PREVALENCE AND FACTORS ASSOCIATED WITH DIARRHOEAL CASES AMONG UNDER- FIVE CHILDREN IN KALINGALINGA, LUSAKA DISTRICT.

BY

MPHATSO MALOLA

DEBORA   SHAWA

MAGRET   BANDA

MELINDA NCHIMUNYA MULEMBE

SUPERVISOR: MR. SIMOONGA

A research report submitted to the Chreso University in partial fulfilment of the requirements of a Degree in Bachelor of Science in Nursing.

Chreso University

2024

DECLARATION

We ,**Mphatso Malola** , **Debora Shawa, Magret Banda and Melinda . N. Mulembe** do hereby declare that this dissertation represents our own work and that it has never been submitted by anyone else at Chreso University or at any other University for the purpose of acquiring a degree or any other qualification.

Sign: ………………

Date: ………………

ACRONYMS

CBOH – Central Board of Health

HIV – Human Immune Virus

IMCI – Integrated Management Childhood Illnesses

MDGS 4 – Millennium Development Goals number 4

SSA – South Asia and Sub-Saharan Africa

UNICEF – United Nations Children Education fund

WHO – World Health Organisation

ZDHS – Zambia Demographic Health Survey

TABLE OF CONTENTS

Abstract

This study investigates the prevalence and contributing factors of diarrheal cases among under-five children in the Kalingalinga settlement of Lusaka District, Zambia. Diarrhea remains a leading cause of morbidity and mortality in this vulnerable age group, particularly in resource-limited settings. A cross-sectional survey was conducted involving 300 households, with data collected through structured interviews and medical records. The study found a high prevalence of diarrhea, affecting approximately 35% of under-five children within the past three months.

The analysis identified several key factors associated with increased risk of diarrhea. Poor sanitation and inadequate access to clean water were significant contributors, with 60% of households lacking reliable sanitation facilities and 45% using unsafe drinking water sources. Malnutrition was another critical factor, with 30% of children classified as underweight, exacerbating susceptibility to diarrheal diseases. Socioeconomic factors also played a role; families with lower incomes and limited access to healthcare services experienced higher rates of diarrhea. Additionally, a lack of awareness regarding proper hygiene practices, such as handwashing and safe food handling, was prevalent among caregivers.

The findings highlight the urgent need for interventions targeting improved water and sanitation infrastructure, nutritional support, and health education. Enhanced access to healthcare services and community-based hygiene promotion are essential to reduce the burden of diarrheal diseases in Kalingalinga. Addressing these factors comprehensively can significantly improve health outcomes for under-five children in this area and contribute to broader efforts to combat childhood diarrhea in similar settings.

CHAPTER ONE

1.1 BACKGROUND

The World Health Organization (WHO, 2005) defines diarrhea as "the passage of three or more loose or liquid stools per day or more frequent passage than is normal for the individual". Diarrhea is the second leading cause of death in under five-year-old children and is responsible for killing around 525 000 children annually (WHO, 2017). Childhood diarrhea affecting children five years old and below accounts for approximately 63% of diarrhea burden and is the second significant cause of infant mortality in developing nations, where poor sanitation and insufficient potable water are lacking (WHO, 2017).

In developing countries, it has been estimated that 1.8 million people die annually due to diarrheal diseases and more than 80% of them are children aged under-five years (Hodge et al, 2016). Diarrhea is responsible for the death of more than 90% of under-five years of age in low and lower-middle income countries, and regionally, South Asia and sub-Saharan Africa (SSA) accounted for 88% of deaths for the same age group (UNICEF, 2019).

Children with diarrhea will face many problems including loss of appetite, electrolyte deficit, malnutrition, increased risk of developing other infectious diseases and delayed physical growth and mental development (WHO, 2015).

Inadequate quantities and quality of drinking water and lack of sanitation facilities cause the death of millions of the world's poorest people through diarrheal diseases each year (Bartlett, 2018). Furthermore, studies revealed that age of child (Danny et al, 2016), maternal education (Hajara et al, 2017), lack of awareness of mothers/caregivers (Tambe et al, 2016), lower socio-economic status (Escobar et al, 2016), distance and source of drinking water (Hussien et al, 2013), latrine and hand washing facilities (Dagnew et al, 2019], breast feeding (Fetensa et al, 2020), place of residence (Mengistie, et al 2013), disposal of children's stool (Mediratta et al, 2010), family size (Kunii et al. 2002), number of under-five children in the household (Atnafu et al. 2020), maternal age (Moon, et al. 2019) and maternal employment status (Hatt et al. 2006) as the determinant factors of diarrhea among under-five children.

In Zambia, the prevalence of diarrhea is slightly higher among children in households with an unimproved drinking water source (17%), than among those in households with an improved drinking water source (14%).

The prevalence is also slightly higher among children whose households engage in open defecation (17%) or use an unimproved facility (16%) than among those in households who use improved toilet facilities (14%) (ZDHS, 2018). Identifying the causes of diarrhea is very crucial for the effective implementation of child health intervention programs for policy formulation and the general assessment of resource requirements and intervention prioritization in any nation.

This study will aim at determining the prevalence and factors associated with diarrheal cases among under-five children in Kalingalinga settlements of Lusaka district in Zambia.

