

# A Rapid Assessment of Knowledge, Attitudes and Practices of Mothers and Caregivers on Childhood Diarrhea in Zanzibar, Tanzania

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Received: November 7, 2024 Accepted: December 28, 2024 Published: February 3, 2025

doi:10.5296/jbls.v16i2.22378 URL: <https://doi.org/10.5296/jbls.v16i2.22378>

## Abstract

Childhood diarrhea is the third cause of admission and deaths with overall incidence remaining unacceptably high while knowledge, attitude and practices (KAP) of the mothers present affecting vitality of the childhood in most affected communities of Tanzania. Therefore, this study aimed to assessment of knowledge, attitudes and practices of mothers and caregivers on childhood diarrhoea in Zanzibar, Tanzania. A quantitative cross-sectional study was conducted from October, 2019 to February, 2020. Twenty-four health facilities were selected from west urban region of Zanzibar in Tanzania. A total of 384 mothers and caregivers with diarrhoea in children under-five years were enrolled. Information on socio-demographic characteristics was obtained by asking the parents/guardians. Questionnaires were interview administered to the participants and data were analyzed using statistical package for social science (SPSS) version 16.0. A total of mothers and caregivers were studied. From the respondents 365(95%) had satisfactory level of knowledge on childhood diarrhea while 20 (5%) had unsatisfactory knowledge. A total of 196 (51%) rejected the use of oral Rehydration Sugars (ORS) at home due to taste and smell and 188 (49%) agree its use. Collectively mothers and caregivers 177 (46%) reported drinking treated or boiling water. A total of 181 (47%) respondents reported hand washing after helping children with defecation while only 73 (19%) respondents reported washing hands before preparing food. Limited use of water sanitation and hygiene (WASH) practices was observed among mothers and caregivers of under-five in the prevention and management of childhood diarrhea. Therefore, there is a need to endorse effective community health education, dissemination of information and community conversation to create a positive practice towards moving knowledge into WASH practices.

**Keywords:** knowledge, attitudes, WASH Practice, nothers of under-fives, caregivers of under-fives and childhood diarrhea

## 1. Introduction

Globally, about 525,000 under-five children are dying of diarrhea diseases each year (Liu et al., 2024) in resource limited settings (GAPPD, 2013). It is also estimated that there are 1.7 billion cases of childhood diarrheal disease every year (Liu et al., 2024). Diarrhea is the third causes of childhood admission and deaths with overall incidence remaining relatively stable over the past two decades (Kheir et al., 2024; Mberu et al., 2024; Reiner et al., 2018)

Diarrhea diseases among under-fives have remained to be a public health problem in Africa (Debancho et al., 2018; Robert et al., 2021) with outbreaks causing 13% of under-five deaths while the remaining 87% causes by non-outbreak diarrhea due to *Salmonella*, *Shigella* *Campylobacter* and *Escherichia coli* (Edwin & Azage, 2019; Ministry of Health Zanzibar, 2016).

A number of key determinants of diarrhea among under-five morbidity and mortality in Sub Saharan Africa and Southeast Asian have been documented (T. et al., 2018). Some of them include individual factors like unemployment status, education and age of mothers/ caregivers (Seidu et al., 2021; Thiam et al., 2019). A caregiver is a person who attends the needs or concerns of a person with short- or long-term limitations due to illness, injury or disability. This could be members of the family, neighbors or close friends. Caregivers are often the main source of valuable information about the children health but concerns may differ to those given by the mothers of the children.

It has been previously described that knowledge, attitudes, and practice of mothers and caregivers on Water Sanitation and Hygiene (WASH) practices can affect household waste disposal practices (Rukambile et al., 2020), that in turn affects poor hygiene and sanitation (Liu et al., 2024; Mekonnen et al., 2018) treatment of stored drinking water (Bennion et al., 2021; Thiam et al., 2019) and Oral Rehydration Salts (ORS) provision to children that led to admission of children with dehydration.

There is a grey literature on the extent of maternal knowledge, attitudes and WASH practices and ORS provision (Mshida et al., 2018; Mwambete & Joseph, 2010) in Tanzania. Few reports have explained intrinsic and extrinsic factors (Abbas, 2018; Kabhele et al., 2018).

