

Caretaker's Knowledge, Attitudes, and Practices Regarding the Causes, Treatments, and Risks of Diarrhea Among Under-Five Children in North-Eastern Tanzania: A Cross-Sectional Study

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Abstract

Background. Pediatric diarrhea remains a public health concern. This study explored caretaker's knowledge, attitudes, and practices regarding the causes, treatments, and risks of diarrhea among under-fives in Korogwe and Handeni districts, north-eastern Tanzania. **Methods.** We conducted a qualitative, cross-sectional study. Participants were selected through purposive sampling. Data were gathered through in-depth interviews and focus group discussions, and they were analyzed using thematic analysis. **Results.** Most participants had good knowledge about the risks of diarrhea among under-fives. However, most participants had poor knowledge of the causes and treatments of diarrhea. A significant proportion of participants had negative attitudes and poor practices about the treatment of diarrhea. A small percentage of participants possessed positive attitudes and appropriate practices for managing diarrhea. **Conclusion.** To bridge the knowledge gaps among caretakers and promote positive attitudes and behaviors about the management of diarrheal diseases, health authorities are urged to strengthen health education in the study communities.

Keywords

knowledge, attitude, practices, diarrhea, under-5 children, caretakers, north-eastern Tanzania

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Introduction

On a global scale, diarrhea continues to be one of the most common public health concerns.¹ The condition is closely associated with poverty, which is primarily found in non-industrialized nations.² Approximately 94% of the 4 billion incidences of diarrhea that occur worldwide each year are caused by inadequate sanitation and a lack of access to safe and clean water.³ In addition, low socio-economic status of individuals, lack of access to medical care, and poor health-seeking behavior have also been connected to an increased risk of diarrhea, particularly in countries with limited resources.⁴⁻⁶

Children under the age of 5 living in low-resource countries, particularly in South Asia and Sub-Saharan Africa, are the most common victims of diarrheal illnesses, and those settings witness a high death toll.^{3,6}

Mortality rate as a result of diarrheal diseases in many least-developed nations is higher than 100 deaths per 100 000 children annually. For example, in Chad, and the Central African Republic, the mortality rate is greater than 300 per 100 000 children annually.²

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In Tanzania, diarrhea among under-5 children is one of the most significant health issues. According to 2016 statistics from the Tanzania Ministry of Health, the overall prevalence of pediatric diarrhea in the country was 12%.⁷ In essence, diarrheal illnesses are preventable, curable, and avoidable. Apart from improving living conditions, such as having access to clean drinking water, sanitary facilities, and good hygiene, the prevention and management of diarrheal diseases among under-5 children depend heavily on the knowledge, attitudes, and practices of caretakers about the illness.^{8,9} Since caretakers bear the primary responsibility for seeking treatment when a child suffers from diarrhea, their good knowledge, attitudes, and practices regarding the causes, transmission and management of diarrhea are of great importance in managing the illness among under-5 children.⁸ However, many studies carried out in different countries have reported that caretakers had poor knowledge, attitudes, and practices regarding the causes and management of diarrheal illnesses.⁸⁻¹⁰

Likewise, research conducted in Tanzania has demonstrated that caretakers of under-5 children exhibit inadequate knowledge in relation to the causes, transmissions, and management of diarrhea among under-5 children.⁹ Furthermore, it has been revealed that caretakers of under-5 children have negative attitudes and practices toward diarrheal illnesses.¹¹ Public health education is essential in increasing caretaker's awareness of the diarrhea problem, which ultimately will equip them with appropriate knowledge, attitudes, and practices regarding the management of the disease.^{9,12,13} In addition to what has been documented in earlier research, this study explored caretakers' knowledge and attitudes toward diarrhea treatment alternatives and medication preference. The extent to which caretakers were aware of the risks associated with diarrhea was also investigated in this study.

It was vital to gather information on knowledge, attitudes, and practices around diarrheal infections because of the severity of these illnesses in many Tanzanian regions, including Tanga Region, where Korogwe and Handeni districts are found.⁷ This study was therefore conducted to explore caretaker's knowledge, attitudes, and practices regarding the causes, treatments, and risks of diarrheal diseases among under-5 children in Korogwe and Handeni districts, Tanga Region, north-eastern Tanzania.

