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Original article

FACTORS ASSOCIATED WITH DIARRHEA AMONG CHILDREN 0-59 MONTHS IN KYAKA II REFUGEE SETTLEMENT, KYEGEGWA DISTRICT- WESTERN UGANDA. A NON-INTERVENTION CROSS-SECTIONAL DESCRIPTIVE STUDY DESIGN

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Abstract

Background:

The purpose of the research was to establish dietary knowledge and the factors associated with diarrhea among children 0-59 months in Kyaka Refugee Settlement, Kyegegwa District- Western Uganda.

Methodology:

A quantitative methodology was embraced with 125 participants selected as a sample to represent the population in the research. Using SPSS as the data analysis tool, the researcher produced outcomes including regression and correlation that affirmed an association between the two independent variables and the dependent variable. The outcomes affirmed that hygiene practices among caretakers of children 0-59 months were one of the strongest keys that contributes to diarrhea.

Results:

In the results of the study, Pearson's correlation showed a positive association between food hygiene practices and the incidence of diarrhea among children 0-59 months. Hygiene practices contributed to 91.4% (2-tailed test) cause of diarrhea among children 0-59 months.

According to the study, Poor hygiene practices (71.7%), and poor disposal of feces (63.7%), were associated with diarrhea among children 0-59 months. The study also revealed that the majority of the caregivers who did not have latrines had a high risk of diarrhea infection in their children and the majority of the diarrhea cases reported were acute watery diarrhea (40%) and 15% were suspected bloody diarrhea.

Conclusion:

In conclusion, the prevalence of diarrhea among children 0-59 months was 7.5%, a value lower than previous statistics with evidence of a significant decline in diarrhea-related hospitalizations and death.

Recommendation:

Improve hand sanitation, particularly after visiting the latrine by increasing the use of hand washing stations equipped with soap and clean water among other recommendations.

Keywords: Complementary feeding, sanitation, Diarrhea, Submitted: 2023-05-25 Accepted: 2023-06-10

1. Background:

According to Wollega University, the world health organization (WHO) defines diarrhea as the passage of three or more loose or liquid stools per day in a period not exceeding 14 days. Diarrhea is commonly a sign of an infection in the intestinal tract that is caused by different bacteria, viruses, and parasitic entities (Hanna,2017).

Diarrhea has many factors associated with it which include but are not limited to waste management, caretaker's education level, hygiene practices, and social-cultural practices. According to Kakulu,2012, Diarrhea disease accounted for 4.6 Billion cases and 2.16 Million deaths worldwide in the year 2009 of which more than 50% were from low-income countries and most of the cases were children 0-59 months. (Omona, 2020)

In Sub-Saharan Africa, estimates by World Health Organization indicate that 88% of all diarrhea diseases are due to inadequate sanitation, poor hygiene practices, poor use of latrines, and low education levels.

In Uganda, the burden is at 75% which is a great threat to the country resulting in morbidity and malnutrition. Furthermore, diarrhea is among the top five causes of morbidity in infants and young children. (Hanaa, 2017). Kyegegwa District in western Uganda contributes about 9% of the national burden in the whole country while Kyaka II refugee settlement contributes 5% of this. The cases in the study area are exceptionally high compared to other places therefore this study aimed at establishing contributing factors to diarrhea among children 0-59 months in Kyaka II refugee settlement, Kyegegwa District.

2. Research Methodology:

2.1. Study design:

The study employed a non-intervention cross-sectional descriptive study design because the researcher only intended to collect, analyze and interpret data to give a clear picture of the situation but not to intervene.

The study was conducted using quantitative methods through interviews of caretakers.

2.2. Study area:

This study was carried out among the households of Kyaka II Refugee Settlement, Kyegegwa District, Western Uganda.

2.3. Study population:

The study population involved caretakers of children 0-59 months.

2.3.1. Inclusion criteria:

Sampled caretakers of children 0-59 months and were willing toparticipate in the study were all included in the study.

2.3.2. Exclusion criteria:

All caretakers with children above 59 months and those that had children 0-59 months but were not willing to participate in the study were excluded.

2.4. Sampling Technique:

Study participants were sampled in the study using snowball sampling. In this technique, the first participant was identified by the Researcher who was then referred to another and this continues until the required number was obtained.

2.5. Sample size determination:

Diarrhea in the Kyegegwa District was at 9%, while the prevalence in the area of study, Kyaka II refugee settlement at 5%. The sample size was obtained by Kish and Leslie's formula (1965) for the population survey. That is

$N= (Z)^2 P (10-p)/^2$

Where: Z is confidence interval valve=1.96

P is expected prevalence rate of the particular attribute which is 0.09% (UDHS 2016)

D is desired degree of precision (0.05)

N is sample size estimate.

Therefore;

$N= (1.96)*2*0.09(10-0.09)/0.05^2$

= 125 respondents.

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2.6. Data collection procedures:

A pre-tested structured questionnaire was used to collect data. It contained variables related to food hygiene practices, socioeconomic practices, and water and sanitation and these were prepared in English.

The technique of data collection was the interview method and in this method, data was collected from the respondents by asking questions in a face-to-face format. The researcher directed questions to the respondent from the interview schedules orally and their responses were recorded by the researcher.