Some of the intrinsic factors include age of the mother, mother's education, residing in an informal settlement. The extrinsic factors include knowledge of the causes of diarrhoea, safe stool disposal mother's hand washing during meal preparation (Bennion et al., 2021) and following the changing of children's diapers (Kabhele et al., 2018). Focused geographic support from UNICEF has shown regions of Mbeya, Njombe, Iringa, Temeke municipality in Dar es salaam, Mufindi, Makete, Mbarali and Zanzibar, to lagging behind the towards adherence of household practices of Water, Sanitation and Hygiene (WASH) is particularly challenging (Mshida et al., 2018).

There is also limited information on knowledge, attitudes and practice of mothers or caregivers towards childhood diarrheal among children under-five in Zanzibar. The Afya Bora project in Zanzibar by UNICEF and UNFPA reported a limited knowledge among families and communities on appropriate practices around maternal, newborn and child health and nutrition, hygiene and sanitation that is thought to affect childhood diarrhea (UNICEF & UNFPA, 2020). Community factors are thought to explain the persistence nature of the childhood diarrhea in Zanzibar (Abbas, 2018) that urges research on community understanding for childhood diarrhea. This study aimed at understanding how the knowledge, attitudes and health practices of the mothers directly reflect on the health and vitality of the child.

### **Ethical Clearence**

Ethical approval was granted from the Zanzibar medical research ethics committee (Ref. No. ZAHREC/02/DEC/2018/6). Permission to conduct the study was sought from the respective health centre authorities. The information about the study was given in writings, and study representative explained the benefits, participation rights and freedom to withdraw from the

study at any time. The consent was obtained from mothers and caregivers aged above 18 years of age before collection of information. With regards to interview mothers and caregivers aged 15 to 17 years, a written informed consent was obtained from a legal guardian for participants below 18 years. Both mothers and caregivers who were above 18 years provided signed consents and the legal guardians signed assent form. The participants were assured of the confidentiality of the information of knowledge, attitude and practice in the household prevention and management of childhood diarrhea. The information obtained from the participant was not intended to be used for any other purpose except for research study.

## **2. Method**

### *2.1 Study Design and Area*

A cross-sectional study design was conducted among mothers and caregivers who attended out-patient department (OPD) for treatment in the randomly selected 24 hospitals from a list of 46 hospitals with their children having childhood diarrhea in selected west urban region.

### *2.2 Sample Size Estimation*

Population proportion formula was employed using desired characteristics of 50% (Edwin & Azage, 2019) from childhood diarrhea cases as calculated below.

Fishers' formula:  $n = Z^2pq/r^2$  (Singh, Ajay & Masuku, 2014)

Where:  $n$  = Desired sample size;  $p$  = Proportion of the population with a desired characteristics which will be 50% (Edwin & Azage, 2019);  $q = 1 - p$ ;  $z$  = standard deviation desired degree of accuracy. Where  $z$  is 1.96 if the degree of confidence is 95%;  $r$  = Degree of error which will be 5%. Therefore:  $n$  was found to be 384. The reason of chosen 50% there are no past studies that already did the same line, also 384 sample size is ethical to the study area are greater than 5000 population.

### *2.3 Inclusion Criteria*

All mothers and caregivers of children under-five years with diarrhea who consented to participate in the study and who were present during the data collection.

### *2.4 Exclusion Criteria*

Any mothers/caregivers of children above-five years with or without diarrhoea by the time of data collection

### *2.5 Data Handling and Statistical Analysis*

Data were initially compiled in an MS excel spreadsheet and statistical analyses were performed using Statistical Package for Social Sciences (SPSS) software 16.0 version. Descriptive statistics were calculated and summarized in frequency and proportions. Knowledge, Attitudes and practice use were determined using univariate analysis. Statistical analyses focused on variables potentially associated with knowledge (dichotomous outcome, yes/no) for the childhood diarrhea  $p$  values  $> 0.05$  were considered statistically significant.

### 3. Results

A total of 384 mothers and caregivers of children under-five years with childhood diarrhoea were included in the study.

