JPH RECODE October 2025; 9 (1): 12-25
http://e-journal.unair.ac.id/JPHRECODE
http://dx.doi.org/10.20473/jphrecode.v9i1.62518

DIARRHEA PREVENTION PRACTICES AMONG CARETAKERS OF UNDER FIVE CHILDREN IN TANZANIA: A CROSS-SECTIONAL STUDY

Erasto Kinemelo*, Daniel Nsongoma

Department of Environmental Health Sciences, Faculty of Information and Communication Technology, Ruaha Catholic University, Tanzania

Corresponding Author: erastuskinemelo@gmail.com

ARTICLE INFO

Article History:
Received: 30th, August 2024

Revised:
From 11th, September 2024

Accepted: 03rd, December 2024

ABSTRACT

Background: Diarrhea remains the second leading public health concern, affecting children under the age of five. The World Health Organization stipulates that diarrhea diseases are responsible for approximately each year 801,000 deaths of children under five years old due to avoidable diarrhea diseases. **Purpose:** The purpose of this study was to assess Practices on Prevention of Diarrhea Disease to under Five Children Cared by Caretakers at Hombolo Ward in Dodoma, Tanzania. **Methods:** Cross sectional study design was used, quantitative approach was employed, 116 participants were included, stratified random sampling was used to select four strata and simple random technique was used from each stratum, questionnaires and observation methods were used to collect data among caretakers. Data analysis used Social Package Statistical Science (SPSS). **Results:** The findings indicate that 64.6% of the caretakers of under five children had moderate knowledge about diarrhea diseases, causes, symptoms and complications of diarrhea. Approximately 68.3 % of the caretakers had a positive attitude towards prevention of diarrhea, while 31.7 % had a negative attitude. Furthermore, it was revealed that in practice, for example,74.1% of caretakers failed to specify the methods they use to treat drinking water. **Conclusion:** The study concludes that the caretakers had moderate knowledge. Also, the caretakers had positive attitudes towards prevention of diarrhea. However, knowledge on diarrhea disease was not related to preventive practices as most caretakers with good knowledge often had poor preventive practices.

Keywords: prevention, diarrehea disease, underfive children, caretakers

Cite this as: Kinemelo, E., & Nsongoma, D. 2025. Diarrhea Prevention Practices Among Caretakers Of Under Five Children In Tanzania: A Cross-Sectional Study. *Journal of Public Health Research and Community Health Development*. 9(1), 12-25. http://dx.doi.org/10.20473/jphrecode.v9i1.62518

INTRODUCTION

The World Health Organization reports that passage of 3 or more than 3 watery stools per day for a child is considered as diarrhea. Worldwide, diarrhea remains the second leading and significant public health concern, particularly affecting children under the age of five. The World Health Organization (WHO, 2022) further stipulates that diarrhea diseases are responsible for approximately each year 801,000 children under five years lost their lives due to avoidable diarrhea diseases, and there are approximately 2 billion cases of diarrhea every year persist and about 88% of all diarrhea diseases are due to unsafe water supply, inadequate sanitation and poor hygiene practices. The most severe threat posed by diarrhea is dehydration. During an episode of diarrhea, water and electrolytes including sodium, chloride, potassium and bicarbonate are lost through liquid stools and vomiting which can lead to kidney failure, stroke, shock, heart attack or even death (WHO, 2022).

In Africa, the burden of diarrhea is significantly high. According to the report of Global Burden of Diseases in Tareke *et al*. (2022), in sub Saharan Africa, total Disability Adjusted Life years estimated due to diarrhea was 13%, as poor access to water, contaminated weaning food or water, inappropriate feeding practice, poor hand washing practice, limited sanitary disposal of excreta, and inadequate knowledge about preventive measures are the leading causes of the under-five diarrhea diseases. Different studies showed that the prevalence of diarrhea diseases among children under five years is high in East African countries. Therefore, if the practice of preventing diarrhea in toddlers is not carried out properly, more children under five will die leading to very low population growth and development. Basing on Meta-analysis conducted in Ethiopia, the prevalence of diarrhea ranges from 19% to 35%. Other studies conducted in Uganda, Rwanda, and Malawi show that the prevalence of diarrhea diseases was 32%, 26.7%, and 20% respectively. Also, the culture of open defecation in East African countries is common. For example, a systematic review done in Ethiopia, Kenya and Uganda showed a low level of open defecation free areas that is 16%, 14 %, and 29% respectively. Moreover, yearly childhood death due to diarrhea illness was estimated to be 95,000. Among over all 170 deaths per 1000 children under five mortality rates, 20% are those caused by diarrhea.

Different studies conducted have shed light on the knowledge gaps, negative attitudes, and poor hygiene practices among caretakers on preventive measures of diarrhea. For example, a study by Edwin & Azage (2019), in low and middle-income countries revealed that only 2/5 of caretakers possessed adequate knowledge about the causes, symptoms, and prevention of diarrhea diseases. Optimal young child feeding practices could prevent more than 10% deaths from diarrhea. Better hygiene practices, particularly hand washing with soap and the safe disposal of excreta can reduce the incidence of diarrhea. Diarrhea was the second contributor of outpatient visits and the cause of mortality among children under the age of five years in the year 2020 up to 2022 with the total cases 6304 at Hombolo ward, in Dodoma region. Caretakers of under five children play a crucial role in preventing diarrhea illness through their knowledge, attitudes, and practices towards hygiene and sanitation improve. Diarrhea continues to be a significant health problem among children under five years in Tanzania, according to Integrated Disease Surveillance and Response (IDSR) cumulative reports in a year 2020 (599,322 diarrhea cases), 2021 (661,556 diarrhea cases) and 2022 (total of 618,226 diarrhea cases) were reported and majority of cases reported in major cities of Dodoma, Dar es salaam and Arusha. In the recent 3 `years, Dodoma region has a total 154,590 equivalents to 11.56% of diarrhea cases reported out of 1,336,714 total cases in Tanzania and the most cases were reported at Hombolo ward in which diarrhea cases increased by 6.11% from 2021 to 2022 compared to other wards (DHIS2, 2021-2022).

Despite the urgency efforts which have been done, such as water supply, hand washing facilities, health education, and provision of Rotavirus vaccine (ROTAVAC) to reduce diarrhea cases, there is a significant increase in diarrhea cases in this ward which results to high morbidity rate in this vulnerable group of children under five years. Therefore, the aim of the study was to assess practices on Prevention of diarrhea disease to under five children cared by caretakers at Hombolo Ward in Dodoma, Tanzania.

Table 1. Shows the total cases of diarrhea 2020-2022

Ward	2020	2021	2022	Total
Hombolo	1886	2074	2344	6304
Nkulabi	1780	2164	1962	5906
Ihumwa	1662	2034	1814	5510
Total	5328	6272	6120	17720

Source: DHIS2, 2020-2022

For that fact, Dodoma region requires a comprehensive assessment of the knowledge, attitude, and practice towards prevention of diarrhea disease among under five children who are cared by care takers at Hombolo ward.

