DETERMINANTS OF DIARRHOEA PREVENTION AMONG CAREGIVERS OF UNDER-FIVE CHILDREN IN HOUSEHOLDS IN BURUMBA WARD, MATAYOS SUBCOUNTY, BUSIA COUNTY, KENYA

BY

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DECLARATION

I declare that this research thesis is my own original work and has not been presented to any other university or institution for a degree or any other award.

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DEDICATION

I whole heartedly dedicate this Research Project to my brother, James Ngugi Kamau. He made immense sacrifices to provide me with a solid foundation for my education. His unwavering support and dedication have been instrumental in shaping my academic journey, and for that, I am eternally grateful.

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I am indebted to the public health officer, Community health workers and caregivers of children under five years in Burumba ward, who willingly participated in this study. It was a pleasure to interact with you during the data collection period, and I am grateful for your cooperation.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVATIONS AND ACRONYMS

CHW : Community Health Workers

ILRI : International Livestock Research Institute

KAP : Knowledge, Attitudes and Practices

KHIS: Kenya Health Information System

MOH : Ministry of Health

NGOs : Non-governmental organization

ODF : Open Defecation Free

ODK : Open Data Kit

QGIS : Quantum Geographical Information System

SPSS : Statistical Package for the Social Sciences

UNICEF : United Nations International Children Emergency Funds

WHO : World Health Organization

OPERATIONAL DEFINATION OF TERMS

Attitudes: beliefs or feeling of caregivers towards diarrhoea prevention

Caregivers: A mother or any other person who was primarily responsible of taking care of the child's health

Determinants: Factors influencing diarrhoea prevention among caregivers

Diarrhea: Passage of loose or watery stool three or more times in 24 hours

Households: Persons living within the same house unit

Knowledge: What caregivers know concerning diarrhoea prevention

Practices: What caregivers do to prevent diarrhoea in under five years' children

Prevalence: Proportion of children affected by diarrhoea two weeks before the study

Prevalence of diarrhoea: Proportion of children who were reported to have diarrhoea two weeks preceding the study

Sanitation: Conditions and practices that promoted the well-being of household members

Sanitation factors: Householdsfactors influencing diarrhoea prevention

Socio economic factors: Factors that contributed to caregiver's health and wellbeing resulting to how best a caregiver can prevent diarrhoea among under five

ABSTRACT

Diarrhoea is a leading cause of illness and death among children under five globally, and in Kenya, it ranks as the fourth most common illness in this age group. In Busia municipality, the diarrhoea prevalence stands at 16%, reflecting the national statistics as of 2017. Despite interventions such as vaccinations, breastfeeding promotion, and the 2015 declaration of Busia county as open defecation free, Burumba ward in Matayos sub-county consistently reported the highest diarrhoea cases at Busia County Referral Hospital from 2014 to 2019. Understanding the determinants of diarrhoea prevention among caregivers of young children is crucial for reducing the disease's impact. This was a cross-sectional study aimed at assessing the determinants of diarrhoea prevention among caregivers of children under five in Burumba ward. The specific objectives were to determine the prevalence of diarrhoea, examine caregivers' knowledge, attitudes, and practices (KAP) regarding diarrhoea prevention, and determine the socio-economic and sanitation factors associated with diarrhoea in this population. A sample of 207 caregivers was selected from a target population of 2255, using systematic sampling with a random start, in four out of eight randomly selected villages. Probability proportional to size method was used to determine the number of households to be sampled from each village. Data collection involved structured questionnaires and observation checklists, to verify availability of sanitation facilities. A recall period of two weeks was applied to obtain information of diarrhoea occurrence. Descriptive statistics was used to obtain data on the proportion of children under five with diarrhoea, while caregivers' knowledge and practices was described as good or poor based on the average total scores above or below (50%) respectively. Attitude was determined using a Likert scale, and regarded as negative (mean score < 3) or positive (mean score > 3) depending on approach towards diarrhoea prevention. Chi square test of independence and Logistic regression analysis was used to test the association between socio-economic and sanitation factors with diarrhoea prevention. A p-value < 0.05 was considered as statistically significant. The diarrhoea prevalence was 42.5% based on the two-week recall period. Although 79% of caregivers had good knowledge of diarrhoea prevention, only 6.3% were aware that breastfeeding could prevent diarrhoea. Goodpractices towards diarrhoea prevention was observed in 71.5% of caregivers, but negative attitude was observed towards boiling and filtering of drinking water with 105 (50.7%) disagreeing to using boiled drinking water, while 172 (83.3%) also disagreeing to filtering their drinking water. Level of education was the only socio-economic factor that showed significant relationship with diarrhoea prevention (χ^2 (4) =1.2298; P=0.032). Further logistic regression showed that secondary school level of education was independently associated with diarrhoea prevention (OR= 3.243; 95% CI= 1.073 – 9.806; P= 0.037). Overall, sanitation was good in 86.5% of households, and none of the sanitation factors was found to be significantly associated with diarrhoea prevention, in this study. These findings underscore the need for continuous health promotion campaigns emphasizing the role of breastfeeding in regard to diarrhoea prevention. Highlights the need of boiling or filtering drinking water in preventing diarrhoea in Burumba ward.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Diarrhea-related deaths are widespread worldwide across all geographic regions(Almasi et al., 2022a). On a global scale, diarrhea stands as the second leading cause of death after pneumonia among children under five years old, contributing to 15% of cause-specific proportional mortality(Gohiya *et al.,* 2020).In addition, approximately 2.5 billion cases of diarrhea are reported annually among children under the age of five(Manetu *et al.,* 2021).Nevertheless, cases of diarrhea are concentrated in low-income countries, as these nations often face challenges due to limited resources and less robust urban and healthcare infrastructure compared to high-income countries(Almasi et al., 2022a).

Diarrhea disproportionately affects children under five across Africa, with developing countries experiencing high rates among this age group(Birhan *et al.,* 2023).In 2018, over 80% of the 5.3 million deaths among children under five occurred in sub-Saharan Africa and Central and Southern Asia(Demissie et al., 2021). Additionally, three out of the five countries accounting for half of global under-five deaths are situated in sub-Saharan Africa(Owusu *et al.,* 2024).According to a meta-analysis carried out in Ethiopia, showed that, the prevalence of diarrhoea in East African countries spans from 19% to 25%(Tareke *et al.,* 2022).Additional research carried out in Uganda, Rwanda, and Malawi revealed that the prevalence rates of diarrheal diseases were 32%, 26.7% , and 20% , respectively(Tareke *et al.,* 2022).

In Kenya, diarrheal diseases rank as the 4th most common reason for outpatient visits and the primary cause of death among children under the age of five, resulting to high morbidity and mortality in the country(Karinja et al., 2020).In 2010, a study conducted in Busia Town, Western Kenya, revealed a 16.7% prevalence of diarrhoea among children aged 6 to 36

months (Onyango and Angienda, 2010). This rate closely mirrors the national prevalence of diarrhoea

among children under the age of five in Kenya, as reported by Elmi and Dioso in 2017. Nevertheless, since 2010, few studies have been conducted to monitor the trends of diarrhoea among children under the age of five in Busia County. Data from Kenya Health Information System(KHIS) in 2014 to 2019 on diarrhoeal morbidity among under five children indicate that Burumba ward in Matayos sub-county consistently had the highest number of diarrhoea cases treated in Busia County Referral Hospital (table 1.1).

Table 1.1 The number of diarrhoea cases in children<5 years in Busia County, from 2014-2019(18th June 2019)

Organization unit / Period	2014	2015	2016	2017	2018	2019
Bunyala Sub County	4,161	2,938	3,279	2,442	3,184	1,318
Butula Sub County	4,600	5,151	4,211	2,484	3,521	1,775
Matayos Sub County	5,986	5,835	7,763	5,872	7,820	3,736
Nambale Sub County	1,166	1,312	1,957	1,413	2,070	948
Samia Sub County	3,360	3,200	2,446	1,799	2,207	1,113
Teso North Sub County	5,331	6,088	4,258	2,761	4,585	1,982
Teso South Sub County	4,862	4,609	4,743	2,985	4,663	2,376
County	29,466	29,133	28,657	19,756	28,050	13,248

Interventions targeted at the community and household level hold the potential to decrease the morbidity caused by diarrhoea in children under the age of five (Keddy, 2020). Which makes it important for this study to know the diarrhoea prevalence in under five children in Burumba ward for intervention purposes.

The knowledge, attitudes, and practices of caregivers can directly or indirectly influence whether their children experience diarrhoea or not(Gohiya *et al.,* 2020).For instance, optimal knowledge on feeding of children could prevent deaths due to diarrhoea, while better hygiene practices, especially hand washing with soap and safe disposal of human excreta, can lead to a further reduction of diarrhoea cases by caregivers employing the right attitude(Tsehay et *al.,* 2021). There has not been a published study on the topic in Matayos sub-county, Burumba ward, despite the evidence that adequate knowledge, practices, and attitudes have a significant impact on diarrhoea prevention(Kukeba et al., 2021).

Socio-economic factors associated with diarrhoea prevention in children under five years play a vital role. These factors, may vary depending on season, geographical area, and between countries(Mulatya & Mutuku, 2020).Characteristics of caregivers' such as education level, maternal age and residence have been found to be important risk factors for diarrhoea prevention in under-five children(Shewangizaw *et al.,* 2023).Household income and wealth index have been also indicated to be determinants for diarrhoea in this age group(Paul, 2020). Adequate sanitation including availability of household latrines and hand washing facilities have been found to reduce risk of diarrhoea among under-five children(Claudine *et al.,* 2021).The declaration of open defecation free status in Busia County in 2015, along with the implementation of community-led total sanitation efforts, was expected to lead to a reduction in diarrhoea cases. While this expectation was met in some sub-counties like Nambale and Bunyala, there has been a concerning trend in Matayos sub-county(Njuguna,

2016).According to a study conducted by Njuguna (2016) in three consecutive years (2012, 2013, and 2014), there was actually an increase in infant diarrhoea cases in Matayos sub-county. The study reported that the prevalence of infant diarrhoea in Matayos sub-county was 17.5% in 2012, 21.2% in 2013, and 27.1% in 2014.These figures indicate a upward trend in diarrhoea cases among infants in this particular sub-county despite the efforts to improve sanitation and achieve open defecation free status. The reasons for this increase in diarrhoea cases in Matayos sub-county indicate there could be specific challenges related to sanitation such as lack of proper drainages or other factors contributing to the prevalence of diarrhoea diseases. Hence, prompting this research to determine sanitation factors that could lead to diarrhoea prevention.

1.2 Statement of the problem

Diarrhoea can have a major effect in children below the age of five years due to dehydration which can later lead to death. Annually, every child is reported to have at least three episodes of diarrhoea in Kenya. Burumba poses as a high risk region for diarrhoea cases due to close proximity with the border and high interaction of people between Kenya and Uganda. Sanitation coverage is reported to be low in Burumba with open defecation still in practice. As much as studies are conducted in this region, there is no study that has documented the current prevalence of children with diarrhoea. Knowledge, attitudes and practices play a key role in diarrhoea prevention, the ongoing studies being done by organization in Busia are focusing on pathogens causing diarrhoea but less study are done to understand what caregivers' knowledge, attitudes and practices are towards diarrhoea prevention. Diarrhoea prevention practices among caregivers are greatly influenced by socio-economic status, Busia comprises of large population from different origins and therefore providing the need to understand how socioeconomic factors play part in diarrhoea prevention. Socio-economic factors and sanitation factors are intertwined and one can rarely talk of one without referring to the other. Sanitation to greater extent determine the presence of diarrhoea and how it can be prevented. Poor sanitation leads to large number of diarrhoea cases, as experienced in Burumba ward which predisposes the children to diarrhoea hence creating the urge to understand how prevention of the cases are dealt with. Subsequently, Socio-economic, demographic and sanitation factors vary between different geographical location and can play key roles on how diarrhoea is prevented among under five children.