#### *3.1 Socio-demographic Characteristics*

Out of the 384 study participants 184 (48%) were mothers and 200 (52%) were caregivers. The ages of the study participants ranged from 15 years to 45 years: Twelve (3%) participants had age range between 15 and 20 years while 127 (33%) and 15 (3.9%) were between 26 to 30 and 41 to 45 years old respectively.

Based on education, primary education was 79 (20.5%), secondary education was 127 (33%) tertiary education was 144 (37.5%) and 34 (8.8%) did not have formal education recognized by the government.

Regarding occupation 128 (33.3%) were housewives, 102 (26.5%) were self-employed, 75 (19.6%) were public employees, 60 (15.7%) were privately employed and 19 (2.9%) were farmers or animal keepers.

With regards to the children 120 (31.2%) were 0 - 6months, 128 (33.3%) were 7-12 months and 136 (35.4%) were 13 - 60 months (Table 1).

Table 1. Socio-demographic characteristics of respondents. n=384

<b>Variables</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Type of respondent</b>		
Mothers	184	48.0
Caregivers	200	52.0
<b>Age of respondents</b>		
15 – 20 years	12	3
21 – 25 years	49	12.7
26 – 30 years	127	33
31 – 35 years	109	28.3
36 – 40 years	72	18.7
41-45 years	15	3.9
<b>Educational level</b>		
Primary education	79	20.5
Secondary education	127	33
Tertiary education	144	37.5
Non educated	34	8.8
<b>Occupation</b>		
Housewife	128	33.3
Self employed	102	26.5
Public employ	75	19.6
Private employ	60	15.7
Farmer Animals keeper	19	4.9
<b>Age of child</b>		
0 - 6 months	120	31.2
7 - 12 months	128	33.3
13 - 60 months	136	35.4
<b>Total</b>	<b>384</b>	<b>100</b>

### 3.2 Knowledge of Mothers and Caregivers of Under-fives towards childhood diarrhoea

Most of the mothers and caregivers 365 (95.0%) defined childhood diarrhea as frequent passing of loose stool 3 or more times per day, 11 (2.8%) defined it as frequent passing of normal stool while only 8 (2.0%) identified blood in the stool. Among 166 (43.2%) of the participants, identified causes of diarrhea were: eaten fecal matter / feces and 41 (10.6%)

teething. More than half 208 (54%) of the participants identified that weakness or lethargy is the danger sign of under-five diarrhea disease while 24 (6.4%) identified marked thirst for water (Table 2)

Table 2. Mother and Caregiver Knowledge about diarrhea among under-five children. n=384

<b>Variables</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>Definition of diarrhea</b>		
Frequent passing watery stool 3 or more	365	95.0
Frequent passing normal stool	11	2.8
Blood in stools	8	2.0
<b>Diarrheal causes</b>		
Teething	41	10.6
Contaminated water	132	34.3
Contaminated food	45	11.7
Eaten fecal matter	166	43.2
<b>Diarrheal danger signs</b>		
Becoming weak	208	54
Repeated vomiting	97	25.2
Fever and blood stool	55	14.3
Marked thirst for water	24	6.2

More than half 200 (52.0%) of participants knew the recommended volume of water for mixing sachets of Oral Rehydration Salts (ORS) (i.e., 1000ml of water to 1 sachet of ORS) while 184 (47.9%) suggested other volumes. 233 (60.6%) of the participants responded correctly to that ORS should be given frequently to the diarrhea child and 42 (10.9%) didn't know. Also 313 (81.5%) thought that ORS should be given to the diarrhea child within 24 hours (1 day) after mixing while 71 (18.4%) didn't know (Table 3). These results indicate that there is a statistically significant relationship between the knowledge of danger signs of diarrhea and how long ORS should be mixed (chi-square with six degrees of freedom = 480.764,  $p = 0.000$ ).