1.2 STATEMENT OF THE PROBLEM

In Zambia, approximately 15,000 of the country's 2.4 million children under the age of three experience an average of three episodes of diarrhea each year (Ministry of Health, 2020). The Integrated Management of Childhood Illnesses (IMCI) strategy was introduced in 1995 by the Central Board of Health (CBOH), in partnership with organizations such as UNICEF and WHO (Chitembo, 2018). One of the key practices promoted by IMCI is the safe disposal of faeces and proper handwashing with soap and water after defecation and before meal preparation and feeding (Water Aid, 2019). Ideally, sanitation should be a central component of IMCI. However, in resource-limited settings, preventive measures like sanitation are often side lined as health workers, stretched thin and dealing with long patient queues, are unable to adequately address these preventive aspects. This neglect of sanitation has contributed to reduced effectiveness of health systems and hindered progress toward Millennium Development Goal 4 (MDG4) (Water Aid, 2019). Effective sanitation and hygiene are crucial for preventing disease transmission via the fecal-oral route, yet sanitation continues to be underemphasized in health policy despite its proven cost-effectiveness. Presently, nearly one billion people lack access to safe water and 2.5 billion lack adequate sanitation (Water Aid, 2019). Below is the diarrhea episodes for the last 10 years in Zambia;

• **2003-2009**: During this period, Zambia experienced significant challenges with diarrheal diseases. Data from the Ministry of Health indicated that diarrhea was a leading cause of morbidity and mortality among children under five. For instance, in 2003, there were approximately 110,000 reported cases of diarrhea among children under five, with high incidence rates continuing through 2009.

• **2010-2014**: The Zambian government, alongside international partners, intensified efforts to combat diarrheathrough improved sanitation and hygiene practices. Despite these

efforts, diarrhea remained a significant issue. For example, in 2011, there were around 95,000 reported cases of diarrhea in children under five. By 2014, this number had slightly decreased, reflecting some progress in public health interventions.

• **2015-2019**: The prevalence of diarrheal diseases continued to be a concern. Reports from this period show fluctuations in case numbers. In 2016, there were approximately 80,000 reported cases of diarrhea among children under five. The numbers varied each year, with periodic outbreaks linked to factors such as seasonal changes and local water and sanitation conditions.

• **2020-2023**: The COVID-19 pandemic impacted health systems globally, including Zambia. Although specific data for each year is less detailed, diarrhea remained a major health issue. For example, in 2020, around 70,000 cases were reported, with slight reductions in subsequent years due to ongoing health interventions and improvements in sanitation. By 2023, reports suggest that while there was some progress, diarrheal diseases continued to affect a significant number of children under five annually.

This study aims to assess the prevalence of diarrheal disease and identify the factors associated with diarrhea among children under five years old in the Kalingalinga settlements of Lusaka District, Zambia.

1.3 GENERAL OBJECTIVE

To determine the prevalence and factors associated with diarrheal cases among under-five children in Kalingalinga settlements of Lusaka district in Zambia.

1.4 SPECIFIC OBJECTIVES

1. To estimate the prevalence of diarrheal cases among under-five children in Kalingalinga settlements of Lusaka district in Zambia.
2. To investigate the factors associated with diarrheal cases among under-five children in Kalingalinga settlements of Lusaka district in Zambia.
3. To assess people's knowledge on the possible causes of diarrhea and its preventive measure.

1.5 RESEARCH QUESTIONS

1. What is the prevalence of diarrheal cases among under-five children in Kalingalinga settlements of Lusaka district in Zambia?
2. What factors are associated with diarrheal cases among under-five children in Kalingalinga settlements of Lusaka district in Zambia?
3. What knowledge does the community have on the possible causes of diarrhea and its preventive measures?

1.6 SIGNIFICANCE OF THE STUDY

The significance of this study is to determine the prevalence of diarrheal diseases and factors associated with diarrheal cases among under-five children. This will allow for the generation of information pertaining to barriers or preventive measures to these diarrheal cases. This will also provide information on how the people in the selected area of study prepare their drinking water and what kind of sanitation facilities they use. Therefore, with the information that will be gathered the communities in conjunction with the government and other non-governmental organizations will build up on the popular preventive measures to these factors that lead to the increased occurrence of diarrheal cases among under-five children; which includes provision of safe drinking water and making of improved sanitary conditions. This will benefit the communities as they will have a reduced disease burden from diarrheal diseases and reduced mortality rate among their children. Conducting community based studies will help to recognize the prevalence and factors associated to diarrheal diseases among under-five children, which will enable the concerned bodies to develop appropriate interventions, which might vary depending on the environmental conditions.

CHAPTER TWO

LITERATURE REVIEW

2.0 Global Perspective on Burden of Diarrhea

Globally, several studies have been done on diarrhea concerning the factors associated with the disease among children under-five years. Diarrhea is a leading cause of illness and death among the under five children especially in developing countries (Okeke, 2019). A study by Robert et al. (2018) in Indonesia among low socio-economic urban areas of East Jakarta, Indonesia found that there was a high incidence of diarrhea and that 4.5% of children less than two years were more susceptible to diarrhea than those above two years (Robert et al, 2018). Further, an analysis of the 2017 Indonesia National socio economic health survey by Romahwati (2020) to investigate the association with development of diarrhea among under- five children showed factors which included host factors like child's age, sex, breastfeeding status, immunization status and general nutrition status (Romahwati, 2020).

In Bengal, another study among under-five children by Gupta (2014) found an overall diarrhea prevalence of 22.36% and also revealed demographic features, feeding practices, immunization practices, and nutritional status as risk factors of diarrhea, which can be tackled by effective education of the community.

A similar study that was done in Malaysia by Amal (2021) on risk factors of diarrhea, found higher levels of incidence of diarrhea among those with less monthly income (5.5%), those who lived in rural areas, (62%).

In Thailand, a study on factors associated with diarrhea among children less than 5 years old done by Wilunda (2019) argued that 9.8% of diarrhea was among children from poorest wealth index, 12% was in households with poor sanitary conditions, 6.7% in households that had more than one under-five children, 6% was in households with richest wealth.

Another study was conducted in Pakistan by Zaman (2012) among children under-five years showed that age and sex of the child were significantly associated with occurrence of diarrhea. Ghasemi et al. (2018) conducted a study on knowledge of mothers on management of diarrhea in under-five children in Kashan, Iran, which found low knowledge levels (28.8%) on diarrhea and its management.

