



# Hygiene and Sanitation Related Factors Influencing Diarrhea among Children Below 5 Years in Bondhere District Somalia

\*Mahad Dahir Turyare<sup>1,2</sup>, Japheth Nzioki Mativo<sup>2</sup>, Mary Kerich<sup>2</sup>, Alex Karuiru Ndiritu<sup>3\*</sup>

- 1 Department of Nutrition, UNICEF Somalia, [mdturyare@unicef.org](mailto:mdturyare@unicef.org)
- 2 Department of Public Health, Jomo Kenyatta University of Agriculture and Technology
- 3 Department of Environmental Health, University of Kabianga

\*Corresponding Author: Alex Karuiru Ndiritu, [alexask.n@gmail.com](mailto:alexask.n@gmail.com)

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## Summary

### BACKGROUND

Diarrhea is ranked the second cause of childhood mortality in developing countries. Studies have documented Somalia as among the country with significant high rates of diarrhea among children below 5 years.

### OBJECTIVE

The aim of this study was to assess hygiene and sanitation related factors influencing diarrhea among children below 5 years.

### METHODOLOGY

The study employed a descriptive cross-sectional study design where data was collected using semi structured questionnaires. Simple random sampling was employed to identify respondents of the study. The data analysis was done using SPSS version 20 at 95% confidence interval. The data was subjected to descriptive and regression analysis.

### RESULTS

Were presented using tables and graphs. Ethical clearance was sought from University of Eastern Africa Baraton ethical review committee. the administrative leadership of Bondhere district and caregivers respectively.

The prevalence of diarrhea among children under 5 years was 22.4%. Hygiene and sanitation related factors reported to significantly influence childhood diarrhea were; hand washing before preparing baby's food and source of water for household use.

### CONCLUSION

The findings of this study may have policy implications on health interventions and suggests that focusing on hand-washing and improving sources of water may have profound benefits on childhood diarrhea in Somalia.

Additionally the Somalia infrastructure is characterized by poor sanitary facilities and lack of piped water.

**Keywords:** Diarrhea, children under 5 years, hygiene and sanitation, prevalence

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## Introduction

Globally there is an estimated 1.7 billion cases of diarrheal disease annually [1]. Diarrhea diseases among children below 5 years accounts for about 84% of the global burden of diarrhea diseases [2].

The highest proportions of the burden of diarrhea occurs in the middle and low income countries [3]. In developing countries diarrhea ranks as the second leading cause of death among children below the age of 5 years accounting for about 18 % of all the deaths. Africa and South East Asia accounts for about 78% of all the diarrhea related deaths among children below 5 years [4]. In Africa alone there are about 4 billion cases of diarrhea among children annually that are associated with poor sanitation [5,6].

Lack of safe water, poor hygiene and sanitation accounts for about 90% of the diarrhea diseases [4]. Diarrheal diseases have been documented to be caused by contaminated water and food sources. Globally about 780 million families do not have access to safe and drinkable water and about 2.5 billion people live in poor sanitary conditions [1]. Studies have documented that environmental factors such as sanitation facilities, solid waste disposal and type of water source are key determinants of diarrhea [7]. Other environmental factors associated with childhood diarrhea includes; hand washing practices, knowledge on diarrhea diseases and their management [8]. Related Diarrhea among children below 5 years in developing countries as a result of gastrointestinal infection by virus, bacteria and parasites [9].

In Somalia only about 45% of the population is able to access improved water sources. The poor access to safe drinking water is attributed to the unpredictable rainfall patterns, conflict and inadequate maintenance of the water sources. Relatedly only about 25% of the population have access to improved sanitation facilities within a distance of 10 meters. Consequently the morbidity rates and malnutrition rates among Somalia children are always alarming [10].