1.3 Study Objectives

1.3.1 General objective

To assess determinants of diarrhoea prevention among caregivers of under-five children in households in Burumba ward, Matayos sub county, Busia county, Kenya.

1.3.2 Specific objectives

1.To determine the prevalence of diarrhoea in under-five children in Burumba ward,Matayos sub county, Busia county, Kenya.

2.To examine knowledge, attitudes and practices on diarrhoea prevention among caregivers of under-five children in Burumba ward,Matayos sub county, Busia county, Kenya.

3.To determine caregiver's socio-economic factors associated with diarrhoea prevention among under-five children in Burumba ward, Matayos sub county, Busia county, Kenya.

4.To determine sanitation factors associated with diarrhoea prevention among under-five children in Burumba ward,Matayos sub county, Busia county, Kenya.

1.4 Research questions

1.What is the prevalence of diarrhea in under-five children in Burumba ward, Matayos sub county, Busia county, Kenya?

2.What is the prevailing knowledge, attitudes and practices on diarrhea prevention among caregivers of under-five children in Burumba ward, Matayos sub county, Busia county Kenya?

3.What are the caregivers' socio-economic factors associated with diarrhoea prevention among under-five children in Burumba ward, Matayos sub county, Busia county, Kenya?

4.What are the sanitation factors associated with diarrhea prevention among under-five children in Burumba ward, Matayos sub county, Busia county, Kenya?

1.5 Significance of the study findings

Diarrhoea prevalence in Burumba ward was 42% which was higher than what was previously reported in 2010.This finding, can be used for Public health assessment to monitor diarrhoea cases in Burumba ward to determine whether the trends are worsening or improving. As the study provides evidence that, there is need for more intervention studies in this region. Knowledge, attitude and practices were good except for the fact that, on knowledge, only a few of caregivers knew breastfeeding prevented diarrhoea, caregivers had negative attitude towards boiling and filtration as methods of water treatment. This results emphasized that health campaign should focus on the role of breastfeeding and treating water for drinking as a way of preventing diarrhoea. And so this study suggests the necessary steps to empower the caregivers with the knowledge and positive attitudes necessary to take proactive steps in preventing diarrhea, leading to healthier community. Socio-economic did not have any significant association with diarrhoea preventionapart from the level of education of caregivers meaning that caregivers with higher education were better at diarrhoea prevention than those who had low level of education. Indicating that educational programs can be prioritized and tailored to increase knowledge and skills among caregivers. Although sanitation factors were not found to be significantly associated with diarrhoea prevalence, presence of feces,rubbish and flies near or around the households can lead to negative impact on diarrhoea prevention as these conditions can enhance transmission of germs that cause diarrhoea diseases.This information encourages the creation of targeted behavior change communication strategies that stress the importance of maintaining a clean environment to prevent diarrhea.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview of diarrhoea prevention in children below five years

Diarrheal diseases stand out as among the most significant health challenges worldwide, contributing to the highest rates of mortality and morbidity in children, particularly those under five years old(Guillaume et al., 2020a). Sub-Saharan Africa experiences over one billion episodes of diarrhea annually, resulting in an estimated 606,024 deaths from the condition each year, with nearly half of these fatalities occurring in children under the age of five(Nwokoro et al., 2020).

Enhanced availability of the rotavirus vaccine, advancements in child growth and well-being, and the establishment of universal access to safe water and sanitation have significantly aided in further diminishing the impact of preventable diseases such as diarrhea(Almasi et al., 2022b). However, despite extensive efforts and achievements in managing diarrhea, the disease continues to rank among the top five causes of mortality and morbidity in Kenya, notably affecting infants and children under the age of five(Njeru et al., 2017).Approximately 90% of the burden of diarrhoea diseases in Kenya are attributed to substandard sanitation conditions and insufficient personal, household, and community hygiene practices(Gohiya et al., 2020). While in Busia county, diarrhoea ranks among the top three primary causes of hospitalization in children under the age of five years(Njuguna, 2016).

2.2 Prevalence of diarrhoea among children below the age of five years

Diarrhoea prevalence among under five in Kenya was reported to be 17 %(Njeru et al., 2017). The knowledge, attitudes, and practices highly influence the prevalence of diarrhoea in children(Abbasi et al., 2021). A study conducted in Mukuru slums, where there was a prevalence of 37.3%, demonstrated that caregivers' knowledge plays a major role in the event of diarrhoea episodes(Samuel et al., 2019). Caregivers who understood the factors that

are associated with diarrhoea ensured that they wash their hands during critical times, kept their toilets clean, and treated their drinking water (Mulatya & Mutuku, 2020).

Diarrhoea prevention requires the efforts of caregivers and their abilities to uphold the recommended practices(Bauleth et al., 2022). Although various factors can stand in the way of proper prevention, such as socioeconomic status and different cultural beliefs, epidemiological evidence can provide a better understanding of the knowledge, attitudes and practices that influence diarrhoea among children under five years of age in the study area (Gohiya et al., 2020).

2.3 Knowledge, attitude and practices of diarrhoea prevention in children below the age of five years

Across Africa, various studies have delved into the knowledge, attitude, and practices of diarrhoea prevention(Abate et al., 2024; Kukeba et al., 2021; Momoh et al., 2022). However, these studies exhibit inconsistency, yielding variable results. Knowledge levels fluctuate between 36.6% and 67%, attitudes range from 45.1% to 94.4%, and practice rates span from 12% to 58%(Shewangizaw et al., 2023).

Caregivers' knowledge concerning diarrhoea prevention can highly influence the health of a child(Opuba et al., 2021). Some mothers have a misdirected approach towards diarrhea prevention due to their improper knowledge, which often leads to a high degree of severe dehydration and finally death(Sobi et al., 2024). In an attempt to prevent diarrhea in children, caregivers must be in a position to recognize diarrhoea, the causes and how they can help a child recover(Waruguru, 2024). Studies have shown that caregivers with a formal education are better able to recognize diarrhoea, compared to those with no formal education (Duguma et al., 2024).This could be due to the fact that people with a formal education have a better understanding of diarrhoea. Additionally, a study done in Norwest Ethiopia on diarrhoea prevention practice and associated factors among caregivers in under five years' children

revealed that, Caregivers who perceived diarrhea as the passage of watery stool two times in a day were 76.3% less likely (0.091, 0.613) to practice diarrhea prevention in under-five children compared to those who perceived it as occurring three times in a day (Agegnehu et al., 2019)**.** Caregivers tend to have conflicting knowledge about what causes diarrhoea. Among the participants, the highest proportion (41.0%) attributed diarrhea to underlying diseases. A significant number (22.8%) believed that seasonal factors played a role, while contaminated water (12.6%) was also identified as a perceived cause by some families (Gohiya et al., 2020)**.** Proper knowledge of the causes of diarrhea, and available solutions, could highly reduce needless suffering of the children and improve their wellbeing(Kukeba et al., 2021).

The sources where caregivers obtain their information on diarrhea from are equally important to ensure they are applying the correct preventive measures(Bohsas et al., 2023a). A study conducted in India demonstrated that, participants who had received health education were at a better place to prevent diarrhoea due to the fact that education influences both lifestyle and health seeking behavior(Paul, 2020).

Caregivers' attitude towards diarrhoea diseases is important as it influences how we promote prevention(Alfaro, 2024). A majority of parents, about 53.4%, believed that diarrhea is unavoidable(Shewangizaw et al., 2023). However, 19.1% of parents thought that it could be prevented by using boiled or clean water, while 16.0% believed that practicing regular hand washing could help in preventing diarrhea (Gohiya et al., 2020). Among the participants, approximately 60.6% (252 individuals) disagreed on the likelihood of their child experiencing diarrhea in the next month, while 37.7% (158 caregivers) disagreed that diarrhea is a normal occurrence in children. On the other hand, about 39.2% (166 caregivers) agreed that diarrhea is a preventable disease, while 27.6% (110 caregivers) disagreed with this notion(Gohiya et al., 2020).

Caregivers also have different attitudes when it comes to diarrhoea prevention. A study done in Northwest Ethiopia revealed that 20% of the caregivers took no measure when their children had diarrheal episodes as they believed it would cease on its own, while only 5% used homemade fluids; another 0.5% used traditional herbs(Abate et al., 2024).

Caregivers disposing children's excreta into the environment can have an impact on the transmission of infectious diseases like diarrhoea(Hailu et al., 2021). According to the study's findings, improper domestic solid waste disposal practices increased the likelihood of developing diarrhea diseases by 2.7 times compared to their counterparts who disposed waste properly (Mosisa et al., 2021).

The water supply available plays a key role as a determinant of diarrhoea occurrences. Caregivers with less water supply may possess an attitude that the little available water should be used for cooking, therefore neglecting other practices, such as hand washing (Gohiya et al., 2020).

The behavior of caregivers towards taking care of their young ones goes a long way in determining whether a child will have diarrhoea or not. These behaviors are entangled in practices adopted by the caregivers. Some practices, like not washing hands after visiting the toilet or before feeding the baby, have been shown to contribute largely to diarrhoea diseases(Bisimwa et al., 2022). A study carried out in Northwest Ethiopia on prevention practices of diarrhoea in under five years children showed that,out of the total participants, 272 individuals (68.3%) reported washing their hands after using the toilet, while only 151 individuals (37.9%) mentioned washing their hands before feeding their child (Agegnehu et al., 2019).

Management of sanitation facilities also helps in diarrhoea prevention; as unsafe disposal of human excreta increases the risk of developing diarrhoea in children below the age of five years. Areas with poor sanitation are more likely to have fecal-oral related diseases that are

transmitted through contaminated water and food, resulting in diarrhoea in the young children(Zerbo et al., 2022). According to, appropriate sanitation practices among mothers could reduce diarrhoea morbidity by up to 37%. Children fed using solid food, or those transitioning from breast milk to other foods, are at a higher chance of developing diarrhoea as a result of poor hygiene of the caregivers(Nwokoro et al., 2020). These findings are similar to those reported in other studies, whereby children between the age of 6 to 24 months were more likely to have diarrhoea as they play on the floor with soil, and are therefore more likely to ingest contaminated materials, which therefore favors the transfer of diarrhoea causing organisms from the hands to the mouth(Mulatya & Ochieng, 2020).

Knowledge of the caregivers can also influence their practices in regard to diarrhoea prevention, and research has shown that mothers who are aware of how diarrhoea comes about are able to apply measures to block it(Bohsas et al., 2023a).

2.4 Socio-economic factors associated with diarrhoea occurrence

Religious practices can influence health seeking behaviors in some communities(Mochache et al., 2020). The implication is that caregivers who should be in the first line of disease prevention are caught up in these practices resulting to poor decisions making. Some caregivers believe that a child having diarrhoea is the will of God, or caused by sorcery, and therefore fail to put implement the necessary measures towards prevention, while also ignoring other possible causes of diarrhoea (Claudine et al., 2021).