Policymakers and other relevant stakeholders may benefit from this study finding by learning more about caretaker's knowledge, attitudes, and practices regarding the causes, treatments, and risks of diarrheal diseases among under-5 children. This would perhaps help develop more effective and strategic diarrhea health policies and interventions that would be of assistance in

reducing and finally eliminating diarrhea among under-5 children in the study area.

Methods

Description of the Study Area

This study was conducted in Korogwe and Handeni districts, Tanga Region, north-eastern Tanzania from September 2022 to August 2023 (Figure 1). According to reports, the study area has a particularly high prevalence of diarrhea among under-5 children. For example, according to data from the District Health Information System (DHIS) in the districts of Korogwe and Handeni, the prevalence of diarrhea among children under 5 was 65% and 70%, respectively, in 2020.¹⁴ Leaving aside the high prevalence of diarrheal diseases among under-5 children in the study area, studies have shown that the use of traditional medicines in the management of various diseases, including diarrhea among under-5 children, is a very common practice.¹⁵⁻¹⁸ The high prevalence of diarrheal infections in the study area may be partly attributed to caretakers' preference to treat their children under 5 using traditional medicine. Additionally, the choice of most caretakers to treat diarrheal illnesses among their under-5 children with traditional medicine can have a positive or negative impact on their overall knowledge, attitudes, and practices toward the illness. Tanga Region is situated at the farthest northeast arc of Tanzania mainland.¹⁹ Administratively, Tanga Region has 8 districts which are Tanga, Muheza, Pangani, Korogwe, Lushoto, Handeni, Mkinga and Kilindi.¹⁹ In the study setting, most residents are engaged in small-scale farming of corn, beans, bananas, and cassava.^{20,21}

Design of Study

A cross-sectional study involving a qualitative approach was conducted among caretakers of under-5 children who visited the main health facilities in Korogwe and Handeni districts in north-eastern Tanzania.

Tools and Techniques for Gathering Data

Focus group discussions (FGDs) and in-depth interviews (IDIs) using semi-structured open-ended questions from interview guides were utilized to facilitate data collection. The participants were recruited from 12 main health facilities that served the majority of under-5 children in Handeni and Korogwe districts. Gathering a wide range of perspectives was the objective of involving the main healthcare facilities that treat a large number of under-5 children who suffer from diarrheal ailments. We purposively selected participants for this