Table 3. Respondent's Knowledge about the Correct use of ORS, West Urban Region

<b>Variables</b>	<b>Frequency</b>	<b>Percent (%)</b>
<b>ORS use</b>		
Agreed	287	74.7
Disagreed	97	25.2
<b>How is ORS prepared?</b>		
I sachet of ORS - 500ml of water	151	39.3
1 sachet of ORS - 1000ml of water	200	52.0
1 sachet of ORS - 1500ml; of water	33	8.5
<b>How often should ORS be given?</b>		
Frequently drink	233	60.6
Whatever child wants to drink	95	24.7
After the passing very loose stool	56	14.5
<b>How long should be mixed ORS last?</b>		
24 hours (1 day)	313	81.5
48 hours (2 days)	30	7.8
Don't known	41	10.6

### 3.3 Attitudes of Mothers and Caregivers of Under-five towards Childhood Diarrhea

From the respondents, the majority of them 196 (51.0) disagreed with the treatment childhood diarrhea disease at home and 188 (48.9%) agreed. More than a third of respondents 332 (86.4%) agreed that mothers can make oral rehydration therapy fluid at home for treatment of childhood diarrhea while 53 (13.5%) disagreed. More than half of the respondents 203 (52.3%) believed that children disagree the taste and smell of ORS and 181 (47.1%) agreed (Figure 1)



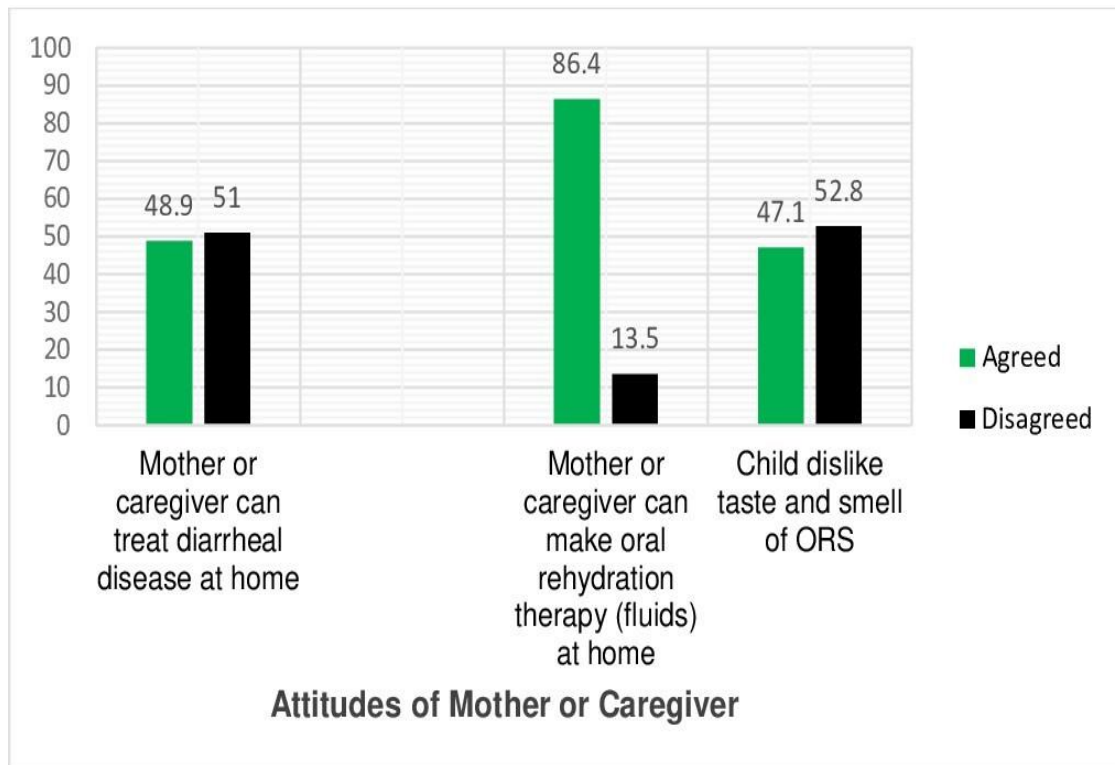


Figure 1. Attitudes of Mother and Caregiver towards ORS and Treated Diarrhoea at Home

There were mothers and caregivers 260 (67.7%) believed that children dislike the taste and smell of chlorinated water or a dilute sodium hypochlorite solution while 124 (32.4%) did not think this was a problem. With regards to possibility of preventing diarrhea diseases, 332 respondents (86.3%) believed they could prevent their admission while 52 (13.7%) thought it was hard to prevent. On the other hand, about 200 respondents (52.0%) reported the diarrhea disease that caused their admission was a communicable and 184 (48.0%) believed it was a non-communicable disease (Figure 2).