The caregivers' occupation often determines the wealth index of a family. In study carried out in Northwest Ethiopia, the authors argued that housewives were 3.9 times more likely to practice diarrhoea prevention, compared to their employed counterparts, as they have more time to get information on diarrhoea prevention measure from various sources (Mulatya & Mutuku, 2020). The location where a child resides plays a significant role in the occurrence of diarrhea. The place of residence serves as a predictor for overall child health, particularly

concerning diarrheal diseases(Paul, 2020). Children living in low-income countries where proper sanitation is a greater challenge tend to experience a higher prevalence of diarrhea cases compared to those in developed countries(Ugboko et al., 2021). Moreover, disparities are evident between children residing in rural and urban areas(Srivastava et al., 2022). In particular, children living in rural areas are more susceptible to experiencing diarrhea than their urban counterparts(Bohsas et al., 2023b).

Poor economic status of the households could be one of the contributing factors in a child having diarrhoea(*Diarrhoeal Disease*, n.d.). This is due to the fact that those households cannot keep up with proper hygiene practices, such as hand washing with soap, construction of a latrine, and treating drinking water, due to poverty. Studies have shown that children coming from higher economic status had a lower odd of developing diarrhoea, compared to those from a lower economic status (Mosisa et al., 2021). This because, higher economic status translates to holistic well-being as influenced by good living conditions.

2.5Sanitation factors influencing diarrhoea occurrence in children under five years

Adequate sanitation reduces the risk of diarrhea among children below the age of five years. Studies have shown that there is a lower chance of children having diarrhea in those households with latrines, as compared to those with shared or no latrines (Njuguna, 2016). Hand washing with soap and water greatly reduces the occurrence of infections. Various studies have shown an association between diarrhea incidences and inadequate hand washing practices. A study done in India reported that hand washing practices were slightly higher in those homesteads with hand washing facilities, as compared to those which did not have such facilities. This could have been due to affordability and maintenance of these facilities (Pauland Kalidas, 2017). Poor usage of latrine results in foul smells that attract houseflies, which in turn can serve as agents for transmission of infections among family members. Poor drainages, presence of faecal matter on top of toilet surfaces or in the compounds, are

potential risks for diarrhea diseases and other faecal-oral transmitted diseases (Guillaume et al., 2020b). According to estimates by the WHO, unsafe water, inadequate sanitation, and poor hygiene are responsible for approximately 88% of diarrhoea cases globally (Webb & Cabada, 2018).This observed variation is likely influenced by factors such as differences in water sources, literacy status, and latrine availability (Agegnehu et al., 2019).

The majority of the predisposing factors that may influence the occurrence of diarrhea in children, such as clogged drainages, breeding places for flies near the house, and poor hygiene practices due to a lack of necessary facilities, are a great threat in maintaining proper sanitation, thereby increasing the risk of diarrhea in children (Mosisa et al., 2021).

Conceptual Framework

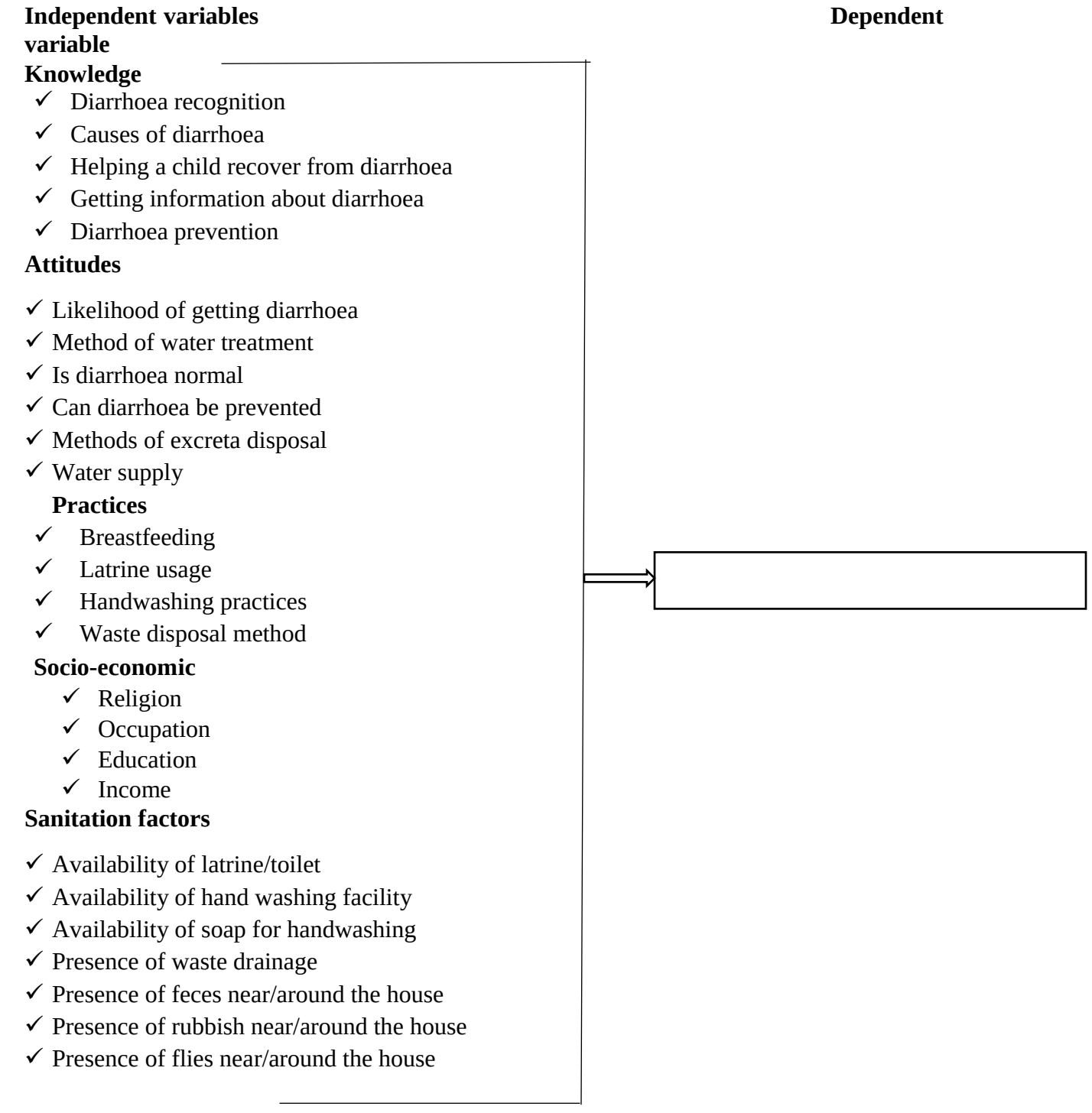

Figure 2.1 Conceptual framework adopted from (Manetu et al., 2021; Mosisa et al., 2021).

CHAPTERTHREE
RESEARCH METHODOLOGY

3.1 Study area

Busia County, situated in the former Western Province of Kenya, shares its borders with Kakamega County to the east, Bungoma County to the north, Lake Victoria and Siaya County to the south, and Busia District in Uganda to the west. It lies between a latitude of 00 and 00 45 norths and 340 25 easts. With a population of approximately 893,861 residents, it covers an area of approximately 1,700 square kilometers, ranking as one of the smallest counties in Kenya.The county's climate is significantly influenced by its proximity to Lake Victoria in the southwestern region. The region receives both short and long rainy seasons, with the predominant type of rainfall being convectional. Busia typically has a warm and humid climate, often characterized by high temperatures and frequent rainfall.Busia County is divided into seven sub counties, namely Funyula, Butula, Bundalang'i, Matayos, Nambale, Teso North and Teso South(Wikipedia, 2024). This study was carried out in the peri-urban Matayos sub-county, which was purposively selected because of its close proximity with the Kenya-Uganda border, and as it hosts Busia town which is the hub for all border activities. Moreover, Matayos sub-county had, in recent years, recorded the highest numbers of diarrhoea cases in children below the age of five years, hence informing our study in this area (KHIS, 2014-2019).

Matayos sub-county is further divided into 5 wards which are Bukhayo West ward, Mayenje ward, Matayos South ward, Busibwabo ward, and Burumba ward(Wikipedia, 2024). Burumba ward was selected as it is within Busia town, where a study done in 2010 showed a high prevalence of16% of diarrhoea cases(D. M. Onyango & P. O. Angienda, 2010). Burumba ward has very low sanitation coverage, with open defecation still prevalent in this

area(Chege *et al.*, 2023). There are eight villages within Burumba ward, namely Burumba A, Burumba B, Burumba C and Burumba D, Maduwa, Mauko A, Mauko B, and Lukonyi(“Busia County,” 2024).

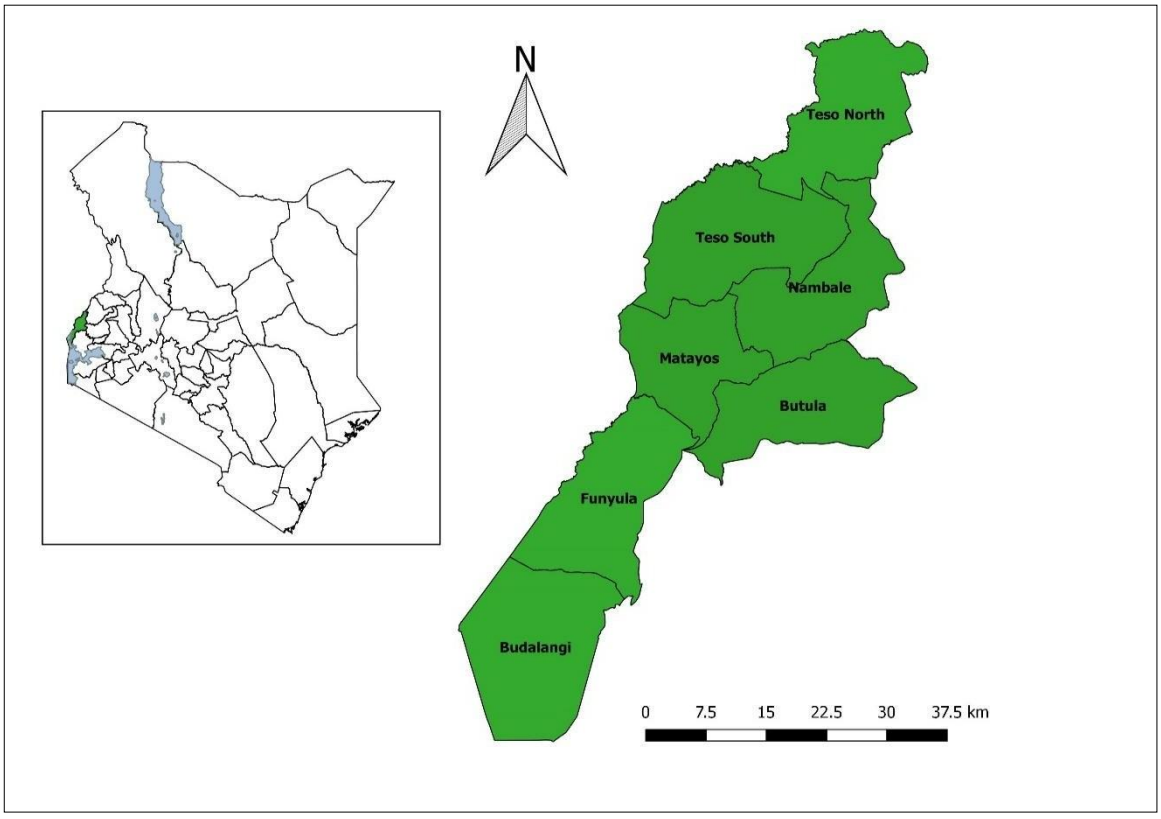

Figure 3.1 A map showing Busia County, Kenya (drawn from Shape Files from QGIS version 2.16.3)

3.2 Target population

All the 2255caregivers with children below the age of five years in Burumba ward.

