

Original Research Article

Sociodemographic factors' influence on diarrheal diseases among children under five years in Kibish sub-county, Turkana, Kenya

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Received: 07 January 2026

Revised: 09 March 2026

Accepted: 13 March 2026

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ABSTRACT

Background: Diarrheal diseases are the third major causes of hospitalization, morbidity and mortality among children under five years in low and middle-income countries. In Kenya, during the year 2018, diarrheal cases among children under five years was 1,499,146. In the same year, Turkana County reported 16.5% diarrheal prevalence rate among children under five years, that suggest the diarrheal diseases are still a challenge. The aim of this study was to assess mitigation challenges on diarrheal diseases among children under five years in Kibish Sub-County, Turkana County.

Methods: The study employed the precede-proceed model, and a mixed-methods research design was used. Target population of 2779 respondents participated in the study. The Yamane formula (1967) was used to determine a sample size of 354 respondents. The simple random sampling, cluster sampling and purposive sampling techniques were used.

Results: The findings revealed that socio-demographic factors, such as household size and the number of children under five, were significant ($p < 0.014$, $p < 0.0001$). Environmental factors, like time spent fetching water, were also significant ($p < 0.01$), as were behavioral factors, including handwashing after disposing of child feces and before feeding ($p < 0.021$, $p < 0.029$). These factors contributed to the prevalence of diarrheal diseases in the region.

Conclusions: The study concluded that diarrheal diseases among children under five years in Kibish Sub-County, requires an integrated approach combining improved household size, WASH services, health education, timely treatment, nutrition support and stronger community-based health systems. The study recommended collaboration among stakeholders, promote household-level prevention measures, improve access to early treatment services, enhance community health education, strengthen water, sanitation and hygiene practices and improve healthcare infrastructure and staffing. Furthermore, the community leaders, stakeholders and community health promoters should design and implement targeted interventions that address the specific challenges experienced in Kibish Sub-County, including water scarcity, limited access to healthcare services, poor sanitation, immunization outreaches, and hygiene practices in order to curb diarrheal diseases.

Keywords: Children under five years, Diarrheal diseases, Socio-demographic factors

INTRODUCTION

Globally, an estimated 1.5 billion cases of diarrhea occur annually, and children under five years alone account for 510 million diarrhea cases and a mortality rate of 475,000

deaths.¹ Diarrheal diseases infect the gastrointestinal tract (GIT), causing a variety of viral, bacterial, and parasitic infections. The oral route is a common portal of entry for gastrointestinal tract infections. When they are ingested alongside contaminated water, contaminated food, or

person-to-person, because of poor hygiene, it leads to diarrhea. The World Health Organization defined diarrhea as the passage of three or more loose or liquid stools that last for several hours or more frequently than is considered normal for an individual. Diarrheal diseases associated with multiple interplays of socio-demographic factors, behavioral factors, and environmental factors.² The same factors confirmed by a scientific survey done in India which linked such factors to diarrheal diseases.³ The mortality rate of diarrheal diseases in low and middle-income countries is almost fifty times higher than in higher-income countries. These diseases are of greater public health importance. However, diarrhea is a preventable disease.⁴

Diarrheal diseases are classified into three classes: Viral diseases include rotavirus, adenovirus, and astrovirus. Bacterial diseases include *Campylobacter spp.*, *Salmonella spp.* (non-typhoid), and *Escherichia coli*, Shigellosis, and parasitic diarrheal diseases include *Cryptosporidium*, *Giardia*, and *Entamoeba spp.* The three episodes of diarrhea that are witnessed include acute watery diarrhea that lasts several hours or days, acute bloody diarrhea, and persistent diarrhea that lasts 14 days or longer, and each episode of diarrhea deprives the child of the nutrition necessary for growth.

Problem statement

Kibish Sub-County is one of the arid and semi-arid areas in Turkana County that experiences the worst situations to mitigate diarrheal diseases among children under five years. Despite more resources from the national government and non-governmental Organizations to Turkana County Government, implementation of health programs in Kibish Sub-County is very poor as compared to other Sub-Counties.⁵ According to a longitudinal study in northern Kenya drylands, which involved Turkana County, it was found that water scarcity, household shocks, and acute malnutrition are significantly associated with diarrhea in children under five years.⁶

Kibish and Turkana North Sub-Counties combined are leading at a 38.6% malnutrition rate.⁶ People living in this area experienced poor access to safe drinking water, sanitation, and hygiene practices, poor immunization status, inadequate health facilities, and a shortage of health workforce, which are associated factors with diarrheal diseases in the area. The community obtained water from seasonal rivers, dams, and springs contaminated by human and livestock fecal matter, which influenced diarrheal diseases in households with children under five years, as a result of their low immunity.