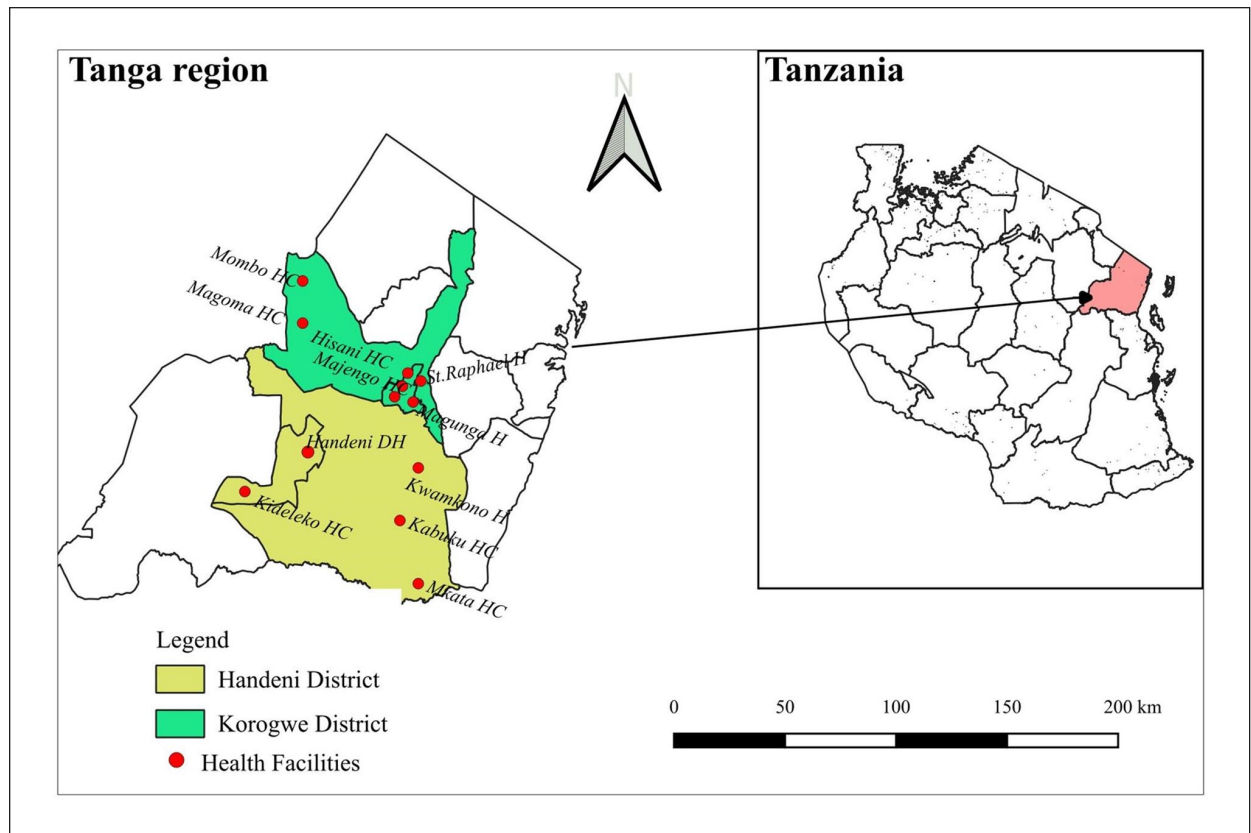


Figure 1. A map of the study area (Korogwe and Handeni districts) and health facilities where study participants were identified from DHIS books.

study based on the history of treating diarrhea in their under-5 children at the 12 designated health facilities during the 6 months prior to enrollment.

Eligibility for Participants

The study enrolled caretakers of children under 5 who attended 12 main healthcare facilities located in the districts of Korogwe and Handeni 6 months prior to the initiation date of this study and were recorded in the DHIS books. Only those participants who voluntarily provided written consent after being informed about the study were included in the study. The research did not include participants who were missing on the day of data gathering; those who were unwell or had any other state that made them unable to take part in the study were also excluded.

Pilot Study

Research tools (Interview guides for FGDs and IDIs) were tested in 2 villages and 2 health facilities in the study area before any data was actually gathered. The

pilot study's objectives were to assess the research team's interviewing skills, participants' understanding of the questions, and the accuracy of the tools. The tools underwent the required modifications and were further enhanced prior to the start of the study. The main study did not include the villages where the pilot study was conducted or the health facilities.

Participant's Selection for IDI

A male and female caretaker was purposively selected from the DHIS books, making a total of 24 from 12 health facilities. The DHIS books contained a wealth of patient information, such as the patient's name, place of residence, gender, age, and the condition that brought them to the health facility. A few days before the interview, the research team located the participants (both IDI and FGD participants) at their residence and informed them of their selection for participation in the study. Sensitization meetings were held prior to the commencement of the study, starting from the regional level, district level, village level, and family level for those families that had participants. As a result, the

majority of participants were informed about the study beforehand and had the chance to ask questions, all of which were satisfactorily addressed. All 24 participants invited to the IDI attended.

Participant's Selection for FGD

Using data extracted from the DHIS books, a total of 147 participants were recruited to participate in the FGDs. A minimum of 6 and a maximum of 10 individuals participated in each FGD. There were 12 FGDs for male participants and 12 groups for female participants. Out of the 168 FGD participants who received invitations, 147 showed up for the interview. Twenty-one participants received an invitation but could not attend because they had an emergency. Some fell ill, while others traveled outside the study area.

