5 years of age residing in Eastern Ethiopia.

Water consumption per person per day in the Banten province is 50.3% more than 100 liters (optimal access). When compared between districts/cities, the highest percentage of people with access optimal water consumption is the Tangerang city (68.3%) and Cilegon (60.8%), (Health Research and Development Board, 2008).Beside the availability of clean water, availability of toilets is also greatly affect waterborne disease. Households without proper toilet facilities are more exposed to the risk of diseases like dysentery, diarrhea, and typhoid fever (SCB, 2007).

The proper disposal of children's stool is extremely important in preventing the spread of diseases. If feces are left uncontained, diseases may spread by direct contact or through animal contact. From the IDHS 2007data, show that 71% mothers of children under-five years old dispose of their youngest child's stools safely (that is, children use a toilet or latrine, the stools are rinsed into the toilet or latrine, the stools are buried, or disposable or washable diapers are used). Mothers report that one in four children always use a toilet or latrine, three in ten have their stools thrown into a toilet or latrine, and 8% report throwing or burying their children's stools in the yard. Twelve percent of mothers throw their children's stools outside their dwelling, 4% rinse them away, and 11% of mothers leave the stools in the open. Mothers with secondary or higher education are much more likely to dispose of their children's stools safely (86%) than mothers with no education (48%) (SCB, 2007).

Similarly, mothers in the highest wealth quintile are much more likely to dispose of their children's stools safely (93%) than mothers in the lowest wealth quintile (47%). Access to a private toilet facility increases the likelihood that a child's stools are disposed of safely; about nine in ten children living in households with a private toilet facility with a septic tank have their stools disposed of safely compare with only about three in ten children in a household without a toilet facility (SCB, 2007).

2.3.6 Housing condition

The type of flooring material in the dwelling can be considered as both an economic indicator and a health indicator for household. Some floor materials like dirt or earthen floor pose health problems for the household because they are the natural environment of pests such as insects and parasites, and may be a source of dust. This kind of flooring is also more difficult to keep clean. In Indonesia, 13 percent of households have an earthen floor. Almost half of households (48 percent) live in dwellings with a concrete, brick, or tile floor, while 13

percent have a wooden floor. There are substantial urban-rural differentials by type of floor material. Whereas 50 percent of urban households have a concrete, brick, or tile floor, the proportion in rural areas is 46 percent. Conversely, 18 percent of rural households have an earthen floor, compared with 5 percent in urban areas (SCB, 2007).

A descriptive study by Supraptini, (2009) on relationship between sanitation and diarrhea stated that Percentage of families that stay in a healthy house is one of the indicators in Indonesian National Development Program. Some studies show the relationship between housing conditions with health. Residential density (in-house overcrowding) would increase risk and severity environment based diseases, especially home environment. From the results of research in Kali Anyar West Jakarta conducted by Jes Clauson-Kaas, et al in 1993-1994, showing a correlation between residential density with the incident diarrhea and acute respiratory infection in children under 3 years. Households with no latrine 60% and which has a toilet meet requirement is 49%. Distance of water drink source with a septic tank is 61% which eligible.

A cross sectional study stated that Residential density (in-house over-crowding) is obtained by dividing the number of household members with floor area in square meters house. Calculation results are categorized according to criteria ministry of health guidance about the healthy house, that is eligible if = 8m2/capita (not over-crowding) and are not eligible if <8m2/capita (over-crowding). There are still 10.7% of households with home earthen floor and 19.9% with in-house over- crowding. The highest percentage of earthen floor houses more than the provincial average are in Pandeglang (21.3%), followed by Serang (13.3%) and Tangerang district (10.8%).The districts with higher in-house over-crowding percentage than the provincial average are Tangerang city (27.1%), Pandeglang (23.4%) and Tangerang district (21.1%), (Health Research and Development Board, 2008).

In conclusion Prevention of diarrheal disease should be everybody's responsibility in the community if the burden disease is to be minimized. Attempts to improve on sanitation management in Uganda have focused on the technical aspects such as the procurement of safe water sources, the immunization of children. In spite of these interventions, the problem of the diarrheal disease still persists in Kanyanda village. This has also resulted into, infant mortality, and stagnant growth in children and family income constraints due to loss of time for work, comorbidities and high expenditure on health, and increased health care sector

expenditure. The factors behind this high episode of diarrheal diseases yet unknown. There is therefore need to study the factors that influence childhood diarrheal diseases among under-five children which prompts the researcher to carry out this study.

CHAPTER THREE: METHODOLOGY

3.0 Introduction

This chapter describes the methodology that was used in the study, this include the study design, study setting, study population, inclusion and exclusion criteria, sample size estimation, variables, data collection technique, data management and analysis, quality control and ethical considerations are described in this chapter.

3.1 Study design

This was a cross sectional study. This design was chosen because data on diarrheal diseases among under-five children was collected at one point in time during the study period and due to the fact that the design is cost effective. This study design has also been reported to be the most suitable for describing associations between variables and therefore informs decisions for further research.

3.2 Study site/area

This study was carried out at Kanyanda village, Kanyanda Parish, Luwero District, Central Uganda. Kanyandais located is approximately 40 km north from Ugandan capital Kampala. The place is located 9km southwest of Luwero town. The area is chosen because it is one of the village with very poor sanitation and high reported cases of malaria in the district according to Luwero district health report, 2014. The area is dominated by the Buganda tribe and the main activities are farming, small scale business among others.

3.3 Sources of data

3.3.1 Primary data

The primary source of data for this study was the information collected from care takers of children below five years of age in Kanyanda, Luwero District.

3.3.2 Secondary data sources

The information was got from textbooks, periodicals, internet, diarrhoeal disease related articles and news coupled with childhood diarrhoeal disease cases and treatment among other sources

3.4 Population

3.4.1 Target population
This study targets all care takers of under-five children in Luwero district

3.4.2 Accessible population
The accessible population included all the care takers of under-five children in Kanyanda, Luwero district.

3.4.3 Study population
This study included care takers of under-five children in Kanyanda who met the eligibility criteria in the inclusion criteria and consented to take part in the study.

3.6 Selection criteria

3.6. 1 Inclusion criteria
The following were included in the study;

All adults, age 18 years and above care takers of under-five children in Kanyanda, Luwero district who consented to participant in the study.

3.6.2 Exclusion criteria
The following were excluded from the study

Care takers of under-five children in Kanyanda who were very sick

Care takers of under-five children in Kanyanda who were mentally unfit will not be enrolled in the study.

Care takers of children who were not be around during the time of data collection will be excluded from the study

3.5 Sample size calculation
Sample size was estimated using the Kish and Leisley formula of 1965 for descriptive studies sample size calculation.