METHOD

Study Design

A cross-sectional study design was used in this study. This design is appropriate because it allows for the collection of data on many participants in a short period of time. The study took eight months (December 2023 to July 2024). The data collected was used to explain the practices of caretakers on the prevention of diarrhea to children under five.

Study Area and Population

The study was conducted at Hombolo ward, Dodoma region. Hombolo ward is a rural area with a population of approximately of 20,033 people where males are 9630 and females are 10,403 (NBS, 2022). The ward has a total number of 5,332 households with seven streets and has a high incidence of diarrhea disease, with an estimated 6.11 % of children under five years of age being hospitalized for diarrhea each year. Caretakers are individuals who are responsible for the care, control and supervision of children (Chan *et al*., 2020). The study population included all caretakers of under five children in Hombolo ward. The target population was caretakers who are responsible for the daily care of children under five because their knowledge, attitudes and practices on prevention affect the care of the children which in turn affects their health.

Research Approach

Research approach refers to the overarching strategies employed in conducting research. There are various research approaches, such as quantitative, qualitative, and mixed-methods approach. Therefore, in this study, quantitative approach was used.

Sample Size

The sample size involved 116 caretakers who were satisfied with the selection criteria and consent of the study Formula (Gupta & Gupta, 2022).

$$n = \frac{NZ^2p(1-p)}{e^2(N-1)+Z^2p(1-p)}$$

Where, N-study population=3368; Z-1.75 (give confidence level of 92%; P-Population proportion= 0.5; e- Acceptable error = 0.08; n-Sample size

$$n = \frac{\mathbf{3368\times(1.75)^2\times0.5\times(1-0.5)}}{\mathbf{(0.08)^2\times(3368-1)+(1.75)^2\times0.5(1-0.5)}}$$

n: 115.5 = 116

Therefore, the sample size (n) involved 116 participants.

Sample and Sampling Technique

Stratified random sampling was used to divide strata and then simple random technique was used to select four strata from seven strata as representatives. The seven names of areas were written on piece of paper, then, the papers folded, mixed and placed in the plate, then randomly picked. The number of households (3368) from four strata selected randomly were Mkoyo Makulu, Bwawani A", Bwawani B" and Chimwaga with 612, 1104, 701, and 951 households respectively. From adopting allocation proportional formula (Gupta & Gupta, 2022), sample size from each stratum was obtained as representative.

Ps = Ns/N; Then; ns = n. Ps; Whereby, Ps- represents the proportion of population included in stratum N- Study population, Ns-Total number of people in a stratum, and n-represents total sample size.

- For stratum with N1= 612; n1 = 116 x 612/3368; Mkoyo makulu, n1= 21 participants

- For stratum with N2=1104; n2 = 116x 1104/3368; Bwawani "A" n2= 38 participants
- For stratum with N3 = 701; n3 = 116 x 701/3368; Bwawani "B" n3 = 24 participants
- For stratum with N4 = 951; n4 = 116x 951/3368; Chimwaga n4 = 33 participants

Participants' Data Flow Chart (Summary)

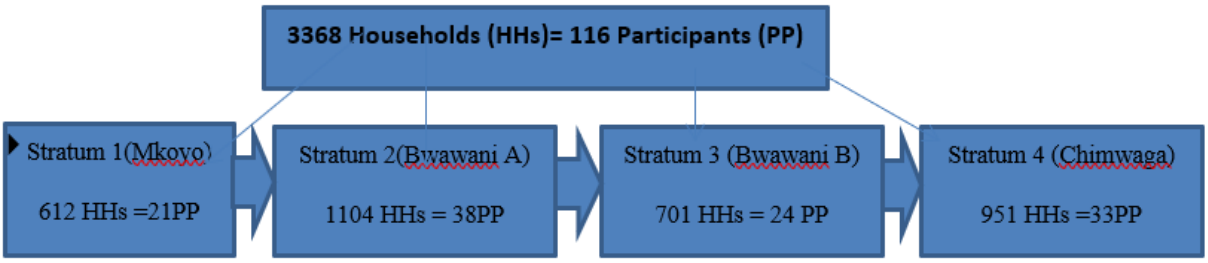

Figure 1. Sample size of participants in each stratum's households

Data Collection Methods, Tools and Procedures

The quantitative data were collected by questionnaire method, where the homes according to the strata of the participants were visited for administering the questionnaires. Also, observation method (used observational checklist) was employed for examining the practices towards prevention of diarrhea among caretakers of children under five years. Some of the areas observed were like, washing hands with soap and water before a meal and after defecation, washing of utensils, boiling of water for drinking, hygienic preparation of food, and proper disposal of faecal matter by using latrine. Two trained assistant researchers were trained to collect data.

Data Quality Control

For safeguarding data quality, the data collection tools were firstly prepared in English, then, translated into Swahili language (Tanzania National Language) and re-translated into English to establish consistency. Seven percent (7%) of the instruments were pre-tested to check whether they are efficient enough to meet the objective of the study. Before data collection, the data collectors and supervisors were trained. To ensure data quality and completeness, follow-up was achieved.

Data Analysis and Presentation

The data collected was analyzed using Statistical Package for Social Science (SPSS) version 25.0. The data was presented using figures and tables.

Study Variables and Categories

Independent variables: Included socio-demographic factors such as primary caretakers (mother, aunt and guardian) age (13-17...38-42), gender (females), marital status (single, married, divorced, widow), occupation (students, housewives, farmers, government employees, private employees) and education (non-formal, primary and secondary schools, and tertiary). The dependent variable was the diarrhea prevention practices.

Ethical Clearance

The Department of Environmental Health Sciences Research Ethics Committee at Ruaha Catholic University provided ethical approval letters Ref. No. RUCU/DEHSREC/17/2023 and Dodoma City Council by City Executive Director (letter with Ref. No.HJD/F.10/689) provide permission to start the research work. Written informed consent was obtained from each participant after providing detailed information about the study.

RESULT

Social Demographic Characteristics

A total of 116 Caretakers with children under five years were all included in the study. The highest number of primary caretakers in the household were 91 (78.4%) of mothers, the age of majority for caretakers was 23-27 years (31%), 55 (47.4%) were married, 51 workers (44 %) were farmers, while more than a half (77 (66.4%)) were primary education level (Table 2).