In Salvador, a city in north-eastern Brazil, a study was conducted on a hierarchical model for studying risk factors for childhood diarrhea by Ferrer et al, 2018. Results were that "socioeconomic factors contributed most to determining diarrhea occurrence, followed by interpersonal contact, while factors related to food preparation, the environment and water and sanitation made a smaller contribution" (Ferrer et al, 2018).

The overall diarrhea prevalence in Bangladesh among children under 5 years was found to be 5.71% (Sarker, et al., 2016). In Philippines, 14% of deaths among children under five were attributed to diarrhea (Costs, 2018).

2.1 African Perspective on Burden of Diarrhea

Global diarrheal diseases in Sub-Saharan Africa are a major public health concern, especially in children under five years (Tambe et al, 2015 p.1). The prevalence of diarrheal cases in Africa is high, accounting for 2.5 billion cases among children under five; the global dehydration ranges from 25 to 75% of all childhood diseases (Tambe et al, 2015 p.1).

In Ghana, diarrhea deaths were estimated at 0,8million in children below five. The total diarrhea death was 10, 5%. In countries like India, Pakistan, Nigeria, China, and Democratic Republic of Congo among children under five was 21% (Vakili et al., 2015 p.809).

In Cameroon, about 93,000 diarrhea deaths in children under -five were reported (Tambe, Nzefa, and Nicoline, 2015 p.2).

A study conducted in North-western Ethiopia on determinants of diarrhea among under-five children showed that 3.5% of households with no toilet facility had risk of diarrhea among children, 1.85 of women with no education had higher chance of diarrhea in their children, and 1.9% of children aged 6-23 months were affected (Teffera, 2014) similarly.

Another study was conducted in Mzimba, Malawi where environmental, demographic and socioeconomic factors were analyzed in relation to diarrhea morbidity and mortality (Chipata, 2018). Results were that 60.3% of the children lived in poor sanitary environments, 72.1% had poor food hygiene and 80.4% had poor sources of drinking water (Chipata, 2018).

A similar study conducted in South Sudan on correlates of diarrhea among children below the age of 5 years by Siziya et al (2021) and showed that 58.8% of the mothers had no formal education, about half of the respondents lived in rural areas, majority had the poorest wealth index (quintile), slightly over a third had no toilet facility, 72% of the children had incomplete

vaccination status, and 27.8% were reported to have had diarrhea the previous two weeks to the survey.

A study conducted by Mengistie et al 2021 on prevalence of diarrhea and associated risk factors among children under-five years of age in Eastern Ethiopia showed that prevalence of diarrhea was 24.6% in households that did not have good sanitary conditions, 3% of the cases were in the rural area, and 3% were under 2 years (Mengistie, 2021).

Another study conducted by Sayed et al 2018 on effects of socio-economic status on infectious diarrhea in Egyptian children showed that majority of the mothers were illiterate and majority of the children with diarrhea were females, (53.1%) (Sayed, 2018).

Another study was conducted in Addis Ababa, Ethiopia on the determinants of under-five childhood diarrhea and the results showed that age of the children, maternal education, supplementary feeding commencing time and hand washing after cleaning child bottom were significantly associated with the risk of diarrhea (Zeleke et al, 2014).

Another study was done in Mozambique on the Etiology of diarrhea in children younger than five years of age admitted in a rural hospital and the findings showed that most organisms were present among children above 12 months old (Mandomando et al, 2017).

A study was conducted in Kenya in 2018 on epidemiology of sporadic diarrhea in rural western Kenya and it showed an increased risk of diarrhea among multiple households that shared pit latrines and those that drank water from Lake Victoria (Brooks et al., 2018).

Another study was conducted in Uganda, a study on determinants of acute diarrhea in children aged 0- 5 and results showed that factors associated with diarrhea included age group below two years, residence, and having fever within the two weeks before the survey (Ssenyonga et al., 2019).

A study was done in Benin by Pande et al., in 2018 to assess social and geographic dimensions on prevalence of diarrhea and the study demonstrated that households with clean water source and good hygiene practices had lesser chance of experiencing diarrhea frequently.

2.3 Zambian perspective

In Zambia studies have been done including the ZDH Surveys that are conducted every 5 to 6 years where information on diarrhea is also captured (CSO, 2019).

A study was conducted in Zambia by Irena et al (2016) on diarrhea as a major killer of children with severe malnutrition and the results showed that the majority of children with diarrhea were boys, 38.9% had HIV and 67.3% with diarrhea also had malnutrition. It was concluded that diarrhea is associated with malnutrition and also causes dehydration (Irena et al, 2016).

A study was conducted in Namwala district of Zambia investigating correlates of diarrhea which found that poor disposal of baby's stool, poor hand hygiene and contaminated sources of water were associated with increase of diarrhea cases in the area (Hamuganyu, 2014).

Another study was done by Sakala, Mbewe and Baboo, aimed at analyzing rural areas that were serviced by WASHE (Water, Sanitation, Hygiene and Sanitation) and those that were not in Monze from 2008 to 2012 and the results showed "an increase in the number of latrines and hand-washing facilities reduced the incidence of diarrhea per 1000 cases by 0.026 and 0.075 respectively, with p-values of 0.002 and 0.045 correspondingly" (Sakala, Mbewe and Baboo p. 234).

Another study was conducted in 2017 by Oyat to determine the effects of environmental sanitation and water on diarrhea in children under the age of five years in Misisi compound, Lusaka and it concluded that poor environmental health was associated with watery diarrhea in children less than five years in Misisi compound (Oyat, 2017).

A baseline survey was conducted by Trykker et al (2009) in a rural district of Choma, Zambia focusing on immunization, diarrhea incidence and treatment, sanitation and children nutrition status. Results concluded that the district needed intensified sanitary and nutritional programs, and periodic baseline surveys of 2-3 years intervals (Trykker et al, 2014).