For Literate respondents, interview schedules were handed over to them and the researcher helped them in recording their answers to various questions in the schedule.

The researcher explained the aims and objectives of the study to remove any difficulties or doubts that could be faced by respondents.

2.7. Data collection:

A structured questionnaire for conducting interviews and observations was used. This consisted of three sections: (a) Food hygiene practices, (b) socioeconomic factors, and (c) water and sanitation. In this tool, a set of questions was asked by the researcher to the respondent, and responses were recorded in a standard form. Standard well-structured questions (both closed and open-ended) in the same form were directed to all respondents.

2.7.1. Validity and Reliability:

Validity is a measure of how well a test measures what it is supposed to measure McClung (1978). The questionnaire was pre-tested with 15 subjects and necessary corrections were made to ensure that it was precise and clear To obtain consistency in the research findings, the validity and reliability were ensured by applying the expert judgment technique where the questionnaire was submitted to the supervisor for review and scrutinization to check for its accuracy before being given to respondents to provide their opinions during the data collection exercise.

2.7.2. Procedure:

The researcher obtained a letter of introduction from the university to the Health Coordinator, Kyaka II Refugee Settlement. After this, it was presented to the RWC for introduction to the zone leaders.

2.8. Data analysis and processing:

Data was sorted, edited, and processed using SPSS version 16. Quantitative data was in the form of tables, pie charts, and percentages while qualitative data was in the form of descriptive statements. The final report was presented for the award of a Bachelors degree in Human Nutrition and Clinical dietetics.

2.9. Ethical Consideration:

An introductory letter from the University addressed to the District health officer (DHO) was collected, endorsed, and approved to conduct the study. The consent to conduct the study in Kyegegwa District was sought from the DHO. The consent of respondents was sought, to participate in the research after citing the reasons why the research was being conducted and their right to withdraw from the study at any time during the data collection process was also clearly explained to respondents. The confidentiality of respondents was considered by ensuring the anonymity of respondents in the questionnaire.

3. Research Findings:

3.1. Biographic Data:

3.1.1. Age of the respondents:

From Table 1, the majority 44% (55) of the respondents were aged 35-44 years, followed closely by those 25-34 years at 32% (40), 20% (25) of the respondents aged 15-24, and only 4% (05) were those aged 45years and above.

Table 2 shows that 48% (60) of the lactating women interviewed had children aged 24-60 months, 32% (40) with infants aged 6-23 months and only 20% (25) had infants aged 0-6 months.

From Table 3, the research findings showed that the majority of the respondents are protestant 44% (55) followed by catholic 36% (45), and the least Muslim with 20% (25).

Table 1. Age of the respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
15-24	25	20.0	20.0	20.0
25-34	40	32.0	32.0	52.0
35-44	55	44.0	44.0	96.0
>45	5	4.0	4.0	100.0
Total	125	100.0	100.0	

Source: primary fteld data 2022.

Table 2. Age of the child

	Frequency	Percent	Valid Percent	Cumulative Percent
0-6months	25	20.0	20.0	20.0
6-23months	40	32.0	32.0	52.0
24-49months	60	48.0	48.0	100.0
Total	125	100.0	100.0	

Source: primary fteld data 2022.

Table 3 Religion of the respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
Catholics	45	36.0	36.0	36.0
Protestants	55	44.0	44.0	80.0
Muslim	25	20.0	20.0	100.0
Total	125	100.0	100.0	

Source: primary fteld data 2022.

3.2. Marital Status of the respondents

The findings in Table 4 showed that out of the 125 lactating women or caregivers, 52% (65) of the respondents were married, 44% (55) were separated from their partners and 4% (05) divorced from their marriages.

3.3. Occupations of the respondents

Fig. 1 Occupation of the respondents.

Figure 1 shows the occupation of the respondents, 62% of the respondents were found to be self-employed, 30% of the respondents were students at a higher institute of learning and only 8% of the respondents are civil servants.

3.4. Respondents level of Education

Fig. 2 Respondents' Level of Education

From Figure 2, the Majority of the respondents 48% had primary as the highest level of education followed by secondary education at 40% and only 12% of the respondents had tertiary education as the highest level of education attained.

3.5. Food Hygiene and Practice

Type of food preferred for children

From Table 5, 48% (60) of the respondents preferred to give packed food to their infants, 32% (40) preferred to give cooked food, and 20% (25) of the respondents preferred to give raw food to their children.

3.6. Food Hygiene Practices

The study also found out that 48% of the respondents washed their hands before eating and

Table 4. Marital status of the respondents

	Frequency	Percent	Valid Percent	Cumulative Percent
separated	55	44.0	44.0	44.0
married	65	52.0	52.0	96.0
Divorced	5	4.0	4.0	100.0
Total	125	100.0	100.0	

Source: Primary fteld data.