Table 2. Social demographic characteristics, 2024 (N=116)

Variable	Category	Frequency	Percent %
Primary caretaker (N =116 [100%])	Mother	91	78.4
	Aunt	13	11.2
	Guardian	12	10.4
Gender (N =116 [100%])	Female	116	100.0
Age (N =116 [100%])	13-17	11	9.5
	18-22	17	14.7
	23-27	36	31.0
	28-32	22	19.0
	33-37	12	10.3
	38-42	18	15.5
Marital status (N =116 [100%])	Single	44	37.9
	Divorced	14	12.1
	Married	55	47.4
	Widow	3	2.6
Occupational (N =116 [100%])	Students	6	5.2
	Housewife	21	18.1
	Farmers	51	44.0
	Government employees	2	1.7
	Private employees	33	28.4
	Other works	3	2.6
Education (N =116 [100%])	No formal education	6	5.2
	Primary education	77	66.4
	Secondary education	30	25.9
	Tertiary education	3	2.5

Caretakers' Knowledge on Prevention of Diarrhea in Children Under Five Years

Definition of Diarrhea

Out of 116 participants, 59 (50.9%) defined diarrhea as the disease that causes fever, 27 (23.3%) defined as the disease that causes loss of watery stools more than 3 times per day, 19 participants (16.4%) define diarrhea as a disease that causes vomiting, and 11 participants (9.5%) defined as the disease that causes skin rash (Figure 2).

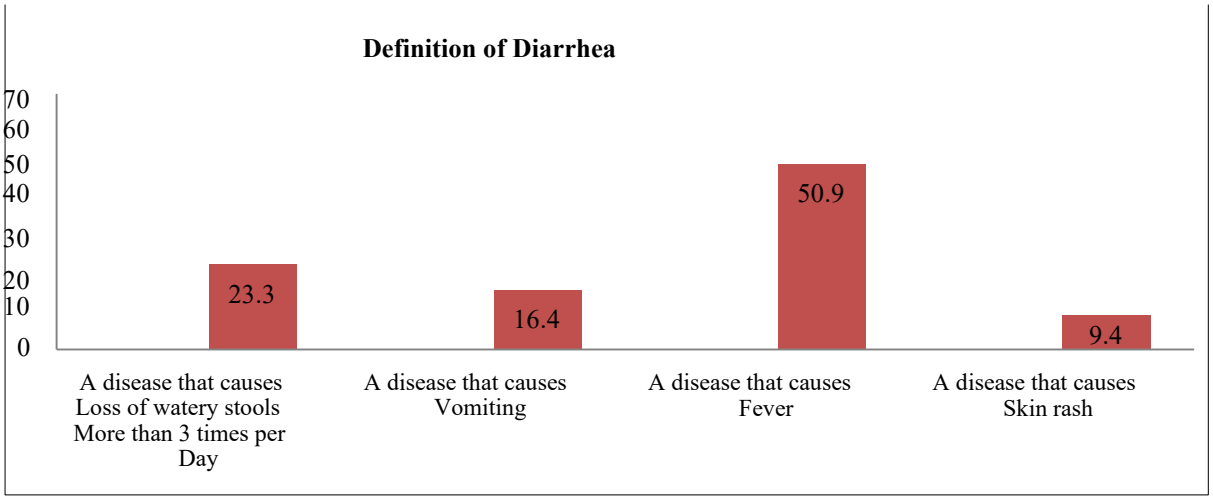

Figure 2. Showing the response of caretakers on defining diarrhea

The findings (Figure 2), show that 23.3 % of the caretakers define and recognize diarrhea as the diseases that causes loss of watery stools more than 3 times per day this implying that a few numbers of caretakers have idea on what diarrhea is, but still larger number of caretakers (76.7 %) didn't define clearly and recognize diarrhea (i.e. a disease that causes vomiting (16.4%), fever (50.9%, and skin rush (9.4)) together, implying that caretakers lack awareness on what is diarrhea disease. The findings indicate that knowledge is very important in recognition of diarrhea among caretakers at Hombolo ward.

Causes of Diarrhea

Out of 116 participants, 71 (61.2%) responded on diarrhea as caused by contaminated food/water, improper fecal matter disposal, and not associated with washing hands provided, 21 (18.1%) responded on diarrhea as the disease caused by eating contaminated food or water, 12 (10.3%) responded on diarrhea as caused by improper disposal of fecal matter, 9(7.8%) responded that it is not associated with washing hands properly, and 3 (2.6%) responded on diarrhea as caused by none of answers provided (Figure 3).

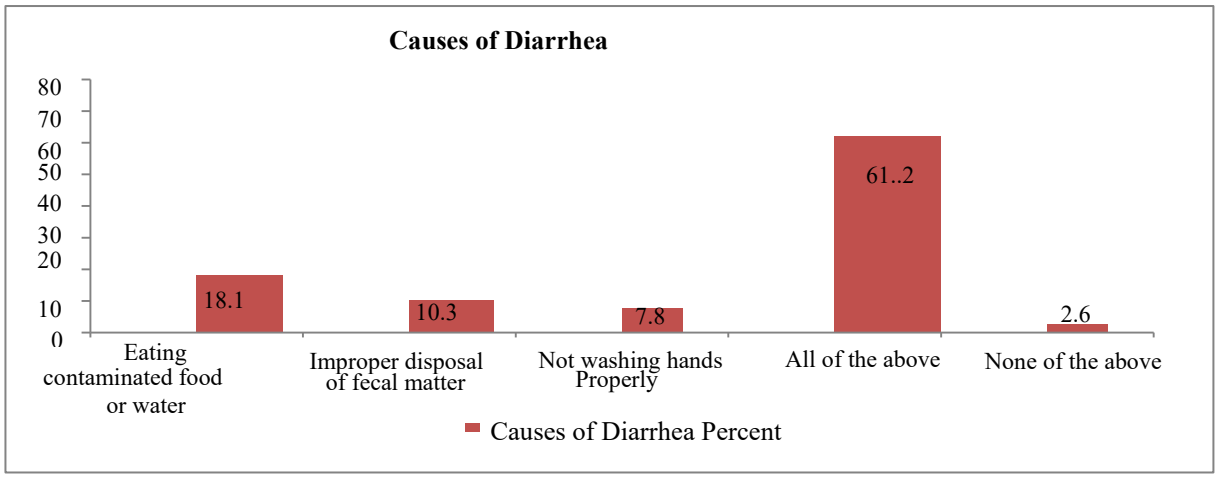

Figure 3. Showing the response of caretakers on causes of diarrhea

The findings (Figure 3) show that about 61.2 % of caretakers know that eating contaminated food or water, improper disposal of fecal matter and not washing hands properly as the causes of diarrhea. This implies that caretakers are aware on how diarrhea disease is caused, but still about 38.8 % of caretakers know only one cause of diarrhea diseases to children of under five years.

Symptoms of Diarrhea

Out of 116 participants, 79 (68.1%) responded that diarrhea is characterized by all of answers provided, 13 (11.2%) responded that diarrhea is characterized by fever, 10 (8.6%) responded that is characterized by vomiting, 8 (6.9%) responded that diarrhea is characterized by loss of water stools more than 3 times per day, 6 (5.2%) responded that diarrhea is characterized by dehydration (Figure 4).

