THE DETERMINANTS OF SAFE DISPOSAL OF CHILDREN FAECAL MATTER AMONG INTERNALLY DISPLACED CAREGIVERS HAVING CHILDREN AGED 5 YEARS AND BELOW IN WADAJIR DISTRICT OF SOMALIA

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The Determinants of Safe Disposal of Children Faecal Matter among Internally Displaced Caregivers having children Aged 5 Years and Below in Wadajir District of Somalia

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DECLARATION

This thesis is my original work and has not been presented for a degree or other in any other university.

Signature……..Date…….

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This thesis has been submitted for examination with our approval as the university supervisors.

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DEDICATION

I wish to dedicate this study to my family especially my beloved Wife for their support and understanding. I also wish to dedicate this thesis to my colleagues for their words of encouragement and continuous motivation to finalize my studies.

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Firstly, I wish to thank Allah for keeping me alive and in good health throughout the study period. Secondly, I wish to thank my supervisor's Dr Susan Mambo, Dr Japheth Mativo and Mr. Cheptoek Muhamud for their guidance and technical support while conducting my research.

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DEFINITION OF TERMS

Internally Displaced Persons	Someone who is forced to leave their home but who remains within their country's borders
Safe Disposal of Child Faecal Matter	This involves helping the child to use a latrine or toilet, or for very young children, putting or rinsing their feces into a toilet or latrine.
Improved child feces disposal	This involves disposing child's feces into an "improved" toilet or latrine
Open defecation	Human practice of defecating outdoors
Unsafe Child Feces Disposal	This involves disposing of child feces using any other method other than the two methods described in first and second definition above. This involves burying them, leaving children faecal matter in the open to decompose, disposing child faecal matter into the dustbin or compost pit.

ABSTRACT

Diarrhea is one of the leading causes of mortality in children, particularly among internally displaced persons (IDP) living in settings where access to care is often limited. To reduce child mortality from diarrhea, it is essential to address careless toilet practices by caregivers and ensure proper disposal of child fecal matter. The objectives of this study were to identify the methods caregivers' use to dispose faecal matter of children aged 5 years and below living in Internally Displaced Camps in in Wadajir District; to establish the socio-demographic factors influencing safe disposal of children (aged 5 years and below) faecal matter among caregivers of children living in the Internally Displaced Camps; to establish the socio-cultural factors influencing safe disposal of faecal matter among caregivers of children aged 5 years and below living in Internally Displaced Camps and to identify the best practices for safely disposing of fecal matter from children with diarrhea in Internally Displaced Camps in Wadajir District. This was a mixed method study with both a quantitative and qualitative approach. Quantitative approach adopted a cross sectional survey method. Data was collected from a sample size of 462 households with a child or children aged below five years. In the qualitative approach, key Informants were used to collect data until data saturation. Descriptive statistics and logistic regression were used to analyze quantitative data. Qualitative data was analyzed using framework analysis. SPSS and the Nvivo software were used for quantitative and qualitative data management and analysis respectively. Confidence interval of 95% was used and P was set at 0.05. Data was presented using appropriate graphical presentations. The results of this study showed that most of the caregivers (60.4%) disposed fecal matter by using diapers and throwing it in compost pit while a minority left the fecal matter in the open to decompose. Socio-demographic factors found to significantly influence safe disposal of children faecal matter were respondents age (OR: 1.757; 95% CI of OR=1.071-2.884, P<0.05), parity (OR: 0.42; 95% CI of OR=0.254-0.698, P<0.05) and employment status (OR: 0.263; 95% CI of OR=0.074-0.934, P<0.05). Socio cultural factors were reported to influence disposal of children faecal matter included perception that child fecal matter is not harmful, lack of gender sensitive latrines, culture of open defecation, low literacy levels among care givers, internal displacement, and Islamic religion. Additionally, the study revealed significant association between children faecal matter disposal in Wadajir and occurrence of Diarrheal diseases among children aged under five years. (Chi square test =29.37, P<0.05). The study therefore recommended that health workers engage in health education, gender sensitive latrines be constructed, women get better education among others.

CHAPTER ONE

INTRODUCTION

1.1 Background Information

In Somalia, there are 1.1 million internally displaced people (IDPs), with the majority living in the southern and central areas. With over 370,000 IDPs, Mogadishu had the highest concentration as per 2016 UNICEF report (UNICEF, 2016). IDPs made up 9% of the Somali population, according to the latest UN population estimates for Somalia. IDPs were mostly from minorities or minority clans, and they faced prejudice and had less informal social safety nets (Kalid *et al.*, 2019). The bulk of IDPs who arrived in Mogadishu as a result of the 2011 famine were from the Digle and Mirifle clans, as well as the Bantu minority from the Bay, Bakool, and Shabelle regions, and they were escaping not only drought but also prejudice by majority clans. Although these IDP communities had social support networks, they were less internationalized than the majority clans and received little in the way of remittances. According to studies, children of IDPs and minorities were the most exposed to child rights breaches. Females lead nearly two-thirds of IDP homes in Mogadishu. IDP families relied mostly on sporadic and precarious casual jobs, humanitarian aid, petty bartering, and charitable donations. IDPs were effectively held captive by predatory 'gatekeepers,' who they relied on for the right to settle and commercially provided utilities like water, and to whom they paid a levy on any humanitarian aid they get (WHO, 2022).

Studies showed that careless toilet practices by caregivers significantly contributed to improper disposal of child feacal matter. Furthermore, it is documented that child fecal matter was highly infectious and was a significant source of contamination. However, some communities considered child fecal matter as innocuous and thus no proper attention was paid towards proper disposal of the fecal matter (Brydl *et al.,* 2020). Key reasons that contributed to the occurrence of child fecal matter contamination could be

due to the fact that children were not be able to use toilets due to their age and level of physical development and the safety concern of their parents.

There was general information on proper disposal of children fecal matter however this area had been significantly neglected by researchers, policy makers and intervention programs. Furthermore, there was still less evidence regarding strategies aimed at ensuring the safe disposal of children fecal matter and thus this was an area that required significant attention by all players. Safe fecal matter disposal methods include the throwing of child fecal matter into the toilets and children using latrines by themselves. Ideally child fecal matter should be handled like adult fecal matter whereby efforts are geared towards ensuring separation of fecal matter from human contact and household contamination (Bawankule *et al*., 2017). Fecal matter contamination was a big contributor to diarrheal diseases among children and especially in an ID setting this was a huge problem. Globally diarrhea killed 2,195 children every day—more than AIDS, malaria, and measles combined. Each year diarrhea killed around 525 000 children under five years age (Ugboko *et al*., 2020). A 2018 World health Organization and UNICEF health bulletin for Somalia indicated that new cases of acute diarrhea including Acute Watery Diarrhea (AWD) and Cholera were gradually increasing in Somalia (WHO, 2022) .

There is a plethora of evidence suggesting that unsafe disposal of children fecal matter resulted to occurrence of diarrheal diseases**.** This was because human excreta contained over 50 known bacterial, viral, protozoan, and helminthic pathogens. The majority of excreta-related infections were obtained through ingestion, less often through inhalation (Brown *et al.*, 2013). Excreta-related infections travel through a variety of routes from one host to the next, either as a result of direct transmission through contaminated hands, or indirect transmission via contamination of drinking water, soil, utensils, food and flies (Brown *et al*., 2013). The following figure (Figure 1) represents an illustration of the different ways in which human excreta can contaminate food and water and cause diarrhea diseases.