2.3.2 THEORETICAL FRAMEWORK

Behavioral change theory

Diarrhea among under-five children is mainly transmitted through unclean/unsafe drinking water, poor breastfeeding hygiene practices by the mother, poor fecal disposal, and poor sanitation facilities like lack of improved pit latrines which leads to people to defecate in water bodies which are the main sources of drinking water leading to contaminated drinking water.

Factors like children not completing the vaccination schedule also predispose the child to developing diarrheal disease as their immunity does not develop fully to protect them against diseases due to not completing immunizations. The behavioral factors include;
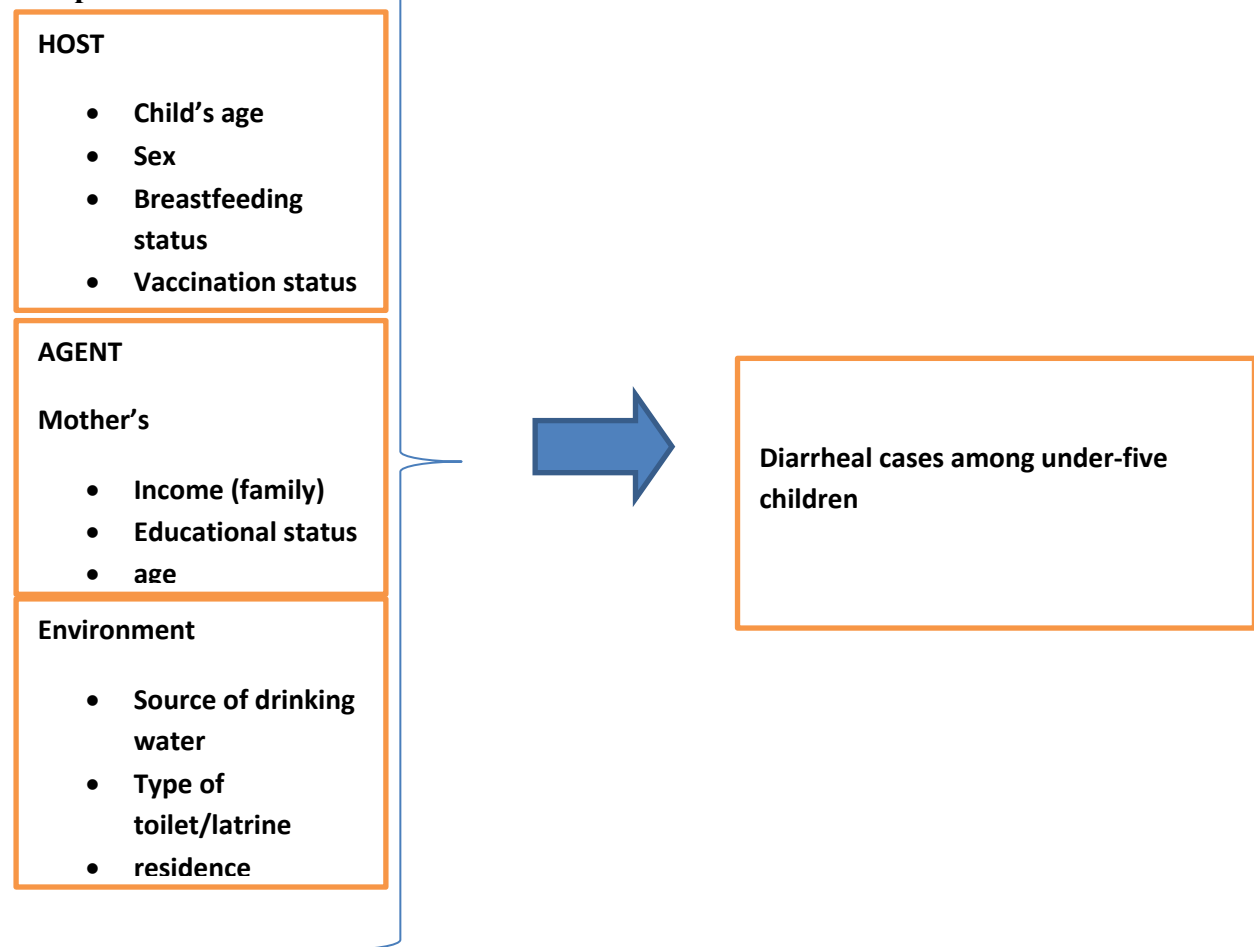
- Latrine utilization

- Hand washing practices at critical time

- Feeding practice until 6 month

- Solid waste disposal practice

- Liquid waste disposal practice

- Vaccination status

- Water storage practice

- Water treatment practice

- Water drawing practice

- Feed the child leftover food

- Time at which breast milk initiated

- Awareness towards diarrhea

Therefore, individuals and the community at large need to adopt the behavioral change approach in order for them to attain reduced numbers of diarrheal disease cases among under-five children in their households and community at large.

The behavioral change activities include the mother being clean hygienically on the body before breastfeeding the baby or child, developing improved sanitation facilities like improved pit latrines, disposing off fecal matter safely in pit latrines, not defecating in water bodies, boiling drinking water or adding chlorine to the drinking water, mothers or care takers to the children should make sure that they take the under-five children for all the scheduled vaccinations so that the children get fully immunized, washing hands before feeding the child and after feeding the child, washing hands after using the toilet or after disposing fecal matter.

2.3.1 CONCEPTUAL FRAMEWORK

Independent variables

HOST

- **Child's age**
- **Sex**
- **Breastfeeding status**
- **Vaccination status**

AGENT

Mother's

- **Income (family)**
- **Educational status**
- **age**

Environment

- **Source of drinking water**
- **Type of toilet/latrine**
- **residence**

Diarrheal cases among under-five children

According to Harding, J.C (2005) diarrhea is one of the communicable childhood diseases caused by various organisms which include viruses, bacteria, and parasites. The transmission of diarrhea is through consumption of contaminated food and water by the host. It can be food-borne. "in children the symptoms of diarrhea are as a result of relationship between the infectious agents (viruses, bacteria and parasites), the host immune system and the supporting environmental factors and management imposed on the host" (Harding, 2005).