$N= (Z^2pq) /d^2)$

Where;

N represents number of respondents required for the study

Z is the value corresponding to 95% confidence interval or risk level (1.96)

P = Overall prevalence of diarrhoea in children aged 0 – 5 years was 23.8% (Ssenyonga et al, 2009) will be used

d=the study accommodated an error of 5% (0.05)

Calculation

N= (1.96 x1.96 x 0.23.8 x (1-0.23.8)/ (0.05 x 0.05)

N= 279 study participants (care takers).

3.7 Sampling procedure

This study employed convenient sampling methods where every caretakers of children below five years in who will be available and consented to the study were recruited until the required sample sized is attained.

3.8 Study variables

3.8. 1 Dependent variables

Dependent variable in this study was prevalence of childhood diarrhoeal among under-five children in Kanyanda, Luwero district.

3.8.2 Independent variables

3.8.2.1 Socio-Economic Factors

Child socio-economic factors

- Age and sex of the child
- Breast feeding
- Routine body weighing, growth chart card ownership, complementary feeding, vitamin A supplementation and measles immunization

Mother socio-economic factors

- Age of the mother
- Number of under-five years children
- Education level and occupation
- Wealth index
- Resident by district and urban/rural area
- Hand washing and defecation place
- Integrated health post

3.8.2.2 Environmental Factors

- Drinking water sources
- Distance of drinking water source from water
- Pollution source and water container type
- Drinking water physical quality

- Type of latrine and ownership
- landfills disposal of human waste
- Liquid and solid waste management

3.9 Data collection techniques

Data was collected by an administered in depth interview with care takers of under-five children in Kanyanda using a questionnaires. The questionnaires were translated to Luganda orally while being administered and it collected information on factors that influence diarrheal diseases among under-five children. Research assistants were trained to help in administration of the questions.

3.10 Data collection tools

The research instrument was the questionnaires which was used and it can be applied on many respondents at shortest period of time. The questions were both closed and open ended in English language. The questionnaires was pretested in Bulamba village, Luwero district to improve the quality and minimize information bias and each questionnaire measured both the dependent and independent variables. Questions generated information on factors associated with prevalence of childhood diarrheal disease among children under five years

3.11 Data management

After the interview, questionnaires were checked for completeness, questionnaires were kept in a secure place where only the researcher and the supervisor had access to them. The questionnaires were checked after being filled by the research assistant to ensure that there is no question left unanswered and then kept under lock and key.

3.12 Plan for data analysis

Data was coded to increase accuracy, data was entered and analysed using SPSS version 17. Descriptive summary statistic such as percentage was computed. Frequency counts, tables and graphs were used to summarize the data in a manner the yielded answers to research questions. Uni-variate analysis was used for the frequency, Bi-variate analysis was used to find out the association between the dependent and independent variables and multi-variate analysis was explained the detailed association between variables.

3.13 Quality control

Quantitative data using structured questionnaires was translated orally into Luganda to facilitate communication. The questionnaires was piloted in Bulamba village Luwero district to improve clarity of the questions. Research assistant was well trained. Data quality was ensured by giving identification number and code to help in data entry and checking.

3.14 Ethical consideration

A letter of introduction was acquired from the research and ethical committee of international Health Sciences University which was presented to authority of Kanyanda village. Then a permission to conduct the study was acquired. Informed consent was obtained from participants and their participation was entirely voluntary. Participants had the right to decline to participate and this would not affect them in any way. The participants also had the right to withdraw from the study at any time or to withdraw any statement provided before data is analysed and to decline to response to any questions they will not wish to answer. The information collected will be kept confidential, only code numbers appeared on the questionnaires, respondent's identification did not appear on the questionnaires to maintain anonymity of the respondents giving out data and study documents were kept in secure location only accessible to the main investigator and the supervisor.

3.15 Limitation of the study

The researcher anticipates the following problems;

Many people declined to take part claiming to be busy or because of fear of stigmatization since diarrhea is attached to poor hygiene and sanitation this was overcome by choosing appropriate time according to guide by the local leaders on which time is the best.

The study findings depended on the respondents answer whether they are wrong or right. This was be overcome by requesting the respondents to be as honest as possible during the answering the questions

3.16 Plan for dissemination

The study finding was presented to International Health sciences University School faculty of Nursing, as partial fulfillment for the award of the degree of Science in Nursing for future reference. The information from the study was also be disseminated to the policy makers and the implementers.

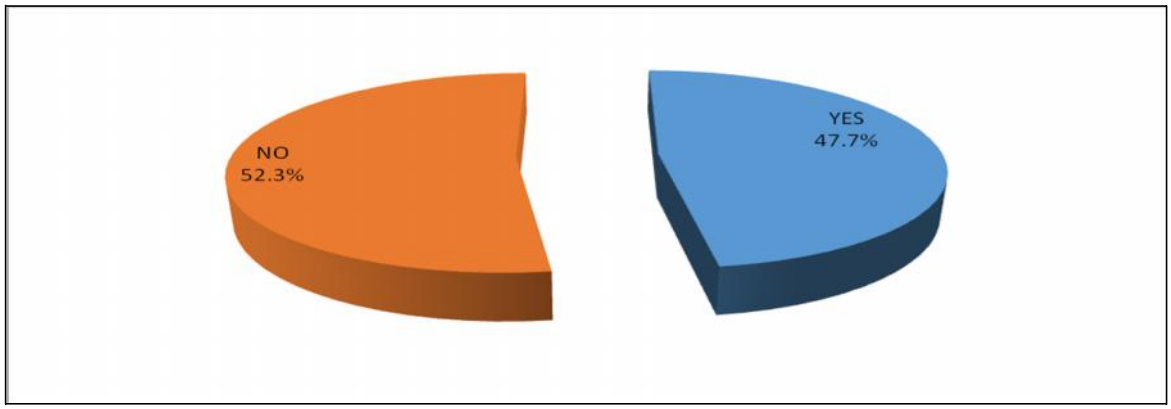
CHAPTER FOUR: RESULTS

4.0 Introduction

A total of 279 mothers/caretakers were interviewed during the period of data collection. The results of the study are presented according to the study objectives. Results from Uni-variate, Bi-variate and Multi-variate analysis are presented in text, tables and figures. For most findings tables have been used in the presentation of the gathered information.