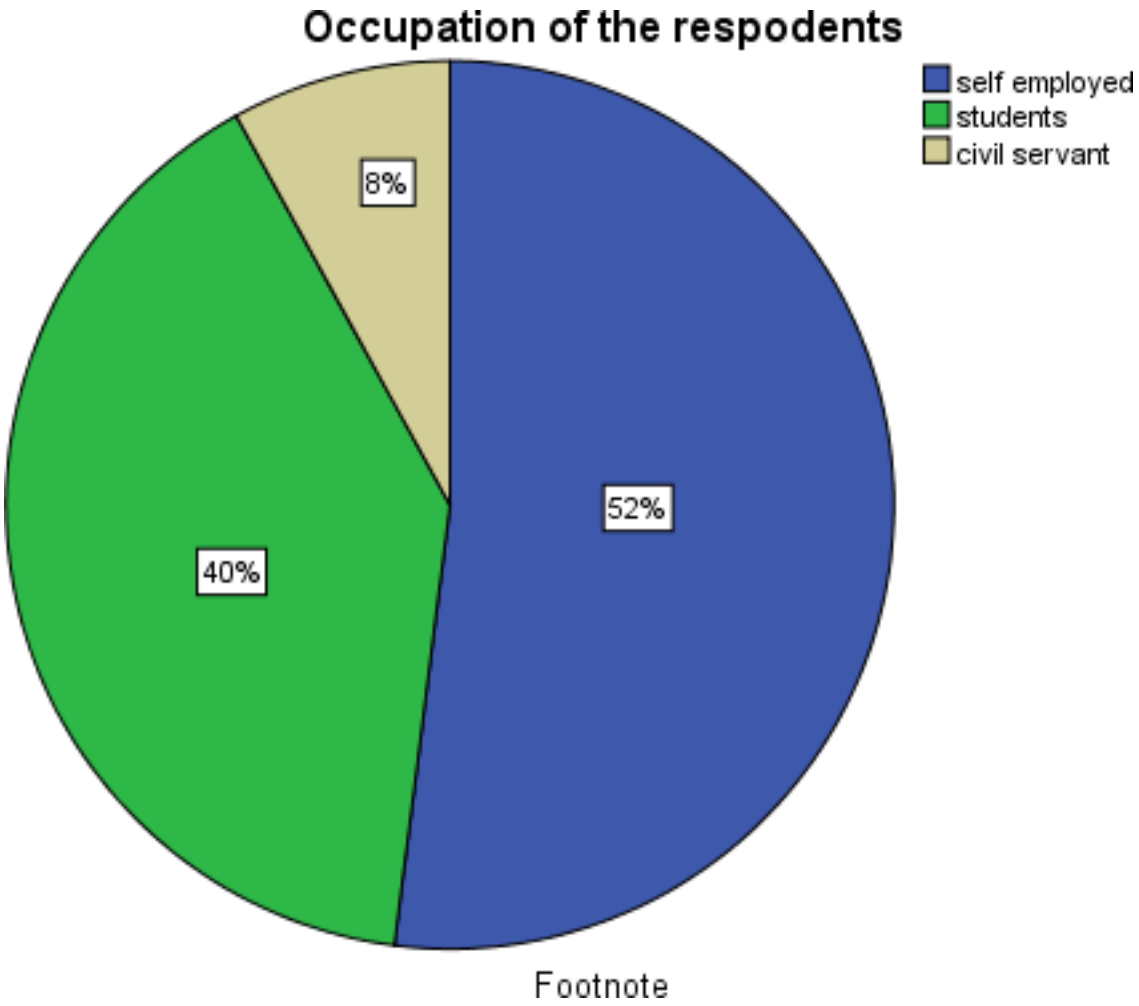


Figure 1: **Occupation of the respondents.(Source: Primary fteld data 2022)**

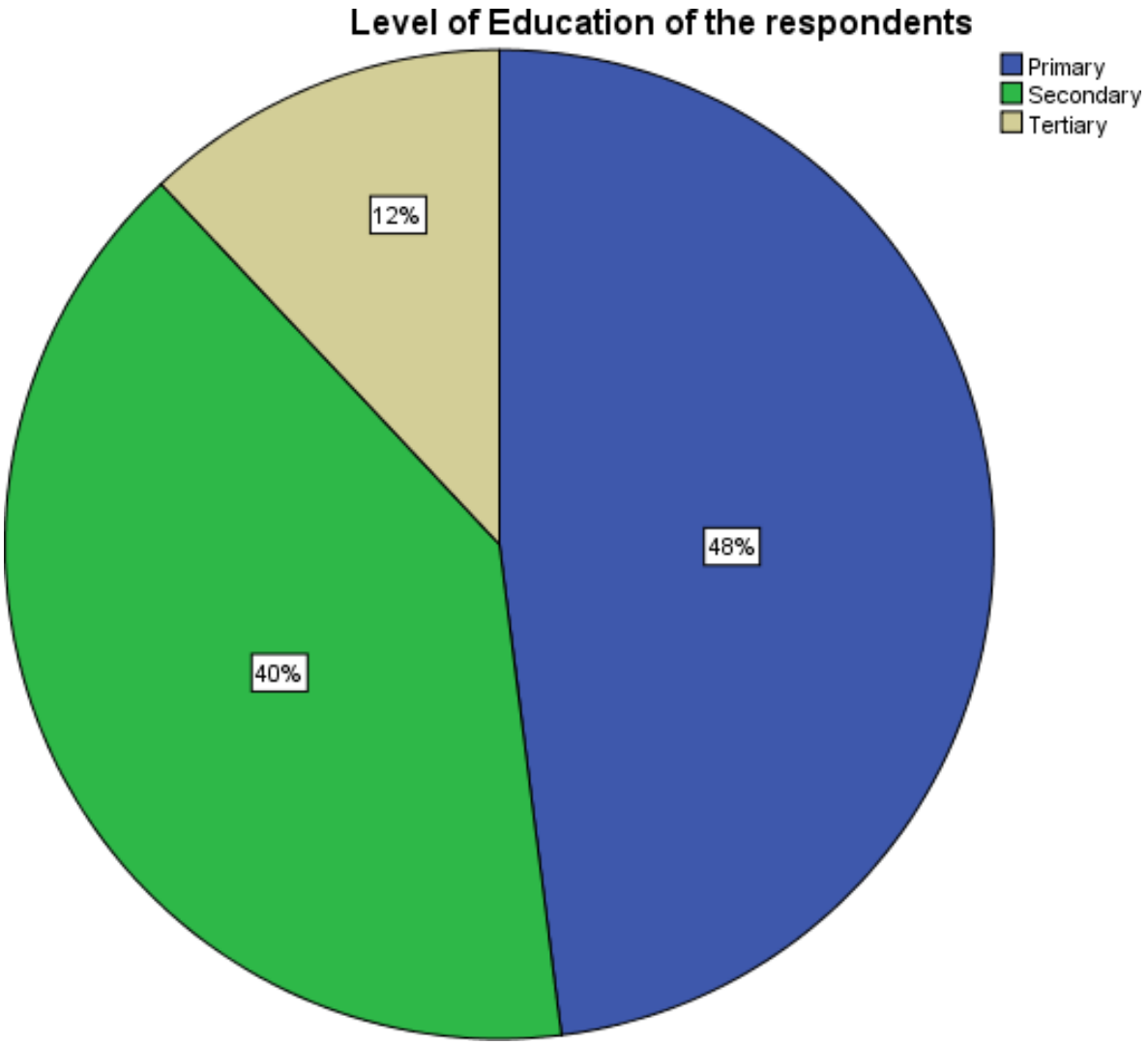


Figure 2: **Source: Primary fteld data 2022.**

Table 5. Which type of food do you prefer to give to your child

	Frequency	Percent	Valid Percent	Cumulative Percent
cooked food	40	32.0	32.0	32.0
Packed food	60	48.0	48.0	80.0
Raw food	25	20.0	20.0	100.0
Total	125	100.0	100.0	

Source: Primary fteld data 2022.

Table 6. Which food hygiene practice do you know

	Fre-quency	Per-cent	Valid Percent	Cumulative Percent
covering food	50	40.0	40.0	40.0
Washing hands before eating and feeding a child	60	48.0	48.0	88.0
Eating food when hot	15	12.0	12.0	100.0
Total	125	100.0	100.0	

Source: Primary fteld data 2022.

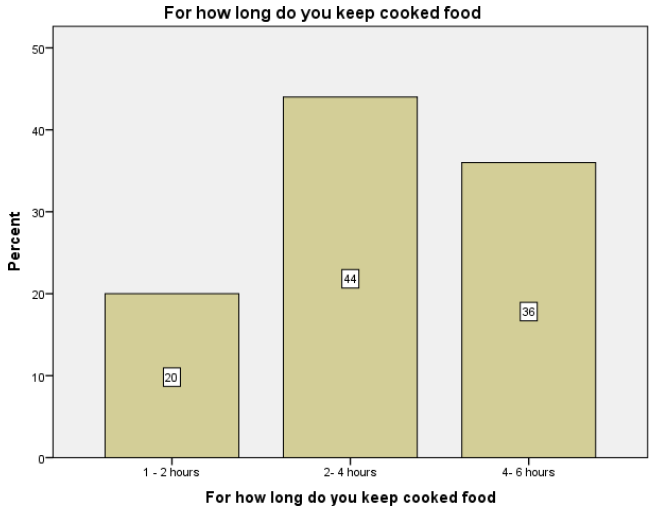
feeding their infants, 40% of the respondents covered their food and 12% of the respondents practiced eating food when it's hot.

3.7. Food storage

Figure 3 shows that 125 respondents were interviewed, out of which the majority 52% (65) of the respondents kept their cooked food in the saucepans while 48% (60) of the respondents kept their cooked food on the plates.

3.8. Length of time to wash utensils after eating

3.9. Length of time for food storage



The research question was to establish a time line for keeping food, 44% of the respondents keep their cooked food between 2-4 hours, while 36% did keep their cooked food between 4-6 hours and only 20% of the respondents kept their cooked food between 1-2 hours.

3.10. Child's age at food introduction

The researcher also asked to establish the age for complementary feeding, out of the 125 respondents, majority 54% of the respondents did initiate supplementary food at the age of 6-12 months, followed by 32% started giving food to their babies at the age below 6 months and 14% gave food to their babies at the age above 12 months.