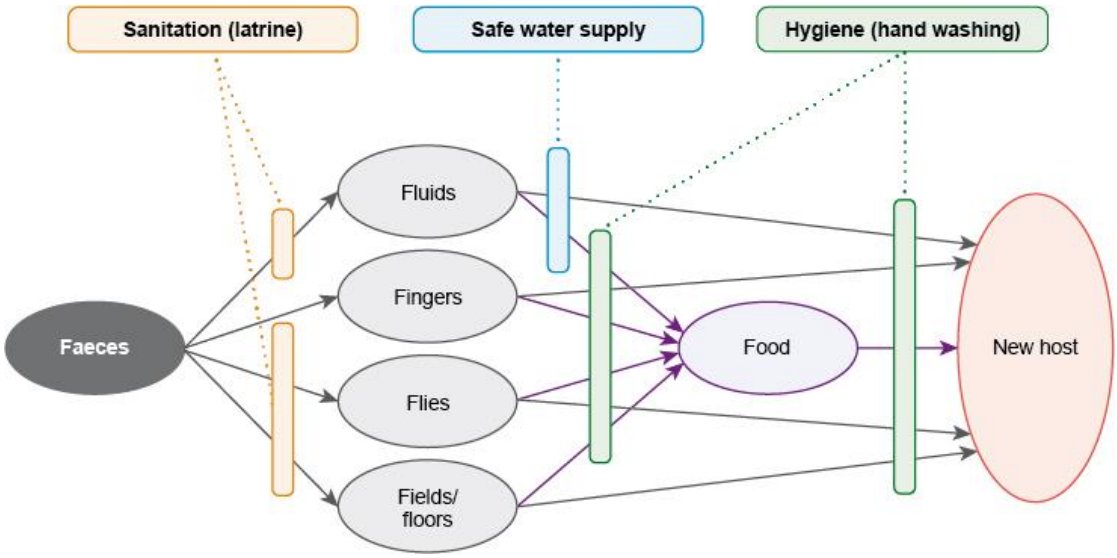

Figure 1.1: The F. Diagram

Source: (Brown et al., 2013)

Figure one illustrated how human beings and other hosts could get contamination from human excreta. When human faecal matter was improperly disposed, it could get into contact with Fluids, Flies, Fingers and Fields/Floors. Human excreta could then be transmitted from Fluids (contaminated water), contaminated Fingers, Flies and Fields, or Floors into food and to the new host, or even directly from the four *F's* to the new host. The diagram further illustrated three interventions which could stop the Feacal Oral transmission route. These include safe faecal disposal (use of latrines), safe water supply and practice of good hygiene (handwashing). This study therefore is focussed on understanding the factors linked with safe disposal of faecal matter by internally displaced caregivers having children below 5 years.

1.2 Problem Statement

Diarrhea among children under the age of five is a major public health concern in Somalia. Somalia's under-five mortality rate (U5MR) is currently the third highest in the world, trailing only Angola and Chad. One out of every seven Somali children dies

before reaching the age of five (UNICEF, 2016). As of 2015, neonatal deaths were estimated at 40 per 1,000 live births and the infant-mortality rate at 85 per 1,000 live births. Though there are multiple contributory causes to these unacceptably high levels of neonatal, infant and child mortality, diarrhea is the second leading cause of infant and child mortality (19%) after pneumonia (24 per cent) in Somalia. Children living in IDP camps are more vulnerable to diarrhea diseases and hence face a higher risk of death than any other child in Somalia (WHO, 2022).

Therefore, research is needed to determine the methods used by caregivers to dispose of children's fecal matter in Internally Displaced People (IDP) camps in Wadajir District of Benadir Region in Somalia. Such research should also investigate the socio-demographic and cultural elements that influence the safe disposal of children's feces (Kalid *et al*., 2019). An understanding of the methods used by caregivers and the social, demographic, and cultural factors that impact safe disposal will provide the evidence needed to inform evidence-based policy and program guidelines to improve the safe disposal of children's feces in the Wadajir District of Benadir Region in Somalia.

1.3 Objectives

1.3.1 Main objective

The general objective of this study was to assess the factors influencing safe disposal of children faecal matter among caregivers of internally displaced children (aged 5 years) in Wadajir district of Somalia

1.3.2 Specific Objectives

1 To identify the methods caregivers', use to dispose faecal matter of children aged 5 years and below living in Internally Displaced Camps in in Wadajir District of Benadir Region in Somalia.

2 To establish the socio-demographic factors influencing safe disposal of children (aged 5 years and below) faecal matter among caregivers of children living in Internally Displaced Camps in Wadajir District of Benadir Region in Somalia.

3 To establish the socio-cultural factors influencing safe disposal of faecal matter among caregivers of children aged 5 years and below living in Internally Displaced Camps in Wadajir District of Benadir Region in Somalia

4 To identify the best practices for safely disposing of fecal matter from children with diarrhea in Internally Displaced Camps in Wadajir District of Benadir Region in Somalia

1.4 Research questions

1 Which are the methods caregivers' use to dispose faecal matter of children aged 5 years and below living in Internally Displaced Camps in in Wadajir District of Benadir Region in Somalia?

2 Which is the socio-demographic factors influencing safe disposal of children (aged 5 years and below) faecal matter among caregivers of children living in Internally Displaced Camps in Wadajir District of Benadir Region in Somalia?

3 Which are the socio-cultural factors influencing safe disposal of faecal matter among caregivers of children living in Internally Displaced Camps in Wadajir District of Benadir Region in Somalia?

4 Which are the best practices for safely disposing of fecal matter from children with diarrhea in Internally Displaced Camps in Wadajir District of Benadir Region in Somalia?

1.5 Study Justification

The need to reduce diarrhea diseases among children living in IDP camps is Somalia cannot be overemphasized. This was turned to reduce children morbidity and mortality rates associated with diarrhea in Somalia. Seeking to better understand the methods caregivers' use to dispose faecal matter of children under five years living in Internally

Displaced Camps in in Wadajir District of Benadir Region in Somalia as well as the socio demographic and sociocultural methods influencing disposal of faecal matter among caregivers of children living in Internally Displaced Camps in Wadajir District of Benadir Region in Somali provided objective insights on interventions that can be implemented to help reduce incidence rate of child diarrhea in IDP camps. This in turn will help reduce mortality rates associated with child diarrhea in Somalia. This justifies the need for this study.

1.6 Significance of the study

This study provided valuable information which will help inform interventions aimed at reducing diarrhea diseases among children living in IDP camps in Somalia. The study also add knowledge to the existing body of knowledge in the field of public health.

1.7 Study Conceptual Framework

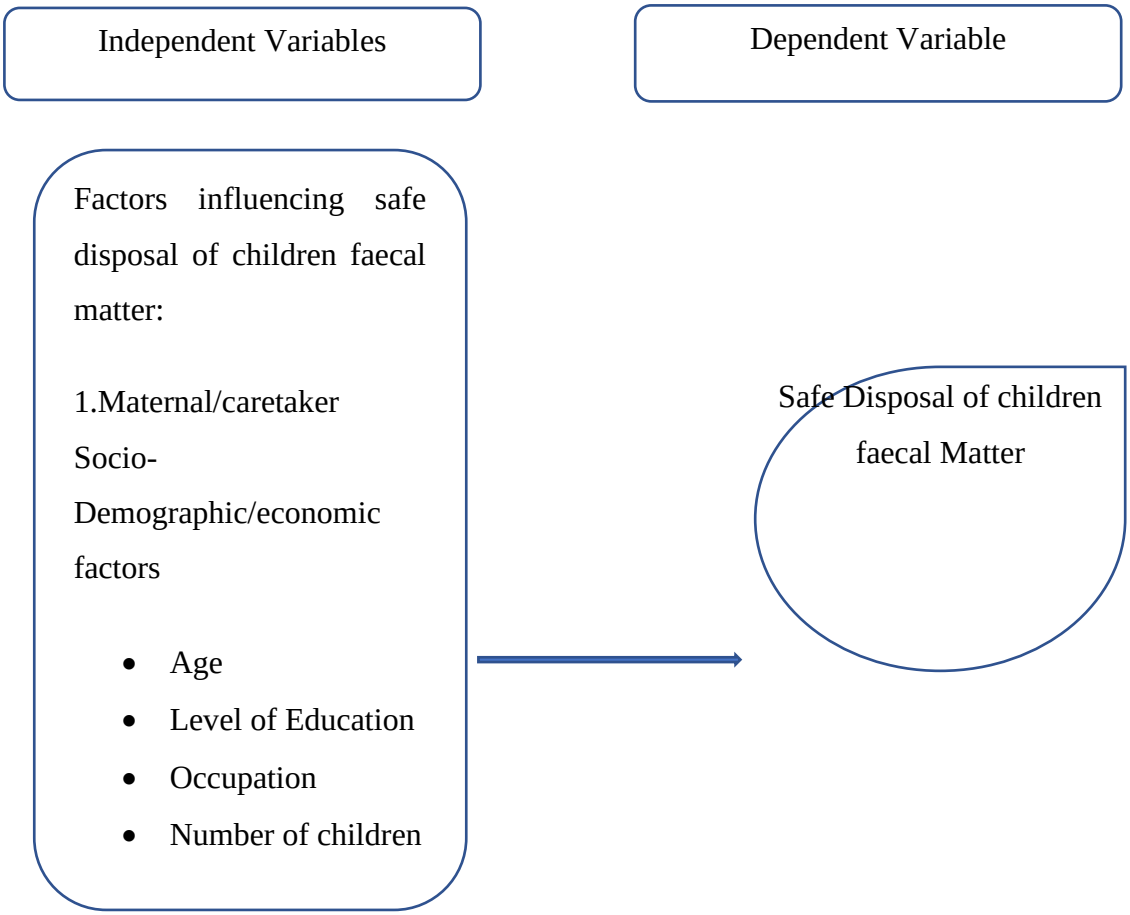

Figure 1.2: Study Conceptual Framework

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Fecal matter is a potential source of infection for caregivers and children, and therefore proper disposal of fecal matter is essential for maintaining a safe environment. Several studies have been conducted to investigate the knowledge, attitudes, and practices of caregivers regarding the safe disposal of fecal matter.