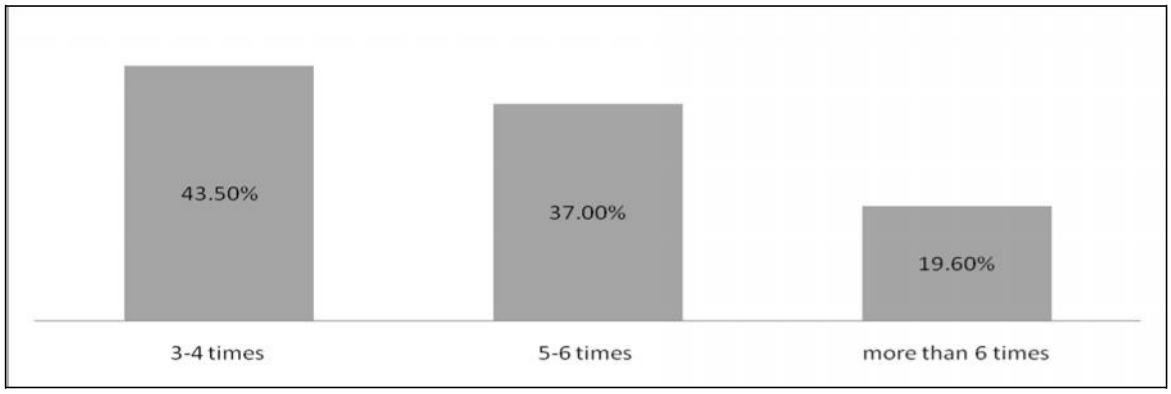
4.1 The prevalence of childhood diarrhea

Figure 2: The prevalence of childhood diarrhea among children below five years in Kanyanda village



From the figure above, it is indicated that 47.7% (133/279) of the children whose care takers were studied had episode of diarrhea in the last 7 days.

Figure 3: The number of episode of the diarrhea in children



The figure indicates that among those who had diarrhea episode within the last 7 days, most of the children 43.5% had 3-4 episode per day, while 37% had 5-6 episode and 19.6% episodes in the last 7 days.

4.2 Socio economic factors

4.2.1 Child socio-demographic factors

Table 1: The socio-demographic characteristic of the children

VARAIBLES	FREQUENCY N=279	PERCENTAGE, %
Gender of the child		
Male	160	57.6
Female	119	42.4
Age of the child?		
0-5months	100	35.8
6-11months	63	22.6
12-23months	76	27.2
24months and above	40	14.3
Birth order of the child		
1st born	126	45.2
2nd born	95	34.1
3rd born	58	20.8
Place where the child was born		
Health facility	148	73.1
Home	75	26.9
Duration of breast feeding		
< 5months	78	28.0
5-11 months	76	27.2
12-23 months	65	23.3
>=24 months	60	21.5
Nutritional status		
Normal	163	58.4
Undernourished	116	41.6
Is the child immunized against immunizable diseases?		
Yes	116	41.6
No	163	58.4
At what age was complementary feeding started? (if applies)	160	57.3
<6 months	119	42.7
>6months		
What is the current methods of feeding?		
Bottles	171	61.3
Cup	108	38.7
Is the child still breastfeeding?		
Yes	136	48.7
No	143	51.3

Most of the children 57.6% were male compared to 42.4%. Majority of the children 35.8% were in the age group of 0-5 months. Most of the children 45.2% were first born. Majority of the children 73.1% were delivered from health facility. Regarding breastfeeding, most of the children 28% were breastfed for less than 5 months. 58.4% of the children had normal nutrition using MUAC tape. On immunization, only 41.6% of the children have been immunized against measles. Most of the children 57.3% were initiated on complementary feed below 6 months. Most of the children 61.3% used bottle feeding. Most of the respondents 51.3% were not breastfeeding.

4.3 Bi-Variate

Table 2: The socio-demographic characteristic of the child associated with diarrhea

VARAIBLES	**DIARHHEA**		**X^2**	**P-VALUE**
	YES (%) N=133	**NO (%) N=146**		
Gender of the child			9.846	.002
Male	89(66.9%)	70(48.3%)		
Female	44(33.1%)	75(51.7%)		
Age of the child?			20.879	.000
0-5months	60(45.1%)	40(27.4%)		
6-11months	18(13.5%)	45(30.8%)		
12-23months	30(22.6%)	46(31.5%)		
24months and above	25(18.8%)	15(10.3%)		
Birth order of the child			29.179	.000
1st born	76(57.1%)	50(34.2%)		
2nd born	24(18.0%)	71(48.6%)		
3rd born	33(24.8%)	25(17.1%)		
Place where was child born				.006
Health facility	59(44.4%)	89(61.0%)	7.698	
Home	74(55.6%)	57(39.0%)		
Duration of breast feeding			91.576	.000
< 5months	63(47.4%)	15(10.3%)		
5-11 months	5(3.8%)	71(48.6%)		
12-23 months	40(30.1%)	25(17.1%)		
>=24 months	25(18.8%)	35(24.0%)		
Nutritional status			37.854	.000
Normal	103(77.4%)	60(41.1%)		
Undernourished	30(22.6%)	86(58.9%)		
Is the child immunized against immunizable diseases			30.487	.000
Yes	78(58.6%)	38(26.0%)		
No	55(41.4%)	108(74.0%)		
At what age was complementary feeding started? (if applies)			2.311	.128
<6 months	70(52.6%)	90(61.6%)		
>6months	63(47.4%)	56(38.4%)		
What is the current methods of feeding?			2.546	.111
Bottles	88(66.2%)	83(56.8%)		
Cup	88(66.2%)	63943.2%)		
Is the child still breastfeeding?			23.393	.000
Yes	85(63.9%)	51(34.9%)		
No	48(36.1%)	95(65.1%)		

At bi-variate analysis, gender of the child (X2=9.846, p=0.002), age of the child (X2=20.879, p=0.000), child's birth order (X2=29.179, p=0.000, delivery place (X2=7.698, p=0.006), duration of breastfeeding (X2=91.576, p=0.000), nutritional status (X^2=37.854, p=0.000), measles immunization status (X^2=30.487, p=0.000) and the current breastfeeding status (X^2=23.393, p=0.000) were the child's characteristics that were significant associated with diarrhea diseases while the other child's factors had no significant association with the occurrence of diarrhea

4.4 Maternal socio-demographic factors

Table 3: Maternal socio-demographic characteristics

Variables	**Frequency, N=279**	**Percentage, %**
How old is the mother/care takers		
18-24	95	34.1
25-34	65	23.3
35-44	54	19.4
>44	65	23.3
How many children are there in a family?		
2	134	48.0
3	78	28.0
4 and above	67	24.0
Religion		
Catholic	114	40.6
Anglican	60	21.6
Muslim	25	9.0
SDA	35	12.6
Pentecost	45	16.2
What is the education level of the mother/care taker?		
Primary	115	41.2
Secondary	85	30.5
Tertiary	79	28.3
Employment status		
Employed	42	15.1
Un-employed	137	49.1
Self-employed	100	35.8
What is your average monthly income?		
Less than 50,000Ugshs	135	48.4
Between 50,000Ugshs-100,000Ugshs	103	36.9
More than 100,000Ugshs	41	14.7
Do you wash your hands after visiting the toilet, before eating or breastfeeding?		
Yes	110	39.4
No	169	60.6
What do you use to wash the hands?		
With water only	176	63.1
Soap and substitutes	103	36.9
Do you cover your food after preparing it?		
Yes	124	44.4
No	155	55.6
Does the child eat left over food?		
Yes	175	62.7
No	104	37.3