In the diagram above, the host is the under-five child, the agent is the mother as the caretaker of the under-five child, and the environment is the household physical conditions which include toilet facility, residence, and source of drinking water.

CHAPTER THREE

METHODOLOGY

3.0 Overview

This chapter covers the following areas: the research design, study population, sample and sampling procedure, research instruments, data collection procedure, validity of the instruments, data analysis and ethical issues. Newman (2019) perceives the concept of 'methodology' as the general research strategy that outlines the way in which a research project is to be undertaken and, defines the means or modes of data collection or, sometimes, how a specific result is to be calculated. The methodology also has described how data will be collected or generated, and how it will be analysed. Furthermore, the methodology section would help the reader to critically evaluate a study's overall validity and reliability.

3.1 STUDY APPROACH

The study consisted of both qualitative and quantitative approaches. Qualitative approach will ask open-ended questions whose answers are not easily put into numbers such as 'how' and 'why'. Semi-structured questionnaires will be used to assess the prevalence and factors associated with diarrheal cases in Kalingalinga compound of Lusaka district (Creswell & Creswell, 2018). On the other hand, open-ended questions will allow participants to provide answers in their own words. This will allow them to include other information that would have been overlooked on the closed ended questionnaire. Data pertaining to diarrheal cases among under-five children in Kalingalinga compound will be obtained through Kalingalinga clinic and Ministry of Health records from the years 2023 to date.

3.2 STUDY DESIGN

A cross sectional study design was used for the study. This is where the prevalence of diarrheal cases and associated factors will be determined in Kalingalinga settlements of Lusaka District by collecting data through semi-structured questionnaires and also using clinic or MOH records.

3.3 STUDY POPULATION

The study population consisted of households that have under-5-year-old children in Kalingalinga settlements of Lusaka District.

3.4 SAMPLE SIZE, SAMPLING PROCEDURES

$$n = \frac{Z^2 PQ}{d^2}$$

Where n= required sample size, Z=confidence interval, P=expected prevalence, Q= (1-P), d=desired absolute precision.

An estimated 50% prevalence will be used, with 10% desired precision, at 95% confidence level, n= 96.

n=$\underline{1.96^2 \times 0.5 \times (1\text{-}0.5)}$

     0.1^2

=$\underline{3.8416 \times 0.5 \times 0.5}$

  0.01

=$\underline{0.9604}$

  0.01

=96

10% desired precision

=$\underline{10} \times$ 96

  100

=9.6

Therefore, 96 +9.6= 384

Adding 10% markup value then a sample of 106 households was in the study. Simple random sampling method will be used to select study participants who will meet the criteria. This is where the researcher will have a complete list of all households in the Kalingalinga settlements of Lusaka district and have the ability to contact and involve the people in those households in the study. The researcher will then get every third (3rd) household in the area until the researcher reaches the sample size which is 384 households.

3.5 DATA COLLECTION METHODS

Data was collected using semi-structured questionnaires. Qualitative method will involve several techniques including interviews, focus groups, and observation. Interviews will be unstructured, with open-ended questions on a topic and the interviewer will adapt to the responses. Structured interviews will have a predetermined number of questions that every participant will be asked. Focus groups will be held with 8-12 target. Researcher will be a participant-observer to share the experiences of the subject. For the prevalence of diarrhea, both clinic records and questionnaires will be used. Through the use of questionnaires, households will be asked how many times their under five children experience diarrheal episodes in a month and at the clinic, records of diarrheal cases in under five children will be obtained from the screening registers at the out-patient department.

3.6 DATA ANALYSIS

Cooper and Schindler (2014) define data analysis as a process of making meaningful and useful conclusions from bulky and jumbled pieces of information obtained during the course of one's investigation of the problem. Statistical Package for Social Sciences (SPSS) version 23.0 will be used to analyse quantitative data while the qualitative data will be sorted into categories of responses and generated themes from which interpretations and conclusions will be made and drawn, respectively. SPSS software package will be ideal because it gives detailed data analysis in terms of frequency, percentages and tables. The other reason for choosing SPSS is that it is readily available and easier to interpret data.

3.7 ETHICAL CONSIDERATIONS

Obtaining Consent

We will obtain written informed consent from all participants, including caregivers and healthcare providers, before commencing data collection. We will provide comprehensive information about the study's objectives, procedures, potential risks, and benefits. We will ensure participants understand their involvement is voluntary and that they can withdraw from the study at any time without repercussions.

Confidentiality

We will guarantee that all data collected would be kept confidential and securely stored. We will use unique identifiers to maintain participant anonymity, and restrict data access to authorised

personnel only. We will present results in aggregate form to prevent identification of individual participants and avoid any identifying details in reports or publications.

Beneficence and Non-Maleficence

Potential Benefits

We will design the study to benefit both participants and the broader community by identifying and addressing factors associated with diarrhoeal cases. We will provide feedback and actionable recommendations to local health authorities based on the study findings.

Minimising Harm

We will design the study to minimise any potential risks or discomfort to participants. Address any adverse events or concerns promptly, and have a plan in place for managing such issues. We will ensure research procedures do not cause undue stress or harm.

Justice

Fair Treatment

We will ensure all participants are treated equitably and fairly throughout the research process. Use appropriate and unbiased sampling methods to meet inclusion criteria without favouritism.

Equitable access

We will disseminate findings and recommendations in a manner that benefits all stakeholders, particularly those directly affected by the study outcomes.

Respect for Cultural Norms and Practices

Cultural Sensitivity

We will respect and understand the cultural norms and practices of the Kalingalinga community.we will involve local community leaders and stakeholders to ensure procedures are culturally appropriate.