Similar studies which took place in Turkana County.^{7,8} The main objectives were on the level of knowledge, unsafe disposal of excreta, and its hygiene practices. These studies are informed by unmerited programs, which are mainly provided by most of the health organizations providing sanitation facilities, rather than

effective use, which have failed to reduce the persistent occurrence of water-borne epidemics like diarrheal diseases among children under five years.

This study, therefore, sought to assess the interplay between socio-demographic factors, environmental factors, and behavioral factors on the burden of diarrheal diseases among children under five years in Kibish Sub-County. The essence of this study was to provide insights into the problems and reinforcements towards improvement of mitigation measures to curb the challenges of diarrheal diseases.

Purpose of the study

The purpose of the study was to assess mitigation challenges on diarrheal diseases among children under five years in Kibish Sub-County, Turkana County, Kenya.

Objectives of the study

To determine socio-demographic factors influencing diarrheal disease mitigation among children under five years in Kibish sub-county.

METHODS

Research design

This research adopted a mixed methods research design. This design describes the topic of the study and facilitate both quantitative and qualitative data and also describe characteristics or behaviors of a particular population, group or phenomenon and identify patterns in the characteristics of a group.

Location of the study

The research was conducted in Kibish Sub-County located in the extreme north-west part of Turkana County. It is one of the arid and semi-arid lands, which rely on pastoralism as the primary source of income. Bordering communities of nyangatom from Ethiopia and toposa from South Sudan. It is part of Turkana North Constituency, occupying 10,466 square kilometers with a total population of 36,769 (KNBS, 2019), with latitudes: 4.34903°N and Longitude: 35.554905°E. It is one of the marginalized sub-counties to access basic services like health services, education, food, and safe drinking water. According to the KNBS (2019) census, the highest population in the area is children 0-9 years old, with a population of 11,847 (32.2%); this gives interest in children under five years only.

Target population

Target population are group of people aimed to study and draw conclusions from. The study targeted 2779 respondents drawn from five sub-locations in Kibish Sub-

County. For this study the respondents include biological mothers or caregivers who were taking care children under five years and health care workers.

Inclusion and exclusion criteria

This study included households with a biological mother or caregiver, children under five years old and health workers per sub-location. The study excluded households with children above five years and those households with children under five years but unwilling to participate in the study. The respondents with children under five years old, who were critically sick, excluded to give room to take care of their children.

Sampling technique and sample size

The study adopted a cluster sampling technique in selecting the required sub-locations (clusters) from the targeted population. A sample population is those respondents with the same characteristics relating to the variables of the study. The cluster-sampling technique was used in the research. All sub-locations have a right of selection. This research technique sampled sub-locations (clusters) from the entire Kibish Sub-County. The mothers/caregivers of children under five and health workers are the main target interviewees considered in the study, mainly because they have firsthand information about the child. The study used a simple random sampling technique to select a representative household sample. Simple random sampling is considered because it gives all households with children under five years an equal chance of selection as a sampled representative and thus no bias. Yamane formula obtained a sample size of 354 respondents from target population.

Research instruments

The study used structured questionnaire for biological mothers or caregivers to collect quantitative data and key informants interview guide for health workers to collect qualitative data in form of scripts. The questionnaire

divided into three sections, the first section included socio-demographic factors, the second included environmental factors and the third section included behavioral factors.

Data collection techniques and data analysis

Data was collected from 21st November 2024 to 1st January 2025 using structured questionnaires and key informant interviews. The IBM SPSS version 26 software and Nvivo software were used for analysis. Descriptive statistics and Pearson correlation performed. $P < 0.05$ considered as statistically significant to the study.

Study approvals and ethical considerations

The researcher obtained a letter of approval from Turkana University College and a license permit number NACOSTI/25/415789 from National Commission for Science, Technology and Innovation. The informed consent obtained from the participants.

RESULTS

Socio-demographic factors of household

Descriptive statistics was used to analyse findings in Table 1, which indicate that 250 (71.6%) participants were married and their relationship with children under five years are all biological mothers. In terms of age, 138 (39.5%) of the participants were between 25-39 years old. Most participants were female at 325 (93.1%), while 108 (30.9%) households state that their children under five years are aged of 13-36 months. The relationship of under-five years child with the participants, 250 (71.6%) are mothers to under-fives children. 233 (66.8%) of the respondents had one child while 100 (28.7%) had two children in household. Respondents 132 (37.8%) revealed that their household's size is 6-7 members, followed by 124 (35.5%) who are between 4-5 members, household >8 members, 65 (18.6%) and finally 2-3 members 28 (8.0%).

Table 1: Descriptive statistics on socio-demographics factors of household.