3.3 Study population

The population of interest was 207 caregivers having children aged between 0 to 5 years, 18 years and above and had lived in Matayos sub-county, Burumba ward for more than six months, and who provided informed consent.

3.4 Study design

A cross-sectional study design was employed in this study because it was community-based study, where the exposure and outcome of the study subjects were ascertained at that same

point in time. The design was used because the study wanted to assess the determinants and burden of diarrhoea in Burumba ward and look at the steps that can be taken to implement interventions to improve on diarrhoea prevention in children under five years. Also, because this design accommodates both qualitative and quantitative analysis. Lastly, cross-sectional study design was used due to its efficiency, cost-effectiveness, feasibility, and ability to provide comprehensive data on diarrhoea prevalence and determinants factors within a community.

3.5 Sample size calculation

The sample size for caregivers with children below the age of five years was calculated using (Fisher *et al..*, 1998) formula, with a precision of +/-5%, and a confidence level of 95%.

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

where:

n= minimum sample size

Z= Standard normal deviation at the required confidence level 95% (1.96)

P= Proportion of the study population estimated to have diarrhea of 16% (Onyango & Angienda, 2010)

q= when p is in decimal terms(1-p)

d = Precision of the estimate (Standard value of 0.05)

$N=(1.96)^2 \times 0.16 \times (1-0.16) / (0.05)^2$

N=206.5 Therefore n=207

Considering that the proportion of the study population estimated to have diarrhea is 16%, the required sample size was 207caregivers.Since the response rate was 100%, this study did not cater for the non-respondent.

3.6 Inclusion criteria

Caregivers with children under five years of age and resident in Matayos sub-county (i.e. had lived in Matayos for more than six months). This is because six months is enough time for a person to settle in a place and get the know*h*ow of the surrounding environment and children would already have had exposure to the environment.

3.7 Exclusion criteria

Caregivers of children below the age of five years in Matayos sub-county but were not willing to participate in the study. Also caregivers of children below five years whose children had other illness other than diarrhoea.

3.8 Study variables

There were two study variables: Independent variables and dependent variables. The independent variables were, diarrhoea prevalence in under five children in Burumba ward. knowledge, attitudes and practices of caregivers towards diarrhoea prevention. socio-economic and sanitation factors influencing diarrhoea prevention. The dependent variable was diarrhoea prevention.

3.9 Sampling techniques

Burumba ward has eight villages, for this study, only four villages were randomly selected as representative.The names of the villages were written on separate pieces of paper, folded uniformly and put in a bowl, and four pieces were picked, thus indicating the name of the villages to be studied, the number of households from the four villages were selected using probability proportional to size method to determine the number of caregivers to be recruited from each village. **Probability proportional to the size method formula**

$$\text{No of households with children<5 sampled per village} = \frac{\text{No of households with children<5per village} \times 207}{\text{Total No. of households with children<5 in the four villages selected}}$$

Thus, the caregivers within the households were selected using systematic random sampling method. Whereby, the first household was selected at random and every eleventh household with a child below the age of five years was selected and when there was no child in the eleventh household, the researcher went to the next household with a child below five years until a sample size of 207 caregivers was achieved.

Systematic random sampling method formula

K=sampling interval K=N/n

N=target population 2255/207

N=sample size K= 11

Hence, sampling interval was every eleventh household with under five child/ren

Table 3.1 Population and sample size distribution of the four villages selected from Burumba ward using probability proportional to size method

Burumba ward			
	Number of households	**Number of households with under five children**	**Selected households with under five**
Burumba D	1000	575	53
Maduwa	2000	980	90
Mauko A	880	500	46
Lukonyi	600	200	18
Total	4480	2255	207

3.10 Data collection

The participants were informed about the study and an informed concept was obtained. Through the use of Open Data Kit(ODK), data was collected using a closed ended questionnaire informed with risk factors (Workie *et al.*.,2018) which was administered through a face-to-face interview, and an observation checklist to verify the availability of sanitation facilities.

3.11 Data analysis

Objective1: **Research question:** What is the prevalence of childhood diarrhea in the two weeks preceding the study in Matayos sub-county? **Study variables:** Diarrhoea experience in the past two weeks **Method of data collection:** Questionnaire **Method of data analysis:** Descriptive statistics
Objective2: **Research question:** What is the prevailing knowledge, attitudes and practices of caregivers of under five years' children in Matayos sub county? **Study variables:** Knowledge, attitudes and practices towards diarrhea prevention **Method of data collection:** Questionnaire **Method of data analysis:** Knowledge was graded 1 for any correct answer and 0 for any wrong or uncertain answer. The total scores from the caregivers were summed up to get the average, above 50% was regarded as good knowledge while below 50% was regarded as poor knowledge. Attitude was determined using a Likert scale. Attitude was described as negative below the mean of 3 or positive above the mean of 3. Practices was described as poor or good based on the total scores of each caregiver. Caregivers scoring above 50% weredescribed as having good practice while those scoring below 50% were described as having poor practice. The overall total scores were then summed up to determine whether caregivers had good practices or poor practices.
Objective3: **Research question:** Socio-economic factors that are associated with diarrhoea prevention **Study variables:** religion, occupation, education, income **Method of data analysis:** Descriptive statistics and logistic regression
Objective4: **Research question:** Sanitation factors influencing diarrhoea prevention **Study variables:** availability of latrine and hand washing facility, method of child waste disposal **Method of data collection:** Questionnaire **Method of data analysis:**In this section, an observation check list was used to determine the availability of sanitation facilities by scoring yes or no in presence or absence of each facility respectively. The average of the total scores above 50% was regarded as good sanitation while below 50% was regarded as poor sanitation. Descriptive statistics and logistic regression was also used for further analysis.

Table 3.2 Analysis of the study objectives

3.12 Pre testing

The purpose of pre-testing the data instrument was to ensure that the items in the instrument were designed and constructed clearly and have the same meaning to all respondents. This pre-test involved checking whether the questions were clear and evoking any positive or negative response. Pre-testing was conducted with 20 questionnaires which were administered to the caregivers in Matayos sub county who were chosen at random representing 10% of the sample size. Contamination was controlled by using stratified randomization by ensuring the caregivers who were selected were from all age groups, whether females or males to avoid bias. The Matayos ward was chosen because of sharing the same environmental conditions and living characteristics and is also neighboring to Burumba ward which was the actual study area. The data that was collected was analyzed and hence informed the adjustment of data collection tools since some few gaps were identified at this process of pre-testing.

3.13 Validity and Reliability

The data collected from a pretest was analyzed and the standard deviation of the questions ranged between 0.07 and 0.50 indicating that the variance of each question was not homogeneous. Standardization of the scores was therefore performed prior to further analysis. Cronbach's alpha was 0.54. However, questions that had an item-rest correlation of <0.2 were removed. Cronbach's alpha for the remaining questions was 0.73, suggesting that these questions were more internally consistent hence, verifying the validity and reliability of the test tool.

3.14 Study limitations

The study utilized a community-based descriptive cross-sectional design with probability sampling. However, a limitation of this design is the inability to establish a temporal

relationship between exposure and outcome variables. Also, the study area was selected through purposive sampling, therefore the impact of non-response on the overall study outcomes would have been minimal, hence not considered.

3.15 Ethical consideration

The ethical approval to do this study was obtained from School of Graduate Studies(SGS) and Maseno University Ethical Committee(MUEC). Permit to carry out this study was obtained from the National Commission for Science, Technology and Innovation (NACOSTI), County government of Busia, department of health and sanitation, the study also sought permission to carry out the study in the households from the Burumba public health officer. The principal investigator explained the purpose of this study and the benefits of the study to the participants and asked them for permission to interview them. Participation was at free will, no participant was forced or persuaded to take part. Those who initially accepted to participate and then decided to withdraw were free to do so. The anonymity of the participant was guaranteed and information provided was confidential. The name of the participants was not recorded in the questionnaire or their contact details. The participants were identified by a unique number. The information given was confidential and was not shared with a third party.

CHAPTER FOUR

RESULTS

This chapter details the analysis of the results obtained from the study. The results are described by percentage frequencies, counts, and cross tabulation as the main descriptive methods of data analysis and also looking at the prevalence of diarrhoea and the significant association between dependent and independent variables using logistic regression and the statistical significance levels ($p<0.05$) considered. This study response rate was 100%.

4.0 Socio demographic characteristic of the study respondents

Most of the caregivers were represented by the mothers of the children (n=162; 78.3%), followed by the fathers (n=29; 14.0%) or other representatives (n=16; 7.7%). The median age of the caregivers was 28 years (range: 18 – 68); fathers had a higher median age (30 years) compared to mothers (27.5 years).The median number of people living in the household on a regular basis was 5 (range: 2 – 10), while the median number of children <5 years old living in each household on a regular basis was 1 (range: 1 – 4).

4.1 Prevalence of diarrhoea in children below the age of five years in two weeks preceding the study

Using descriptive statistics, the prevalence of children who had a diarrhoea was calculated and presented in percentage. whereby, 42.51% caregivers reported that their children had had a diarrhoea episode against 57.49% who reported no diarrhoea based on the two-week recall period as shown in table 4.1.

Table 4.1 Prevalence of diarrhoea in under five children in Burumba ward.

Total sample size	**207**	**100%**
Sample size that reported diarrhoea	88	42.51 %
Sample size that did not report diarrhoea	119	57.49 %

4.2 Knowledge, attitude and practices of caregivers in diarrhoea prevention

4.2.1 Caregivers knowledge on diarrhoea prevention in children under five years in Burumba ward.

In overall, 164(79.2%) of caregivers had good knowledge of diarrhoea prevention, while 43(20.8%) had poor knowledge (table 4.2). However, only 6.3% were aware that breastfeeding could prevent diarrhoea.

Table 4.2 Knowledge of caregivers on diarrhoea prevention.