In the year 2015 the UN assembly adopted 17 sustainable development goals among them is on clean water and sanitation, since then there has been a lot of investment put forward by countries, non-governmental

organizations and other partners in the health sector. However in Somalia the prevalence of diarrhea is still considerably high at about 27% [9]. The suffering from diarrhea in Somalia is further intensified by the drought conditions where hundreds of children have been reported to suffer from acute watery diarrhea [11]. Therefore this study aims at investigating the hygiene and sanitation related factors influencing diarrhea among children under 5 years in Bondhere district Somalia.

## Methodology

### Study site

The study was conducted in Bondhere district. Bondhere district is located in the southeastern part of Banaadir region Somalia. Bondhere district is an administrative region and its coordinates are 2°1'59.999"N, 45°21'0.000"E. Bondhere district is one of the districts in the Banaadir region. The region has a population size of 1,650,227 with an inclusion of 369, 288 internally displaced persons (IDPs) [12]. The region is bordered by lower Shebelle, middle Shebelle and the Somalia sea.

### Study design

The research employed descriptive cross sectional design which helped in determining factors influencing adoption of hygienic practices associated with diarrhea among children under 5 years in Bondhere district.

## Experimental procedure

Data was collected using a semi structured questionnaire. The study was ethically approved by University of Eastern Africa Baraton. Permission and consent was sought from the administrative leadership of Bondhere district and caregivers respectively. A sample size of 246 caregivers was computed and clustered random sampling was used to enroll participants in the study.

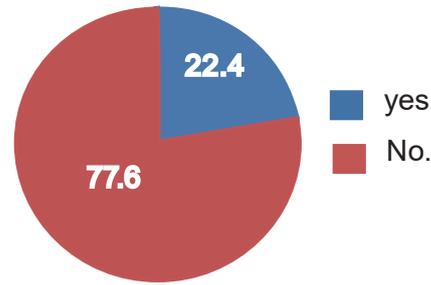
### Data analysis and presentation

Data was cleaned, coded and data entry done. The data was analyzed using Statistical Package for Social Scientists (*SPSS version 20.0*). Binomial regressions were computed to show the interactions between the hygiene and sanitation related variables and prevalence of diarrhea. The regression analysis was done at 95% confidence level.

## Results

### Prevalence of diarrhea

In the current study 22.4 % of the caregivers reported that their children had experienced diarrhea in the last two weeks before the survey was conducted while the 77.6% of the caregivers reported that their children had not experienced diarrhea in the last two weeks before the survey was carried out



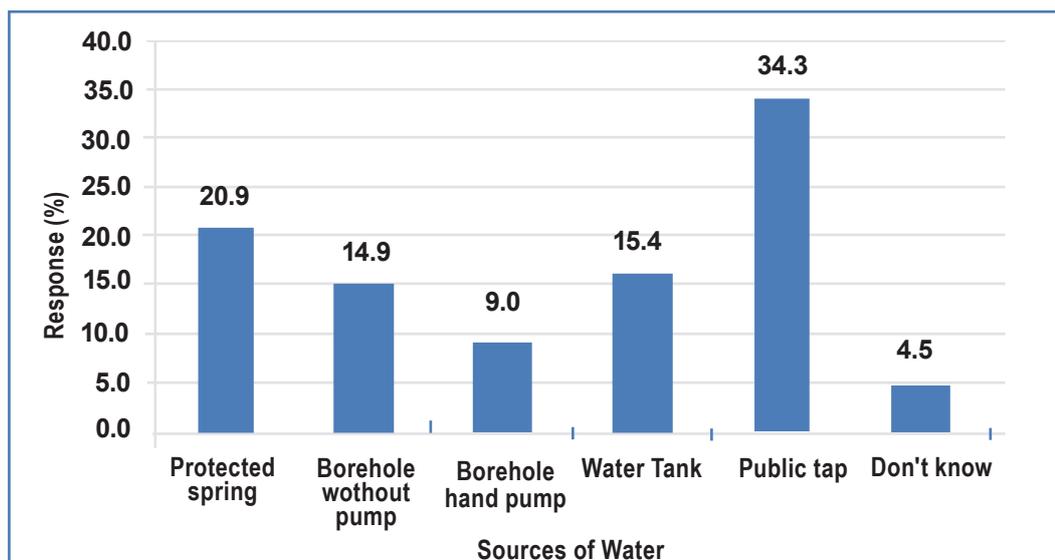
**Table 1:** Rates of hygiene and care practices by caregivers of children below 5 years