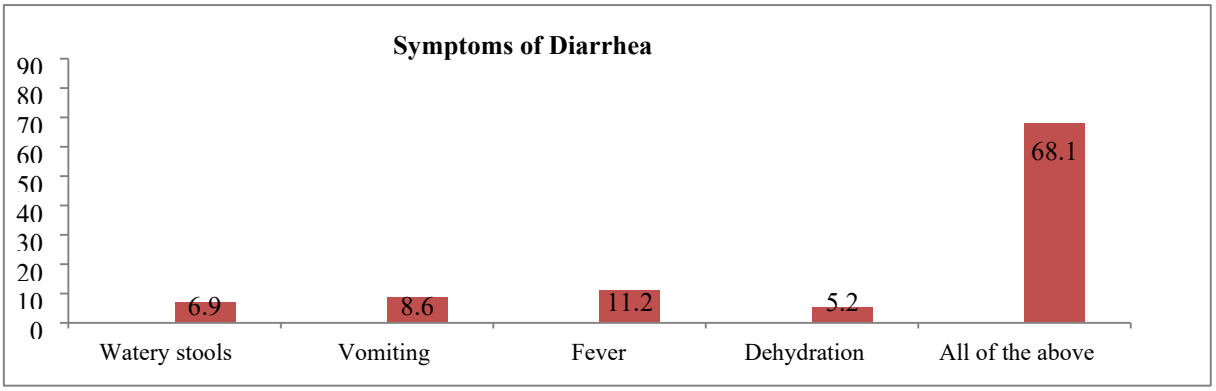

Figure 4. Showing the response of caretakers on symptoms of diarrhea

The findings show majority of caretakers (68.1 %) have knowledge on symptoms of diarrhea disease.

Complications of Diarrhea

Out of 116 caretakers, 69 (59.5%) responded that diarrhea is associated with all complications provided, 16 (13.8%) responded that diarrhea is associated with death complications, 13 (11.2 %) responded that diarrhea is associated with dehydration, 12 (10.3%) said that diarrhea is not associated with any complications and 6 (5.2 %) responded that diarrhea is associated with malnutrition (Figure 5).

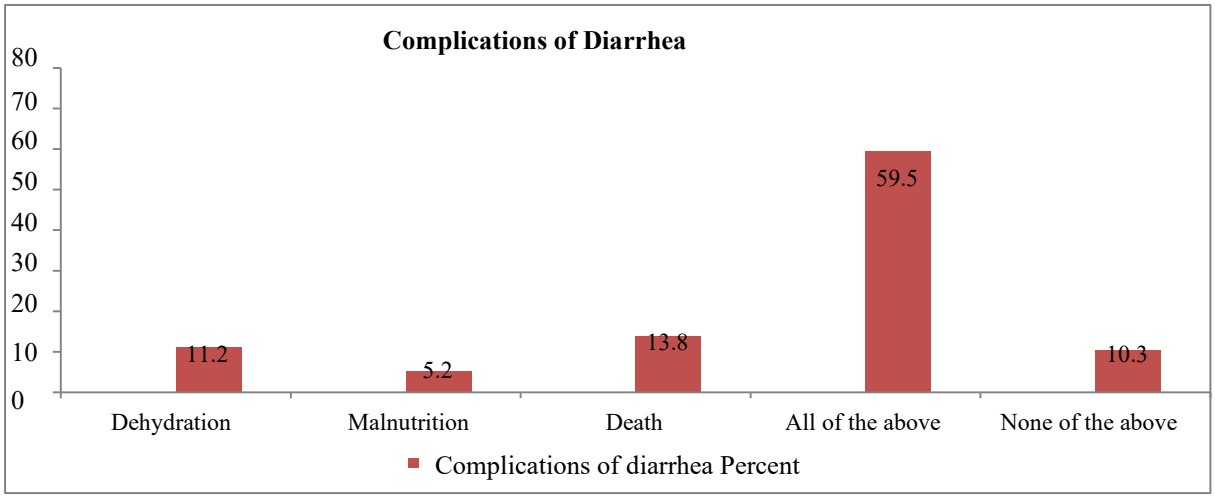

Figure 5. Complications of diarrhea

The findings (Figure 5) show that the caretakers (59.5%) have knowledge on complications associated with diarrhea disease, this may indicate high prevalence of diarrhea at Hombolo ward and most of under five children suffered and experience diarrhea complications.

Information on Diarrhea

To question regarding where they get information about diarrhea disease, it was discovered that out of 116 participants, 96 (83%) get information about diarrhea from Health centers, 17 (15%) get information about diarrhea on Radio, and 3 (2 %) get information about diarrhea from Television (Figure 6).

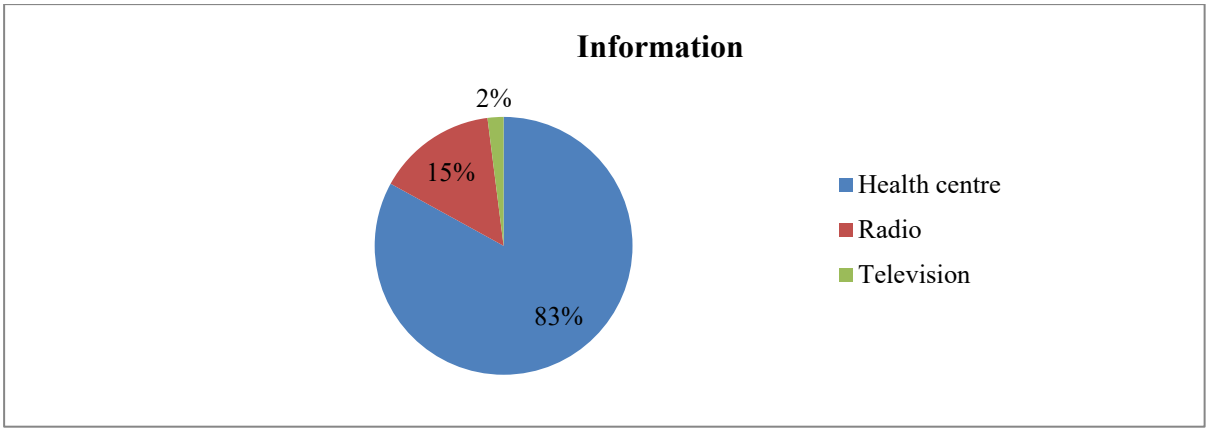

Figure 6. Information of diarrhea

The findings (Figure 6) show that health facility provides high knowledge concerning diarrhea disease which is a greater intervention for prevention against diarrhea to under five children, 83 % of caretakers heard about diarrhea disease in the health centres by recognized symptoms, also health facilities have to provide education on diarrhea through media radio (15%) and television (2%).