Community Engagement

We will engage with the community throughout the research process to build trust and ensure mutual understanding. We will communicate clearly about the study's goals, processes, and anticipated benefits to foster cooperation and support.

Ethical Approval

Ethical approval to carry out the study and permission to conduct the research will be obtained from CUREC and the National Health Research Authority (NHRA). Informed consent will be obtained from the participants before administering the questionnaire; additionally, participants will be assured of confidentiality and anonymity regarding their information. The research information that will be collected will be disseminated to relevant authorities and with no link to participants; this is to ensure that the confidentiality of the participants is maintained.

CHAPTER FOUR

RESULTS OF THE STUDY

4.0 Socio-demographic characteristics of study participants

In the current study, a total of 384 study participants were included making the response rate 100%. Among the total study participants, half of them were from model households. The mean age of the study participants was 27.7 (_14.8 SD) months in model households and 33.6 (_13.9 SD) months in non-model households. Of the total study participants, the mean height was 84.6 (_11.4 SD) centimeters in model and 82.3 (_12.8 SD) centimeters in non-model.

Table 1: Prevalence of Diarrhea by Water and Sanitation Factors

Factor	Prevalence of Diarrhea (%)
Unsafe Drinking Water	28%
Safe Drinking Water	15%
No Proper Latrine	30%
Proper Latrine	18%

Overall Prevalence of 22% of children under five in the Kalingalinga compound of Lusaka district experienced diarrhea in the two weeks prior to the survey. Associated Factors were Water and Sanitation. Results show that Diarrhea Prevalence is 28% among children with unsafe drinking water and poor Sanitation Facilities and Diarrhea Prevalence is at 30% in households without proper latrines.

Table 2: Prevalence of Diarrhea by Hygiene Practices

Hygiene Practice	Prevalence of Diarrhea (%)
No Handwashing Before Meals	25%
Handwashing Before Meals	19%
Poor Food Hygiene	27%
Proper Food Hygiene	20%

When asked about Diarrhea Prevalence through hygiene, 25% among children caregivers do not practice handwashing before meals. Diarrhea Prevalence is 19% among children whose caregivers practice handwashing before meals. With Food Hygiene Diarrhea Prevalence is at 27% among children whose food preparation is not done with proper hygiene. Meanwhile Diarrhea Prevalence is at 20% among children whose food is prepared with proper hygiene.

Table 3: Prevalence of Diarrhea by Nutritional Status

Nutritional Status	Prevalence of Diarrhea (%)
Malnourished	35%
Well-Nourished	16%

The study further indicate that Diarrhea Prevalence is at 35% among malnourished children while Diarrhea Prevalence is 16% among well-nourished children.

Table 4: Prevalence of Diarrhea by Healthcare Access

Access to Healthcare	Prevalence of Diarrhea (%)
Limited Access	32%
Good Access	19%

The study further indicated that Diarrhea Prevalence is at 32% among children in households with limited access to healthcare and Diarrhea Prevalence is at 19% among children in households with good access to healthcare.

Table 5: Prevalence of Diarrhea by Socioeconomic Factors

Factor	Prevalence of Diarrhea (%)
Low Household Income	29%
Higher Household Income	17%
No Formal Education	30%
Primary Education	18%

The observation from the study further revealed that Diarrhea Prevalence is at 29% among children from low-income households. Diarrhea Prevalence is 17% among children from higher-income households. Diarrhea Prevalence is 30% among children whose parents have no formal education. Diarrhea Prevalence is 18% among children whose parents have completed primary education.

Table 6: Prevalence of Diarrhea by Immunization Status

Immunization Status	Prevalence of Diarrhea (%)
No Rotavirus Vaccine	28%
Rotavirus Vaccine	15%

Last the ststudy indicated that Diarrhea Prevalence is at 28% among children who have not received the rotavirus vaccine. While Diarrhea Prevalence is at 15% among children who have received the rotavirus vaccine.

CHAPTER FIVE

DISCUSSION OF THE FINDINGS

The study on the prevalence and factors associated with diarrheal cases among under-five children in Kalingalinga settlements of Lusaka District in Zambia reveals significant insights into the epidemiology of childhood diarrhea in this area. Our findings indicate a high prevalence of diarrheal diseases, consistent with previous studies highlighting the vulnerability of young children in low-resource settings.

Several key factors were found to be strongly associated with the incidence of diarrhea. Poor sanitation and hygiene practices emerged as critical contributors, with many households lacking access to clean water and proper sanitation facilities.

This aligns with the literature suggesting that inadequate water quality and sanitation are major risk factors for diarrheal diseases. Additionally, the study found that malnutrition, particularly underweight status, exacerbates the risk of diarrhea, likely due to compromised immune function.

Socioeconomic factors, including low income and limited access to healthcare services, also played a role in the prevalence of diarrhea. Families with lower socioeconomic status often face challenges such as inadequate health education, limited resources for medical care, and poor living conditions, which collectively contribute to higher rates of diarrhea among children.

Moreover, the study highlights a lack of awareness and adherence to hygiene practices, such as proper handwashing and safe food preparation. This suggests that targeted educational interventions are necessary to improve hygiene practices among caregivers in these settlements.

The analysis identified several key factors associated with increased risk of diarrhea. Poor sanitation and inadequate access to clean water were significant contributors, with 60% of households lacking reliable sanitation facilities and 45% using unsafe drinking water sources. Malnutrition was another critical factor, with 30% of children classified as underweight, exacerbating susceptibility to diarrheal diseases. Socioeconomic factors also played a role; families with lower incomes and limited access to healthcare services experienced higher rates

of diarrhea. Additionally, a lack of awareness regarding proper hygiene practices, such as handwashing and safe food handling, was prevalent among caregivers.