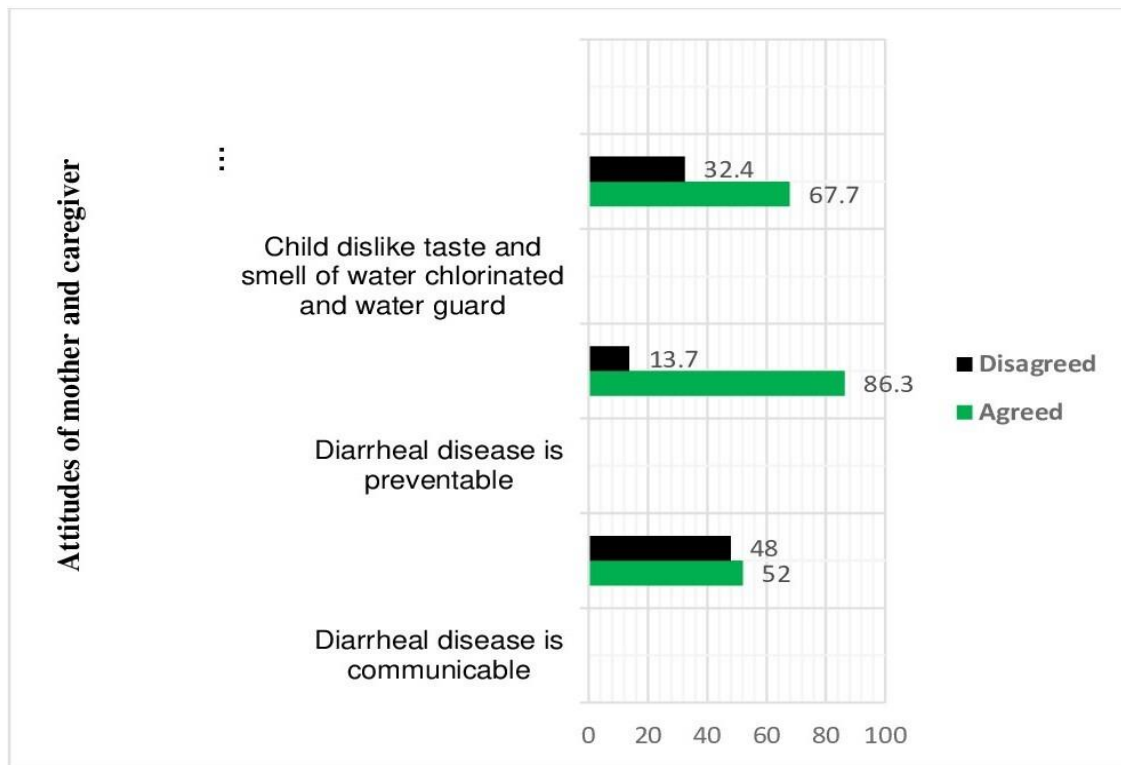


Figure 2. Attitudes of Mother and Caregiver towards Dislike Tastes and Smells

### 3.4 Practices of Mothers and Caregivers of Under-five towards Childhood Diarrhea

Most respondents 361 (94%) said that they dispose of child waste in a latrine while 23 (5.9%) do not. Similarly, 208 (54.0%) replied that they do not drink treated or boiled water while 176 (45.8%) do so. (Figure 3 and figure 4). The majority of respondents 154 (40%) breast fed their child more than usual and only 87 (22%) of the mothers and caregivers breast fed less than usual during the childhood diarrhea.