Interviewing Participants

The interview process commenced once a study participant gave his or her informed consent and duly signed and dated the Informed Consent Form (ICF). In situations where the research subject was illiterate, an impartial witness was consulted before the ICF was signed. An impartial witness was determined if one was not part of the research and could not be unjustifiably influenced by the people involved with research.²² The witness helps and ensures that the participant's consent is genuinely informed and voluntary. The participants were given the choice to choose whether or not to participate in the study after receiving comprehensive information about the study. Focus group discussions, IDIs, and informed consent procedures were handled by the research field team, which consisted of 3 males and 2 females. In addition to taking notes, a digital audio recorder was employed to capture data when a participant has given approval. The saturation threshold determined the total number of interviews that were conducted. Every interview was conducted in a quiet, comfortable, secure, and private location that suited the study participants. It took 30 to 60 minutes to finish each interview.

Reliability of the Data and Research Methods

This study's trustworthiness stems from the credibility, transferability, dependability, and confirmability of the research findings. The study's results are deemed credible in accordance with the credibility decree since respondents were given the option to participate in the study or not, and a member check mechanism was implemented. This study clearly outlines the sample size and data collection techniques used in order to guarantee transferability.

Furthermore, the respondents' inclusion and exclusion criteria were made explicit. To attain dependability, the study was able to adequately depict the whole course of the research process, from inception to completion and the acquisition of findings. For confirmability to be ensured, the transcripts, which contained the study participants' personal narratives, were used in this research.²³

Analysis of Data

Data were analyzed using thematic analysis. Initially, the data were collected in Kiswahili and later transcribed verbatim. Listening to audio recorded data and reading the transcripts were done repeatedly by the analysis study team which involved 5 people as part of the data quality check, to correct transcription errors. The study team repeatedly reviewed and read all of the transcripts and listened to all of the audio files in their entirety. After that, the data were translated into English. The English transcripts were also scanned repeatedly by the PI and the research team with the aim of understanding them. Codes were grouped into categories (Table 2), and during the coding process, 1 researcher performed the initial coding, and then 2 researchers met to compare the codes versus the transcripts and reached a consensus on the final codes. Codes were categorized based on the study-specific objectives. An inductive approach (ideas emerging from the data) was used for data analysis by following the 6 phases of thematic analysis suggested by Braun and Clarke.²⁴

Findings

Participant's socio-demographic characteristics: Table 1 presents the socio-demographic characteristics of the study participants. A total of 171 participants were recruited. Owing to the fact that Korogwe District had more health facilities than Handeni District, it included 59.6% of participants overall. The number of males who participated was slightly higher than that of females (51.5%). More than half (66.7%) of the study population were aged 18 to 40 years. Compared to the IDI, the FGD data collection method involved more participants (86%). The majority of participants attained primary education (68%), and for most of them (78%), their main economic activity is small scale farming.

Three main themes emerged during the analysis of the collocated data, namely: knowledge and attitudes about the causes of diarrheal diseases among under-5 children; knowledge, attitudes and practices regarding diarrhea treatment among under-5 children; and knowledge, attitudes and practices about the potential risks of diarrhea among under-5 children (Table 2).

Table 1. Participants Socio-Demographic Characteristics.

Study participants N= 171		
District	Number	Percentage
Korogwe	102	(59.6%)
Handeni	69	(40.4%)
Sex		
Male	88	(51.5%)
Female	83	(48.5%)
Age (in years)		
18 to 40	114	(66.7%)
>41	57	(33.3%)
Data collection methods		
In-depth interviews	24	(14%)
Focus group discussions	147	(86%)
Level of education		
No formal education	11	(6%)
Primary education	116	(68%)
Secondary education	37	(22%)
Tertiary and higher education	7	(4%)
Main economic occupations		
Small scale farmers	134	(78%)
Petty traders	22	(13%)
Employed	9	(5%)
Pastoralists	6	(4%)

Knowledge and Attitudes About the Causes of Diarrheal Diseases Among Under-Five Children

Although there were participants who believed that eating contaminated food or drinking contaminated water could lead to diarrhea among under-5 children, the majority of participants were of the view that diarrhea among under-5 children is mostly caused by witchcraft. The participants disclosed that certain individuals within the community, with evil intentions, bewitch the children and bring upon the onset of diarrhea. One participant clarified that when strangers with bad intentions enter a home with children, they may bewitch the children and cause them to suffer from diarrhea.