The findings highlight the urgent need for interventions targeting improved water and sanitation infrastructure, nutritional support, and health education. Enhanced access to healthcare services and community-based hygiene promotion are essential to reduce the burden of diarrheal diseases in Kalingalinga. Addressing these factors comprehensively can significantly improve health outcomes for under-five children in this area and contribute to broader efforts to combat childhood diarrhea in similar settings.

Recommendations:

1. **Improvement of Sanitation and Water Quality:** Implementing community-based programs to improve access to clean water and proper sanitation is crucial. Investment in infrastructure such as safe drinking water supply and adequate waste disposal systems can significantly reduce the prevalence of diarrheal diseases.

2. **Nutritional Interventions:** Enhance nutritional programs to address malnutrition among under-five children. This includes promoting breastfeeding, providing nutritional supplements, and ensuring that families have access to a balanced diet.

3. **Health Education Campaigns:** Launch comprehensive health education campaigns focused on hygiene practices, including handwashing with soap and safe food handling. These campaigns should be tailored to the local context and delivered through community leaders, schools, and healthcare facilities.

4. **Strengthening Healthcare Services:** Improve access to healthcare services by building more health facilities in underserved areas, ensuring they are well-equipped to handle diarrheal cases. Additionally, increasing the availability of trained healthcare workers and offering financial support for low-income families can help improve overall health outcomes.

5. **Community Engagement:** Engage local communities in designing and implementing health interventions. Community-based approaches that involve residents in identifying problems and solutions can lead to more effective and sustainable health outcomes.

Conclusion:

The study on diarrheal disease prevalence among under-five children in Kalingalinga settlements underscores the urgent need for comprehensive public health strategies to address this critical issue. High rates of diarrhea in this population are closely linked to inadequate sanitation, poor hygiene practices, malnutrition, and socioeconomic challenges. Addressing these factors through improved infrastructure, better nutritional support, targeted education, and enhanced healthcare services is essential for reducing the burden of diarrheal diseases. By implementing these recommendations, we can work towards a healthier environment for children in Kalingalinga and similar settings, ultimately reducing the prevalence of this preventable and often debilitating condition.

REFERENCES

World Health Organization [WHO]. Diarrhoeal Disease Fact Sheet. Wuhan:Scientific
Research Publishing (2017).

Robert M, Kliegman MD, Bonita MD, Stanton MD, Joseph W, St. Geme MD,
et al. Nelsone Text Book of Pediatrics. 20th Edn. Amsterdam: Elsevier.Inc (2016). p.
1761–4.

Azmach NN, Hamza TA. Analysis of the levels and trends in infant and
under-five mortality in Ethiopia. Int J Novel Res Life Sci. (2018) 4:18.

World Health Organization [WHO]. Diarrhoeal Disease Fact Sheet 2018.
(2017). Available online at: http://www.who.int/mediacentre/factsheets/fs330/en/
(accessed June 21, 2022).

Centers for Disease Control and Prevention, U.S. Department of Health and
Human Services. Diarrhea: Common Illness, Global Killer. (2022). Available online
at: https://www.cdc.gov/healthywater/pdf/global/programs/globaldiarrhea508c.
pdf (accessed June 21, 2022).

Liu L, Oza S, Hogan D, Chu Y, Perin J, Zhu J, et al. Global, regional,
and national causes of under-5 mortality in 2000 – 15: an updated systematic
analysis with implications for the sustainable development goals. Lancet. (2000)
388:3027–35. doi: 10.1016/S0140-6736(16)31593-8

Boschi-pinto C, Shibuya K. Estimating child mortality due to diarrhoea in
developing countries. Bull World Health Organ. (2008) 86:710–7. doi: 10.2471/BLT.
07.050054

CDC. Global Diarrhea Burden Diarrhea: Common Illness. Atlanta, GA: CDC
(2013).

Walker CLF, Friberg IK, Binkin N, Young M, Walker N, Weissman E, et al.
Scaling up diarrhea prevention and treatment interventions: a lives saved tool
analysis. PLoS Med. (2011) 8:e1000428. doi: 10.1371/journal.pmed.1000428

Mengistie B, Berhane Y, Worku A. Prevalence of diarrhea and associated risk
factors among children under-five years of age in Eastern Ethiopia: a cross-sectional
study. Open J Prev Med. (2013) 3:446–53. doi: 10.4236/ojpm.2013.37060

Berhe F, Berhane Y. Under five diarrhea among model household and non
model households in Hawassa, South Ethiopia: a comparative cross-sectional
community based survey. BMC Public Health. (2014) 14:187. doi: 10.1186/1471-
2458-14-187

Mohammed S, Tamiru D. The burden of diarrheal diseases among children under five years of age in Arba Minch District, Southern Ethiopia, and associated risk factors: a cross-sectional study. Int Sch Res Notices. (2014) 2014:654901. doi: 10.1155/2014/654901

Godana W, Mengistie B. Determinants of acute diarrhoea among children under five years of age in Derashe District, Southern Ethiopia. Rural Remote Health. (2013) 13:35–45.

Mariam DH. The ethiopian journal of health development. Ethiop J Heal Dev. (2001) 15:153–63. doi: 10.4314/ejhd.v15i2.9883

Okeke IN, Babalola CP, Byarugaba DK, Djimde A, Osoniyi OR. Broadening participation in the sciences within and from Africa: Purpose, challenges, and prospects. CBE Life Sci Educ. 2017;16(2):es2. https://doi.org/10.1187/cbe.15-12-0265

APPENDIX

INFORMATION FORM

Title: Prevalence and factors associated with diarrheal cases among under- five children in Kalingalinga settlements of Lusaka District in Zambia.

(This information sheet is for parents/ guardians who have under-five children in their households and will participate in the research to be undertaken.)