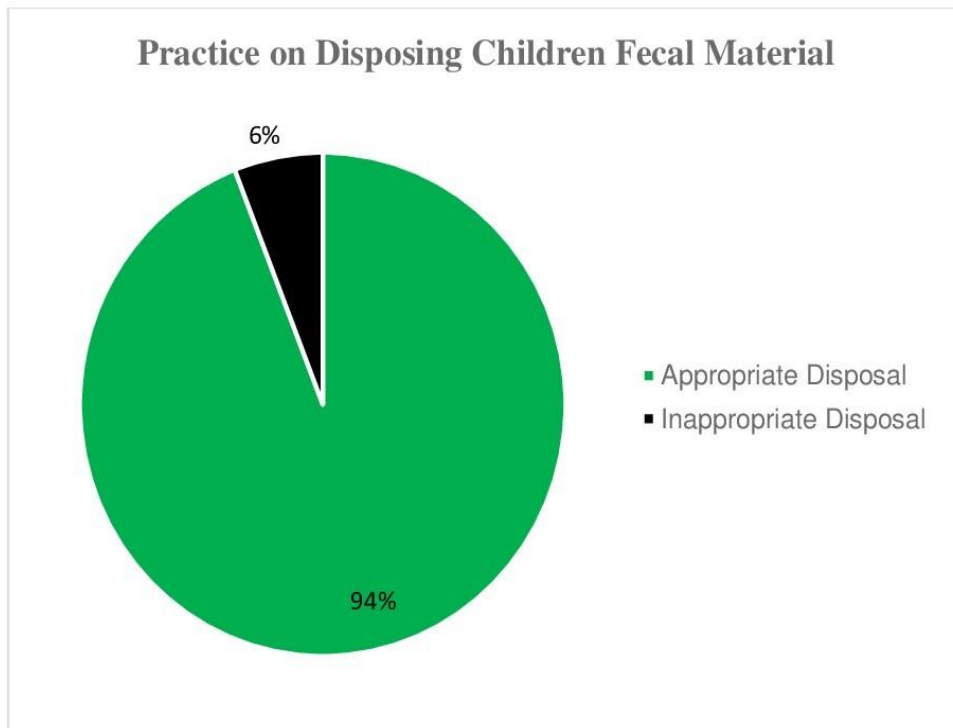


Figure 3. Reported practice of Disposal of Child Waste in Latrine among Mother and Caregiver

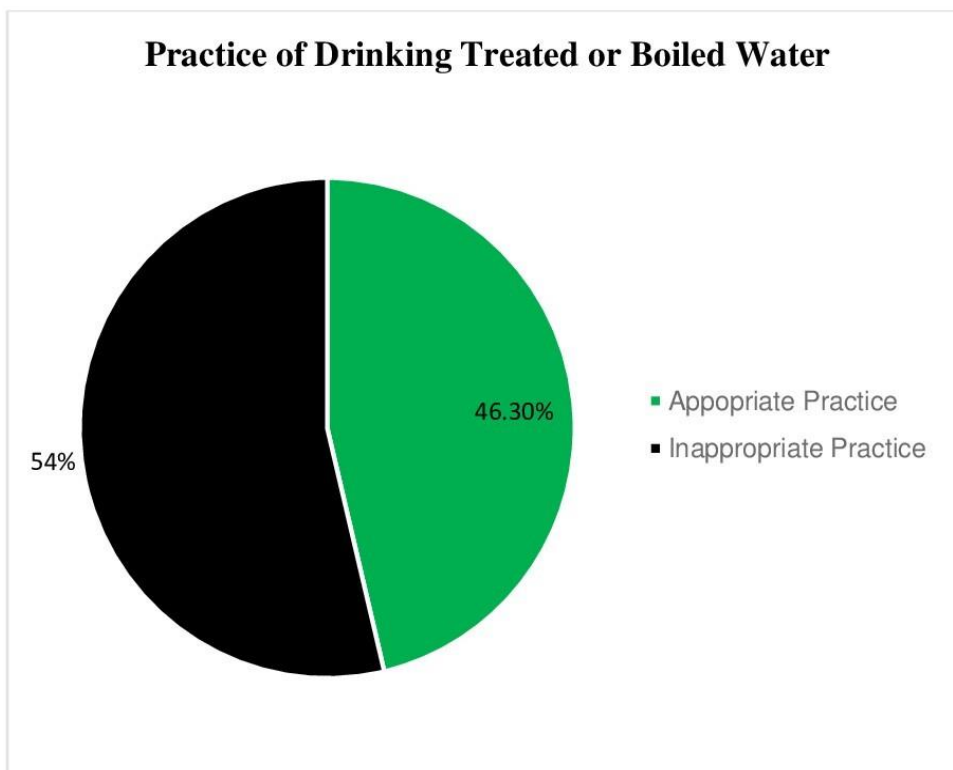


Figure 4: Reported practice of Drinking Treated or Boiled Water Mother and Caregiver