According to a study by Scar et al., (2022) only 54% of caregivers having children under 5 years were aware of the importance of proper disposal of fecal matter. Furthermore, only 36% of the caregivers disposed of their children's fecal matter in an appropriate manner. The most common methods of disposal reported by the caregivers were open defecation, followed by burying and flushing. The study concluded that more tailored interventions are needed to increase awareness and practice of proper disposal of fecal matter among caregivers (Sclar *et al*., 2022).

A second study conducted in Nigeria of mothers of children under five years of age found that only 43% of the mothers were aware of the importance of proper disposal of fecal matter. Further, only 19% of the mothers disposed of their children's fecal matter in an appropriate manner. The most common methods of disposal reported by the mothers were open defecation and burying. The study concluded that educational interventions was important in raising the awareness and practice of proper disposal of fecal matter among caregivers (Aliyu & Dahiru, 2019). A third study conducted in Uganda of caregivers of children under five years of age found that only 42% of the caregivers were aware of the importance of proper disposal of fecal matter. Further, only 31% of the caregivers disposed of their children's fecal matter in an appropriate manner. The most common methods of disposal reported by the caregivers were open defecation, followed by burying and flushing. The study concluded that health education

interventions was needed to increase the awareness and practice of proper disposal of fecal matter among caregivers. Overall, these studies showed that there was a lack of awareness and practice of proper disposal of fecal matter among caregivers of children under five years of age (Addis *et al*., 2022). To ensure a safe environment for children, health education interventions tailored to the local context were needed to increase the awareness and practice of proper disposal of fecal matter among caregivers.

2.2 Caregivers' socio-demographic factors

2.2.1 Age

The safe disposal of children's faecal matter was a critical factor in the prevention of disease transmission in low-income countries. In Africa, it was particularly important to consider the influence of age on safe disposal practices due to the high prevalence of childhood diseases and the large population of young children on the continent. This literature review examined how age was a factor influencing safe disposal of children's faecal matter among caregivers in Africa. Studies in Sub-Saharan Africa Studies conducted in Sub-Saharan Africa found that age was a major factor influencing the safe disposal of children's faeces. In a study in Tanzania, it was found that caregivers' safe disposal practices were significantly better for younger children than for older children. The study also found that elderly caregivers were more likely to practice safe disposal than younger caregivers (Chebet *et al*., 2020). In another study in Nigeria, it was found that age of the child was significantly associated with safe disposal practices. The study found that caregivers of children aged 5-14 years were more likely to practice safe disposal than those of younger children.

2.2.2 Level of education

The issue of safe disposal of children's faecal matter was an important factor in protecting public health, and was particularly relevant in developing countries. The level of education of caregivers was one of the factors influencing the safe disposal of

children's faecal matter. This literature review examined the current evidence on this topic. Studies conducted in India, Nigeria, and Ethiopia found that higher levels of education among caregivers was associated with better safe disposal practices for children's faecal matter. A study in India found that caregivers with a higher level of education were more likely to use safe disposal methods such as burying and flushing, while those with lower levels of education were more likely to use unsafe disposal methods such as open defecation and disposal in water bodies (Majorin *et al.*, 2019). Similarly, a study in Nigeria found that caregivers with higher levels of education were more likely to use safe disposal methods such as burying and flushing, while those with lower levels of education were more likely to use unsafe disposal methods such as open defecation. In Ethiopia, the study found that caregivers with higher levels of education were more likely to use safe disposal methods such as burying and flushing, while those with lower levels of education were more likely to use unsafe disposal methods such as open defecation and disposal in water bodies (Addis *et al.*, 2022).

Another study conducted in Zimbabwe found that caregivers with higher levels of education were more likely to use safe disposal methods such as burying and flushing, while those with lower levels of education were more likely to use open defecation or disposal in water bodies. In addition, the study found that mothers with higher levels of education were more likely to have knowledge about the importance of proper disposal of faecal matter, and were more likely to have access to sanitation facilities (Seidu *et al*., 2021). Overall, the evidence suggests that higher levels of education among caregivers was associated with better safe disposal practices for children's faecal matter. This suggests that education interventions aimed at increasing the level of education of caregivers could be an effective strategy for improving safe disposal practices of faecal matter and reducing public health risks.

2.2.3 Occupation

The safe disposal of children’s faecal matter was an important public health issue, as it is linked to a variety of communicable diseases. Caregivers’ occupation has been identified

as a factor that influences the safe disposal of faecal matter among children. A number of studies have examined the impact of occupational factors on faecal disposal practices (World Bank & WHO, 2019). One study conducted in India found that mothers in occupational and higher-income households were more likely to practice safe faecal disposal practices than those in lower-income households. The study reported that this difference may be due to the greater availability of resources and education that mothers in higher-income households have access to. Similarly, another study in Tanzania found that mothers who had a job were more likely to practice safe faecal disposal than those who did not have a job. The researchers concluded that this may be because mothers who had a job had a better understanding of the risks associated with unsafe disposal practices and had a greater ability to access resources for safe disposal (Mshida *et al*., 2020). Additionally, a study in Burkina Faso found that mothers with a professional occupation were more likely to practice safe faecal disposal practices than mothers with an unskilled occupation. The researchers suggested that this difference may be because professional occupations are more likely to be associated with higher levels of education and resources, which may have led to an increased awareness of the importance of safe disposal practices. In conclusion, a number of studies had demonstrated that occupation was a significant factor influencing the safe disposal of children's faecal matter among caregivers (World Bank & WHO, 2019). Caregivers who had a job or a professional occupation were more likely to practice safe disposal practices than those without. Moreover, those in higher-income households were also more likely to engage in safe disposal practices due to their greater access to resources and education. These findings suggested that interventions aimed at promoting safe faecal disposal practices should target caregivers of different occupations and levels of income.

2.2.4 Number of children

The number of children was an important factor in determining the safe disposal of children's faecal matter among caregivers. Recent studies had highlighted the significant impact that having multiple children had on the disposal of their faecal matter. A comparison was made between the disposal practices of caregivers with one child and

those with multiple children, and it was found that those with multiple children were more likely to engage in unsafe disposal practices. The authors attributed this difference to the lack of resources available for caregivers, such as lack of water supply, time, and money, which limited their ability to properly dispose of faecal matter safely (Majorin *et al*., 2014). The number of children had an impact on the disposal of faecal matter, with those having more children being more likely to dispose of faecal matter in an unsafe manner. The authors suggested that the higher burden associated with the care of multiple children led to the adoption of unsafe disposal practices. Furthermore, on the impact of the number of children on the disposal of faecal matter in rural Nigeria. They found that having multiple children was associated with poor disposal practices, with those having more children more likely to practice unsafe disposal methods. The authors suggested that this could be attributed to the lack of resources available to caregivers, as well as their lack of knowledge on safe disposal practices (Aliyu & Dahiru, 2019). Overall, the number of children was an important factor in determining the safe disposal of children's faecal matter among caregivers. Studies had showed that having multiple children was associated with poorer disposal practices due to the lack of resources and knowledge available to the caregiver. Therefore, it was important that caregivers were adequately supported and educated on safe disposal practices, and that resources are made available to ensure their ability to do so.

2.3 Socio economic factors

2.3.1 Poverty and low income

Socioeconomic factors were known to have a significant impact on the safe disposal of children's faecal matter among caregivers. Studies showed that poverty and low income contributed to unsafe disposal practices due to lack of access to adequate sanitation services which led to increased exposure to bacteria and other pathogens which have serious health implications. In addition, inadequate access to sanitation services led to increased risk of water-borne diseases, such as diarrhoea. Other socioeconomic factors including, cultural norms, education levels, and knowledge of safe disposal practices led

to unsafe disposal practices (Gomez *et al*., 2019). For example, in some cultures, it was considered taboo to discuss or touch faecal matter and so caregivers may not be aware of how to safely dispose of it or may be unwilling to do so. Additionally, in some cases, caregivers lacked the necessary knowledge or resources to be able to safely dispose of faecal matter, such as access to toilets or appropriate waste disposal systems (Kumar *et al*., 2020).

In addition, poverty could also limit a caregiver's ability to purchase or access the necessary supplies for safe disposal, such as soap for handwashing and diapers for babies (Kumar *et al*., 2020). This could further contribute to the risk of improper disposal practices and increased exposure to pathogens. Overall, it was clear that socioeconomic factors could have played a significant role in the safe disposal of children's faecal matter among caregivers. Poverty and low income, cultural norms, education levels, and knowledge of safe disposal practices could also contribute to unsafe disposal practices and an increased risk of water-borne diseases (Majorin *et al*., 2019). It was therefore important that interventions were developed to address these issues in order to ensure that caregivers were able to safely dispose of faecal matter and reduced the risk of disease.