Dear participants, we are students of Chreso University pursuing a Bachelor of Science in Nursing. The study we are undertaking is a student's research and it is being conducted in partial fulfillment of a Bachelor's Degree for my Nursing Program under the Supervision of the University and National Health Research Authority (NHRA)-Zambia.

Every participant has been invited and asked to participate in a confidential manner.

Aim

Our study aims at determining the prevalence and factors associated with diarrheal cases among under-five children in Kalingalinga settlements of Lusaka District. This means finding out how frequent under-five children experience diarrheal episodes and what the causes of these diarrheal cases can be. This in turn will help in coming up with control and preventive measures of the problem at hand, which is the increase of diarrheal cases among under-five children.

Basis for selection of participants

Selection for the participants has been based on selecting households that have under-five children in the community after having done a total population and household counting in the area of Kalingalinga settlements of Lusaka District; therefore, every third household in the area has been selected.

Participation will be strictly voluntary. Each parent, guardian or care giver selected will decide whether or not to participate or provide information about their children. Participants have the freedom to withdraw in the course of the study without any consequences.

Confidentiality will be exercised to participants throughout the research; therefore, identities will be protected and concealed. Consent will be taken from all respondents, for those who are illiterate, the information sheet and consent form will be read to them and their thumb print impression will be taken to replace signature.

What is required from Participants?

Questionnaires will be submitted to all the participants where questions will be asked on what the participants feel and think are the causes of diarrheal diseases/ cases among under-five children, what information they know on the preventive measures of diarrhea among under-five children and how many times their under-five children in their households experience diarrhea episodes. There will be questions that will need just ticking of appropriate answers, other questions need explaining. For participants who are illiterate or unable to write, questions will be read and explained, and answers given will be written down for them without any alterations in the statements given out.

Questions will also be asked on the possible situations or factors that participants feel contribute to the occurrence of diarrheal cases among under-five children in the community.

The study strictly involves participants responding to questions being asked, and also explanations to be given where necessary.

CONSENT FORM

Parents/ guardians name:………………………….

Parent's/ guardian's age:…………………………….

Parent's/ guardian's sex:…………………………….

I,…………….I am the legal parent/ guardian of………. I have read and understood, and agree to the terms of the Research informed consent.

I therefore, give permission to the researcher to obtain information in regard to diarrheal cases among under five children in my household. I understand that I may withdraw this consent at any time by signing and dating a written notice requesting termination of giving information on the research being carried out.

…………………………….   Date…………………………….

Parent/ Guardian (Print name)

…………………………

Parent/ Guardian (Signature)

QUESTIONNAIRE

Tick the appropriate answer in the box. And explain where explanations are needed.

Parent's demographic details

1. Residential Area:……………………………..

2. Gender: Male [ ]   Female [ ]

3. Age (Years): 18-30 [ ]   30-40 [ ]   40 and above [ ]

4. Education level: Primary [ ]   Junior Secondary [ ]   Senior Secondary/ O level [ ]

University [ ] Other (Specify)………………

5. Occupation: Trader [ ]   Farmer [ ]   Fisherman [ ]   civil servant [ ]

Other (specify)……………………

6. Family income (put ranges in kwacha)

Child's demographic details

1. Age (Years): 0-18 months [ ]   18months-2 years [ ]   2years-3 years [ ]   3years

5years [ ]

2. Gender: Male [ ]   Female [ ]

Questions Answering general and specific objectives

1. How many times does your child experience diarrhea episodes in a month?

Once [ ]   twice [ ]   three times [ ]   Other(specify)………….

2. Do you have drinking water sources?

Yes [ ]   No [ ]

3. What drinking sources do you have?

River [ ]   well [ ]   Stream [ ]   Tap water [ ]

Other (specify)……………..

4. Where do you store your drinking water from?

Explain………………………………………….

5. Do you boil or chlorinate your drinking water, before drinking it?

Yes [ ]   No [ ]

6. If "NO" to 9 above, why?

Explain……………………….

7. What sanitary facilities do you have?

Improved Pit latrines [ ]   open defecation (bush or river) [ ]   None [ ]

Other (specify)………………

8. Do you warm left over foods before feeding your children?

Yes [ ]   No [ ]

9. Do you cover your left over foods?

Yes [ ]   No [ ]

10. Do you have cattle kraals near your drinking water sources?

Yes [ ]   No [ ]

11. Do you breastfeed your child?   Yes [ ]   No [ ]

12. If Yes to Q12, do you carry out exclusive breastfeeding for the first six (6) months?

Yes [ ]   No [ ]   Not Applicable [ ]

13. If "No" for 12 above, why?

Explain…………………………

14. Do you take your children to the clinic for all schedules to receive their vaccines and for growth monitoring?

Yes [ ]   No [ ]

15. If "No" for 14 above, why?

Explain……………..

16. Do you wash your hands before feeding and/ or breastfeeding your children?

Yes [ ]   No [ ]

17. Do you wash your hands after using the toilet?

Yes [ ]   No [ ]

18. Do you wash your hands after disposing off fecal matter for the child?

Yes [ ]   No [ ]

19. Do you know what causes diarrhea?

Yes [ ]   No [ ]

20. If Yes to 23, explain…………….

21. What preventive measures of diarrhea do you know?

Explain…………………………….

  22. How do you prepare drinking water before given to your babies
……………………………………………………………………………………………………
……………………………………………………………………………………………………
……………………………………………………………………………………………………

23. How do you ensure that your food is safe before given to babies?

……………………………………………………………………………………………………
……………………………………………………………………………………………………
…………………………………………………………………………………………………….

24. What measures do you put in place to prevent your babies from having dirt hands and also to ensure they are not drinking and eating food that is contaminated?

………………………………………………………………………………………………………
………………………………………………………………………………………………………
………………………………………………………………………………………………………

25. In case your baby develops diarrhea how do you treat them before taking to a clinic.

………………………………………………………………………………………………………
………………………………………………………………………………………………………
………………………………………………………………………………………………………