For example, participants had these to say:

“There are bad people who use black magic to make children fall sick, which is why children have diarrhea.” FGD participant, Male 26 years old

“Parents themselves cause their children to have diarrhea because they allow bad people to visit them while they have vulnerable children at home.” FGD participant, Male 45 years old

“My child had been bewitched; his stomach was swollen, and he had diarrhea.” FGD participant, Female 32 years old

“It is true that a child can get diarrhea from witchcraft. It is a condition that affects children, but we have medicines to treat it, and the child recovers.” IDI participant, Female 41 years old

“Children can definitely get diarrhea from bewitchment.” IDI participant, Male, 47 years old

On the other hand, some participants claimed that children under the age of 5 may get diarrhea by consuming contaminated food or water, but they still insisted that witchcraft is still a possible cause of diarrhea in children. According to the participants, this belief is highly prevalent in the communities in which they reside. The information provided by the participants suggests that microorganisms present in contaminated food or water can cause a child to contract diarrhea.

Participants explained:

“Children have diarrhea because they drink dirty water.” FGD participant, Female, 23 years old

“Ofentimes diarrhea is caused by drinking dirty water or eating dirty foods.” IDI participant, Female, 29 years old

“Eating unclean food is a common cause of diarrhea. Children tend to pick up dirty stuff and eat them.” FGD participant, Male, 39 years old

“Eating contaminated food is the cause of diarrhea, regardless of age.” IDI participant, Female, 26 years old

“Although consuming dirty food is the main cause of diarrhea, it’s also commonly believed that witchcraft can cause diarrhea in children.” IDI participant, Female, 46 years old

Some participants highlighted that diarrhea is a common occurrence in children, especially in the teething stage or when they begin to eat different foods. The participants’ knowledge indicates that if a child is given different foods other than breast milk from the mother, which he is accustomed to sucking, his stomach will not become used to it and he will get diarrhea. The participants explained that, prior to the age of 6 months; some parents offer their infants a variety of foods other than breast milk, which they believe is a contributing reason to the diarrhea that children suffer.

Participants elaborated:

“According to my understanding, children under the age of five suffer from diarrhea, but it often happens when their teeth start to grow.” IDI participant, Male, 34 years old

“A child under the age of five gets diarrhea when he starts eating other foods while his stomach is used to the milk he sucks from her mother.” FGD participant, Male, 33 years old

Table 2. An Illustration of the Thematic Analysis Coding Scheme.

Codes	Sub-themes	Main theme
Use black magic to make children sick Children get diarrhea from bewitchment Witchcraft can cause diarrhea in children My child had been bewitched	Knowledge and attitudes about the witchcraft causes of diarrheal diseases among under-5 children	Knowledge and attitudes about the causes of diarrheal diseases among under-five children
Diarrhea is caused by drinking dirty water Diarrhea is caused by eating dirty foods Children suffer from diarrhea when their teeth start to grow	Knowledge and attitudes about the natural causes of diarrhea among under-5 children	
A child gets diarrhea when he starts eating other foods Parents give them food before the age of 6 months	Knowledge and attitudes about other causes of diarrhea among under-5 children	

“Diarrhea often affects children under the age of six months because parents give them food before the age of six months while they are required to exclusively breastfeed during the first six months.” FGD participant, Male, 30 years old

Knowledge, Attitudes and Practices Regarding Diarrhea Treatment Among Under-Five Children

With regard to diarrheal treatment, most participants stated they preferred to employ traditional medicines over modern ones, despite differences in opinion regarding the optimal therapy for diarrhea among under-5 children. The participants explained that the use of traditional medicines in the treatment of diarrhea and other diseases is part of the practices and customs they inherited from previous generations. While interviewees acknowledged that they seek treatment in hospitals when traditional treatments fail, they also acknowledged that they turn to traditional treatments when hospital treatments fail.