Variables	Category	N (%)
Marital status	Married	250 (71.6)
	Divorced	2 (0.6)
	Single	59 (16.9)
	Separated	3 (0.9)
	Widowed	35 (10)
Age of mother/caregivers (in years)	13-17	36 (10.3)
	18-24	95 (27.2)
	25-39	138 (39.5)
	>40	80 (22.9)
Gender of participants	Female	25 (93.1)
	Male	24 (6.9)
Relationship with U5C	Mother	250 (71.6)
	Father	13 (3.7)

Continued.

Variables	Category	N (%)
	Brother	6 (1.7)
	Sister	23 (6.6)
Number of U5C	1	233 (48)
	2	200 (42)
	3	48 (10)
Age of the child (months)	0-6	40 (11.5)
	7-12	48 (13.8)
	13-36	108 (30.9)
	37-59	7 (10.6)
Gender of U5C	Female	109 (46.8)
	Male	124 (53.2)
Number of HH size	2-3	28 (8.0)
	4-5	124 (35.5)
	6-7	132 (37.8)
	>8	65 (18.6)
Highest Level of education	No formal education	299 (85.7)
	Primary level	30 (8.6)
	Secondary level	13 (3.7)
	Tertiary level	7 (2.0)
Source of income	Livestock keeping	148 (42.4)
	Formal employment	10 (2.9)
	Farming	1 (0.3)
	Business	45 (12.9)
	Other (specify)	145 (41.5)
Type of the house	Temporary	315 (90.3)
	Semi-Permanent	33 (9.5)
	Permanent	1 (3.0)

The high level of education showed that no formal education in most households at 299 (85.7%) and at least education level attained is primary education at 30 (8.6%). Source of income most households rely on is livestock keeping at 148 (42.4%) and other sources specified as charcoal burning, firewood at 145 (41.5%). Type of house used are temporary at 315 (90.3%) while most children under five years were male at 124 (53.2%). These findings show clear picture of Kibish Community and their lifestyle that influenced diarrhea among children under five years old.

DISCUSSION

Socio-demographic factors and diarrhea cases among children under five years

Pearson correlation analysis was used in Table 2 to show the relationship between socio-demographic factors and diarrhea prevalence among children under five years old. Diarrhea among mothers or caregivers who were divorced (50.0%) and single (42.4%) was high but low to married (34.8%), separated (34.4%) and widowed (31.4%). The results highlighted that an interplay of factors results to diarrhea.⁹ Relationship of children under five years with sister (52.2%) and father (46.2%) found to have high influence on diarrheal diseases but low to mothers (34.0%) and other, specified as grandmother (35.1%).

This suggests that a mothers and grandmothers are keener in taking care of the child than any other person. A study conducted in Uganda among biological mothers revealed that the risk of diarrhea increased in non-working mothers and children aged between 6 and 24 months.^{10,11} This finding implies that diarrhea is associated with the socio-demographic factors of a household.

There is high influence of diarrhea among household with three (75.0%) or two children at (56.0%) respectively, lower to households with one child (24.5%). Similar results from a study done in Mathare settlement, Kenya revealed that the birth order matters as well, with the first-born child being spaced from the second child.¹² Low influence on diarrheal diseases to household size of 2-3 members (17.9%) and 4-5 members (30.6%) respectively but high to household size between 6-7 members (42.4%) had high influence on diarrheal diseases. Similar study that took place in northwest Ethiopia highlight household size influence diarrheal diseases in a homestead.^{13,14} Households with no education level (36.8%) influence diarrhea compared to a family with tertiary education (14.3%). Similar results from the study that took place in 57 LMICs in Sub-Saharan African identified that educational inequalities influenced diarrhea in children with wide variations in magnitude and contributions of the risk factors to pro-illiterate inequalities.^{15,16} This study demonstrated that diarrhea prevention strategies must be

in the pro-illiterate countries and extended to educate mothers. Source of income such as other, specified as charcoal burning, firewood, casual work etc. (42.8%) and livestock keeping (31.1%) influence diarrheal diseases among children under five years in household. This finding is similar to the study done in Turkana which

illustrate that pastoralists' health outcomes tend to be poorer compared to those of populations that are more sedentary.^{16,17} Temporary house influence diarrhea at (36.5%) compared to semi-permanent at (30.3%). This study revealed temporary houses with no ventilated floor results to diarrhea among under- five children.

Table 2: Pearson correlation on assessment of socio-demographic factors and diarrhea cases among children under five years.