Most of the caretakers 34.1% were in the age group of 18-24 years. Most of the respondents had 2 children compared to 28% who had 3 children. Regarding religion, the dominant religion was Catholics at 40.6%. On education attained, most of the respondents 41.2% had attained primary education. Most of the respondents 49.1% were unemployed (housewife) compared to only 15.1% who were employed. On the average monthly income, most of the respondents 48.4% had average monthly income of less than 50,000Ugshs. Only 39.4% of the caretakers washed their hands after visiting the toilet, before eating or breastfeeding. Majority of the respondents 63.1% washed hands with water only at any one time. Less than half of the respondents 44.4% covered their food after preparing it and finally, 62.7% of the care takers reported that their children ate left over food.

Table 4: The maternal factors and childhood diarrhea

VARAIBLES	DIARHHEA		X^2	P-VALUE
	YES (%) N=133	NO (%) N=146		
How old is the mother/care takers			45.564	.000
18-24	50(37.6%)	45(30.8%)		
25-34	23(17.3%)	42(28.8%)		
35-44	10(7.5%)	44(30.1%)		
>44	50(37.6%)	15(10.3%)		
How many children are there in a family?			35.834	.000
2	87(65.4%)	47(32.2%)		
3	18(13.5%)	60(41.1%)		
4	28(21.1%)	39(26.7%)		
Religion			1.46	.285
Catholic	78(58.6%)	35(24.1%)		
Anglican	5(3.8%)	55(37.9%)		
Muslim	5(3.8%)	20(13.8%)		
SDA	0(0.0%)	35(24.1%)		
Pentecost	45(33.8%)	0(0.0%)		
What is the education level of the mother/care taker?			58.496	.000
Primary				
Secondary	78(58.6%)	37(25.3%)		
Tertiary	45(33.8%)	40(27.4%)		
	10(7.5%)	69(47.3%)		
Employment status			7.401	.025
Employed	27(20.3%)	15(10.3%)		
Un-employed	56(42.1%)	81(55.5%)		
Self-employed	50(37.6%)	50(34.2%)		
What is your average monthly income?			67.821	.000
Less than 50,000Ugshs	67(50.4%)	68(46.6%)		
Between 50,000Ugshs-100,000Ugshs	25(18.8%)	78(53.4%)		
More than 100,000Ugshs	41(30.8%)	0(0.0%)		
Do you wash your hands after visiting the toilet, before eating or breastfeeding?			18.557	.000
Yes	70(52.6%)	40(27.4%)		
No	63(47.4%)	106(72.6%)		
What do you use to wash the hands?			.001	.980
With water only	84(63.2%)	92(63.0%)		
Soap and substitutes	49(36.8%)	54(37.0%)		
Do you cover your food after preparing it?			70.832	.000
Yes	94(70.7%)	30(20.5%)		
No	39(29.3%)	116(79.5%)		
Do the child eat left over food?			46.734	.000
Yes	111(83.5%)	64(43.8%)		
No	22(16.5%)	82(56.2%)		

At bivariate analysis, maternal factors of age (X^2=45.564, p=0.000), number of children (X^2=35.834, p=0.000), educational level (X^2=58.496, p=0.000), average monthly income (X^2=67.821, p=0.000), hand washing (X^2=18.557, p=0.000), covering food after preparing (X^2=70.832, p=0.000) and eating leftovers by children (X^2=46.734, p=0.000) were significantly associated with childhood diarrhea diseases while the other maternal factors were found to have no association with childhood diarrhea diseases

4.5 Environmental factors

Table 5: The environmental factors of the respondents

VARIABLES	FREQUENCY, N=279	PERCENTAGE, %
What is the source of your water?		
Well	92	33.0
Spring	65	23.3
Boreholes	83	29.7
Tap	39	14.0
What type of toilet do you have?		
Flash toilet		
Pit latrine	30	10.8
VIP	30	10.8
Bucket latrine	60	21.5
Public toilet	75	26.9
No facility	84	30.1
What is the floor of your house made of?		
Mud	137	49.1
Cements	142	50.9
Where is child faecal matter disposal off?		
Latrine/toilet	174	62.4
Not in the latrine/toilet	105	37.6
Where do adults defecate?		
Open defecation	68	24.4
Latrine/toilet	211	75.6
Where do dispose of your domestic waste?		
In the compound	95	34.1
In the field	184	65.9
Are there flies in the kitchen when you are prepare food		
Yes	120	43.0
No	159	57.0
How do you manage wastewater?		
In a drainage	138	49.5
Pour outside	141	50.5
Do you have domestic animals near the house?		
Yes	176	63.1
No	103	36.9
What measures can be put in place to reduce the occurrence of diarrheal disease		
Improve sanitation	86	30.8
Sensitize the community on diarrhea	43	13.4
Mother should immunize their children	28	10.0
Government should bring tap water or drill boreholes	80	28.7
Hand washing should be encourage	42	15.1

The majority of the respondents 33% the main source of water was from well, most of the respondents 30.1% had no facility for human waste disposal. Less than half of the respondents 49.1% lived in houses made of mud floor, 62.4% of the respondents reported that they dispose off the children fecal matter in latrine/toilet. Majority of the respondents 65.9% dispose off their domestic in the field. 24.4% of the respondents reported that adults still practiced open defecation. Only 34.1% of the respondents reported having flies in their kitchen. On water waste management, 50.5% said they poured the water waste outside the

house. And 63.1% of the respondents said they had domestic animals near their house. Most of the respondents 30.8% suggested improve sanitation by members would reduce diarrheal diseases.