Caretakers' Attitude Towards Prevention of Diarrhea in Children Under Five Years

Seriousness on Diarrhea

To the question regarding how serious they think diarrhea is, out of 116 participants, 45 (38.7%) participants responded diarrhea as serious disease, 37 (31.9 %) said that diarrhea is extremely serious disease, 23 (19.8%) respondents responded that diarrhea as very serious disease, 8 (6.9 %) responded as not very serious disease and 3 (2.6 %) responded on diarrhea as not serious at all (Figure 7).

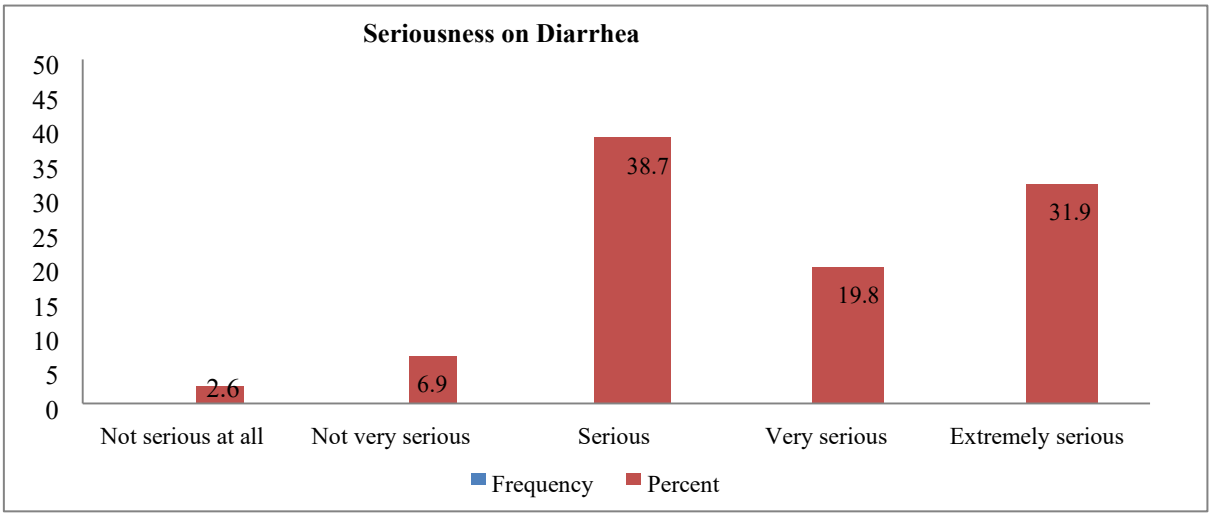

Figure 7. Showing the response of caretakers on how seriousness they think about diarrhea

The findings (Figure 7) show the majority of caretakers (90.4%) have positive attitude with seriousness of diarrhea disease, this indicates that caretakers are more likely to take preventive measures which may lead to better health outcomes for the children. But also, 9.5% of caretakers having negative attitude indicating a lack of awareness about the severity of diarrhea which could potentially result in high prevalence of diarrhea disease to under five children.

Afraid on Diarrhea

Out of 116 participants, 56 (48.3%) were very afraid on diarrhea disease, 40 (34.5%) afraid on diarrhea, 14 (12.1 %) do not very afraid and 6 (5.2 %) do not afraid at all (Figure 8).

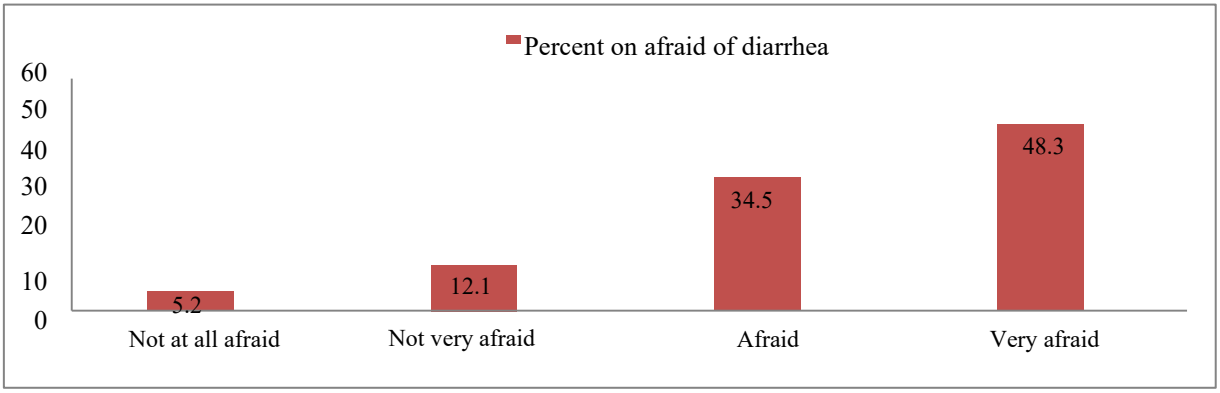

Figure 8. Showing the response of caretakers on afraid of diarrhea

The findings (Figure 8) show that caretakers (5.2 %) have positive attitude on diarrhea disease indicating a significant variation in the perceived severity of the illness among the caretakers. The high number of caretakers who are afraid of diarrhea indicates a greater awareness of the potential negative consequences of the diarrhea disease, motivating them to take precautions and preventive measures. But also, 17.3% of the caretakers who do not afraid indicate a lack of concern or understanding regarding the

seriousness of diarrhea, potentially leading to a higher risk of complications due to delayed intervention.

Prevention on Diarrhea (and Ways of Prevention)

Out of 116 participants, 101 (87.0%) agree diarrhea as preventable disease, 9 (7.8 %) respondents disagreed diarrhea as preventable disease, and 6 (5.2%) respondents did not respond on either diarrhea disease is preventable or not. Also, 63 (54.3 %) responded on drinking clean water and safe food, 18 (15.5%) on washing hands properly, 15 (12.9 %) agree on all answers provided, 11 (9.5%) on proper disposal of fecal matter, and 9 (7.8 %) did not provide answers (Table 3).

Table 3. Diarrhea prevention (N = 116)

Variable	Category	Number (N)	Percent %
Disease prevention (N =116 [100%])	Yes	101	87.0
	No	15	13.0
Prevention ways of diarrhea (N =116 [100%])	Proper hand washing	25	22.0
	Drinking /eating clean and safe water and food)	77	66.0
	Proper fecal disposal	14	12.0

The findings (Table 3) indicate that the majority (87 %) of caretakers expressing belief in prevention indicate a positive attitude towards acting to practice and prevent diarrhea disease, which can be beneficial for adopting healthy practices and reducing the prevalence of diarrhea among under five children. About 13% of caretakers who do not believe in prevention may require education or awareness campaigns to highlight the importance of preventive measures. That is they need further clarification or encouragement to promote understanding and engagement in preventive strategies. Also, the results indicate 66% of caretakers have comprehensive understandings of the drinking/eating clean and safe water/and or food as preventive measures that can help to reduce the risk of diarrhea disease to under five children.