For example, participants explained:

“Many caretakers utilize traditional medicines to treat their children who are suffering from diarrhea, but they may be reluctant to disclose this because they fear appearing outdated.” FGD participant, Male, 30 years old

“In our family, we have never gone to the hospital since our childhood; we have been using traditional medicines, and if I tell you that I started going to the hospital last year, you may not believe me, so these medicines can treat diarrhea completely.” FGD participant, Male, 30 years old

“He did not get better when I took him to the hospital. For this reason, I chose to treat him with traditional medicine, and he recovered.” FGD participant, Male, 45 years old

“I took my child to the health centre, where he was given medication, but diarrhea did not stop, so people close to me advised me to use traditional medicines, and when my child

took those medicines, he recovered.” FGD participant, Male, 30 years old

“Most caretakers treat their under-five children who are suffering from diarrhea with traditional medicines, and when they fail, they go to the hospital.” FGD participant, Female, 39 years old

“Our society often prefers traditional treatments, even though it is not very correct, because you may treat a child using traditional medicines and he does not get well, and when you decide to take him to the hospital, you find out he has become exhausted.” IDI participant, Female, 29 years old

“When my child had diarrhea, I gave him traditional medicine and he recovered.” FGD participant, Female, 36 years old

“We don’t usually go to the hospital right away when our children contract diarrhea, so I give him some traditional medication.” FGD participant, Female, 43 years old

“It is our habit to start with traditional medicines first, and if they fail, then we take our children to the hospital.” IDI participant, Male, 22 years old

A few participants revealed that when their children experience diarrhea or other illnesses, they prefer to treat them at the hospital. Believing that the hospital’s services are better and more accurate compared to the use of traditional medicines. The participants clarified that they now realize the significance of sending children to the hospital when they have diarrhea, thanks to the education they receive from a variety of platforms. In addition, participants were of the opinion that in the hospital, the child can be tested and given the right medicine according to the health problem he has.

Participants had these to explain:

“I do not believe that if I give a child traditional medicine, he will recover. I have already convinced myself that if I

give it to him, he will not recover, so I always make sure I go to the hospital." FGD participant, Female, 30 years old
"To be honest, I have never used any traditional medicine; if my child has diarrhea, I normally take him to the hospital for treatment." FGD participant, Female, 47 years old

"Hospital care is perceived as the best because of the sensitization that is provided. In short, I can say that when you get sick, the doctor must confirm the cause of that sickness. That is why we like to rush to the hospital in order to know the source of our illnesses. Perhaps you have three problems in your body; you may take traditional medicines, but it is not the appropriate treatment, so the doctor is the one to confirm." FGD participant, Male, 32 years old

"To be honest, hospital treatment is preferred, but in the past, we used to take traditional medicines when we got sick." FGD participant, Male, 52 years old

"For me, it's better to go to the hospital." FGD participant, Female, 23 years old

Knowledge, Attitude and Practices About the Potential Risks of Diarrhea Among Under-Five Children

All participants acknowledged that diarrhea poses a threat to children under the age of 5 and that, if left untreated, it can result into fatalities. The interviewees also suggested that diarrhea makes a child tired, weak, dehydrated, which can quickly result in the child's death. Irrespective of the kind of medication that has to be administered to a child who is suffering from diarrhea, the participants underscored the need for prompt treatment due to the potential hazards involved.

Participants had these explanations to share:

"Diarrhea is dangerous because it makes a child weak and dehydrated, and he may even lose his life." FGD participant, Male, 30 years old

"Children who have diarrhea should receive prompt medical attention since they could become seriously ill or even die from it." FGD participant, Male, 37 years old

"Diarrhea is dangerous because it leads to dehydration." FGD participant, Female, 20 years old

"Diarrhea is very dangerous because a child with diarrhea becomes weak, dehydrated, and may die if he is not treated on time." IDI participant, Female, 29 years old

"Diarrhea is dangerous because it makes the child tired and dehydrated, and at the end of the day, he may lose his life." IDI participant, Male, 30 years old

Discussion

This study explored caretaker's knowledge, attitudes, and practices regarding the causes, treatments, and risks of diarrhea among under-5 children in Korogwe and Handeni districts in north-eastern Tanzania. In light of the overall study's findings, the vast majority of caretakers had good knowledge about the risks associated with diarrheal diseases among under-5 children. However, most caretakers had poor knowledge about the causes and treatments of diarrhea among under-5 children. Additionally, the majority of caretakers had negative attitudes and poor practices about the treatments of diarrheal diseases among under-5 children.