2.3.2 Access to latrine

The safe disposal of children’s faecal matter was critical importance, as poor hygiene and sanitation practices could lead to the spread of infectious diseases. Access to latrines was one of the key factors influencing the safe disposal of faecal matter among caregivers. Studies have shown that improved access to basic sanitation facilities such as latrines could lead to a decrease in the prevalence of diarrheal diseases among children in developing countries (Aliyu & Dahiru, 2019). Several studies have focused on the role of access to latrines in the safe disposal of children’s faecal matter. A study conducted in Bangladesh found that households with access to latrines were more likely to properly dispose of faeces compared to those without access (Islam *et al*., 2018). Another study conducted in rural Ghana found that access to latrines was associated with

improved health and hygiene practices, including the safe disposal of faecal matter (Ritter *et al*., 2018). In addition, access to latrines was reported to positively influence the adoption of safe disposal practices among caregivers. One study conducted in India found that the presence of a latrine increased the likelihood that caregivers would dispose of faecal matter safely (Majorin *et al*., 2019). Similarly, a study conducted in Kenya found that access to sanitary facilities was associated with improved faecal disposal practices among caregivers. Overall, the available evidence suggested that access to latrines was a key factor influencing the safe disposal of faecal matter among caregivers. Improved access to basic sanitation facilities could lead to improved health and hygiene practices, which could ultimately reduce the prevalence of infectious diseases.

2.4 Socio-cultural and religious factors

Socio-cultural and religious factors had a significant role in influencing the safe disposal of children's faecal matter among caregivers. Cultural and religious beliefs could determine the way a caregiver interacted with the environment, and affected their perception of risk and their behaviour towards waste disposal. For example, in some cultures, it was believed that handling faecal matter is impure and taboo, and it was not accepted in certain social contexts (Roberts & Okereke, 2017). Religious beliefs could also shape the attitudes and practices of caregivers towards the disposal of faecal matter. In some religious settings, there was an emphasis on cleanliness and sanitation, and caregivers were expected to follow certain protocols for the safe disposal of faecal matter. For example, in Islam there were specific rules and regulations for the disposal of faecal matter that must be adhered to (World Health Organization, 2019). In addition, socio-cultural norms could influence the disposal of faecal matter. In some cultures, children's faeces were considered to be dirty and must be disposed of in a specific way in order to protect the health of the family. Different types of waste disposal methods were preferred in different cultures, such as the use of pits, latrines, and open defecation (Bauza *et al*., 2019). In conclusion, socio-cultural and religious factors had a significant role in influencing the safe disposal of children's faecal matter among caregivers.

Caregivers were aware of their own cultural and religious beliefs and expectations in order to ensure that they were following the appropriate protocols for disposal. Additionally, socio-cultural norms and expectations must be taken into account when developing and implementing waste disposal policies and initiatives in the future.

CHAPTER THREE

MATERIALS AND METHODS

3.1 The Study Area

The study was carried out in Wadajir district of Benadir region in Somalia. Wadajir is situated on the Indian Ocean coast of the Horn of Africa, in the Benadir administrative region in southeastern Somalia. Wadajir District was purposively chosen since about two thirds of internally displaced persons resides in the district.

3.2 Research Design

There was a mixed method study in which data will be collected in two phases. Phase one collected quantitative data while phase two involved collection of qualitative data. The quantitative phase adopted a descriptive cross-sectional survey method. In this phase quantitative data on social demographic characteristics of respondents, on occurrence of diarrhea among children (self-reporting in last two weeks prior to the study) and the methods used by respondent's in disposing off child faecal matter was collected. Phase two involved collection of qualitative data using Key Informant Interviews (KIIs).

3.3 The Study Population

The study population were internally displaced persons or women of reproductive age 18 to 49 years with under five years old children in Wadajir District in Mogadishu Somalia**.**

3.4 The Sampling Procedure

3.4.1 Caregivers

In order to select a representative sample of 462 caregivers for this study, a multiple cluster sampling technique was used. The first step was to identify the population of caregivers of internally displaced children aged 5 years and below in Wadajir District of Somalia using a sample frame from the government's list of internally displaced persons beneficiaries. The population was grouped into 11 administrative units. Next, a purposive sampling technique was used to select three clusters of administrative units: Wadajir, Dharkenley, and Daynile. Within each selected cluster, a simple random sampling technique was used to select a representative sample of caregivers. This process ensured that every member of the population had an equal chance of being selected, resulting in a truly random sample that was representative of the population. The sample frame for this study was a government-provided list of internally displaced persons beneficiaries, which included information on caregivers and their dependent children. From this sample frame, a random number generator was used to select 462 caregivers by randomly selecting numbers that corresponded to the caregivers on the list. The caregivers corresponding to the selected numbers were invited to participate in the study. This process ensured that every member of the population had an equal chance of being selected, resulting in a truly random sample that was representative of the population. Using the government-provided list of internally displaced persons beneficiaries as a sample frame also helped to ensure that the sample was representative of the population of interest and that the sample was not biased.

3.4.2 Group leaders for KIIs

The first step was to identify the population of breastfeeding group leaders of internally displaced children aged 5 years and below in Wadajir District of Somalia using a sample frame from the government's list of internally displaced persons beneficiaries. The population was grouped into 11 administrative units. Next, a purposive sampling

technique was used to select three clusters of administrative units: Wadajir, Dharkenley, and Daynile. Within each selected cluster, a simple random sampling technique was used to select a representative sample. The sample frame for this study was a list of 50 women group leaders who were identified through outreach efforts and community engagement. From the sample frame, a random number generator was used to select 12 women group leaders by randomly selecting numbers that corresponded to the group leaders on the list. The group leaders corresponding to the selected numbers were interviewed as key informants in the study. The process ensured that every member of the population had an equal chance of being selected, resulting in a truly random sample that was representative of the population of women group leaders. Using a sample frame of 50 women group leaders that were identified through outreach efforts and community engagement also helped to ensure that the sample was representative of the population of interest and that the sample was not biased

3.5 Sample Size Determination

3.5.1 Quantitative Survey

The overall number of reproductive-age women in Mogadishu's Wadajir district is estimated to be around 14,000 people. This number is in the tens of thousands. As a result, a formula similar to that employed by Fisher et al 1998 was utilized to calculate the minimal sample size. The chosen formula, as employed by Fisher et al., (1998), is as follows:

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

Where, n = is the desired sample size (when the study target population is over 10,000)

Z - is the standard normal deviate=1.96. (Corresponding to 95% Confidence Interval)

p **-** Proportion of the target population estimated to have the desired characteristics.

q = 1.0 – ***p***

d = Degree of accuracy required usually set as 0.05

Though the estimated number of women of reproductive age in Wadajir district is 14,000 (World Vision, 2017), the proportion of the target population (women of reproductive age with a child aged below 5 years old) is not known. Therefore, in the absence of a reasonable **p** is estimated at 50% (0.50) (Fisher *et al.*, 1998).

p = 50/100 or 0.50

q = 1-***p*** = 1- 0.50 = 0.50

Hence, the desired sample size (***n***) has been calculated as follows.

$$n = \frac{Z^2 pq}{d^2} = \frac{1.96^{\,2} \text{x } 0.50 \text{ x } 0.50}{0.05^2}$$

$$n = \frac{0.9604}{0.0025}$$

n = 384.16 which is approximately 384.

20% of 384 participants were added to increase representativeness and non-response of respondents.

Thus 20% of 384 = 76.8 subjects.

Thus ***n*** = 384+76.8= 461

3.5.2 Qualitative survey

The researcher purposively chose 12 breastfeeding women group leaders**.**

3.6 Inclusion and exclusion criteria

3.6.1 Inclusion Criteria

Mothers or caretakers of children aged below five years in Wadajir district of Mogadishu.

3.6.2 Exclusion Criteria

Mothers or caretakers of children aged below five years in Wadajir district of Mogadishu who for some reason are unable to give informed consent.

3.7 Data Collection tools

Data collection tools for this study were structured questionnaire and a Key Informant Interview question guide available in appendix I and II**.** The questionnaire was research administered and was divided into easy-to-understand sections. At the onset the researcher explained the purpose of the study to the respondents and only those who consented before the study were interviewed. For qualitative data, Key informant 30-minute interviews were conducted with fourteen (12) key informants who were community health volunteers. Purposive sampling was used to select the KIIs. The key informant interview guide was developed based on the main thematic areas of the quantitative data tools. Before conducting the key informant interviews, the key informants were taken through the essence of conducting the interview and informed consent was sought from them.