	Yes (%)	No (%)
Do you wash your hands after visiting the toilet	85.1	14.9
Do you wash your hands after changing baby's diapers	74.6	25.4
Do you exclusively breastfeed your child/ children	73.1	26.9
Do you wash your hands before feeding your child/ children	83.6	16.4

**Figure 1:** Prevalence of Diarrhea among Children Below 5 years Behavioral Factors

85.1% of the caregivers washed their hands after visiting toilets while 14.9% of the caregivers did not wash their hands after visiting toilet. 74.6% of the caregivers washed their hands after changing baby's diapers while 25.4 % of the caregivers did not wash their hand after changing baby's diapers. 73.1% of the caregivers exclusively breastfed their children while 26.9% did not exclusively breastfed their children. Only 83.6% of the caregivers washed their hands before feeding their children, 16.4% of the caregivers did not wash their hand before feeding the children.

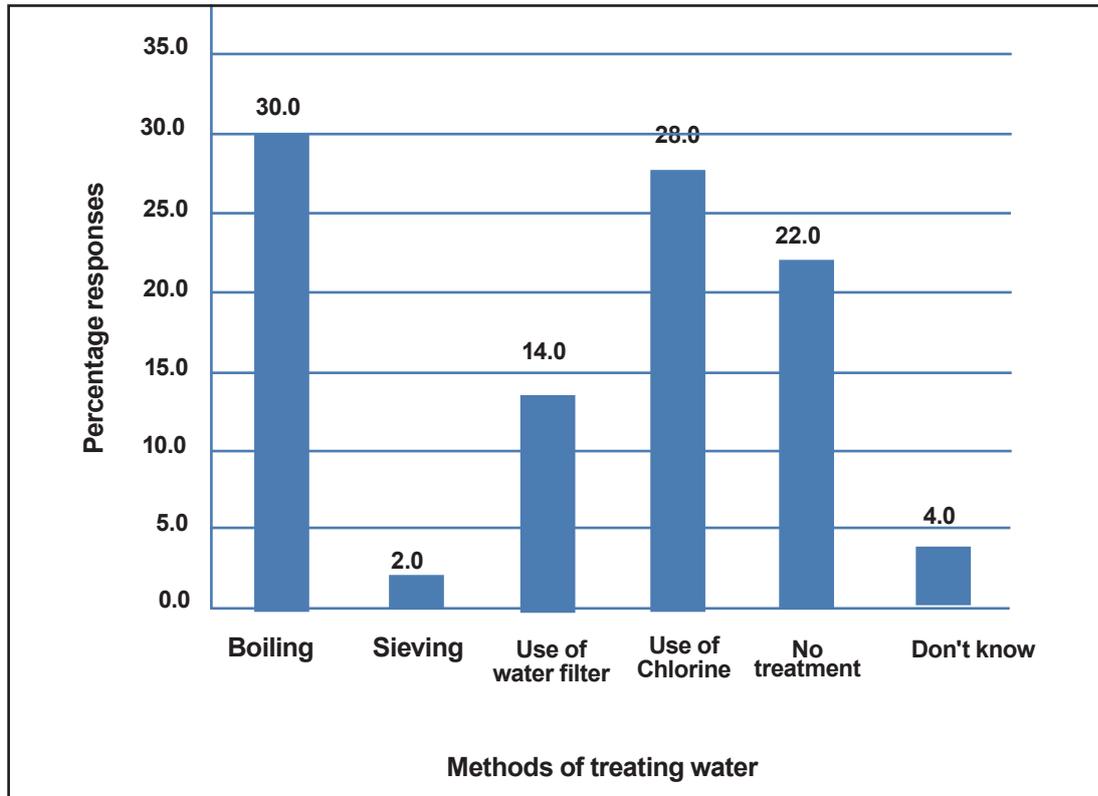
### Water and sanitation



**Figure 2:** Sources of Water for Household use

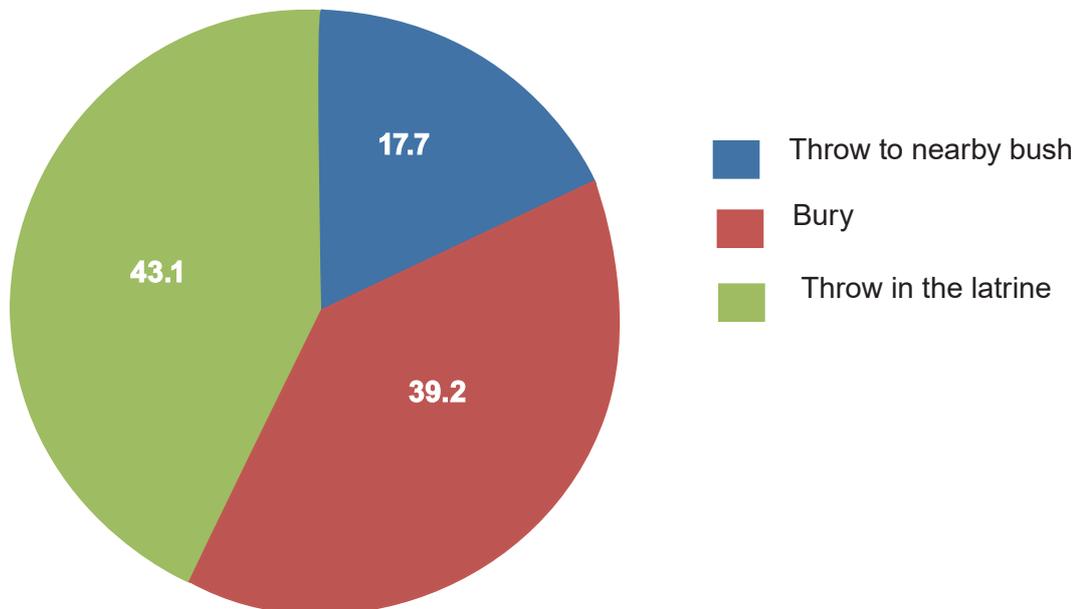
20% of the caregiver's accessed water for household use from protected springs, 15% and 10% got it from borehole without pump and borehole with a hand pump

respectively. About 18% of the caregivers used water from the water tanks and 35% of the caregivers sourced water from a public tap.