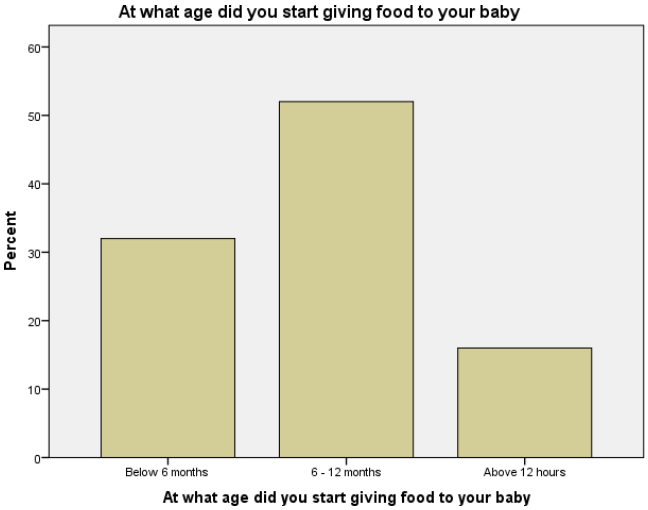


Table 7 indicates that Pearson's correlation showed a positive association between food hygiene practices and the incidence of diarrhea among children 0-59 months. Hygiene practices contribute to 91.4% (2-tailed test) causes of diarrhea in children 0-59 months.

3.11. Water and Sanitation and Diarrhea

Table 8 shows that of the 125 respondents interviewed, 60% (15) had latrines at home while 40% (50) of the respondents did not have latrines at home.

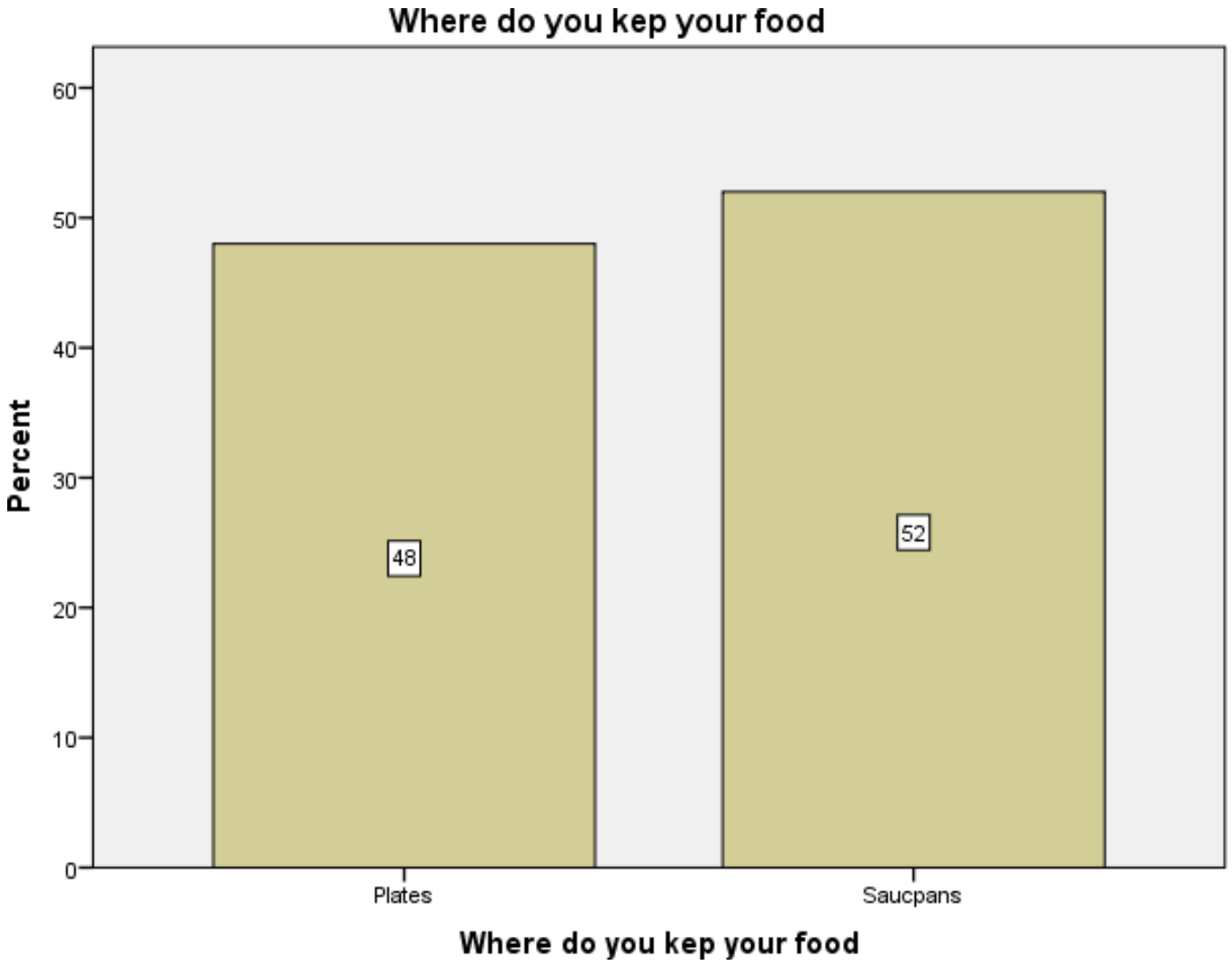


Figure 3: **Source: Primary fteld data 2022.**

Correlations

		Which food hygiene practice do you know	Did your child get diarrhea
hich food hygiene practice do you know	Pearson Correlation	1	.010
	Sig. (2-tailed)		.914
	N	125	125
Did your child got diarrhea	Pearson Correlation	.010	1
	Sig. (2-tailed)	.914	
	N	125	125