Caretakers' Practices Towards Prevention of Diarrhea in Children Under Five Years

The caretakers were asked when to wash their hands, treatment of water for drinking, what methods they use for treatment of water, where family members go to defecate, and where young children usually defecate.

Hand Washing

Out of 116 participants, 58 (50.0 %) wash their hands in all critical moments, 32 (27.6 %) wash hands after using toilets, 3 (2.6 %) of respondents wash their hands after cleaning up a child, 21 (18.1 %) wash their hands after eating, and 2 (1.7 %) wash their hands before preparing food (Figure 9).

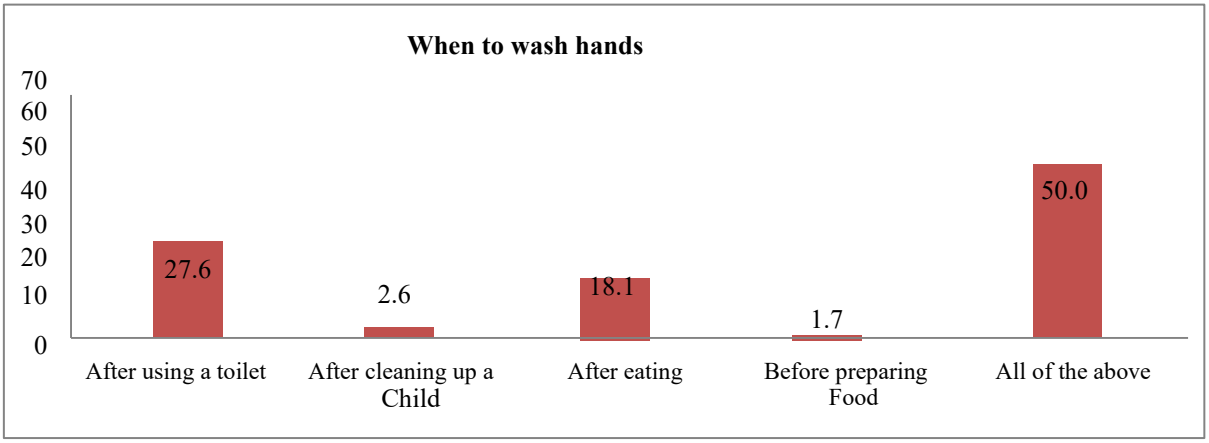

Figure 9. Showing the response of caretakers when to wash their hands

The findings of Figure 9, show that the majority of caretakers (50 %) mentioned that they wash their hands after using the toilet, after cleaning up a child, after eating, and before preparing food. It reveals a high level of awareness and adherence to good hand hygiene practices among the caretakers.

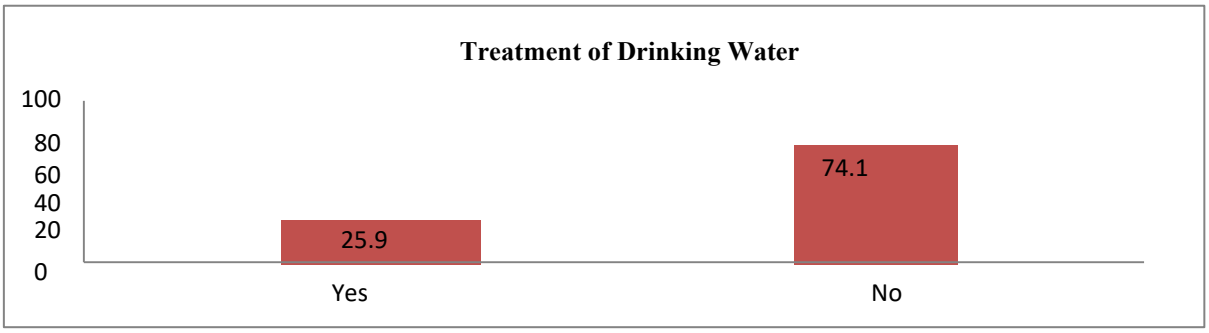

Figure 10. Treatment of water

Treatment of Drinking Water and Their Methods

The findings of Figure 10, 86 (74.1 %) of participants did not agree on treatment of drinking water and 30 (25.9 %) agreed on treatment of drinking water. Also, 86 (74.1%) did not respond on any methods of treatment drinking water, 27 (23.3 %) participants said they are using boiling method for drinking water, and 3 (2.6 %) respondents filter drinking water with cloth material (Figure 11).

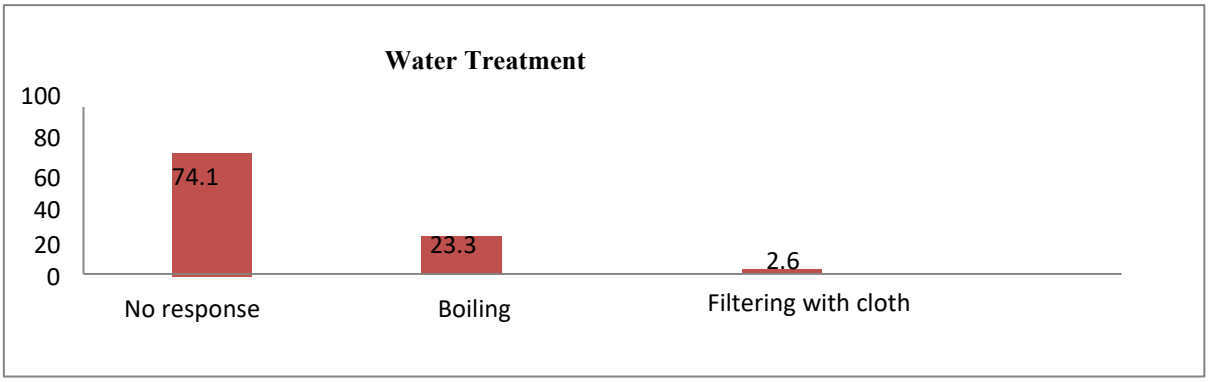

Figure 11. Methods to treat drinking water

The findings of Figure 11, also show the caretakers reported treating water, however, the majority (74.1 %) did not specify the methods they use for water treatment. This lack of information indicates a potential gap in knowledge or practice regarding appropriate water treatment methods. But also, a small number of caretakers 23.3% reveal using boiling and 2.6% filtering with clothes as water treatment methods.

Family Members and Children Defecation

The 107 (92.2 %) participants use home latrine to defecate, and 9 (7.8 %) of respondents use neighbor's toilet to defecate. Also, 26 (22.4 %) said that children use home latrine to defecate, 9 (7.8 %) of children use potty to defecate, 81 (69.8 %) of children defecate where they can or in open space (Table 4).