4.6 Bi-Variate Analysis

Table 6: The environmental factors associated with childhood diarrhea diseases

VARIABLES	Diarrhea		X^2	P-value
	Yes (%) N=133	No (%) N=146		
What is the source of your water?			1.015	.250
Well	71(53.4%)	21(14.4%)		
Spring	28(21.1%)	37(25.3%)		
Boreholes	5(3.8%)	78(53.4%)		
Tap	29(21.8%)	10(6.8%)		
What type of toilet do you have?			24.829	.000
Flash toilet	5(3.8%)	25(17.1%)		
Pit latrine	20(15.0%)	10(6.8%)		
VIP	20(15.0%)	40(27.4%)		
Bucket latrine	40(30.1%)	35(24.0%)		
Public toilet	48(36.1%)	36(24.7%)		
No facility	23(12.3%)	0(0.0%)		
What is the floor of your house made of?			11.770	.001
Mud	51(38.3%)	86(58.9%)		
Cements	82(61.7%)	60(41.1%)		
Where is child faecal matter disposal off?			1.498	.221
Latrine/toilet	78(58.6%)	96(65.8%)		
Not in the latrine/toilet	55(41.4%)	50(34.2%)		
Where do adults defecate?			6.979	.008
Open defecation	61(45.9%)	90(61.6%)		
Latrine/toilet	72(54.1%)	56(38.4%)		
Where do dispose of your domestic waste?			14.952	.000
In the compound	30(22.6%)	65(44.5%)		
In the field	103(77.4%)	81(55.5%)		
Are there flies in the kitchen when you are prepare food			3.946	.047
Yes	49(36.8%)	71(48.6%)		
No	84(63.2%)	75(51.4%)		
How do you manage wastewater?			1.567	.200
In a drainage	118(88.7%)	20(13.7%)		
Pour outside	15(11.3%)	126(86.3%)		
Do you have domestic animals near the house?			6.294	.012
Yes	94(70.7%)	82(56.2%)		
No	39(29.3%)	64(43.8%)		
What measures can be put in place to reduce the occurrence of diarrheal disease			1.638	.427
Improve sanitation	45 (33.8%)	41 (28.1%)		
Sensitize the community on diarrhea	24(18.1%)	19(13.0%)		
Mother should immunize their children	16(12.0%)	12(9.0%)		
Government should bring tap water or drill boreholes	34(25.6%)	46(34.6%)		
Hand washing should be encourage	14(10.5%)	28(21.1%)		

The environmental factors of types of toilets (X^2=24.892, p=0.000), material which the floor is made off (X^2=11.770, p=0.001), place of adult defecation (X^2=6.979, p=0.008), domestic

waste disposal (X^2=14.952, p=0.000), presence of flies in the kitchen (X^2=3.946, p=0.047) and presence of domestic animals near the house (X^2=6.294, p=0.012) were statistically significant with childhood diarrhea diseases at bi-variate analysis.

4.7 Factors That Influence Childhood Diarrhea

Table 7a: Factors associated with childhood diarrheal diseases

VARIABLES	OR	95% CI	P-VALUE
Age of the child?			.000
0-5m	1.87	1.02-7.73	
6-11m	4.64	1.22-10.33	
12-23m	3.05	1.63-16.62	
24 and above	1.00	Reference	
Place where was child born			.044
Health facility	0.74	0.02-1.92	
Home	1.00	Reference	
Duration of breast feeding			.000
< 5months	4.97	1.73-6.76	
5-11 months	2.33	0.42-7.66	
12-23 months	1.28	0.42-4.76	
>=24 months	1.0	Reference	
Is the child immunized against immunizable disease?			.000
Yes	0.28	0.04-2.76	
No	1.0	Reference	
Is the child still breastfeeding?			.002
Yes	0.30	0.14-0.54	
No	1.0	Reference	
Age of the mother/care taker			.000
18-24	2.12	1.07-16.53	
25-34	3.51	1.00-6.92	
35-44	2.84	0.02-17.23	
>44	1	Reference	
How many children are there in a family?			.030
2	0.47	0.34-0.65	
3	1.32	1.03-4.82	
4	1.0	Reference	
What is the education level of the mother/care taker?			.000
No formal education	6.73	1.21-11.58	
Primary	3.37	0.12-9.99	
Secondary	1.91	0.01-1.32	
Tertiary	1.0	Reference	
Employment status			.002
Employed	2.53	0.42-9.66	
Un-employed	4.28	0.42-7.76	
Self-employed	1.0	Reference	

Table 7b: Factors associated with childhood diarrheal diseases

Do you wash your hands after visiting the toilet, before eating or breastfeeding?			.037
Yes	0.60	0.05-19.21	
No	1.0	Reference	
What type of toilet do you have?			.000
Flash toilet	0.59	0.07-2.20	
Pit latrine	0.86	0.09-3.12	
VIP	0.72	0.15-10.62	
Bucket latrine	4.02	2.77-7.99	
Public toilet	2.66	1.41-9.11	
No facility	1.0	Reference	
Where do adults defecate?			.000
Open defecation	6.00	2.84-8.54	
Latrine/toilet	1.0	Reference	
Are there flies in the kitchen when you are preparing food			.000
Yes	3.90	1.20-6.70	
No	1.0	Reference	
Do you have domestic animals near the house?			.045
Yes	3.00	1.83-8.09	
No	1.0	Reference	

The final model was constructed using forward stepwise logistic regression. Variables with a significant association in the analysis ($p<0.05$) and those related to the objectives of the study such as;

Child age was significantly associated with cases of childhood diarrhea diseases; age group of 6-11 months were 4 times more likely to have diarrhea cases (OR=4.64), age group of 12-23 months were 3 times more likely to develop diarrhea (OR=3.05)compare those were 24 months and above.

Place of delivery was significantly associated with cases of childhood diarrhea diseases; those children delivered from the health facility were less likely to develop diarrhea cases (OR=0.74).

Duration of breastfeeding significantly associated with cases of childhood diarrhea diseases; children who breastfed only for 5 months were almost 5 times more likely to develop diarrhea cases (OR=4.97), those who breastfed for 5-11 months were two times more likely to develop diarrhea (OR=2.33) compared to those who breastfed for more at least 24 months.

Immunization status significantly associated with cases of childhood diarrhea diseases; children immunized against immunizable diseases were less likely to develop diarrhea (OR=0.28).

Still breastfeeding significantly associated with cases of childhood diarrhea diseases; children who were still breastfeeding were less likely to develop diarrhea (OR=0.30) compared to those who had stopped breastfeeding.

Age of the mother also significantly associated with cases of childhood diarrhea diseases; age group of 18-24 years had children who were 2 times more likely to diarrhea (OR=2.12), age group of 25-34 years had children who were 3 times more likely to develop diarrhea (OR+3.51) and those who mothers were 35-44 years were two times more likely to develop diarrhea (2.84) compared to those who were more than 44 years.

Number of children in the family significantly associated with cases of childhood diarrhea diseases; having one children was protective to diarrhea cases (OR=0.47) compared to the family with more than one children.

Maternal education level significantly associated with cases of childhood diarrhea diseases; child with mother with no formal education were 6 times more likely to develop diarrhea (OR=6.73), those whose mother had attained primary education were 3 times more likely to develop diarrhea (OR=3.37) and those whose mothers had attained secondary education were almost two times more likely to develop diarrhea (OR=1.91) compared to those who mothers had attained tertiary education.

Maternal employment status significantly associated with cases of childhood diarrhea diseases; children whose mother were employed were 2 times more likely to develop diarrhea (OR=2.53) and those who mothers were unemployed were four times more likely to develop diarrhea (OR=4.28) compared to those whose caretakers were self-employed.