3.8 Variables in the study

Independent variables in the study were the sociodemographic factors influencing safe disposal of children faecal matter. Dependent variable was safe disposal of child Faecal matter.

3.9 Study Validity and Reliability

To ensure the validity and reliability of the data collected in this study, a pretest of the questionnaire was conducted. This involved administering the questionnaire to a small pilot sample of caregivers before conducting the main study. The pilot sample of 45 caregivers was selected using the same sampling technique that was used in the main study. The pretest involved the following steps and was carried in Dhanaane. The questionnaire was translated into the local language to ensure that all caregivers understood the questions and could provide accurate responses. The questionnaire was administered to the pilot sample of caregivers by trained research assistants. The responses from the pilot sample were used to evaluate the questionnaire. This included assessing the clarity and understanding of the questions, as well as the time it took to complete the questionnaire. Based on the feedback received from the pilot test, revisions were made to the questionnaire to ensure that it was clear, easy to understand, and easy to complete. Once the questionnaire had been evaluated and revised, it was finalized and ready for use in the main study. By conducting a pretest of the questionnaire, it was ensured that the data collected in this study was valid and reliable, and that the questionnaire was suitable for the population of caregivers of internally displaced children aged 5 years and below in Wadajir District of Somalia. The Cronbach's alpha statistic test used to determine the reliability while to ensure validity, the tools were subjected to expert validation to determine if the tool would measure what they were designed to measure as recommended by Bolarinwa, (2015).

3.10 Data Analysis and Management

Quantitative data was analyzed using descriptive and inferential statistics, logistic regression

In order to achieve the objectives of this study, a combination of descriptive and inferential statistics was used to analyze the data collected. Descriptive statistics such as frequencies, percentages, and means were used to describe the methods used by caregivers to dispose of children's faecal matter and the socio-demographic and socio-cultural factors influencing safe disposal practices. Inferential statistics were used to test the relationships between the independent and dependent variables. The chi-square test was used to examine the association between the methods used by caregivers to dispose of children's faecal matter and the socio-demographic factors such as age, education, and income. Probit binary regression analysis was used to identify the socio-demographic and socio-cultural factors that were most strongly associated with safe disposal practices among caregivers. In addition, a qualitative analysis was conducted to provide a more in-depth understanding of the factors influencing safe disposal practices among caregivers. This involved conducting in-depth interviews with a sub-sample of caregivers selected from the main sample. The interviews were transcribed and analyzed using content analysis to identify common themes and patterns. The results of the statistical analysis were presented in tables, figures, and text, and were discussed in relation to the study objectives and the existing literature. The findings of the qualitative analysis were presented in the form of direct quotes and themes, and were integrated with the findings of the study.

3.11 Limitation of the study

One limitation of this study was the potential for self-reported bias among caregivers when providing information about their practices and attitudes towards safe disposal of children's faecal matter. Caregivers may not have accurately reported their practices or may have provided socially desirable responses due to fear of judgment or stigma.

Additionally, the study was based on a sample of internally displaced persons in one district and the findings may not have been generalizable to other regions of Somalia or other settings where internally displaced persons are located. Additionally, the study's sample size and sampling technique may not have been sufficient to draw conclusions about the entire population of caregivers of internally displaced children aged 5 years and below in Wadajir district. Thus, a more robust study with larger sample size should be undertaken.

3.12 Ethical Consideration

To ensure that the rights and well-being of the study participants were protected, the following ethical considerations were taken into account. Informed consent was obtained from all study participants before they were enrolled in the study. Participants were informed of the purpose of the study, the procedures that would be used, and any potential risks or benefits associated with participation. They were also informed that their participation was voluntary and that they could withdraw from the study at any time without penalty. The confidentiality and privacy of the study participants were maintained throughout the study. Participants' personal information and study data were kept confidential and only shared with authorized personnel involved in the study. The study was designed to minimize potential risks to participants while maximizing potential benefits. The study procedures were reviewed by the University of Eastern Africa Baraton's ethical review committee to ensure that they were appropriate and minimized potential risks. Participation in the study was voluntary and participants were informed that they could choose to participate or not without any penalty. Participants were informed that they could withdraw from the study at any time without penalty. Permission to carry out the study was sought from the Jomo Kenyatta University of Agriculture and Technology graduate school and the institutional review ethical committee (IREC) of the University of Eastern Africa Baraton was sought.

CHAPTER FOUR

RESULTS

4.1 Socio-demographics

4.1.1 Socio-Demographic Characteristics of the respondents

The following table represents the sociodemographic characteristics of the respondents.

Table 4.1: Socio demographic Characteristics of Study Participants

		Frequency	Percent
Respondent's age	16-20 Years	39	8.4
	21-25 years	95	20.6
	26-30 years	111	24.0
	31-35 Years	99	21.4
	36-40 Years	47	10.2
	41-45 Years	47	10.2
	Over 45 Years	24	5.2
	Total	462	100.0
Age of lastborn child	0 to 12 months	102	22.1
	13 to 24 months	175	37.9
	25 to 36 months	95	20.6
	37 to 60 months	90	19.5
	Total	462	100.0
Parity	1	24	5.2
	2	84	18.2
	3	114	24.7
	4	97	21.0
	5	78	16.9
	6 and above	65	14.1
	Total	462	100.0
Respondent's Education Level	No formal education	178	38.5
	Primary	182	39.4
	Secondary	101	21.9
	College/university	1	.2
	Total	462	100.0
Respondent's Employment Status	Employed	142	30.7
	Not Employed	320	69.3
	Total	462	100.0

Respondent's Marital status	Single	6	1.3
	Married	360	77.9
	separated	13	2.8
	Divorced	83	18.0
	Total	462	100.0
Respondent's Income in Somali SHS	0-10,000	174	37.7
	10,001-20,000	84	18.2
	20,001-30,000	60	13.0
	Above 30,000	144	31.2
	Total	462	100.0

4.1.2 Methods of Child Faecal Matter Disposal

Data revealed that a majority of respondents disposed child faecal matter by using diapers and threw the faecal matter in a compost pit, close to a quarter (21.6%) used diapers and threw it in a pit latrine, 2.8% of respondents buried child faecal matter in the soil and 0.4% left it in the open to decompose.The following bar graph provide a summary of this data.

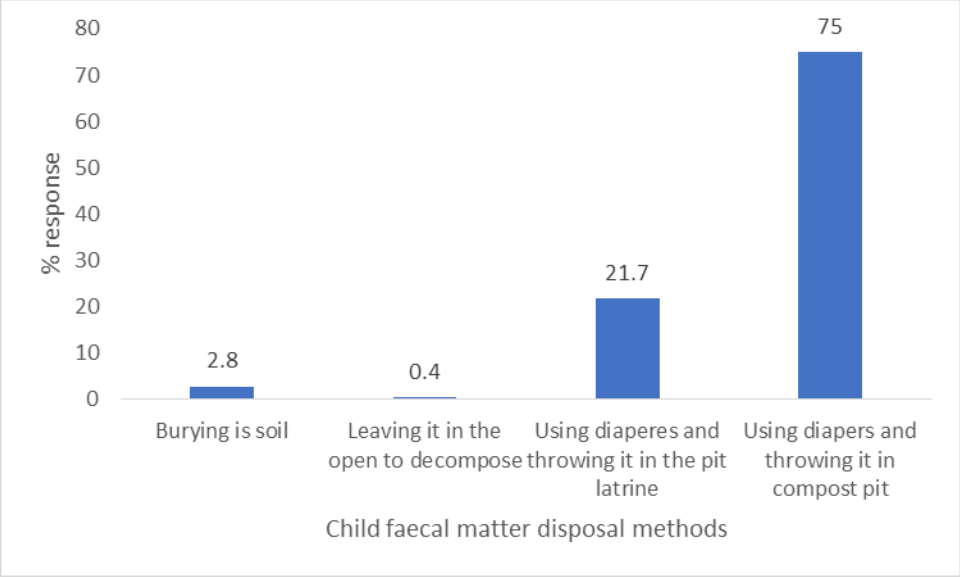

Figure 4.1: Child Faecal Matter Disposal in Wadajir District

4.2 Socio-demographic factors influencing safe disposal of children (aged 5 years and below) faecal matter

For the purpose of this study, safe disposal of children faecal matter is defined as disposing of Children faecal matter in a pit latrine. Based on the available data on child faecal matter disposal methods, only 21.6% reported to be disposing child faecal matter by throwing in a pit latrine. All the other methods of faecal matter disposal are considered as open defecation. The following table provides a summary of this data.