Table 4. Family defecation (n = 116)

Variable	Category	Number (n)	Percent %
Family members' defecation (N =116 [100%])	Use home latrine	107	92.2
	Use neighbours' latrine	9	7.8
Children's defecation (N =116 [100%])	Home latrine	26	22.4
	Potty	9	7.8
	Open space	81	69.8

The findings of Table 4, show that the majority of caretakers (92.2 %) reported using a home latrine for defecation, while a small percentage (7.8 %) of caretakers reported using a neighbor's toilet. This suggests that a significant portion of families have access to and utilize proper sanitation facilities within their homes, which is a positive indicator for hygiene and disease prevention. Also, the findings reveals that a relatively small numbers of children 22.4% use a home latrine, while a few children 7.8% use a potty for defecation. However, a significant majority of children (69.8%) reported to defecate in the open environment.

DISCUSSION

Sixty-four point six (64.6%) of the caretakers define and recognize diarrhea correctly. This indicates that caretakers had moderate knowledge about diarrhea diseases, causes, symptoms and complications of diarrhea in children under five years as adopted from Bloom's cut off category; (80%>= High, 60-79%-moderate and <60% means low knowledge) (Disassa & Ashenafi, (2022) The major issue is converting the knowledge into practice. This has a great impact which can lead to high prevalence of diarrhea at Hombolo ward in Dodoma region. This fact is consistent with findings of a study conducted among caretakers in Maracha district in Uganda by Tiko (2018), which shows that one third (1/3) of caretakers were aware of risk factors and causes of childhood diarrhea. About 33% of the caretakers were not aware of the risk factors of diarrhea, 30% describe diarrhea as normal in children's growth stage. This reveals a deficit in the caretakers' knowledge. According to the study by Kevin (2019), it revealed that only 40% of caretakers possessed adequate knowledge about the causes, symptoms, and prevention of diarrhea diseases. Therefore, this study ensures health education and effective follow up to caretakers of children under five at Hombolo ward so that the knowledge is converted appropriately into practice. The issue of finance is still at paramount as more health practitioners are needed to be employed.

In Hombolo ward, diarrhea disease to children under five years has a public health implication because it reduces the quality of life of the children as well as bringing complications like dehydration and malnutrition. In addition, it affects the countries' development by diverting resources, loss of working hours and loss of life of the children. Workie *et al*. (2018), stipulate that caretakers' education has been proclaimed the single best indicator for child health outcomes worldwide; mothers continue to be the primary caretakers. Also, it reports that the higher level of knowledge and attitudes towards prevention diarrhea the more the caretakers are likely to practice proper hygiene methods. But the study conducted in Hombolo ward revealed that knowledge on diarrhea disease was not related to preventive practices as most caretakers with good knowledge often had poor preventive practices. For example, 74.1% of caretakers failed to specify the methods used in treating drinking water. This could be due to different geographic locations, inadequate water supply, poor hygiene and sanitation practices. Therefore, the study is advantageous since it suggests to the government to work hard on supplying enough resources to the area and make follow up to implement the hygienic practices in households.

Apart from that, the findings revealed that 90.5% of caretakers believe diarrhea is a serious disease, while 9.4% of caretakers believe diarrhea is not a serious disease. Also, 82.7% of the caretakers felt afraid of diarrhea disease. About 87 % of caretakers agree and believe that they could prevent their children from getting diarrhea. Further, it shows that about 13% of caretakers know the multiple ways on how they could prevent their children from getting diarrhea. Hence, about 68.3 % reveals and shows a positive attitude towards prevention of diarrhea by the caretakers, while 31.7 % of caretakers indicate a negative attitude among caretakers. Attitude is also affected by the level of knowledge and education, as caretakers who are highly literate are more inclined to have a positive attitude towards preventive practices. These findings agree with the views of Workie *et al*. (2018), which explain that negative attitudes have public health implications as neglect from caretakers increase the risk of their children getting diarrhea thus strains the capacity of the economy and households in terms of incurred cost in the health sector and medical bills, yet reduction could be achieved by having positive attitudes that would influence preventive practices.

According to the Centers for Disease Control and Prevention (CDC, 2022), hand washing is one of the most effective ways to prevent the spread of diarrheal diseases, especially to young children who are more vulnerable to infections. Also, the study in Latin America and Caribbean conducted by Gassmann *et al*. (2022) revealed that 38 % of caretakers did not always wash hands of their children's prior meals. The caretakers (50%) responded to washing hands only after specific activities such as using the toilet or cleaning up a child. This indicates a potential gap in knowledge or practice among caretakers. It is important to educate about the importance of hand washing at all critical times to effectively prevent diarrhea in children. Overall, results suggest that the majority of caretakers are aware of the importance of hand hygiene in preventing diarrhea among under-five children. However, there is still room for improvement in ensuring consistent and thorough hand washing practices among all caretakers at Hombolo ward in Dodoma region. This highly expects to reduce the death rate of children under five.

According to the World Health Organization (WHO, 2022), treating drinking water is essential to ensure its safety and prevent waterborne illnesses, but also the study in Peru conducted by Torres-Slimming *et al*. (2023) revealed that 55% of caretakers did not boil water for their children. Methods such as boiling, chlorination, or filtration can effectively eliminate harmful pathogens and contaminants from water, making it safe for consumption. The high number of caretakers who do not treat drinking water highlights the need for increase of awareness and education on the importance of water treatment in preventing diarrhea diseases. Public health campaigns and community-based interventions may be necessary to promote safe drinking water practices and improve health outcomes. Boiling water can effectively kill pathogens, while filtering can help remove physical impurities. Encouraging caretakers to adopt simple and effective water treatment methods, such as boiling or using water filters, can significantly reduce the risk of waterborne diseases like diarrhea in young children. This is consistent with the study conducted in Uganda by Kevin (2019), which reveals that water treatment by boiling in Uganda were 39.8%.

Access to and uses of proper sanitation facilities, such as latrines or toilets, are crucial in preventing the spread of diarrhea diseases. The findings are comparable with the study conducted in Kenya by Guillaume (2020). reports that the high rates of diarrhea may be related to deficits in prevention practices, similarly to the findings conducted at Hombolo ward in Dodoma region which show that 63.8% of toilets are not clean and properly maintained. Proper disposal of human faeces in a sanitary manner helps reduce the contamination of water sources and the environment with harmful pathogens, ensuring that all family members have access to and use hygienic sanitation facilities like home latrines can contribute to a healthier living environment and lower the risk of diarrhea diseases among children in Hombolo ward. Children who defecate in the open environment are particularly vulnerable to infections due to exposure to fecal pathogens. The study conducted in Bangladesh by Müller-Hauser *et al*. (2022) reveals that most of caretakers considered children faeces and defecating to the open environment as normal. Thus, recommended to promote and encourage the use of proper sanitation facilities, such as latrines for children to prevent the transmission of diseases and ensure a safe and healthy environment for their growth and development.