More than three-quarter 301 (78.3%) of respondents offered a drink more than usual while 16 (4.1%) offered a drink less than usually during the diarrhea disease. Regard feeding, the majority 166 (43.2%) of respondents offered food more than usual during the diarrhea disease but 85 (22.1%) offered food less than usual. Most of the mother and caregivers 181 (47.1%) responded that they usually wash hands with soap after helping children with defecation, but only 73 (19,0%) usually wash their hands before preparing food (Table 4). A statistically significant relationship between the knowledge of diarrhea and practice of wash hand with soap (chi-square with six degrees of freedom = 330.268,  $p = 0.000$ ).

Table 4. feeding Practices during Child's Diarrheal disease and Hand Washing Behavior

Variables	Category	frequency	Precent (%)
Breastfeed him/her less than usual, about the same amount, or more than usual?	Less	83	21.6
	Same	135	35.1
	More	150	39.2
	Breastfed	16	4
Offered less than usual to drink, about the same amounts, or more than usual to drink?	Less	16	4.1
	Same	67	17.4
	More	301	78.3
Offered less than usual to eat, about the same amount, or more than usual to eat?	Less	85	22.1
	Same	133	34.5
	More	166	43.2
when do you wash hands with soap?	Before prepare food	7.3	19
	Before feeding	114	29.6
	After defecation	181	47.1
	Never	16	4.1

### ***Mother and Caregiver Care-seeking Behavior and Places During their Childhood Diarrhea***

Most respondents 350 (91.1%) sought medical treatment for their children during the time of diarrhea diseases and 34 (8.85) did not. From those who sought care for their child's diarrhea, more than half 203 (52.8% visited health centers diarrhea, less than half 158 (41.1%) went to the hospital and only 23 (5.9%) went to diarrhea a traditional practitioner (Table 5).

Table 5. Respondents Care-Seeking Behavior and Places During their Children Diarrhea.

Variables	Category	Frequency	Percent (%)
Seek advice or treatment outside of the home	Yes	350	91.1
	No	34	8.8
First place goes for advice or treatment	Hospital	158	41.2
	Health center	203	52.8
	Traditional practitioner	23	5.9

#### 4. Discussion

This study assessed the knowledge, attitudes, and practice of mothers and caregivers on childhood diarrhea in west urban region in Zanzibar, Tanzania.

##### *Knowledge of Mothers and Caregivers of Under-fives towards childhood diarrhoea.*

The study reported majority of respondents 365 (95%) have satisfactory knowledge about diarrhea which is higher than a study finding 92% in Ethiopia (Workie et al., 2018), 85% in Cambodia (Merali et al., 2018) and 41% in Ethiopia (Agegnehu et al., 2019). Similarly, 343 (88%) of the respondents had good knowledge about causes of diarrhea disease. The finding is higher than studies conducted in Pakistan, India, Mali and Ethiopia (Debancho et al., 2018; Merga & Alemayehu, 2015; Workie et al., 2018). The high level of awareness in urban areas probably because mothers' access to various diarrhea issue through mass media and community education campaigns. Another possible reason was the effect of Afya Bora Project that provided community knowledge of WASH through community health care workers from 2015 to 2019 Zanzibar (UNICEF & UNFPA, 2020).

##### *Attitudes of Mothers and Caregivers of Under-five towards Childhood Diarrhea*

Concerning attitude, more than half of the mothers and caregivers 196 (51%) were negative towards the use of oral rehydration salts (ORS) at home reflecting missed education during hospital services or antenatal care education; This pattern was almost similar to negative attitude prevalence of 55% among mothers in ORS reported by Workie *et al* in Ethiopia (Workie et al., 2018). Mothers and caregivers discouraged by the feedback of ORS from their children "Unpleasant taste and smell". It observed that this finding subjected to the mothers on the taste of chlorine, sugar and salt in combination in the management of diarrhea among under-five children.