**Figure 3: Treatment of Drinking Water**

30% of the caregivers treated their drinking water by boiling, 2% by sieving, 15% by use of a water filter, 28% by use of chlorine while 25% of the caregivers never treated their drinking water.



**Figure 4: Method used to Dispose Children Faeces**

17.7% of the caregivers disposed their children faeces by throwing to nearby bush, 39.2% of the caregivers bury the children faeces and 43.1% of the caregivers disposed the children faeces by throwing into a pit latrine.

## Hygiene and Sanitation Related Factors Influencing Diarrhea

**Table 4:** Regression Analysis of Hygiene and Sanitation Related Factors Influencing Prevalence of Diarrhea among Children Below 5 years

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
<b>Step 1<sup>a</sup></b>	Handwashing after visiting the toilet	1.315	1.613	.665	1	.415	3.726	.158	87.867
	Handwashing after changing diapers	.121	.284	.183	1	.669	1.129	.647	1.970
	Handwashing before preparing babys food	2.453	1.242	3.899	1	.048	11.623	1.018	132.677
	Source of household water	1.188	.637	3.486	1	.042	3.282	.943	11.428
	Water treatment method	.057	.238	.058	1	.810	1.059	.664	1.688
	Faeces disposal method.	-.460	.754	.372	1	.542	.631	.144	2.768
	Constant	-10.719	5.299	4.091	1	.043	.000		

<sup>a</sup>. Variable(s) entered on step 1:

Handwashing after visiting the toilet.  
 Handwashing after changing diapers.  
 Handwashing before preparing baby's food.  
 Source of household water.  
 water treatment method.  
 Faeces disposal method.