Primary care giver	Good knowledge	Poor knowledge
Mother	129	33
Father	22	7
Other	13	3
Total	164 (79.2%)	43 (20.8%)

Most of the caregivers 119(57.49%) were able to define diarrhoea as passage of watery or loose stool three or more times in a day. Some mentioned that diarrhoea is passing of watery stool once a day 40(19.32%) while others stated that diarrhoea is passing of watery stool twice a day 21(10.15%). The remaining 27(13.04%) respondents were completely ignorant on the symptoms of diarrhoea as described in table 4.2. 96 (46.38%) of caregivers responded that diarrhoea is caused by drinking of dirty water and eating unsafe foods. 91(44%) said that diarrhoea is caused by poor hygiene and 45(21.74 %) identified germs as a cause for diarrhoea in under five children. Respondents mentioned other causes. Most 34(16.42%)who mentioned others felt it was a stage of development, in particular, teething among children. 8(3.86%) respondents included diarrhoea as part of other diseases or infection. Diseases mentioned include stomachache, Malaria and roundworms. 3(1.45%) respondents felt it was as a result of some allergies.However, there were 4(1.93%) who mentioned they had no idea on the cause of diarrhea among children. 2(0.97%) respondent mentioned that breast feeding can also cause diarrhoea. About helping a child recover from diarrhoea, 63(30.44%) gave

ORS while 50(24.16%) did nothing. 132 (63.77%) took the child to the hospital, 23 (11.11%) treated at home by mixing water with salt and sugar. 22(10.63%) gave more fluids, 88(3.9%) gave less fluid while 4(1.9%) stopped breastfeeding (table 4.2).The most common source of information on diarrhoea was the hospital 152(73.43%). Fewer considered the television 26(12.56%), radio 23(11.11%), or community health workers23 (11.11%) as sources of information. Among those who mentioned others 8(3.87%)stated that they learn about it from their environment, including schools, church and general community information outlets. 6(2.9%)of them mentioned that they learn from friends and neighbours, while 1(0.48%) person learns through social media. There were 12(5.8%) respondents who were completely ignorant on matters concerning diarrhoea (table 4.2). On asking the caregivers what should be done to prevent diarrhoea in under five children, 131(63.3%) responded that eating clean food will prevent diarrhoea, 103(49.8%) mentioned keeping surrounding clean as a way of preventing diarrhoea, 79(38.2%) said hand washing, 54(26.09%) identified use of latrine while 13(6.3%) mentioned breastfeeding. Respondents mentioned other methods of preventing diarrhoea among children includes; treating drinking water to kill germs 17(8.21%). However, some 20(9.66%) respondents were had no idea on how to prevent the case of diarrhoea (Table 4.2).

Table 4.3 Caregivers knowledge on diarrhoea prevention in Burumba ward

Knowledge questions			
		Frequency	percent
1	What is diarrhoea		
	a. Passing of watery stool once a day	40	19.32
	b. Passing of watery stool twice a day	21	10.15
	c. Passing of watery stool three or more times a day	119	57.49
	d. other	27	13.04
2	Causes of diarrhoea		
	a. Change of weather	4	1.93
	b. Dirty/ unsafe drinking water	96	46.38
	c. Eating bad/unsafe food	96	46.38
	d. Bad spirits	1	0.97
	e. Poor personal hygiene	91	43.97
	f. Bad smells	1	0.97
	g. Germs	45	21.74
	h. Other	51	24.64
3	The last time your child had diarrhoea, how did you help them recover?		
	a. Nothing	50	24.16
	b. Gave home mixture	23	11.11
	c. Gave more fluids	22	10.63
	d. Gave less fluids	88	3.9
	e. Stopped breastfeeding	4	1.9
	f. Give ORS	63	24.16
	g. Visited the hospital	132	63.77
	h. Went to traditional healer	0	0
4	How do you get information about diarrhoea?		
	a. Television	26	12.56
	b. Radio	23	11.11
	c. From hospital	152	73.43
	d. Community Health workers	23	11.11
	e. other	27	13.04
5	In your opinion what should be done to prevent diarrhoea incidences?		
	a. Promote breast feeding	13	6.3
	b. Eat clean/safe foods	131	63.3
	c. Handwashing	79	38.2
	d. Use latrine	54	26.0
	e. Keep surrounding clean	103	49.8
	f. Other	37	17.87

Table 4.4 caregivers' attitudes on diarrhoea prevention among under five in Burumba ward

Attitude questions	Response Categories	Frequency	%	Mean	Attitude
How likely do you think your child will get diarrhea next month?	Strongly disagree	65	31.4	4	Positive
	Disagree	77	37.2		
	Neutral	7	3.4		
	Agree	34	16.4		
	Strongly agree	24	11.6		
	Total	**207**	**100.0**		
It is normal for a child to have diarrhea	Strongly disagree	60	29	4	Positive
	Disagree	71	34.3		
	Neutral	15	7.2		
	Agree	18	8.7		
	Strongly agree	43	20.8		
	Total	**207**	**100.0**		
I can prevent my child from getting diarrhea	Strongly disagree	10	4.8	5	Positive
	Disagree	17	8.2		
	Neutral	23	11.1		
	Agree	45	21.7		
	Strongly agree	112	54.1		
	Total	**207**	**100.0**		
Does your family use any of these methods in treating drinking water?					Negative
a). Boiling water	Strongly disagree	0	0	2	
	Disagree	105	50.7		
	Neutral	21	10.1		
	Agree	23	11.1		
	Strongly agree	58	28		

	Total	**207**	**100.0**		
b). Filter water	Strongly disagree	3	1.4		
	Disagree	172	83.1	2	Negative
	Neutral	3	1.5		
	Agree	10	4.8		
	Strongly agree	19	9.2		
	Total	**207**	**100.0**		
c). Chlorine treated water	Strongly disagree	1	0.5		
	Disagree	73	35.3	5	Positive
	Neutral	6	2.9		
	Agree	22	10.6		
	Strongly agree	105	50.7		
	Total	**207**	**100.0**		
d). Nothing (Does not treat drinking water)					Positive
	Strongly disagree	29	14		
	Disagree	143	69.1	4	
	Neutral	7	3.4		
	Agree	8	3.8		
	Strongly agree	20	9.7		
	Total	**207**	**100.0**		
We use pit latrine	Strongly disagree	0	0		
	Disagree	1	0.5	5	Positive
	Neutral	3	1.4		
	Agree	13	6.3		
	Strongly agree	190	91.8		
	Total	**207**	**100.0**		
Child excreta is disposed in latrine	Strongly disagree	0	0		
	Disagree	9	4.3	5	Positive

	Neutral	12	5.8		
	Agree	16	7.7		
	Strongly agree	170	82.1		
	Total	**207**	**100.0**		
The caregiver satisfied with the current water supply situation?	Strongly disagree	0	0	4	positive
	Disagree	49	23.7		
	Neutral	27	13		
	Agree	131	63.3		
	Strongly agree	0	0		
	Total	207	100.0		

4.2.2 caregivers' attitudes on diarrhoea prevention among under five in Burumba ward

The caregivers who had a mean of 3 and below were rated as having negative attitude while those who had a mean above 3 were rated as positive attitude.

Out of the 207 respondents, 77(37.2%) and 65(31.4%) disagreed and strongly disagreed on the statement that their children would get diarrhoea in the next month respectively. 71(34.3%) and 60(29%) disagrees and strongly disagreed that diarrhoea is normal in their children. 112(54.1%) of the caregivers strongly agreed to the fact that they can prevent their children from getting diarrhoea. 105(50.7%) and 172(83.1%) disagreed on boiling and filtration as methods of water treatment respectively showing a negative attitude, while 105(50.7%) strongly agreed on using chlorine to treat drinking water. 143(69.1%) disagreed on any method of water treatment. 190(91.8%) strongly agreed on use of latrine,170(82.1%) strongly agreed in latrine usage for disposal of child excreta, while 131(63.3%) agreed that they were satisfied with the available water supply (table 4.4).

Table 4.5 Caregivers practices on diarrhoea prevention in Burumba ward

Practices of caregivers on diarrhoea prevention			
		yes	no
1	Did you breastfeed your child for at least six months after birth? If No, Why?	182(87.92%)	25(12.08%)
		frequency	percent
2	What is your water source? a. Private tap b. Public well c. Public tap d. River e. Stream f. Other	 36 75 61 8 25 44	 17.4 36.2 29.5 3.9 12.1 21.3
3	Where do family members go to ease themselves? a. Latrine b. Public toilet c. Neighbors toilet	 174 19 14	 84.06 9.18 6.76
4	Do you wash your hands after changing baby's diaper?	157	75.8
5	Do you wash your hands before feeding the baby?	177	85.5
6	Do you wash food eaten raw before eating?	178	86
7	Do you wash hands with soap and water before meal?	164	79.2
8	Do you wash your hands with soap and water after visiting the toilet?	181	87.4
9	How do you dispose your child's stool? a. Communal dumping site b. In the latrine c. In the bushes	 53 151 3	 25.60 72.95 1.45

4.2.3 Caregivers practices on diarrhoea prevention among under five in Burumba ward

Socio-economic characteristics		count	percent

Caregivers' practices towards diarrhoea prevention were assessed by asking nine questions as shown in the table 4.5above. Individuals were awarded one for any right answer and zero for any wrong answer. Those whose scored above the 50% were rated as having good practice while those who scored below 50% were considered as having poor practice. It was found out that 148(71.5%) had good practice while 59(28.5%) had poor practice towards diarrhoea prevention.

The main reasons cited for not breastfeeding the child included parent's health complications and their unavailability, or the grandparents were the ones taking care of the child. Other sources of water included private wells, purchasing from vendors or drawing from public spring.

4.3 Socio economic factors influencing diarrhoea prevention in caregivers of children below the age of five years in Burumba ward

Socio economic factors were analyzed using descriptive statistic where more than two third (93.72%) of the caregivers were Christian, with 52.17% doing business. Other occupations included informal employments such as Casual labourer, *Jua kali*, hair dresser. Self-employment options mentioned were poultry keeping, farming, painter, Welders, masonry, mechanic and hair dresser. Two mentioned they were unemployed with one still staying at home with parents. In terms of education levels, majority of caregivers had studied up to primary school (45%). In many households, fathers were the main bread winners (59.9%). Many caregivers' (51.21%) were low income earners while 48.8% were high income earners.

Table 4.6 Socio economic factors influencing diarrhoea prevention among caregivers in Burumba Ward

Religion	Christian	194	93.72
	Muslim	13	6.28
Occupation	Business	108	52.17
	Employed	18	8.70
	Housewife	60	28.99
	Student	5	2.42
	Other	16	7.73
Education	Primary	93	44.93
	Secondary	77	37.20
	Tertiary	20	9.66
	Other	17	8.21
Breadwinner	Both parents	24	11.59
	Father	124	59.90
	Mother	48	23.19
	Other	11	5.31
	Earnings		
Monthly income	Category	count	percent
	<13000	106	51.21
	≥13000	101	48.79

Variables	**Categories**	**Diarrhoea prevalence**	**P- value**

		diarrhoea	no diarrhoea	
Socio economic factors				
Primary caregivers	Father	13(44.83)	16(55.17)	0.0754
	Mother	64(39.51)	98(60.49)	
	Other	11(68.75)	5(31.25)	
Age group				0.7213
	18-25	30(44.12)	38(55.88)	
	26-35	44(40)	66(60)	
	36-45	11(50)	11(50)	
	46-55	1(25)	3(75)	
	>55	2(66.67)	1(33.33)	
Income				
	<13000	48(45.28)	58(54.72)	0.4821
	≥13000	40(39.6)	61(60.4)	
Religion				
	Christian	83(42.78)	111(57.22)	>0.9999
	Muslim	5(38.46)	8(61.54)	
Occupation				
	Business	48(44.44)	60(55.56)	0.8989
	Employed	7(38.89)	11(61.11)	
	Housewives	23(38.33)	37(61.67)	
	Student	2(40)	3(60)	
	Other	8(50)	8(50)	
Education				
	Primary	35(37.63)	58(62.37)	0.032
	Secondary	40(51.95)	37(48.05)	
	Above secondary	5(25)	15(75)	
	other	8(47.06)	9(52.94)	

Table 4.7 Factors influencing diarrhoea prevention among caregivers of children below the age of five years in Burumba ward

Chi square test of independence was also used to determine whether there was statistically significant between the socio economic factors and diarrhoea prevention. Level of education was the only socio-economic factor that showed significant relationship with diarrhoea prevention (χ^2 (4) =1.2298; P=0.032). Further logistic regression showed that secondary school level of education was independently associated with diarrhoea prevention (OR= 3.243; 95% CI= 1.073 – 9.806; P= 0.037) (table 4.7).