Generally, this study will help to bring positive impacts to the practices of children's caretakers regarding the prevention of diarrhea disease at Hombolo ward in Dodoma region at household levels. Health education programs and interventions will be emphasized more, associated with close follow up in the area of implementation, since the government will employ more environmental health practitioners. This will bring improved health outcomes for children.

During data collection some of the participants responded late when given questionnaires as the researcher went three to four times to collect the forms. Thus, perseverance in a researcher was needed. Also, the study could include some health practitioners who could be interviewed to get more information on how diarrhea was under five children in the health centers/hospitals at Hombolo ward.

CONCLUSION

The study indicates that 64.6 % of the caretakers have moderate knowledge. Furthermore, the study revealed that 58.6% of caretakers at Hombolo ward have positive attitudes towards prevention of diarrhea. The study revealed that knowledge on diarrhea disease was not related to preventive practices as most of caretakers with good knowledge often have poor preventive practices. Also, the 74.1% of caretakers failed to specify the methods they use for water treatment.

SUGGESTION

Improving access to clean water, promoting proper hygiene practices, could all play a crucial role in preventing diarrhea among under five children in the community. Furthermore, community-based interventions, including health education campaigns on the drinking water treatment methods, training programs for caretakers, and the implementation of sanitation programs, should be prioritized to address the root causes of diarrhea and promote a healthier environment for children. Collaborative efforts involving environmental health officers, community leaders, policymakers, and stakeholders are essential to implement sustainable interventions and bring about positive changes in diarrhea prevention practices among caretakers.

ACKNOWLEDGMENT

The authors take opportunity to thank the Ruaha Catholic University management for providing chance for conducting the study. Also, more thanks reach the Dean in Faculty of Information and Communication Technology for closely advice during preparation of the manuscript. Eventually, great thanks find the staff of the Department of Environmental Health Sciences for effective cooperation.

CONFLICT OF INTEREST

The authors declare there is no conflict of interest.

DECLARATION OF ARTIFICIAL INTELLIGENCE (AI)

The authors affirm that no artificial intelligence (AI) tools, services, or technologies were employed in the creation, editing, or refinement of this manuscript. All content presented is the result of the independent intellectual efforts of the authors, ensuring originality and integrity.

FUNDING SOURCE

This article was personally funded by the authors.

AUTHOR CONTRIBUTION

Erasto Kinemelo was responsible for data supervision and manuscript preparation. Daniel Nsongoma worked on data collection and analysis.

REFERENCES

Center of Diseases [CDC]. 2022. https://archive.cdc.gov/www_cdc_gov/globalhealth/stories/diarrhea

Chan, C. K., Vickers, T., & Barnard, A. 2020. Meaning through caregiving: a qualitative study of the experiences of informal carers. *The British Journal of Social Work*, *50*(3), 682-700. https://doi.org/10.1093/bjsw/bcz039

Disassa, H., & Ashenafi, M. 2022. Household food insecurity and food safety knowledge, attitude, and practice of mothers with outpatient under-five children at Cure Hospital, Addis Ababa. *SINET: Ethiopian Journal of Science*, *45*(3), 322-329. https://doi.org/10.4314/sinet.v45i3.7

District Health Information System2 [DHIS2] report 2021-2022. https://dhis.moh.go.tz/

Edwin, P., & Azage, M. 2019.Geographical Variations and Factors Associated with Childhood Diarrhea in Tanzania: A National Population Based Survey 2015-16. Ethiopian Journal of Health Sciences, *29*(4), 513-524. https://doi.org/10.4314/ejhs.v29i4.13

Gassmann, F., de Groot, R., Dietrich, S., Timar, E., Jaccoud, F., Giuberti, L., & Arts, M. 2022. Determinants and drivers of young children's diets in Latin America and the Caribbean: Findings from a regional analysis. *PLOS Global Public Health*, *2*(7), e0000260. https://doi.org/10.1371/journal.pgph.0000260

Guillaume, D. A. 2020. *Management practices of acute diarrhoea by caregivers of children under five years in Mathare Informal Settlement, Nairobi City County, Kenya.* Doctoral dissertation, Doctoral dissertation, Kenyatta University.

Gupta, A., & Gupta, N. 2022. *Research methodology*. SBPD publications.

Kevin, N. U. 2019. The Evaluation of Water Treatment Methods Utilized among Households in Kyegegwa District, Uganda. *Health, 11*(10), 1291-1298.https://doi.org/10.4236/health.2019.1110099

Müller-Hauser, A. A., Sobhan, S., Huda, T. M. N., Waid, J. L., Wendt, A. S., Islam, M. A., Rahman, M., & Gabrysch, S. 2022. *Key* food hygiene behaviors to reduce microbial contamination of complementary foods in rural Bangladesh. *The American Journal of Tropical Medicine and Hygiene*, *107*(3), 709. https://doi.org/10.4269/ajtmh.21-0269

Tanzania National Bureau Statistics [NBS]. 2022. Tanzania National Bureau Statistics .United Republic of Tanzania (Census).

Tareke, A. A., Enyew, E. B., & Takele, B. A. 2022. Pooled prevalence and associated factors of diarrhea among under-five years children in East Africa: A multilevel logistic regression analysis. *PLoS One, 17*(4), e0264559. https://doi.org/10.1371/journal.pone.0264559

Tiko, A. 2018. *Knowledge, attitude and practices of caregivers of children under five years on diarrhea prevention at kijomoro health centre iii, olufu sub-county, Maracha district*. Kampala International University. School of Health Sciences (Western Campus). http://hdl.handle.net/20.500.12306/4341

Torres-Slimming, P. A., Carcamo, C. P., Wright, C. J., Lancha, G., Zavaleta-Cortijo, C., King, N., ... & Harper, S. L. 2023. Diarrheal disease and associations with water access and sanitation in Indigenous Shawi children along the Armanayacu River basin in Peru. *Rural and Remote Health*, *23*(3), 1-11. https://doi.org/10.22605/RRH7198

UNICEF, 2018; *Diarrhea, why children are still dying and what can be done*. https://data.unicef.org/topic/child-health/diarrhoeal-disease

Workie, H. M., Sharifabdilahi, A. S., & Addis, E. M. 2018. Mothers' knowledge, attitude and practice towards the prevention and home-based management of diarrheal disease among under-five children in Diredawa,Eastern Ethiopia, 2016: a cross-sectional study. *BMC Pediatrics, 18*(1), 358. https://doi.org/10.1186/s12887-018-1321-6

World Health organization [WHO]. 2022. *Diarrhoea cases status World wide-WHO*. https://www.who.int/news-room/fact-sheets/detail/diarrhoeal-disease