Hand washing significantly associated with cases of childhood diarrhea diseases; those mothers/caretakers who washed their hands after visiting the toilets, before eating or breastfeeding were less likely to have diarrhea cases compared to those whose care takers did not wash their hands.

Type of toilets significantly associated with cases of childhood diarrhea diseases; having flash toilets, pit latrine, and VIP were less likely to have diarrhea cases with odd ratio of 0.59, 0.86 and 0.72 respectively, having bucket toilets was 4times more likely associated with

cases of diarrhea (OR=4.02) and having public toilet was 2 times more likely to be associated with cases of diarrhea (OR=2.66) compared to those who have no facility.

Adult defecation practices significantly associated with cases of childhood diarrhea diseases; open adult defecation was 6 times more to be associated with childhood diarrhea cases (OR=6.00) compared to where adult defecate in the latrine.

Presence of flies in the kitchen significantly associated with cases of childhood diarrhea diseases; children whose caretakers reported having flies in the kitchen were almost 4 times more likely develop diarrhea (3.90) compared to those who mothers reported no flies in the kitchens.

And finally, domestic animals near the house was also found have significant association with cases of childhood diarrhea diseases; those who had domestic animals s near their house were three times more likely to develop diarrhea cases (OR=3.00)

CHAPTER FIVE: DISCUSSION

5.0 Introduction

This chapter discusses the research findings in relation to the problem statement, literature review of studies conducted elsewhere with and in line with the specific study objectives. It also explains the obtained results from the study.

5.1 The prevalence of diarrheal diseases among under-five children in Kanyanda, Luwero District

The prevalence of childhood diarrhea was high at 47.7%. This could probably be because of the poor sanitation in the area. This is in line with Mengistie et al, (2013) which stated that the prevalence of diarrhea among under-five children was found at 30.5%. This implies that children below five years have high prevalence of diarrhea. Similarly, two-week prevalence of diarrhea among children under 5 years of age was 22.5%. Shikur et al, (2014). However, Ssenyonga et al, (2009) disagree with this finding when they found that Overall prevalence of diarrhea in children aged 0 – 5 years was 23.8%. The difference could be because of the difference in the study designs whereas this study is a simple cross sectional study, while Ssenyonga et al, (2009) was a national survey.

The study indicated that most of the children who had diarrhea had 3-4 episode of diarrhea per day. This is in line with study by Mekashaet et al, (2013) which found that incidence of diarrheal diseases was 5.48 episodes per child per year.

5.2 The socio-economic factors that influence diarrheal diseases among under-five children in Kanyanda, Luwero District

The study found that Child age was significantly associated with cases of childhood diarrhea diseases; age group of 6-11 months were 4 times more likely to have diarrhea cases (OR=4.64), age group of 12-23 months were 3 times more likely to develop diarrhea (OR=3.05)compare those were 24 months and above. This is in agreement with a above done by José et al, (2007) which reported that highest incidence rates were found among children under one year old. Similarly, Amugsi et al, (2015) stated that Children in the 6-11, 12-23, and 24-59 month's age groups had, respectively, 3.48, 4.57, and 1.93 increased odds of getting diarrhoea infection compared to those in the youngest age category (0-5).

The study also found that Duration of breastfeeding significantly associated with cases of childhood diarrhea diseases; children who breastfed only for 5 months were almost 5 times

more likely to develop diarrhea cases (OR=4.97), those who breastfed for 5-11 months were two times more likely to develop diarrhea (OR=2.33) compared to those who breastfed for more at least 24 months. This is in line with José et al, (2007) which reported that Children who were not breastfeeding had higher odds of childhood diarrhoea compared to those who were breastfeeding. Similarly, Ssenyonga et al, (2009) stated that duration of breastfeeding less than six months was highly associated with diarrhea incidence.

The study also indicated that currently breastfeeding was significantly associated with cases of childhood diarrhea diseases; children who were still breastfeeding were less likely to develop diarrhea (OR=0.30) compared to those who had stopped breastfeeding. This is in line with Rishi, (2010) who found that Children who were breastfed and not completely weaned had half the risk of developing diarrhea than children who were not breastfed and not completely weaned. Further analysis revealed that children, aged 1-6 months, who were breastfed and not completely weaned, had a lower risk of acute diarrhea, with the same trend for children aged 13-24 months. However, children, aged 7-12 months, who were breastfed had a higher risk of diarrhea.

The study revealed that number of children in the family was significantly associated with childhood diarrhea diseases; having one children was protective to diarrhea cases (OR=o.47) compared to the family with more than one children. Gebremariam et al, (2006) which found that number of children was particularly associated with high prevalence of diarrheal in households with large number of children. Another study was found to have be in agreement with this study findings when it's stated that having two or more under five children, history of maternal diarrheal morbidity, and mode of feeding by cup, and malnutrition were determinants of childhood diarrhea. Alemu et al, (2013)

The study further found that immunization status significantly associated with cases of childhood diarrhea diseases; children immunized against immunizable diseases were less likely to develop diarrhea (OR=0.28). This is line with Mekashaet al, (2013) which reported that lack of complete immunization, attack of measles and acute respiratory infections (ARI) in the previous two weeks were found to be significantly associated with occurrence of diarrhoeal disease

The study found that Age of the mother also significantly associated with cases of childhood diarrhea diseases; age group of 18-24 years had children who were 2 times more likely to

diarrhea (OR=2.12), age group of 25-34 years had children who were 3 times more likely to develop diarrhea (OR=3.51) and those who mothers were 35-44 years were two times more likely to develop diarrhea (2.84) compared to those who were more than 44 years. This is in line with Melo et al, (2008) who reported that Children with young mothers have increased incidence or prevalence of diarrhea, these include births in which the mother is too young (under age 18) or too old (age 35 or older).

The study found that Maternal education level was significantly associated with cases of childhood diarrhea diseases; child with mother with no formal education were 6 times more likely to develop diarrhea (OR=6.73), those whose mother had attained primary education were 3 times more likely to develop diarrhea (OR=3.37) and those whose mothers had attained secondary education were almost two times more likely to develop diarrhea (OR=1.91) compared to those who mothers had attained tertiary education. This is in line with Kare Molbak et al, (2006) which stated that lack of maternal education was one of the major determinant of persistent diarrhea among children. This could be because educated mothers or care giver is more informed about hygiene practices that reduces the chances of diarrhea. Bachrach et al, (2012) concurs with this findings when he said maternal education was significantly associated with diarrhea, this is because Education is a key determinant of the lifestyle and status an individual enjoys in a society. Studies have consistently shown that educational attainment has a strong effect on reproductive behavior, contraceptive use, fertility, infant and child mortality, morbidity, and attitudes and awareness related to family health and hygiene. Mother's educational attainment is inversely related to childhood mortality levels; children of less educated mothers generally have higher mortality rates than those born to more educated mothers.