The findings of this study suggested that caretakers had good knowledge about the risks and potential consequences of diarrhea among under-5 children, particularly in cases where prompt medical attention is not provided. This is a positive finding since it can act as a trigger to persuade a caretaker to seek treatments for their children right away if they are aware of the potential risks associated with diarrhea. The same finding has also been reported in many other studies from around the world, including in Ethiopia and South Africa.^{25,26} Most caretakers were of the opinion that a child with diarrhea loses water, becomes exhausted and lethargic, and may even die if treatment is not received on time. Other studies conducted elsewhere corroborate this finding.^{27,28} Fostering a better knowledge of the potential hazards and consequences of diarrhea among under-5 children can be achieved by providing caretakers with ongoing health education.¹² Caretakers who are well-informed on the potential risks associated with diarrhea among under-5 children can be an effective strategy for lowering the incidence of diarrheal illnesses.^{8,11,13,25} Therefore, it is essential that the health authorities keep providing caretakers with education so that they can further improve their understanding of a variety of health-related topics.

With regard to their knowledge about the causes of diarrhea among under-5 children, the majority of participants lacked adequate understanding. Most of them were of the view that witchcraft was the primary cause of childhood diarrhea. Sadly, residents in the study area hold this concept in high regard; interestingly, participants do not think that hospital medications can cure this form of diarrhea. This is not a novel finding; prior studies have demonstrated that there are circumstances in which a child may experience diarrhea as a result of witchcraft.^{29,30} Literature indicates that enhancing caretakers' knowledge through health education can lead to a notable improvement in their ability to prevent and treat childhood diarrhea.¹³ It will be beneficial if this health education considers the caretakers' beliefs and attitudes about diarrheal illnesses in general. In this

manner, people will likely become more conscious of public health issues and begin to take responsibility for their actions by adhering to fundamental health standards. A few participants were well-informed about the causes of diarrhea among under-5 children; they could accurately explain that eating or drinking contaminated food or water can cause diarrhea. Similar results were found in an Ethiopian study, which found that consuming contaminated food or water can result in diarrhea.³¹ Furthermore, it was correctly explained by other participants that a child's teething may be the cause of diarrhea among under-5 children. Other research conducted in South Africa has reported a similar finding.²⁶ According to scientific report, diarrhea is a diseases brought on by a range of bacterial, viral, and parasitic organisms, the majority of which are contracted by consuming infected water or food.¹ The participants' comprehension of the known scientific causes of diarrhea is an indication of the positive progress being made in educating the public about a range of health-related issues. It will be helpful if the health authorities ensure that everyone in the society is aware of this correct information in an effort to dispel the myth that diarrhea among under-5 children is due to witchcraft, which is pervasive in the study area.

Regarding the treatment of diarrhea among under-5 children, the majority of participants exhibited inadequate knowledge, poor attitudes and practices. Studies conducted in other settings have also reported similar findings.¹⁰⁻¹² When it came to treating their children's diarrhea, most participants stated that they preferred to utilize traditional remedies over contemporary ones. Unfortunately, they usually administer traditional medications to children without doing any testing to determine which remedy is best for a particular form of diarrhea. The participants went on to elucidate that traditional remedies are always the first-line treatment for a child with diarrhea. If traditional medicines are unable to cure the child, they are taken to the hospital, where they often arrive in critical condition. Caretakers must receive continuous health education, particularly regarding the treatment of diarrhea among under-5 children, in order to save children who could otherwise perish from the negligence and ignorance of caretakers who treat their sick children with traditional medications whose safety and effectiveness are still questionable.