Based on the regression analysis the following hygiene and sanitation related factors were reported to significantly influence the prevalence of diarrhea among children below 5 years; hand washing before preparing the baby's food ( $p = 0.048$ ) and source of household water ( $p = 0.042$ ). On the other hand; handwashing after visiting the toilet, handwashing after changing diapers and faeces disposal method had no significant influence on the prevalence of diarrhea among children below 5 years.

## Discussion

The results of the current study indicate a considerably high prevalence of diarrhea among children below 5 years. Similarly based on a study conducted in Ethiopia the prevalence of diarrhea was considerably high (22.5%) [13]. Relatedly studies have documented higher rates of diarrhea (30.5%) among children below 5 years as compared to the results obtained in this study (14). However based on a study conducted in Tanzania the prevalence of diarrhea among children below 5 years was considerably low (6.1%) [5]. The observed deviation in prevalence of diarrhea between the studies could be attributed to varying degree of implementation of child survival strategies aimed at promoting health and care practices [15].

Hygiene and sanitation related factors documented to significantly influence prevalence of diarrhea were hand washing before preparing baby's food and source of household water. Similarly based on a study conducted in Nigeria poor handwashing before food preparation and feeding was associated with diarrhea among children below 5 years [16]. Relatedly in a study done in Vietnam higher risk to diarrhea in children was reported among caregivers who did not wash hands properly with soap and water before feeding [17]. Studies have documented that simple hygiene practices such washing hands with soap and water significantly reduces the rates of water [16].

In the current study over two thirds of the caregivers reported to wash their hands at critical times. This finding is consistent with other studies who have documented an improvement in behavior among mothers as a result of health education programs, experience and formal education [18,19]. Additionally studies have reported that caregivers wash their hands at

appropriate times to prevent diarrhea and other hygiene related communicable diseases [20].

The availability of safe drinking water has been documented to significantly influence the prevalence of diarrhea [21]. Relatedly based on a meta-analysis interventions aimed at improving the sources of water for household use has been reported to significantly reduce the prevalence of diarrhea among children [22]. Additionally studies have documented that improving the sources of water is a key strategy of reducing the rates of diarrhea among children below 5 years, although this strategy has to be integrated with other approaches for it to contribute significantly in reducing rates of diarrhea [23]. However other studies have not established association between the source of water and prevalence of diarrhea (20). The contrast in findings between the current study and other studies could be possibly due to differences in water quality infrastructure as well as seasonal variations [24]. Additionally the differences in utilization of water within the sampled homes could possibly explain the variance between the studies [25].

In the current study handwashing after visiting the toilet, hand washing after changing the baby's diapers, water treatment method and facial matter disposal method were documented to have no significant influence on the prevalence of diarrhea among children under 5 years. Relatedly based on a study done in Ethiopia facial matter disposal method had no significant influence on childhood diarrhea [25]. In contrast other studies have documented that handwashing by caregivers at the critical times such as after visiting the toilet considerably influences the rates of diarrhea among children [20,26]

Furthermore studies have reported that improper refuse disposal may result to children coming into direct contact with human excreta as they crawl thus predisposing them to disease vectors that may cause diarrhea [18]. Relatedly a study done in Kenya documented that interventions aimed at improving hygiene and water treatment had no significant improvement on childhood diarrhea [27]. The contrast in findings between the current study and other studies could be due to differences in study designs and regions where study were conducted [13].



## Conclusion

Our study provides evidence that there are considerably high rates of childhood diarrhea in Somalia. Additionally the data suggests that handwashing before preparing baby's food and source of household water has significant influence on the rate of diarrhea among children below 5 years. In general the findings of this study may have policy implications on health interventions and suggests that focusing on handwashing and improving sources of water may have profound benefits on childhood diarrhea in Somalia.

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