The study also found that Maternal employment status was significantly associated with cases of childhood diarrhea diseases; children whose mother were employed were 2 times more likely to develop diarrhea (OR=2.53) and those who mothers were unemployed were four times more likely to develop diarrhea (OR=4.28) compared to those whose caretakers were self-employed. This is in agreement with Olatunde et al, (2014) which stated that higher level of education of both the caregiver and that of the partner, as well as caregiver's occupation were associated with selection of medical Centre, pharmacies and home care as compared to no treatment. In contrast, caregiver's partners' occupation was negatively associated with selection medical Centre and home care for managing diarrhea.

The study found that Hand washing significantly associated with cases of childhood diarrhea diseases; those mothers/caretakers who washed their hands after visiting the toilets, before eating or breastfeeding. This is in line with Shikur et al, (2014) which stated that personal hygiene practices and mothers' poor hand washing practice were found predictors of diarrhea. Similarly, Bui Viet Hung, (2006) also stated that hand washing by mothers after going to toilet); no hand washing by mothers before feeding children were independently associated with the diarrhea.

The study found no significant association between income level and diarrhea diseases. This is inconsistent with study by Caruso et al, (2010) which stated that Mothers with high levels of maternal agency or of high economic status were significantly less likely to report their child experienced an episode of diarrhea than women of low levels Caruso et al, (2010) used principal components analysis whereas this study used logistic regression.

The study found no significant association between nutritional status and occurrence of diarrhea diseases. This was not in line with study by Glasziou P. P. and Mackerras D. E. M., 2012) who stated that VAD can also increase the severity of infections such as measles and diarrheal diseases in children and can slow recovery from illness. This difference could be because of the difference in the immunization rate in the two study settings, there could be a lower immunization rate including vitamin A compared to this study where there is high immunization rate.

5.3 Environmental factors that influence diarrheal diseases among under-five children in Kanyanda, Luwero District

The study found that the type of toilets significantly associated with cases of childhood diarrhea diseases; having flash toilets, pit latrine, and VIP were less likely to have diarrhea cases with odd ratio of 0.59, 0.86 and 0.72 respectively, having bucket toilets was 4times more likely associated with cases of diarrhea (OR=4.02) and having public toilet was 2 times more likely to be associated with cases of diarrhea (OR=2.66) compared to those who have no facility. Adult defecation practices significantly associated with cases of childhood diarrhea diseases; open adult defecation was 6 times more to be associated with childhood diarrhea cases (OR=6.00) compared to where adult defecate in the latrine. This is in line with Bui Viet Hung, (2006) which stated that latrine-sharing among more than 5 people was independently associated with the diarrhea. Masangwi et al, (2008) also concur with this

study when they stated that the independent predictors of childhood diarrhoea revealed in the study improper refuse disposal and being non-model families for the health extension programme. Similarly, Mihrete et al, (2014) revealed that the occurrence of diarrhoea was significantly associated with lack of latrine ownership, lack of home-based water treatment, lack of improved water sources and consumption of left-over food.

The study revealed that having domestic animals near the house was also found have significant association with cases of childhood diarrhea diseases; those who had domestic animals near their house were three times more likely to develop diarrhea cases (OR=3.00). This is line with Kare Molbak et al, (2006) who stated that having pigs in the home was one of the major determinant of persistent diarrhea among children.

The study found no association between where the child feces is disposed off and occurrence of diarrhea. This is contrary to Statistic Center Board, (2007) which stated that proper disposal of children's stool is extremely important in preventing the spread of diseases. If feces are left uncontained, diseases may spread by direct contact or through animal contact, this because diarrhea is fecal oral route transmission, hence poor disposal of children stools can easily transmit the infection.

The study also found that Presence of flies in the kitchen significantly associated with cases of childhood diarrhea diseases; children whose caretakers reported having flies in the kitchen were almost 4 times more likely develop diarrhea (3.90) compared to those who mothers reported no flies in the kitchens. This is in line with Oloruntoba et al, (2014) who indicated that presence of clogged drainage near the house and breeding places for flies was one of the factors which was significantly associated with diarrhoea.

The study found no significant association between the sources of water and diarrhea episode in children. This is contrary with Masangwi et al, (2008) the findings showed that children from households that use private taps were less likely to have suffered diarrhoea than those that use public taps. Those whose member used own basin or running water on a taps for washing hands were less likely to have suffered diarrhoea than those that use cups to pour water from containers. This could probably be because very limited number of the family used tap water.

The study also found no significant association between diarrhea and domestic ad water waste management. This is in disagreement with Mengistie et al, (2013) which stated that improper refuse disposal practices, lack of hand washing facilities, living in rural area, the presence of two or more siblings in a household, and age of the child were the major risk factors for diarrhea

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This chapter deals with the brief summary of the steps taken in the study, conclusions, study findings and implications to District management and recommendations.

6.1 Conclusion

Generally, the prevalence of childhood diarrhea diseases was high at 47.7% among under five children.

6.1.1 Socio-demographic factor

Child age;; age group of 6-11 months , age group of 12-23 months were positively associated with diarrhea diseases.

Place of delivery; children delivered from the health facility were less likely to develop diarrhea cases

Duration of breastfeeding; breastfeeding only for 5 months, and 5-11 months were positively associated with diarrhea diseases

Measles immunization; immunized against measles had protective effect on diarrhea diseases

Still breastfeeding; children who were still breastfeeding were less likely to develop diarrhea.

Maternal Age; young maternal age was a positive predictors of childhood diarrhea.

Number of children; having more children in the household had a positive influence of childhood diarrhea

Maternal education level; low maternal education was independently influencing childhood diarrhea in children

Maternal Hand washing practices; proper hand washing after visiting toilet and before eating or breastfeeding was found to lesser the diarrheal cases among children

6.1.2 Environmental factor

Type of toilets; having toilet was found to have a protective effects against diarrhea in children

Adult defecation practices; open defecation was positively associated with diarrheal cases

Presence of flies; having flies in the kitchen was found to influence diarrheal diseases in children

Domestic animals near the house; presence of domestic animals near the house had a positive influence on diarrheal cases

6.2 Recommendations

From the findings of the study, we therefore recommend the following;

Efforts to improve personal and domestic hygiene including campaigns to promote the appropriate use of soap by the community member themselves and the leaders as well.

Efforts to improve weaning practices by the health workers and the mothers

Evaluations of improved food and water handling and storage methods and practices and

Immunization programs for cholera and other enteric pathogens when new, effective vaccines become available by the ministry of health and other health related stakeholders.