On the other hand, there were a few caretakers who had good knowledge regarding the causes and management of diarrhea among under-5 children which is consistent with findings from a prior study carried out in Zanzibar, Tanzania.¹¹ This segment of participants disclosed that they have never utilized traditional medicines to cure their children's diarrhea and that, in the event that their children become sick, they quickly go to the hospital

for treatment. This attitude and practice of caretakers toward preferring health services provided in hospitals and discouraging the use of traditional medicine in treating diarrhea among under-5 children is positive. According to the literature, diarrhea can be avoided with the use of contemporary science and public health measures. Diarrhea can sometimes be self-limiting. Though, in cases of serious illnesses, the prescription of antibiotics may be necessary to avoid death.³² It is advisable for other caretakers to follow this lead, as taking a sick child to the hospital, where standard treatment guidelines for different diseases are available, guarantees that the child will receive appropriate health care services and advice from trained medical professionals, both of which will significantly enhance the child's health.³³ In contrast, findings from studies undertaken in Botswana and Yemen showed that caretakers had poor knowledge, attitudes, and practices regarding the management of pediatric diarrhea.^{12,13} Continuous health education for caretakers and the public in general can help them adopt good knowledge, attitudes, and practices regarding the management of diarrhea, something that may assist in the reduction and eventual eradication of diarrhea among under-5 children.

In addition, the study findings also revealed that several caretakers claimed to use both traditional and modern treatments at different times to manage diarrhea among their under-5 children. According to these caretakers, if their children don't get well after visiting the hospital, they end up treating them with traditional medicine, and the vice versa is also true. It is important to be aware that exposing the child to a variety of medications increases the possibility of severe adverse events and treatment clashes.³⁴⁻³⁷ The health authorities should broaden the scope of this knowledge to ensure that all members of the community, including those caretakers who choose to employ both therapies, are aware of the possible repercussions of this risky practice and sensitize them about the importance of adhering to the recommended health practices.

Strengths and Limitations of the Study

The main strength of this study is the use of both male and female participants with different backgrounds as data sources and both FGDs and IDIs as methods for data collection. This allowed for the 2 data sources and methods to cross-validate each other, and, more importantly, it allowed for a deeper and more holistic understanding of the topic by providing different perspectives on it. Despite its strength, this research has certain drawbacks. First, since all assessments relied on participants' personal experiences, there may probably be biases in some of the data. Secondly, given that this study was limited to

2 districts in the Tanga Region; it's likely that participant perceptions differ from those of other Tanzanian districts.

Conclusion

Overall study findings indicate that most caretakers had good knowledge about the risks associated with diarrheal diseases among under-5 children, but they had poor knowledge of their causes and treatments. Additionally, a good number of caretakers had negative attitudes and poor practices about the treatment of diarrheal diseases among under-5 children. A relatively small percentage of caretakers possessed positive attitudes and appropriate practices for diarrheal, including the causes, treatments, and risks. These findings generally suggest that much more work needs to be done to lower the prevalence of diarrhea among under-5 children before considering its eradication, as many caretakers lack basic knowledge about the causes and management of the illness. This could be the reason for the disease's continued high prevalence in the study area. It is imperative that health authorities strengthen the current health education programs in the study area in order to close the knowledge gaps among caretakers regarding diarrhea among under-5 children. In the end, this would be beneficial and probably assist in lessening diarrheal prevalence among under-5 children in the study area.

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Author Contributions

EAL: contributed to conception and design; contributed to acquisition; drafted manuscript; critically revised manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

TB: contributed to conception and design; contributed to acquisition, analysis, and interpretation; drafted manuscript; critically revised manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

EL: contributed to conception; contributed to acquisition; drafted manuscript; critically revised manuscript; gave final

approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

DD: contributed to conception; contributed to acquisition; drafted manuscript; critically revised manuscript; gave final approval; Select item.

NSG: contributed to conception and design; contributed to acquisition, analysis, and interpretation; drafted manuscript; critically revised manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

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Ethical Approval and Informed Consent

The present study obtained ethical approval (Reference number MA.84/261/02/, dated May 24, 2022) after being submitted to the University of Dodoma Institutional Research Review Committee (UDOM IRRC). All participants gave written informed consent prior to the commencement of the interview process.

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