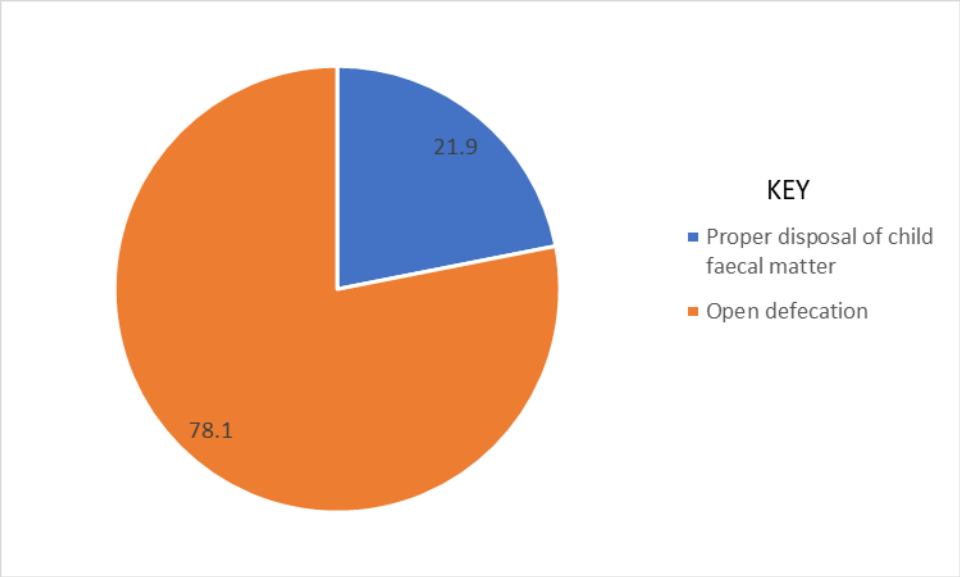

Figure 4.2: Proportion of Open Defecation Vs Safe Disposal of Children Faecal Matter

Further analysis established that social demographic characteristics which influenced safe disposal of children faecal matter were respondents age (OR: 1.757; 95% CI of OR=1.071-2.884, P<0.05), Parity (OR: 0.42; 95% CI of OR=0.254-0.698, P<0.05), and Respondent's employment status (OR: 0.263; 95% CI of OR=0.074-0.934, P<0.05). The following table (4.7) provides the summary of this data.

Table 4.2: Socio-demographic Characteristics influencing Safe Disposal of Children Faecal Matter

Variables in the Equation									
								95% C.I.for EXP(B)	
		B	S.E.	Wald	df	Sig.	Exp(B)	Lower	Upper
Step 1[a]	Respondents Age	.564	.253	4.977	1	.026	1.757	1.071	2.884
	Parity	-.865	.258	11.245	1	.001	.421	.254	.698
	Respondents Education Level	.009	.453	.000	1	.984	1.009	.415	2.454
	Respondents Employment Status	-1.337	.647	4.263	1	.039	.263	.074	.934
	Respondents Marital Status	-.535	.345	2.399	1	.121	.586	.298	1.153
	Respondents' Average household income	.000	.000	1.938	1	.164	1.000	1.000	1.000
	Constant	5.804	1.977	8.618	1	.003	331.657		

a. Variable(s) entered on step 1: Respondents Age, Parity, Respondents Education Level, Respondents Employment Status, Respondents Occupation, Respondents Marital Status, Respondents Average household income.

4.3 Social cultural factors influencing disposal of children faecal matter

In regard to socio cultural factors influencing disposal of children faecal matter, a total of six themes emerged from the qualitative data, these are 1. perception that 'child fecal matter is not harmful', 2. lack of gender sensitive latrines, 3. culture of open defecation, 4. low literacy levels among care givers, 5. internal displacement, and 6. Islamic religion.

4.3.1 Perception that Child Fecal Matter is not harmful

All the 9 key informants stated that majority of parents and care takers believe that faecal matter from children is not harmful. The following is three data sets from the key informants verbatim.

"Mothers believe that child poop has no germs and therefore cannot harm anyone, that is why they can throw it on the open ground to decay" Key informant 2

“Caretakers/mothers believe children poop is safer than adults’ poop and it cannot cause arm if left uncovered” Key informant 1

Mothers believe that no one has ever been infected poop from children, that’s why if left on the ground, it is not harmful” Key informant 8

4.3.2 Lack of gender sensitive latrines in IDP camps

Majority of key informants indicated that mothers/caregivers find it hard to dispose children faecal matter in latrines especially in IDP camps because the latrines are not gender sensitive.

“Most women feel instead of going to the latrine and meeting a man there, they would rather throw child faecal matter in the dustbin” Key informant 4

“Most donors did not take into consideration that women need their own private latrines and that is why majority of care givers who are women do not use latrines to dispose child faecal matter…… Because there is a danger of meeting a man in the latrine which is not allowed by our religion” Key informant 6

4.3.3 Culture of Open Defecation

All the nine key informants indicated that open defecation is a widespread culture in Mogadishu and Somalia in general and therefore disposing children faecal matter in the open is normal and acceptable.

“Here people are used to defecating in the bush ……. throwing child poop in the open is not a big problem” …. Key informant 4.

Why will anyone have a problem with throwing child poop…or leaving child poop in the open ground if they themselves defecate in the open? …people are used to seeing poop everywhere.” Key informant 11.

4.3.4 Low literacy levels among mothers/caregivers

Key informants indicated that majority of the caregivers have very low literacy levels and they even don't even know that they could be infected by exposures associated with child faecal matter.

"Majority of our women are not educated…. they even don't know the dangers associated with faecal matter…that's why they will dispose it in the open" Key informant 7

Our women did not attend any formal education…this is the main cause of ignorance in our society…they don't associate children faecal matter with disease occurrence…that's is the reason faecal matter is disposed like any other household garbage" Key informant 9.

4.3.5 Internal Displacement and Poverty

The Key informants indicated that internal displacement has caused poverty in the community and as a result community has lagged behind in many development issues including access to proper sanitation. This in turn has led to poor sanitation practices including improper disposal of children faecal matter.

"We have been experiencing insecurity which has displaced so many people……this has caused disorientation in families….and fueled poverty…. poverty comes with all sorts of inadequacies including lack of adequate sanitation facilities…this is the cause of open defecation and improper disposal of children faecal matter" ..Key informant 10

"We disposal children faecal matter in the open simply because we lack proper sanitation facilities…we are poor…displacement does not give people time to grow economically" Key informant 8

4.3.6The Islamic Religion

All the eleven Key informants identified Islamic faith as a key determinant of the way caregivers/mothers of children under five years dispose children faecal matter.

“Abu Maalik AL-Ash’ari (Allah be pleased with him)-the massager of Allah said “cleanliness is a part of faith…. In most households where the parents are strong in Islamic faith…children faecal matter is disposed in latrines….compound is free from faecal matter”….Key informant 9

“The hall mark of Muslim community is the abundance of places of convenience and adequate sewerage system in homes and public places….Islam advocates for keeping the body and the surrounding sane……Ensuring cleanliness that encompasses every part of the human being to his or her surroundings…from the seat of the body which is the heart that should be purified through outward part of the body that should be washed frequently….spreading all the way to the surroundings…..such teachings make improper disposal of child faecal matter un acceptable among the Muslims”. Key Informant 8

4.4 Association between disposing of child faecal matter and occurrence of diarrhea among children

This study established a significant association between occurrence of childhood diarrhea and disposal of children faecal matter. A majority of children below 5 years who had diarrhea in the last two weeks were of caregivers who disposed fecal matter by throwing away used diapers in compost pit followed by those who threw fecal matter in the pit latrine while the least number of children who had diarrhea in the last two weeks were from caregivers who disposed fecal matter by leaving it in the open to decompose.

Table 4.3: Cross tabulation of Diarrhea Episodes against Children Faecal Matter Disposal

	Observed Diarrhea episode in a child under 5 years in last 2 weeks?		**P value**
Methods of fecal matter disposal	**Yes216 (%)**	**No 246 (%)**	**<0.001**
Burying in the soil	7(1.5)	6(1.3)	
Leaving it in the open to decompose	0(0)	2(0.4)	
Throwing into the compost pit	51(11)	16(3.4)	
Using diapers and throwing it in the pit latrine	43(9.3)	58(12.6)	
Using diapers and throwing it in compost pit	115(24.8)	162 (35.5)	

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussion

5.1.1 Methods of Child Faecal Matter Disposal in Wadajir District

The findings of this study indicated a significant problem with open defecation among households in the region. Specifically, only 21% of households reported disposing of children's fecal matter in latrines. Instead, a range of other methods were used, including burying the fecal matter in soil, leaving it to decompose in the open, throwing it into a compost pit, and using diapers and throwing them into the compost pit (Ntekpe & Hussain, 2020). All of these methods constitute open defecation, which is a major contributor to the high prevalence of diarrhea among children observed in the study's objective three.