Table 7. Correlations between food hygiene practices and diarrhea. (. Correlation is signiftcant at the 0.01 level (2-tailed)**

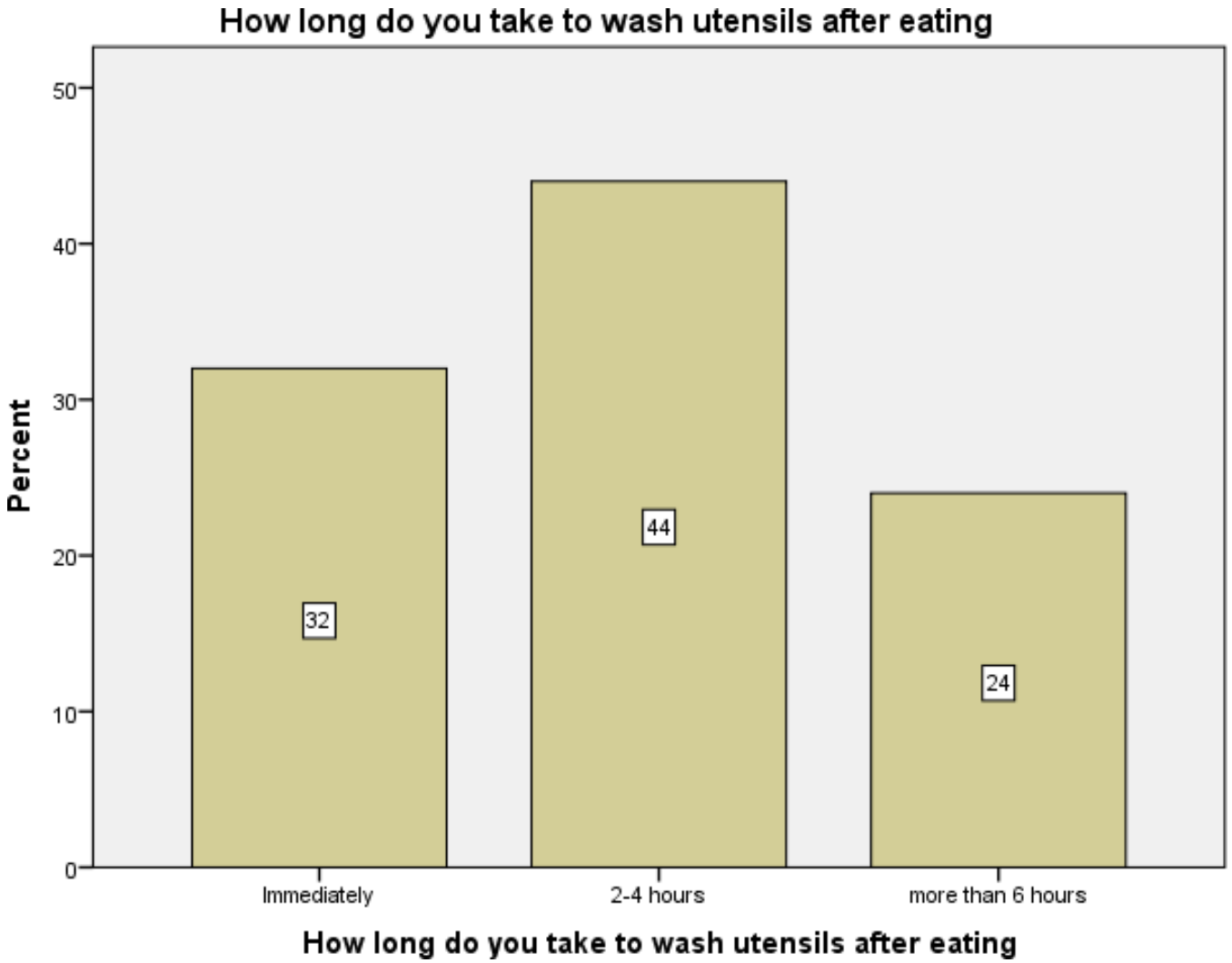


Figure 4: shows the findings on the length of time the respondents took to wash their used utensils. The findings showed that, 44% of the respondents took between 2-4 hours to wash their utensils, 32% of the respondents took between 4-6 hours and 24% of the respondents took between 1-2 hours.

Table 8. Do you have a latrine

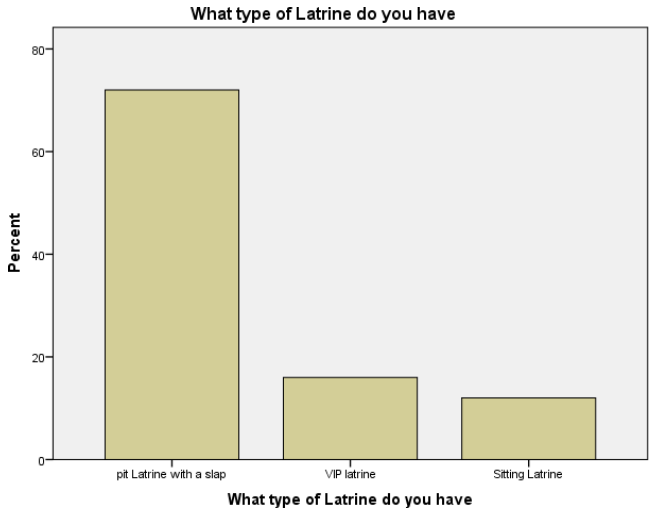
	Frequency	Percent	Valid Percent	Cumulative Percent
Yes	75	60.0	60.0	60.0
No	50	40.0	40.0	100.0
Total	125	100.0	100.0	