There should be Interventions to increase the availability and use of safe water supplies by the government and the community

Studies of local practices and perceptions of diarrhea in order to devise strategies to interrupt transmission should be done by ministry of health

The present study indicates that there is an urgent need for effective intervention measures to curtail the incidence of diarrhea among children, health intervention programs, including proper child feeding to enhance children's physiological resistance against diseases, household and community level environmental health awareness, and maternal hygiene education should be implemented in order to reduce the incidence of diarrhea by the health ministry.

The study also recommends that more research should be carried out on childhood diarrheal diseases and related topics that would help in more intervention to curb the vice among children below five years by different scholars.

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APPENDIX I: CONSENT FORM

FACTORS THAT INFLUENCE CHILDHOOD DIARRHOEAL DISEASES AMONG UNDER-FIVE CHINDEN IN KANYANDA, LUWERO DISTRICT

You are invited to participate in a research study investigating factors that influence diarrheal diseases among under-five children in Kanyanda, Luwero District. The purpose of the study is to determine the factors that influence diarrheal diseases among under-five children in Kanyanda, Luwero District.

This study is being conducted by **Namutebi Lydia Kakungulu** who is student of International Health Sciences University. You have been selected because you are a care taker of an under-five child residing in Kanyanda.

Procedure:

You are requested to answer the question attached to this consent form by ticking the box corresponding to the appropriate answer. This will take approximately 20 minutes to complete.

Risks and Benefits of the study

There are no known risks involved in participating in this study.

Confidentiality

Any information in connection with this study that can be identified with you will remain confidential and will be disclosed only with your permission. In any written report or publication, no one will be identified or identifiable and only aggregate data will be presented.

Voluntary nature of study

Your decision whether or not to participate will not affect your staying in this area and will not stop you from your daily activities. If you decide to participate, you are free to withdraw at any time before your data is de-identified.

Contact and questions:

The researcher in this study is **Namutebi Lydia Kakungulu**. You may ask questions you have at this time. If you have questions later, you may contact **0700574612 orlkagungulu2015@gmail.com**

I……..…….give my consent to/ for then researcher to use the data collected for presentation of the research. (Please write yes or no and initials) ….You are making a decision whether or not to participate. Your signature indicates that you have read the information provided above and have decided to participate. You may withdraw at any time before the information is de-identified without prejudice after signing this form should you choose to discontinue participation in this study.

APPENDIX II: QUESTIONNAIRE

PART ONE: SOCIO-ECONOMIC FACTORS

Child socio-demographic

1. Gender of the child
   a. Male [ ]
   b. Female [ ]
2. Age of the child?
   a. 0-5m b.
   6-11m c.
   12-23m
   d. 24 and above
3. Birth order of the child
   a. 1st born [ ]
   b. 2nd born [ ]
   c. 3rd born [ ]
   d. Others (specify).....
4. Place where was child born
   a. Health facility
   b. Home
5. Duration of breast feeding
   a. < 5months
   b. 5-11 months
   c. 12-23 months
   d. >=24 months
6. Nutritional status
   a. Normal
   b. Undernourished
7. Is the child immunized against immunizable diseases?
   a. Yes
   b. No
8. At what age was complementary feeding started? (If applies)
   a. <6 months

b. >6months

9. What is the current methods of feeding?

a. Bottles

b. Cup

10. Is the child still breastfeeding?

a. Yes

b. No

11. Has the child had any diarrheal episode in the last 7 days?

a. Yes

b. No

If yes, on average how many episode per day? ……..

Mother socio-demographic

12. How old is the mother/care taker? ……

13. How many children are there in a family?

a. 2 [ ]

b. 3 [ ]

c. 4 [ ]

d. 5 [ ]

e. Others (specify).....

14. Religion

a. Catholic [ ]

b. Anglican [ ]

c. Muslim [ ]

d. SDA [ ]

e. Pentecost [ ]

15. What is the education level of the mother/care taker?

a. Primary [ ]

b. Secondary [ ]

c. Tertiary [ ]

16. Employment status

a. Employed [ ]

b. Un-employed [ ]

c. Self-employed [ ]

d. Others (specify).....

17. What is your average monthly income?
    a. Less than 50,000Ugshs [ ]
    b. Between 50,000Ugshs-100,000Ugshs [ ]
    c. More than 100,000Ugshs [ ]
18. Do you wash your hands after visiting the toilet, before eating or breastfeeding?
    a. Yes
    b. No

19. What do you use to wash the hands?
    a. With water only
    b. Soap and substitutes
20. Do you cover your food after preparing it?
    a. Yes
    b. No
21. Do the child eat left over food?
    a. Yes
    b. No

PART TWO: ENVIRONMENTAL FACTORS

22. What is the source of your water? DIARRHOEAL
    a. Well
    b. Spring
    c. Boreholes
    d. Tap
    e. Other
23. What type of toilet do you have?
    a. Flash toilet
    b. Pit latrine
    c. VIP
    d. Bucket latrine
    e. Public toilet
    f. No facility
24. What is the floor of your house made of?
    a. Mud
    b. Cements

25. Where is child faecal matter disposal off?
    a. Latrine/toilet
    b. Not in the latrine/toilet
26. Where do adults defecate?
    a. Open defecation
    b. Latrine/toilet
27. Where do you dispose of your domestic waste?
    a. In the compound
    b. In the field
    c. Store and transfer to pit
28. Are there flies in the kitchen when you prepared food?
    a. Yes
    b. No
29. How do you manage waste water?
    a. In a drainage
    b. Pour outside
30. Do you have domestic animals near the house?
    a. Yes
    b. No
31. What measures can be put in place to reduce the occurrence of diarrheal diseases?

…….

…….

…….

Thanks you for the time

APPENDIX III: INTRODUCTORY LETTER AND CORRESPONDENCE

IHSU INTERNATIONAL HEALTH SCIENCES UNIVERSITY
sanitas per scientiam

making a difference in health care

Office of the Dean, School of Nursing

Kampala, 7th October 2016

THE CHAIRMAN
KANYANDA VILLAGE
MAKULUBITA Sub County
LUWERO DISTRICT

Dear Sir/Madam,

RE: ASSISTANCE FOR RESEARCH

Greetings from International Health Sciences University.

This is to introduce to you **Namutebi Lydia,** Reg. No. **2013-BNS-TU-056** who is a student of our University. As part of the requirements for the award of a Bachelors degree in Nursing of our University, the student is required to carry out research in partial fulfillment of her award.

Her topic of research is: **Factors that influence childhood diarrhoea diseases among under five children in Kanyanda, Luwero District**

This therefore is to kindly request you to render the student assistance as may be necessary for her research.

I, and indeed the entire University are grateful in advance for all assistance that will be accorded to our student.

Sincerely Yours,

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