This presented a significant public health concern, as open defecation is a major risk factor for the spread of diarrhea and other diseases. Therefore, it was crucial that efforts are made to improve access to and use of latrines in the region. This involved providing education and awareness-raising campaigns about the importance of proper sanitation and hygiene, as well as providing financial and technical assistance to households to construct and maintain latrines (Okullo & Ogendi, 2017).

In addition, it was important to note that the use of diapers and throwing them in the compost pit is a wrong practice, this is because diapers are not biodegradable and can take a long time to decompose. Therefore, it was crucial that the community is educated on the use of diapers and their disposal methods. Overall, this study highlights the urgent need for action to address the problem of open defecation in the region and improve access to proper sanitation and hygiene in order to protect the health of the community's children (Bauzza *et al.,* 2019).

5.1.2 Socio-demographic factors influencing safe disposal of children faecal matter

The study investigated the social demographic factors that influenced the safe disposal of children's fecal matter in a certain region. The results of the study indicated that several social demographic characteristics are associated with safe disposal practices. These include the age of the respondent, parity, employment status, and occupation.

One of the most notable findings of the study was that older respondents were more likely to dispose of children's fecal matter in a pit latrine compared to younger respondents. This finding was important because it suggests that older caretakers may have a greater understanding of the importance of proper disposal practices compared to younger caretakers (Bauza *et al*., 2019). This was due to a greater awareness of the potential health risks associated with open defecation, as well as a greater understanding of the benefits of using a pit latrine for disposal.

Another key finding of the study was that employed caretakers were less likely to dispose of children's fecal matter safely. This was due to the fact that employed caretakers are more likely to delegate caregiving responsibilities to other family members during the times they are at work (Strasser, 2003). This led to a culture of unsafe disposal practices, as those with delegated responsibilities were understand the importance of proper disposal or may lack the resources to do so.

Furthermore, the study found that parity, employment status, and occupation also had an influence on safe disposal practices. Women with more parity were less likely to dispose children fecal matter safely compared to those with fewer parity. This was attributed to the fact that mothers with more children had less time and resources to devote to proper disposal practices. These findings highlighted the importance of considering social demographic factors when designing interventions to improve sanitation and hygiene practices in the community. This was especially important in low-income communities where access to proper sanitation facilities was limited. Interventions aimed at specific groups, such as older caretakers and employed caretakers, were particularly effective in

promoting safe disposal practices (Simiyu *et al*., 2020). Additionally, providing education and resources for mothers with more parity was beneficial in reducing the prevalence of unsafe disposal practices.

However, it was important to note that these findings were based on a single study and may not be generalizable to other populations or regions. Further research is needed to better understand the underlying mechanisms that influence safe disposal practices and to identify effective interventions to promote safe disposal in low-income communities (Clasen *et al*., 2010).

5.1.3 Social cultural factors influencing disposal of children faecal matter

5.1.3.1 Practices for disposing children feacal matter

The study identified five practices for disposing of children's fecal matter, including burying in soil, leaving it to decompose in the open, throwing it into a compost pit, and wrapping it with diapers and throwing it in a pit latrine. The study's findings were supported by a similar survey conducted by UNICEF and African Voices, which found that only 29% of households in the region were practicing open defecation. Furthermore, qualitative data collected in this study suggested that several socio-cultural issues supported open defecation in the Benadir region (Shire et al., 2020). Out of the six socio-cultural factors influencing the disposal of children's fecal matter, only one (Islamic religion) appeared to be supporting proper disposal.

The high prevalence of open defecation in the Benadir region was also supported by a recent humanitarian survey conducted by the Somalia humanitarian country team and partners, which indicated that Somalia was facing a double tragedy in terms of access to adequate sanitation. The study found that there was a steady increase in displacement and many IDPs suffer from secondary displacement. This was coupled with refugee returnees from Dadaab camp in Kenya. These two factors put a lot of pressure on existing sanitation facilities, which contributed to improper disposal of children's fecal

matter (Mafuta & Chipaike, 2021). Without access to a latrine, caretakers and mothers were left with limited options, including burying children's fecal matter in soil, leaving it to decompose in the open, throwing it into a compost pit, and using diapers and throwing them in a compost pit.

Therefore, the study highlights the need to consider both practices and socio-cultural factors when designing interventions to improve sanitation and hygiene practices in the Benadir region of Somalia. Targeting specific groups, such as internally displaced populations, and providing education and resources for mothers with more children could be beneficial in reducing the prevalence of unsafe disposal practices (Warsame, 2016). Furthermore, addressing the socio-cultural factors that support open defecation was crucial in reducing the prevalence of open defecation in the region and promoting safe disposal of children's fecal matter.

5.1.3.2 Social cultural issues influencing children disposal of fecal matter

The study identified six socio-cultural factors that influence the disposal of children's fecal matter, including the perception that "child fecal matter is not harmful," a lack of gender-sensitive latrines, a culture of open defecation, low literacy levels among caretakers, internal displacement, and the influence of Islamic religion. The results of this study highlight the importance of considering socio-cultural factors when designing interventions to improve sanitation and hygiene practices in the Benadir region of Somalia. The six socio-cultural factors identified are typical of any Somali community living in displacement (Shire et al., 2020). The fact that most of the people in the Benadir region are internally displaced, it was expected that they didn’t have adequate access to sanitation facilities and therefore they have developed a culture of open defecation over time.

Previous studies support this finding. Studies conducted in Ethiopia, Nigeria, India, and Odisha, have all associated factors such as low levels of education, poverty, and lack of access to sanitation facilities with unsafe disposal of children's fecal matter.

Furthermore, religion was also identified as a factor influencing sanitation practices, including the disposal of children's fecal matter (Sahiledengle, 2019).

In order to address the problem of open defecation and unsafe disposal of children's fecal matter in the Benadir region, interventions should target specific groups, such as internally displaced populations, and provide education and resources to improve access to sanitation facilities. Health education should also be used to educate people on the negative effects of unsafe disposal of children's fecal matter (Islam *et al*., 2018b). Furthermore, interventions should take into account the socio-cultural factors that support open defecation in the region and work to change the cultural norms and beliefs that contribute to unsafe disposal practices.

5.1.3.3 Association between disposing of child faecal matter and occurrence of diarrhea among children

The results of this study revealed a significant association between the disposal of children's fecal matter and the occurrence of diarrheal diseases among children under five years old. This association was likely due to the widespread practice of open defecation in the district. Research had established that unsafe disposal of children's fecal matter promoted the breeding of houseflies, which in turn leads to an increased prevalence of diarrheal diseases in the area. These findings were supported by several previous studies. There was a link between open defecation and the occurrence of diarrheal diseases among children. Open defecation was a significant risk factor for diarrheal diseases among children (Bawankule *et al*., 2017). These findings highlighted the importance of addressing unsafe disposal of children's fecal matter in order to reduce the occurrence of diarrheal diseases among children. This can be achieved through interventions such as providing education and resources to improve access to sanitation facilities, and promoting safe disposal practices in the community. Additionally, interventions should be designed to change the cultural norms and beliefs that contribute to open defecation in the region.

5.2 Conclusion

The following are the conclusions in this study

The study found that the majority of caregivers in Internally Displaced Camps in Wadajir District of Benadir Region in Somalia practice open defecation when disposing of the fecal matter of children aged 5 years and below. The most common methods include burying in soil, leaving it to decompose in the open, throwing it into a compost pit, and wrapping it with diapers and throwing it in a pit latrine.

The study established that several socio-demographic factors influence the safe disposal of children's fecal matter among caregivers in Internally Displaced Camps in Wadajir District of Benadir Region in Somalia. These include the age of the caregiver, parity, employment status, and occupation. Specifically, the study found that older caregivers were more likely to dispose of children's fecal matter in a pit latrine compared to younger caregivers, and employed caregivers were less likely to dispose of children's fecal matter safely.

The study identified several socio-cultural factors that influence the safe disposal of children's fecal matter among caregivers in Internally Displaced Camps in Wadajir District of Benadir Region in Somalia. These include the perception that "child fecal matter is not harmful," a lack of gender-sensitive latrines, a culture of open defecation, low literacy levels among caregivers, internal displacement, and the influence of Islamic religion. The study found that all six socio-cultural factors identified are typical of any Somali community living in displacement.