Table 4.8 Logistic regression on socio economic factor influencing diarrhoea prevention in under five children in Burumba ward

Variables	Odds ratio	95% CI	P-value
Level Education			
Primary education	Reference		
Secondary school education	3.243	1.073 – 9.806	0.037
Above secondary school education	1.820	0.611 – 5.420	0.282
Other	1.500	0.270 – 8.344	0.643

4.4 Sanitation factors influencing diarrhoea prevention among caregivers of children below the age of five years in Burumba ward.

It was found out that 179(86.47%)had a good sanitation while 28(13.52%) had poor sanitation.

Chi square test did not show any statistical significant association between sanitation factors and diarrhoea prevention. There were presences of feces, rubbish and flies around the households, despite the fact that Busia had been declared ODF.

CHAPTER FIVE

DISCUSSION

5.1 Prevalence of diarrhoea in under five in Burumba ward

The prevalence of diarrhoea in Burumba ward was higher at 42.51% than the one that was previously reported in Busia municipality which was 16% (D. M. Onyango & P. O. Angienda, 2010).The difference could have been due to lack of recent published studies highlighting the importance of diarrhoea among under five children in this region hence leading to the caregivers being reluctant on factors that contribute to diarrhoea prevention such as handwashing during critical times, exclusive breastfeeding for at least six months cleaning foods eaten raw before eating, cooking food adequately, proper usage of the toilet/latrine and keeping surrounding clean. Similarly, this study prevalence of diarrhoea in children under five years was relatively higher than what was reported by various studies which had prevalence of 27.2%, 10.8%, 22.1%, and 11.3% respectively in two weeks before the study(Gessesse & Tarekegn, 2022; Getachew et al., 2018; Nwokoro et al., 2020; Yaya et al., 2018). The different between the prevalence of the current study and those other studies can be attributed to maternal education where by, mothers from those studies had high education so better at diarrhoea prevention.

5.2 Knowledge, attitude and practices of caregivers towards diarrhoea prevention in under five children in Burumba ward

In this study Knowledge of diarrhoea prevention among caregivers was relatively higher at 79.2%. Similar to a study conducted in Lagos, Nigeria where more than half of the study participants (59.2%)had good knowledge on diarrhoea prevention(Momoh et al., 2022) but contrary to a study done in Engela District in Namibia, that showed only 36% of the caregivers had good knowledge on diarrhoea prevention (Bauleth et al., 2022). This could have been attributed to the different project that are ongoing in the area by NGOs such as ILRI keen to uplift the wellbeing of the community by educating them on various disease and on how they come about. Knowing what diarrhoea is in a child becomes the first step of prevention. More than half (57.49%) of the caregiver were able to define what diarrhoea is, where else,the extent of good knowledge regarding diarrhoea definition ranged from 42.74% in Kenya to 55.70% in Ethiopia(Tareke et al., 2022). This results indicated that, majority of the caregivers can easily identify the onset of diarrhoea in their children. A number of caregivers identified dirty water and eating unsafe foods, poor hygiene and germs 46.38%, 44% and 21.74% respectively as causes of diarrhoea compared to a study done in South Africa where 76.4 %, 93.2% and 63.1% mentioned that diarrhoea is caused by unsafe food, germs and poor hygiene respectively (Ndou et al., 2021). Meaning that, the study participants in South African were better in identifying the causes of diarrhoea compared to caregivers of this study. Better explained by the fact that, these two studies were done in two different setups, the South Africa study was done from a clinic and since the caregivers had taken their children for treatment, they were already having a fresh recall compared to this study that was done in a community and relied on two weeks recall period.Once a child has diarrhoea, caregivers should know what is the next course of action to prevent more serious consequences like dehydration which can eventually result to death. 30.44% of caregivers

mentioned that they gave their children oral rehydration salts to help them recover, this result is different from a study done in Ethiopia where 54.4% of the caregivers gave their children ORS to help them recover(Duguma et al., 2024). Those who gave homemade mixture of salt and sugar were 11.11% contrary to 28.7% of caregivers in a study conducted in Syria(Bohsas et al., 2023b). This could be because most of the caregiver 63.77% went to health facility during diarrhoea episodes as similarly reported by done in Kakamega(64%) (Njeru et al., 2017). About quarter (24.16%) of caregivers did nothing and waited for diarrhoea to disappear on its own, which agrees with a study done in Northwest Ethiopia which showed that 20% of caregivers took no measure during diarrhoea episodes and only 5% gave homemade fluids (Desta, Assimamaw & Ashenafi, 2017). 10.63% gave more fluids, 3.9% gave less fluids while 1.9% stopped breastfeeding, which fairly low compared to 30% (Gohiya *et al.*,2020) who choose to continue with breast feeding during child diarrhoea which quite alarming as breast feeding plays a critical role in prevention of diseases in children Moreso diarrhoea.

Health information sources are important to ensure caregivers are employing correct preventive measures. From our findings 12.6 % of the caregivers received information about diarrhoea in children from TV, 11.1% from radio, 30.44% from hospitals, 11.1% from CHWs and 13% from other sources. The findings are similar to the study conducted Rwanda whichindicated that,study participants , 37.0% got information from the hospital, 35.4 % from TV, 23.7% from radio, 11.4% from CHWs and 5.6% from other sources(Ndikubwimana, 2020). In both studies, it is evidence that majority of the study participants received information about diarrhoea in children from health facility, this is coupled by the fact that caregivers took their children to the hospital during diarrhoea episodes.

On asking the caregivers what should be done to prevent diarrhoea in under five children, 63.3% responded that eating clean food will prevent diarrhoea, 49.8% mentioned keeping surrounding clean as a way of preventing diarrhoea, 38.2% said hand washing, 26.09% identified use of latrine while 6.3% mentioned breastfeeding, according to the study conducted in Kakamega, 31% of the caregivers when asked on how they prevent diarrhoea, it is interesting to note that caregivers from this study reported that hand washing, proper waste disposal and exclusive breastfeeding could not prevent a child from having a diarrhoea(Njeru et al., 2017). This is a clear indication of the knowledge gap that should be address during health campaigns.

In this study 64.3% of the caregivers had positive attitude while 35.7% had negative attitude towards diarrhoea prevention. On the other hand, caregivers strongly disagreed (31.4%) and disagreed (37.2%) to the statement that a child was likely to have a diarrhoea next month showing a positive attitude. Similar results were observed in Ethiopia, where it was reported that, among the participants 60.6% disagreed on the like hood of their child experiencing diarrhoea in the next month(Agegnehu et al., 2019). Caregivers strongly disagreed (29%) and disagree(34.3%) that a child getting diarrhoea is normal showing a positive attitude. This finding is similar to what was reported in North West Ethiopia, whereby only 37.7% disagreed that diarrhoea is normal occurrence in children(Agegnehu et al., 2019). Contrarily to what was reported in India whereby, the study participants, 53.4% believed that diarrhoea is unavoidable since children come into contact with dirt as they are crawling or playing(Gohiya et al., 2020). Caregivers agreed (21.7%) and strongly agreed (54.1%) that they can prevent their children from getting diarrhoea showing a positive attitude.

On methods of water treatments 50.7% disagreed to boiling drinking water, 83.1% disagreed to filteringexhibiting negative attitude,while 50.7% strongly agreed to using chlorine as a method of water treatment. Others 69.1%, disagreed with the statement that nothing should

be done to treat drinking water showing a positive attitude, meaning that, majority of the caregivers were aware water should be treat to avoid diarrhoea in children under five years. Contrary to our results, a study done in Pakistan showed positive attitude where 75.1% of the households used various methods for water treatment hence improving the quality of life (Abbasi et al., 2021). The discrepancy could be because the caregivers believed the water from their sources was safe for use despite the analogy that "clean water is not always safe"(WaterAid, n.d.). Towards latrine use and method of child excreta disposal, caregivers had positive attitude where they reported strongly agreeing to use latrine (91.8%), where 82.1% strongly agreed to disposing child excreta in the latrine. Proper attitude on excreta disposal is important to avoid transmission of diseases such diarrhoea, these findings agree with study done in Ethiopia which showed that improper domestic solid waste disposal practices increased the likelihood of developing diarrhoea diseases by 2.7 times(Mosisa et al., 2021). They also agreed(63.3%)that they were satisfied with the water supply available showing positive. The rest who were unsatisfied, cited that the water took too much time to be delivered by water vendors, others responded that the water available is not enough for needs, others said that the water they get is of poor quality while others argued that the water is unsafe for drinking. The attitudes of caregivers on water availability can play a key role in diarrhoea prevention since lack of it can create a notion that the available water is for cooking only.

Practice with execution of knowledge and the right attitude can result to better prevention. Most of the practices are very basic but often overlooked(Kukeba et al., 2021). One of the best practices to prevent diarrhoea in children is exclusive breastfeeding for the first six month of birth and also continues to breastfeed even after the baby has started weaning(Ickes et al., 2021). This study shows that caregivers (87.92%) breastfed their children. The findings are divergent from what was observed in Nepal and Northwest Ethiopia which showed a low

of 31% and 2.5% respectively(Getachew et al., 2018; Mathema et al., 2020). The possible explanation for these low records of the two studies could be due to the fact that the studies were done in remote areas with limited access to information on importance of breastfeeding compared to our data which was collected from peri-urban areas. Despite understanding that usage of latrine in homestead is imperative in diarrhoea prevention, this study found out 84.06% of the caregivers eased themselves in the latrine, a practice which was contrary to what was reported in a study done in Tanzania that demonstrated that only 41% used their own latrines, this study finding reported a high number of latrine usage compared to the Tanzania study, this can be explained by the fact that, Busia had been declared open defecation free hence influencing latrine usage and also the study done in Tanzania was conducted in pastoralist community, meaning that majority did not have a latrine as their livelihood involves movement from one place to another hence they see no need to construct latrines(Jacob & Kazaura, 2021). Enhancing hand washing practices at all times goes a long way in ensuring children are protected against diarrhoea and therefore, washing of hands during the most critical times is important if not always. 75.85% washed hands after changing baby's diaper, 56.52% washed hands before feeding the baby, 85.99% washed food eaten raw, 79.23% washed hands with soap and water before meals, 87.43% washed hands with soap and water after visiting the toilet. Contrarily to this study findings, another study reported in Properly managing the excreta eliminates chances of diarrhoea in children, in this study, on disposing the child's excreta, 25.60% disposed in the dumping site, 72.95% in the latrine and 1.45% in the bush. (Guillaume *et al.*.,2020) stated that 100% of the study respondents washed hands after visiting the toilet. This is because they were using public toilets which had soap and water. However, 27.78% did not wash their hands after changing their children's diapers. Almost half of the caregivers 38.89% disposed children feces in the garbage.