Prevalence of latrines (Source: Primary fteld data 2022)

4. Methods of waste disposal

4.1. Types of latrines

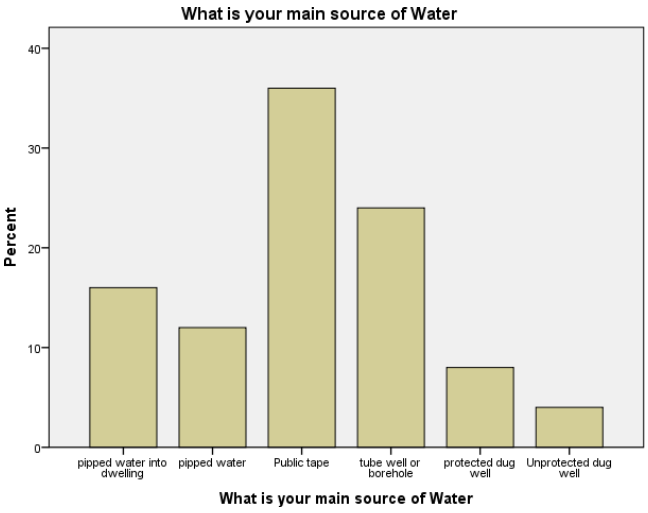
Figure 7, 75% of the respondents had pit latrine equipped with soap at their homes, 25% had ventilated improved pit latrine (VIP) and none of the respondents had sitting latrines at their home.



From Table 11, Pearson's correlation showed a positive association between the disposal of fasces and the incidence of diarrhea among children 0-59 months. Disposal of fasces contributes to 58.4% (2-tailed test) cause of diarrhea in children under 5 years.

4.2. Source of Water at Home

Figure 8 shows the respondent's main source of drinking water, the findings showed that out of the 125 respondents, 36% of them used public tape as their source of water, 25% used tube wells or boreholes for drinking water, 18% piped water into the dwelling, 12% piped water, 06% protected dug wells and only 03% unprotected dug well.



4.3. Places for defecation

From Table 12, 48% of the respondents dropped the last fesses of their infants into the latrine, 40% of them covered the fesses with soil, 08% of the respondents disposed into the soil waste garbage and 4% of the respondents dropped it outside the premises.

5. Methods of water puriftcation

table 13 shows the findings in an attempt to ask for the source of clean water. Out of the 125 respondents interviewed, 48% (60) leave the water collected for drinking to settle at itself, 24% boil the water or add chlorine to purify the water, and 04% sleeves the water through a cloth to purify the water for drinking.

5.1. Storage for drinking water

Figure 9 shows that, 60% of the respondents keep their drinking water in an open jerrycan, 25% keep their drinking water in a bucket and 15% do keep their drinking water in a covered jerrycan.

Table 9. If no where do you and your family defecate

	Frequency	Percent	Valid Percent	Cumulative Percent
Bush	40	80.0	80.0	80.0
Water streams	10	20.0	20.0	100.0
Total	50	100.0	100.0	

Source: Primary fteld data 2022.

		The last time stool where were the feces disposed off	If yes, what type of diarrhea
The last time stool where were the faeces disposed off	Pearson Correlation	1	.049
	Sig. (2-tailed)		.584
	N	125	125
If yes, what type of diarrhea	Pearson Correlation	.049	1
	Sig. (2-tailed)	.584	
	N	125	125

Table 11: Correlations between disposal of feces and diarrhea (. Correlation is signiftcant at the 0.01 level (2-tailed).**

Table 12. The last time stool where were the fesses disposed off

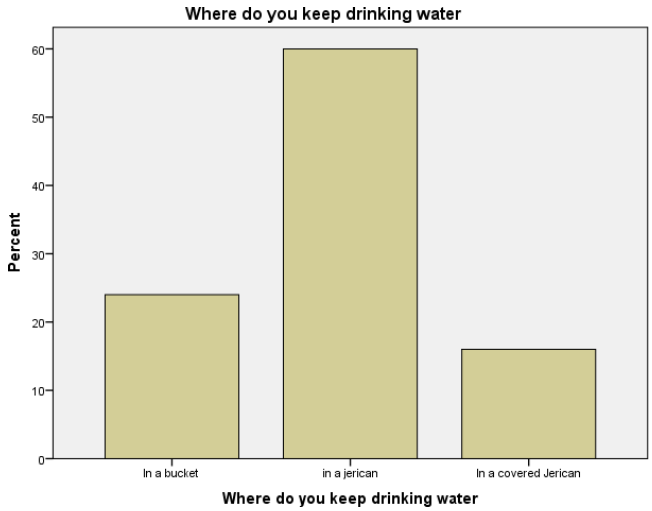
	Frequency	Percent	Valid Percent	Cumulative Percent
Dropped into the latrine	60	48.0	48.0	48.0
Dropped outside the premises	5	4.0	4.0	52.0
Disposed into solid waste garbage	10	8.0	8.0	60.0
Covered with soil	50	40.0	40.0	100.0
Total	125	100.0	100.0	

Source: Primary fteld data 2022.