##### *Practices of Mothers and Caregivers of Under-five towards Childhood Diarrhea*

There was a pattern of only 176 mothers and caregivers (46%) with good practice of drinking treated or boiled water. However, despite high knowledge the majority mothers of Unguja hold poor practice and inadequate technical follow up on household practice on prevention of

childhood diarrhea. Although higher than the study by Agegnehu *et al* prevalence 31% reported in North western Ethiopia (Agegnehu et al., 2019), 40% in Senegal (Thiam et al., 2017) and 27.8% from India (T. et al., 2018), Health system managers in Zanzibar is urged to design community-based interventions that are linked with the routine hospital-based health education interventions on childhood diarrhea.

With the recorded of only 73 mothers and caregivers (19%) to report appropriate experience of washing their hands before preparing food. This finding was lower than a study finding 100% (Workie et al., 2018); 69.3% and 49% (Bennion et al., 2021). But higher than a finding that 16% of the mothers reported washing their hands after defecation (Merga & Alemayehu, 2015). While the variation might be due to difference in ethics, culture, belief, socio-demographic and information access for WASH health education in Africa (Darvesh et al., 2017; Kabhele et al., 2018). It is anticipated that community infection prevention control practices were missed in Zanzibar. This pattern is far beyond regular findings in Ethiopia 67.8% in report by Workie and co-workers and 66.7% the report of UNICEF in Tanzania mainland. In a confusing way we observed, 181 (47%) who reported to wash hands with soap after helping children with defecation diarrhea which means the practical use of running water and soap is not well understood in Unguja communities.

Generally, we found the paradoxical knowledge levels with attitude and practices. This means mothers might be aware of the causes and risks of diarrhoea but there have been limited cultural changes towards practical application of the knowledge (Gagliardi et al., 2016; Graham et al., 2018; Morse et al., 2020; Mshida et al., 2018). Additionally, there is a need to use of integrated knowledge translation (IKT) for assuring moving knowledge given is taken into action in Unguja Zanzibar. IKP is ongoing relationship between researchers and decision makers (clinicians, managers, policy makers etc.) for the purpose of engaging in a mutually beneficial research project or program of research to support decision making (Gagliardi et al., 2016; Kothari et al., 2017). It is the potential strategies for bridging the gap between knowledge and practice in advanced as a way to increase the relevance, applicability, supported and impact of results.

## **5. Conclusion and Recommendation**

Mothers and Caregivers of West Urban Region of Unguja present with poor attitudes and practices among children under-five that do not reflect their high level of knowledge on the causes, transmission and management of childhood diarrhea. There is a need to endorse effective community health education, dissemination of information and community conversation to create a positive practice towards moving knowledge into WASH practices as a key prerequisite of community management of diarrheal diseases in the under-fives.

## **6. Strength and Limitation of the Study**

As there was no the same study in the study area conducted in other regions, it can use as a baseline for other studies. Similarly, it can also be a blueprint to conduct an interventional study in the particular area. The limitation of this study is that it was not possible to establish temporal relationship between exposure and outcome variable as this study design was a

cross-sectional study. Additionally, determinant factors for the negative attitude and poor practice of the mothers were not included due to limitation of time and resource. So, further study is needed to further to determine these associated factors.

### **Acknowledgments**

The authors are very thankful to the Ministry of Health Zanzibar Medical Research Ethical Committee, Department of Molecular Biology and Biotechnology and Department of microbiology/Immunology University of Dar es Salaam for providing valuable support during the study.

### **Authors contributions**

KMK developed the concept note, study design, data collection, laboratory work, data analysis, and interpretation of data as well as initial development of the manuscript. BM made substantial contributions to design, acquisition of data, analysis, and interpretation of data. KO has made substantial contributions to the interpretation of data and initial draft the manuscript and led the final write up of the manuscript. MD, LN supervisors who worked tirelessly with great contribution on proposal development and manuscript formation. All the authors have been involved in drafting the manuscript and revising it critically for important intellectual content, and; have given final approval of the version to be published.

### **Funding**

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

### **Competing interests**

Authors have declared that no competing interests exist.

### **Informed consent**

Obtained.

### **Ethics approval**

The Publication Ethics Committee of the Macrothink Institute.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

### **Provenance and peer review**

Not commissioned; externally double-blind peer reviewed.

### **Data availability statement**

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

### Data sharing statement

No additional data are available.

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