5.3 Socio economic status associated with diarrhoea prevalence in under five children in Burumba ward

The wealth status of the household showed a significant association with the occurrence of diarrhoea in children (Paul, 2020). Contrarily to this study finding where there was no association between income and diarrhoea prevention. Religion is said to influence the health seeking behaviour of caregivers and ultimately affecting their judgement on prevention(Gessesse & Tarekegn, 2022). 93.78% of the caregivers were Christians while 6.28% were Muslims. Religion in this case did not prove to be of significant as far of diarrhoea prevention in children is concerned.

Occupation of the parents can determine the health status of a family, for instance in a family where parents have a good return, it is expected that they have good health seeking behaviour, provide good diet to their children and live in a clean environment(Bisimwa et al., 2022). Contrary to that, a study conducted in northwest Ethiopia stated that housewives are at 3.9 times more likely to practice diarrhoea prevention as they spend more time with their babies as compared to the employed counterparts(Agegnehu et al., 2019). This study did not establish any association between occupation and diarrhoea prevention.

Studies have shown that, in a household where breadwinner is a mother, children are mostly well taken care of as mother tend to give more focus to the children wellbeing (Mathema et al., 2020)while could not be proved to be the case as most of the breadwinners (59.90%) in our study were fathers.

Education of caregivers of children under five years has been demonstrated to be of great significance when it comes to applying protective measures. It is argued that, caregivers with any formal education are better placed to understand diarrhoea as well as warning signs and what to do in such events(Duguma et al., 2024). Another study revealed that mothers with low level of education did not have the knowhow on diarrhoea prevention hence leading to

increased diarrhoea episodes in children(Njeru et al., 2017), similar to our findings whereby education showed significant association in diarrhoea prevention which concur with a study done in Mathare slums (Guillaume *et al..*,2020) while the caregivers who had gone upto secondary school were 3 times better at diarrhoea prevention (OR= 3.243; 95% CI= 1.073 – 9.806; P= 0.037). This finding is similar to a study that was conducted in Bangladesh which showed that, caregivers who literate were better at diarrhoea prevention compared to their illiterate counter parts (OR= 0.55; 95% CI= 0.35 to 0.88; p = 0.012).

Young caregivers are believed to be more careful in terms of using preventive measures to prevent their children from diarrhoea as it assumed their minds is fresh from school and able to practice what they were taught compared to their older counter parts who base their prevention from their previous experiences with their elder children rather than keeping themselves up to date with the recent acceptable practices(Alfaro, 2024).

Children being taken care of by their mothers are less likely to develop diarrhoea as mothers are keener on health status of their children and always want to give the best(Ndou et al., 2021). However, this study did not find any relationship between the primary caregivers and diarrhoea prevention.

5.4 Sanitation factors associated with diarrhoea prevalence in under five children in Burumba ward.

In this study, there was no statistical significant association between sanitation factors and with diarrhoea prevention among caregivers,However, presence of faeces, rubbish and flies around or near the houses despite Busia county was declared open defecation free(Njuguna, 2016), suggested that there is need for ODF reverification to ensure that Busia maintains the ODF status. This finding is consistent with the findings of the study conducted in Kericho, Kenya which showed that, faeces played an integral part in causing diarrhoea in children as a result of contamination(Kipngeno & Aseta, 2020). Although sanitation factors were not

significantly associated with diarrhoea prevention among caregivers, various studies have shown, availability of handwashing facility leading to enhanced practices(Gohiya et al., 2020; Mosisa et al., 2021). In this study, 42.5% of the respondents said they had a handwashing facility, but handwashing facility was only observed in 36.7% households. However, water and soap were available for handwashing in 66.2%and 67.2%households, respectively. This means that though most households had water and soap, they did not have somewhere designated for handwashing. Contrary to our findings, a study done in Kakamega showed that 77% of households did not have handwashing facility(Njeru et al., 2017).Additionally, rubbish and flies were observed near or around at 39.6% and 35.8% households, respectively, Presence of rubbish / faeces / flies around the households poses a risk of food contamination with agents that cause diarrhoea in under five children.

CHAPTER SIX
CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

1. The prevalence of diarrhoea in this study was found to be 42.51% which was high compared to the previous study done in 2010. This is as a result of lack of recent publication on diarrhoea prevalence in this study area leading to lack of necessary attention to prevent diarrhoea that can lead to more child mortality.

2. The research indicates that overall, respondents exhibited knowledge, attitude, and practices above average levels.Some caregivers had a negative attitudeon method of water treatment such as boiling and filtration towards diarrhoea prevention.Majority got water from public water which they assumed it was treated but there were other instances they got water from water vendors which they were not sure of the source.

3. Education was the only factor that was statistically significantly associated with diarrhoea prevention. This was despite the fact that; majority of caregivers had gone up to primary school.

4. Although there was no statistical significant between sanitation factors and diarrhoea prevalence, it was observed that, most of the houses did not have handwashing facility as majority resorted to old method of washing hands from a basin due to problematic water supply.

6.2 RECOMMENDATIONS

1. Diarrhoea prevalence patterns can be influenced by seasonal variations and therefore future studies should be taken through various seasons to ascertain the real picture of diarrhoea prevalence in Burumba ward.

2. The importance of breastfeeding in regards to diarrhoea prevention should be emphasis during child clinics. Negative attitudes towards boiling and filtration as methods of water treatment can highly influence diarrhoea in under five, therefore public health officer in Burumba ward should educate the caregivers and help them understand that treating water kills germs in water that can cause diarrhoea.

3.Health promotion campaign should focus in educating caregivers on various way of preventing diarrhoea so that everyone is at per with recommended practices.

4. The practice of handwashing can be enforced through the county government of Busia ensuring that water is available in all homesteads and communities trained by community health workers on how to improvise a handwashing facility. Presence of faeces around the households suggested that, public health officer in Burumba ward should ensure that there is availability of latrine in every household.

6.3 RECOMMENDATIONS FOR FURTHER STUDY

1. Conduct longitudinal studies to monitor trends in diarrhoea prevalence over time. This would help in understanding the long-term impact of interventions and identify any emerging factors that could hinder diarrhoea prevention.

2. Investigate the impact of different types and levels of educational programs on diarrhoea prevention. Studies could focus on comparing the effectiveness of various educational methods (e.g., community health workers, public health talks in hospitals and media) in improving knowledge, attitudes, and practices among caregivers.

3. Examine the barriers to adopting water treatment methods such as boiling and filtration. Understanding the reasons behind the negative attitudes toward these methods can inform the design of more acceptable and practical solutions for the community.

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APPENDICES

APPENDIX I: Information sheet for consent to participate in research Introduction
Hello, my name is [redacted] I am a student at Maseno University pursuing Master in Public Health. As a requirement for the master degree completion, I am undertaking a research study entitled '' Determinants of diarrhea and caregiver's knowledge, attitudes and practices on diarrhea prevention among under five in Burumba award, Matayos sub county, Kenya''.

The purpose of the study

The study intends to find out what is the prevalence of diarrhoea in this area and how caregivers play part in diarrhoea prevention taking a keen look on knowledge, attitudes and practices as well as how socio-demographic, socio-economic and sanitation factors affect your diarrhoea prevention in children below the age of five years.

Procedure

I have a few questions about diarrhoea and related issues. Your answers will be written and then used for analysis. We will need at least 20 minutes to discuss and record the information. You can withdraw from the interview at any stage if you do not wish to continue.

Risks

There will be no risks as results of participating in this study.

Benefits

There will be no direct benefits in participating in this study but answers provided will help in formulation of policy in diarrhea prevention.

Confidentiality

All information you provide will be handled as confidential, and your individual answers will not be known by anyone except for the interviewer and the coordinator of this study. The results will only be used to improve strategies for prevention of diarrhoea, one of the most common diseases in the community.

Will you participate in this study? Yes□ No□

Do you have any questions? Yes □No □ Caregiver unique ID……..

APPENDIX II: Certificate of consent

I have read and understood the above document describing the research study entitled'' Determinant of diarrhoea and caregivers' knowledge, attitude and practices on diarrhea prevention in Burumba ward, Matayos sub county, Kenya' 'I have asked the questions regarding the study and answered to my satisfaction. I freely consent to participate in this study and I understand I have the right to withdraw from participating without victimization.

Signature: Date: Interviewer: Signature: Date:

Kiambatisho I: Hatifahamivuya RidhaaUtangulizi

Hujambo, jina langu ni [redacted]. Mimi ni mwanafunzi wa uzima wa afyaya jamii katika chou kikuu cha Maseno. Ndio ni weze kukamilisha kazi ya uzamili, nahitaji kufanya utafiti wenye anwani ‘’Mambo yanayochangia kuhara na ummarifa, mtazamo and mazoea ya watunzi katika kuzuia kuhara baina ya Watoto wenye umri chini ya miaka tano, Burumba, eneo mbunge la Matayos, Kenya’’’’.

Lengo la utafiti

Utafiti huu unanuia kufahamu kiasi cha Watoto wanaoharisha na pia kuchuguza ummarifa, mtazamo na mazoea ya watunziwa Watoto kwenye kuzuia kuhara baina ya Watoto chini ya miaka tano katika sehemu mbunge la Burumba, Busia.

Utaratibu wa utafiti

Katika kutekeleza utafiti huu, nitauliza maswali machache kuhusu jinsi kuhara kunaweza zuruiwa na mambomengineyanayohusianakwamudawadakikaishirini.Majibuutakayopeanayatandikwa kwenye simu ya rununu na ndio itakayotumika katika kujumuisha matokeo ya utafiti huu. Kama utajihisi kutoendelea na kujibu maswali, unaweza nyamaza, na pia vilevile unahuru wa kujiondoa kabisa kwenye utafiti huu.

Hatariyautafiti

Nakuhakikishia hakuna hatari yoyote, ujumbe wowote utakaopeana utahifadhiwa kwasiri.

Manufaa

Hakutakuana Manufaa yamojakwamojakwako,hatahivyo,ushirikawakoutatusaidiakuwanamikakatiitakayosaidiakuzuiamaradhiyakuharabainaya Watoto wenyeumrichiniyamiakatano.

Usiri

Habari yote utakayotoaitachukuliwakwanjiayausirinahaitatoleakwamtumwingineyeyotewalakutumikakwa njiaingine ila tukwautafitiulioelezwa. Majibu yako itatumika tu kutafuta namna kuhura kwa Watoto kunavyo zuiliwa katika jamii.

Utajumuika kwa utafiti huu? Ndio□Laa□

Uko na swali lolote? Ndio □Laa□

Kiambatisho II: Cheti cha kuridhia

Nimesoma na kueleze wahati ya awali inayoelezea utafiti wenye anwani’’’Mambo yanayochangia kuhara na ummarifa, mtazamo and mazoea ya watunzi katika kuzuia kuhara baina ya watoto wenye umri nchini ya miaka tano, Burumba, eneo mbunge la Matayos, Kenya’’. Vilevile nimeuliza maswali kuhusu utafiti na kuridhia majibu yake. Kwa hiari yangu na kubali kushiriki katika utafiti huu na kuelewa kuwa nina haki ya kujiondoa katika utafiti huu bila kudhurumiwa.