The study found that the best practices for safely disposing of fecal matter from children with diarrhea in Internally Displaced Camps in Wadajir District of Benadir Region in Somalia include using pit latrines, properly covering children's fecal matter, and providing education and resources to improve access to sanitation facilities. Additionally, interventions should be designed

5.3 Study Recommendations

The following recommendations can be made from the findings of this study:

1 The government of Somalia should increase access to sanitation facilities, such as pit latrines, in Internally Displaced Camps in Wadajir District of Benadir Region in Somalia.

2 The Public Health division should target specific groups, such as older caregivers and employed caregivers, in interventions to promote safe disposal of children's fecal matter

3 The Public Health division should address socio-cultural factors that support open defecation in the region, such as the perception that "child fecal matter is not harmful," through health education and awareness campaigns.

4 The government of Somalia should prioritize access to pit latrines and proper sanitation facilities in Internally Disposed Camps in Wadajir District of Benadir Region in Somala

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APPENDICES

Appendix I: Informed Consent

I am Bashir Abdi Shire, a student at Jomo Kenyatta University of Agriculture and Technology conducting a study titled "Prevalence of diarrhea and factors influencing safe disposal of children faecal matter among caregivers of internally displaced children aged 5 years and below in Wadajir district of Somalia". I wish to request for your consent to proceed and ask you a few questions with regard to this study. Information given will be treated with utmost confidentiality. Participation is voluntarily.

Procedure

The questionnaire will take between 15-20 minutes. No names will be written for anonymity purpose, but the questionnaires will be coded.

Benefits

This will provide important information for the ministry of public health in Somalia on how to come up with interventions to help reduce child diarrhea and improve sanitation management in your community. This in turn will help improve health of children and adults.

Confidentiality

Confidentiality and privacy will be achieved by maintaining very strict controls over access to the respondent's information. Anonymity will be practiced by using code numbers only instead of names. The information provided will be used only for research purpose and will not be divulged without the respondent's consent.

Voluntary consent

Participation will be voluntary, and the respondents will not be coerced nor penalized for declining to participate in the research. The respondents will also be free to withdraw anytime during the research and ask any question at any time during the research.

Potential risks

There will be no risk during the research.

I _____ accept to be part of this research. Signature: _____ Date:_____

Appendix II: Questionnaire

Questionnaire

Camp Name……...

Enumerator Name…….

HOUSEHOLD CODE.……

SECTION 1: Demographic Information

101. How old are you?

1. 16-20 Years ☐
2. 21-25 Years ☐
3. 26-30 Years ☐
4. 31-35 Years ☐
5. 36-40 Years ☐
6. 41-45 Years ☐
7. Over 45 Years ☐

102. How many children have you given birth to? (Seek to get total number of children born of the respondent both alive and still births (these who did not survive) 1. ☐ 2. ☐ 3. ☐ 4. ☐ 5. ☐ 6. Over 6 ☐

103. What is the age of your last-born child?

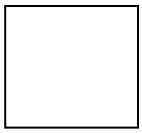
1. 0 to 12 months ☐

2. 13 to 24 months

3. 25 to 36 months

4. 37 to 60 months

104. What is your level of Education?



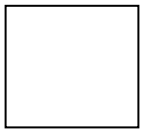
1. Primary

2. Secondary

3. College/university

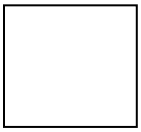
105. Are you employed?

1. yes



2. No

106. What is your primary occupation?



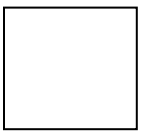
1. Peasant farming

2. Engaged in Small scale business

3. in gainful Employment

4. Other_____

107. What is your Marital Status?



1. Single

2. Married

3. Separated

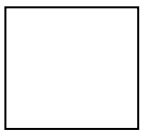
4. Divorced

108.What is your combined (your income + your spouse income) average total monthly income in Sshs. _____

109. Do you have access to a toilet?

1. yes

2. No



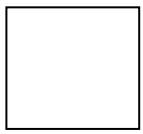
SECTION 2: Child Faecal Matter Disposal Practices and occurrence of child diarrhea

108. Is child faecal matter harmful?

1. Yes

2. No

3. Don’t know



109. How do you dispose child faecal matter?

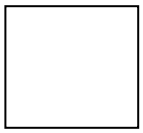
1. Burying in soil

2. Leaving it in the open to decompose

3. Throwing into the compost pit

4. Using diapers and throwing it in the pit latrine

5.Using diapers and throwing it in the compost pit

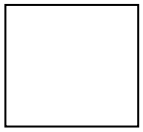
5. Any other method_____ 

110. Is your toilet improved or non-improved (research assistant to observe to establish if it is improved or non-improved**)**

1. Improved 

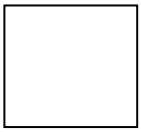
2. Non-improved

111. Have you observed diarrhea in any of your child under 5 years in the last 2 weeks?

1. yes 

2. No

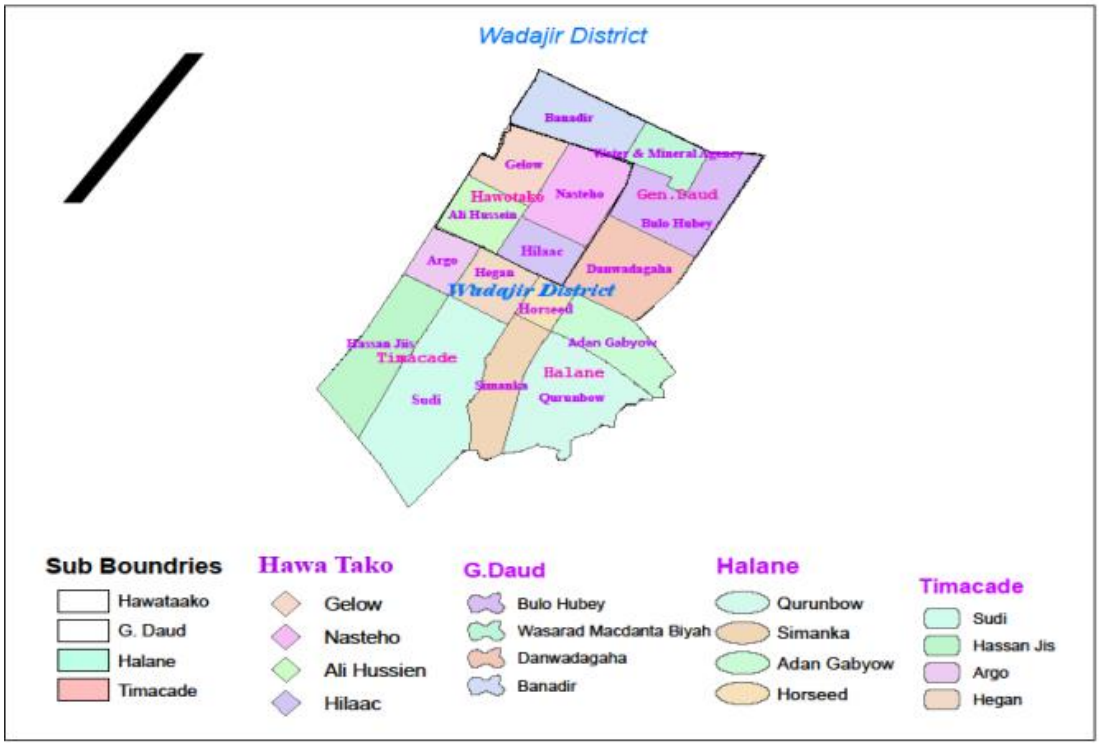
112. If the answer is yes, list total number of children under five years who suffered diarrhea in the last 2 weeks



Appendix III: Key Informant Questionnaire Guide

1. How do women/caregivers dispose child faecal matter in this camp?
2. What socio-cultural issues influence how women/caregivers dispose child faecal matter
3. Do you know any religious believes that influence disposal of child faecal matter in this community?
4. Do you know of any challenges hindering safe disposal of faecal matter in this camp?
5. What factors promote safe disposal of child faecal matter in this camp?

Appendix IV: Map of the Study Area



Appendix V: Budget

Item	Number of items	Cost per Item (USD)	Total (USD)
Questionnaire	462	0.5	231
SPSS software	1	200	200
Printing and binding of proposal	6	30	180
Printing and binding of thesis	6	60	360
Travel cost			100
Remuneration for research assistants	4	100	400
Stationary	1	50	50
Total			**1,521**

Appendix VI: Workplan

ACTIVITY	Sep-Dec 2019	Jan-April 2020	May-Aug	Sep-Dec	Jan-April 2021	May-Aug	Sep-Dec	Jan-April 2022	May-Aug	Sep-Dec	Jan-April 2023
Concept development and defence											
Proposal development and proposal defence											
Review of proposal by ethics board											
Piloting and data collection											
Data cleaning and analysis											
Paper development and Publication											
Thesis development											
Thesis defence											
Thesis submission											