Variables	Category	Diarrhea		Pearson's R
		Yes, N (%)	No, N (%)	
Marital status	Married	87 (34.8)	163 (65.2)	r=-0.007
	Divorced	1 (50)	1 (50)	p=0.890
	Single	25 (42.4)	34 (57.6)	
	Separated	1 (33.3)	2 (66.7)	
	Widowed	11 (31.4)	24 (68.6)	
Gender of participants	Female	117 (36.0)	208 (64.0)	r=0.014
	Male	8 (33.3)	16 (66.7)	p=0.793
Relationship with U5C	Mother	85 (34.0)	165 (66.0)	
	Father	6 (46.2)	7 (53.8)	r=-0.027
	Brother	2 (33.3)	4 (66.7)	p=0.620
	Sister	12 (52.2)	11 (47.8)	
	Other, specify	20 (35.1)	37 (64.9)	
Number of u5c	1	57 (24.5)	176 (75.5)	r=-0.342**
	2	56 (56.0)	44 (44.0)	p=0.000
	3	12 (75.0)	4 (25.0)	
Gender of U5C	Female	26 (23.9)	83 (76.1)	r= -0.202
	Male	31 (25.0)	93 (75.0)	p=0.84
Number of HH size	2-3	5 (17.9)	23 (82.1)	r=0.132*
	4-5	38 (30.6)	86 (69.4)	p=0.014
	6-7	56 (42.4)	76 (57.6)	
	>8	26 (40.0)	39 (60.0)	
Education level	No formal education	110 (36.8)	189 (63.2)	
	Primary level	11 (36.7)	19 (63.3)	r=0.075,
	Secondary level	3 (23.1)	10 (76.9)	p=0.163
	Tertiary level	1 (14.3)	6 (85.7)	
Source of income	Livestock keeping	46 (31.1)	102 (68.9)	
	Formal employment	1 (10.0)	9 (90.0)	r=-0.104,
	Farming	1 (100.0)	0 (0.0)	p=0.053
	Business	15 (33.3)	30 (66.7)	
	Other (specify)	62 (42.8)	83 (57.2)	
Type of the house	Temporary	115 (36.5)	200 (63.5)	r=0.049,
	Semi- Permanent.	10 (30.3)	23 (69.7)	p=0.362
	Permanent	0 (0.0)	1 (100.0)	

P=p value r=Pearson correlation *statistically significant at 0.05 ** statistically significant at 0.01 n=frequency

This finding revealed that number of household size ($r=0.132^*$, $p=0.014$) and number of children under five years ($r=-0.342^{**}$, $p=0.000$) in the study are statistically significant to the study. Similar studies conducted previously found that the number of household members influenced diarrheal diseases in a household.^{13,14} This finding showed that the number of household members who consume food in the same household influenced diarrheal diseases. The study showed that most household sizes range between 6 and 7 members. The results

showed that the first child being spaced from the second child is significant, according to the study done in Pakistan, which examined an overview of diarrheal diseases among infants and under-five children in Punjab, Pakistan.¹²

Qualitative results revealed that socio-demographic factors contribute to diarrheal diseases. The following statement from Key informant's interview explained the finding:

“...Most households are pastoralists; they discourage the use of contraceptives in family planning. Which has been influenced by culture and customs of a community to have more children under five years in households...” CHP

“...We have greatly supported health education campaigns on family planning but myths and misconceptions surround family planning, it has reduced uptake of contraceptives in the entire Sub-County...” CHA

There are limitations of the study. The majority of respondents were illiterate, posing a challenge. The study used quantitative data, which is limited to the thoughts of the respondents, and the study faced challenges of research generalizability to all counties with similar features to those of Turkana County.

CONCLUSION

The study sought to determine the effect of Socio-demographic factors influencing diarrheal diseases among children under five years in Kibish Sub-County. The study revealed that the number of members ($r=-0.132^*$, $p=0.014$) and the number of children in households ($r=-0.342^{**}$, $p=0.000$) were statistically significant in the study. All null hypotheses in this study that diarrheal diseases among children under five years in Kibish Sub-County are not influenced by these factors were rejected.

Recommendations

The study recommended collaboration among stakeholders, promote improved household size, improve access to early treatment services, enhance community health education, strengthen water, sanitation and hygiene practices and improve healthcare infrastructure and staffing to reduce diarrhea among children under five years. Furthermore, the community leaders, stakeholders and community health promoters should design and implement targeted interventions that address the specific challenges experienced in Kibish Sub-County, including water scarcity, limited access to healthcare services, poor sanitation, immunization outreaches, and hygiene practices in order to curb diarrheal diseases.

ACKNOWLEDGEMENTS

The authors would like to extend their gratitude to Turkana University College's School of Postgraduate Studies, NACOSTI, and the Kibish Sub-County health workers for their support during this research.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Turkana University College post graduate studies research and ethics committee and from Nacosti

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Cite this article as: Stephen EE, Lusire L, Paul ML. Sociodemographic factors' influence on diarrheal diseases among children under five years in Kibish sub-county, Turkana, Kenya. *Int J Community Med Public Health* 2026;13:4066-72.