Saini: Terehe: Msailiwa: Saini: Tarehe

APPENDIX III: Survey tool

Questionnaire No……

1. Socio-demographic profile
   a) Primary caregiver in the household
      1. Mother
      2. Father
      3. Other
2. What is your age?
3. How many people live in your household on regular basis?
4. How many children(<years) live in your household on a regular basis?
5. What is the age/s of your children?

SECTION A

1. Prevalence
   a) Did your child/children have diarrhoea in the past two weeks?
      1. Yes
      2. No
   b) What form or type of diarrhoea has your child suffered from
      1. Mucoid
      2. With blood
      3. Very watery
      4. Other

SECTION B

1. KNOWLEDGE

Knowledge of caregivers on diarrhoea prevention			
		YES	NO
1	**What is diarrhoea** Passing of watery stool once a day Passing of watery stool twice a day Passing of watery stool three or more times a day other		
2	**Causes of diarrhoea** Change of weather Dirty/ unsafe drinking water Eating bad food Bad spirits Poor personal hygiene Bad smells Germs Other		
3	**The last time your child had diarrhoea, how did you help them recover?** Nothing Gave home mixture Gave more fluids Gave less fluids Stopped breastfeeding Give ORS Visited the hospital Treated at home Went to traditional healer Other		
4	**How do you get information about diarrhoea?** Television Radio From hospital Community Health workers other		
5	**In your opinion what should be done to prevent diarrhoea incidences?** Promote breast feeding Eat clean/safe foods Handwashing Use latrine Keep surrounding clean Other		

Attitudes questions		
	Response category	frequency
1.How likely do you think your child will get diarrhea next month?	Strongly disagree Disagree Neutral Agree Strongly agree	
2.It is normal for a child to have diarrhea	Strongly disagree Disagree Neutral Agree Strongly agree	
3. I can prevent my child from getting diarrhea	Strongly disagree Disagree Neutral Agree Strongly agree	
4.Does your family use any of these methods in treating drinking water? a). Boiling water b). Filter water c). Chlorine treated water d). Nothing (Does not treat drinking water)	 Strongly disagree Disagree Neutral Agree Strongly agree Strongly disagree Disagree Neutral Agree Strongly agree Strongly disagree Disagree Neutral Agree Strongly agree Strongly disagree Disagree Neutral Agree Strongly agree	
5.We use pit latrine	Strongly disagree Disagree	

	Neutral Agree Strongly agree	
6.Child excreta is disposed in latrine	Strongly disagree Disagree Neutral Agree Strongly agree	
7. The caregiver satisfied with the current water supply situation?	Strongly disagree Disagree Neutral Agree Strongly agree	

2. Practices

Practices of caregivers on diarrhoea prevention			
		Yes	No
1	Did you breastfeed your child for at least six months after birth? If No, Why?		
2	What is your water source? Private tap Public well Public tap River Stream Other		
3	Where do family members go to ease themselves? Latrine Bushes Public toilet Neighbors toilet		
4	Do you wash your hands after changing baby's diaper?		
5	Do you wash your hands before feeding the baby?		
6	Do you wash food eaten raw before eating?		
7	Do you wash hands with soap and water before meal?		
8	Do you wash your hands with soap and water after visiting the toilet?		
9	How do you dispose your child's stool? Communal dumping site In the latrine In the bushes other		

SECTION C

1. SOCIO ECONOMIC FACTORS
   a) What is your religion
      1. Christian
      2. Muslim
      3. Other
   b) What is your occupation?
      1. Housewife
      2. Business
      3. Student
      4. Employed
      5. Other
   c) What is the level of your education?
      1. Primary
      2. Secondary
      3. University
      4. Other
   d) Who is the breadwinner of the family?
   e) How much do you earn per month?
   f) Where is your residence?

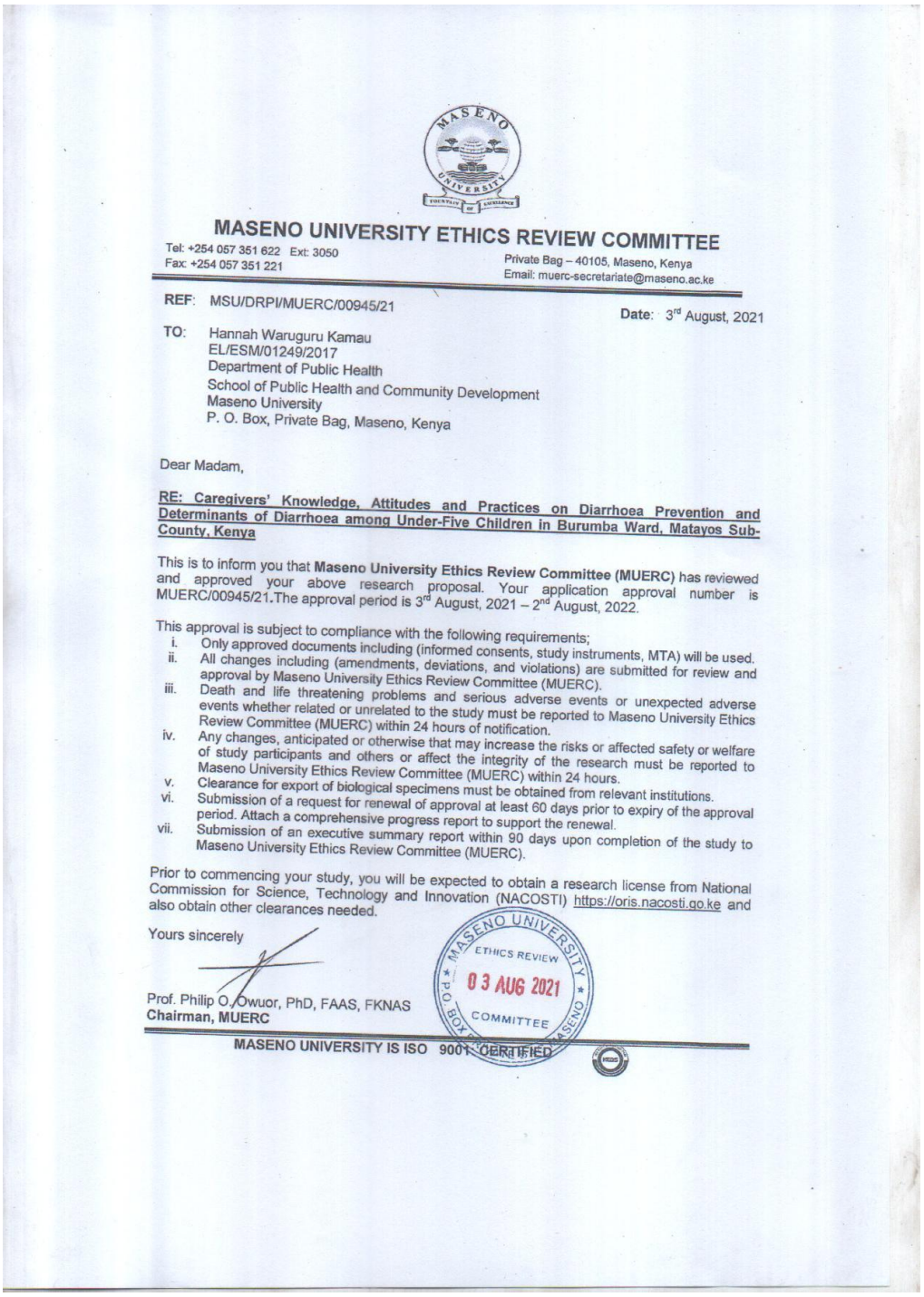
SECTION D

Observation checklist on Sanitation Factors

Sanitation factors	Yes	No
Availability of a latrine/toilet		
Availability of hand washing facility		
Availability of water for hand washing		
Availability of soap		
Presence of water drainage		
Presence offeces near/around the house		
Presence of rubbish near/around the house		
Presence of flies		

The END.

APPENDIX IV: Ethical approvals



MASENO UNIVERSITY ETHICS REVIEW COMMITTEE

Tel: +254 057 351 622 Ext: 3050
Fax: +254 057 351 221

Private Bag – 40105, Maseno, Kenya
Email: muerc-secretariate@maseno.ac.ke

REF: MSU/DRPI/MUERC/00945/21

Date: 3rd August, 2021

TO: Hannah Waruguru Kamau
EL/ESM/01249/2017
Department of Public Health
School of Public Health and Community Development
Maseno University
P. O. Box, Private Bag, Maseno, Kenya

Dear Madam,

RE: Caregivers' Knowledge, Attitudes and Practices on Diarrhoea Prevention and Determinants of Diarrhoea among Under-Five Children in Burumba Ward, Matayos Sub-County, Kenya

This is to inform you that **Maseno University Ethics Review Committee (MUERC)** has reviewed and approved your above research proposal. Your application approval number is MUERC/00945/21.The approval period is 3rd August, 2021 – 2nd August, 2022.

This approval is subject to compliance with the following requirements;

i. Only approved documents including (informed consents, study instruments, MTA) will be used.
ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by Maseno University Ethics Review Committee (MUERC).
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to Maseno University Ethics Review Committee (MUERC) within 24 hours of notification.
iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to Maseno University Ethics Review Committee (MUERC) within 24 hours.
v. Clearance for export of biological specimens must be obtained from relevant institutions.
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
vii. Submission of an executive summary report within 90 days upon completion of the study to Maseno University Ethics Review Committee (MUERC).

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) https://oris.nacosti.go.ke and also obtain other clearances needed.

Yours sincerely

Prof. Philip O. Owuor, PhD, FAAS, FKNAS
Chairman, MUERC

MASENO UNIVERSITY ETHICS REVIEW COMMITTEE 03 AUG 2021

MASENO UNIVERSITY IS ISO 9001: CERTIFIED

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR
SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **258439**

Date of Issue: **26/August/2021**

RESEARCH LICENSE

This is to Certify that Ms.. Hannah Waruguru Kamau of Maseno University, has been licensed to conduct research in Busia on the topic: Caregivers' Knowledge, attitudes and Practices on Diarrhoea prevention and determinants of diarrhea among under-five children in Burumba ward, Matayos sub-county, Kenya. for the period ending : 26/August/2022.

License No: **NACOSTI/P/21/12466**

258439

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR
SCIENCE,TECHNOLOGY &
INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

COUNTY GOVERNMENT OF BUSIA
DEPARTMENT OF HEALTH AND SANITATION,
P.O. BOX 1040 - 50400
BUSIA, KENYA

[illegible] DATE: 4th [illegible]

TO WHOM IT MAY CONCERN

RE: AUTHORITY TO CONDUCT RESEARCH

Ms. Hannah Wangari Kamau is a Post graduate Student at Maseno University and ha ve been authorized to undertake research on '**Caregivers' Knowledge, attitudes and Practices on Diarrhoea Prevention and determinants of diarrhea among under five children in Burumba Ward, Matayos Sub-County, Kenya**" in partial fulfillment of her degree at Maseno University.

Attached are relevant documents from university.

Kindly accord her any necessary cooperation.

Yours faithfully,

Dr. Maha Lowoto
County Director of Health
Department of Health and Sanitation
BUSIA COUNTY

C.C. CECM - Department of Health and Sanitation

Chief Officer - Department of Health and Sanitation