Table 13. What does your household do to make the water safe

	Frequency	Percent	Valid Percent	Cumulative Percent
Boil the water	30	24.0	24.0	24.0
Add chlorine	30	24.0	24.0	48.0
sleeves it through clothes	5	4.0	4.0	52.0
Let it settle and stand	60	48.0	48.0	100.0
Total	125	100.0	100.0	

Source: Primary fteld data 2022.

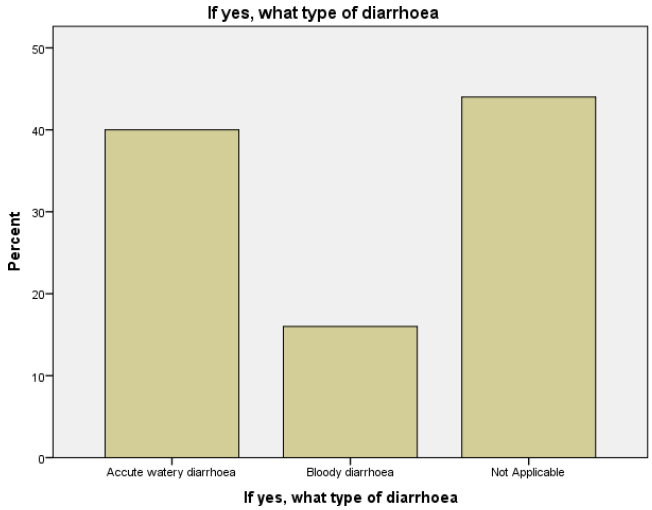


5.2. *Incidence of diarrhea*

Table 14 Shows that 56% of the respondents said their infants haddiarrhea in the last three months, while 44% said that their infants had not had any diarrhea in the last three months.

5.3. *Categories of diarrhea*

Figure 10 shows that 45% out of the infants of interviewed lactating or caregiver did not have diarrhea, 40% of the infants had acute watery diarrhea and 15% of the respondents' infants had bloody diarrhea.



6. Discussions:

6.1. *Demographic bio-data:*

According to the study, the majority of respondents, 44% were aged 35-44 and 35% 25-34, and the least with ages ranging from 40 years and above as illustrated in Table 1 above. This could be because at this age mothers have completed schooling and have settled for marriage, most having their first or second child. The majority of the respondents were married representing 52%. This could be because most African cultures don't allow having children without being married. As the Majority were married it meant they had support from their husbands relating to child nutrition, especially breastfeeding and complementary feeding, therefore were expected to have a low rate of diarrhea.

The majority 48% had attained primary education which implied that they had limited knowledge of newborn care. Some mothers (12%) had tertiary education meaning they had a lot of knowledge on diarrhea. The majority 52% were self-employed meaning they had time to breastfeed and care for their children and thus were expected to care for their infants. This is in agreement with this study since most self-employed mothers can have enough time for their children hence preventing diarrhea than those who are employed.

6.2. *Prevalence of Diarrhea among Under-fives:*

The research had 100% (125) response rate for the sample size, of this, 70 of the mothers interviewed had their children with diarrhoae in the last month, placing under-five diarrhea prevalence at 56%. Despite this figure being a bit higher than the 6.1% reported in Mkuranga District, Tanzania in 2014 by (Mashoto et al., 2014), the 22.5% reported in Eastern Ethiopia (Mengistie et al., 2013), 40% of the reported diarrhoae were acute watery diarrhea and 15% had suspected bloody diarrhea.

Table 14. Did your child had diarrhea

	Frequency	Percent	Valid Percent	Cumulative Percent
yes	70	56.0	56.0	56.0
No	55	44.0	44.0	100.0
Total	125	100.0	100.0	

Source: Primary fteld data 2022.

6.3. Factors Associated with Diarrhea among Under-fives:

Poor hygiene practices (71.65%), and poor disposal of feces (63.70%), were associated with diarrhea among the under-fives. Non-adherence to exclusive breastfeeding for at least six months was also associated with diarrhea among the under-fives. Those aged 6 months to 2 years had an increased risk probably due to the introduction of new foods and also at this age, the child is very active and playing so much outside with increased interaction with the surrounding environment. This increases exposure to diarrhea-causing pathogens. Family factors associated with diarrhea were the practice in preparing and eating practices in a family whose mother had primary level as the highest level of education and those primary caretakers lived a peasant way of life or was a housewife but no significant relationship was found between the age of the mother and diarrhea among the under-fives.These results agree with those found by (Woldu et al., 2016) in their study on the socio-demographic determinants of under-five diarrhea among nomadic pastoralist communities of Northeastern Ethiopia. Environmental correlates to diarrhea among under-fives were low levels of water treatment that was fetched from unprotected wells or springs that were mainly situated downstream to traditional pit latrines.

6.4. Water, hygiene and Sanitation, and diarrhea among Under-fives:

The study revealed that the majority of the caregivers who do not have latrines have a high risk of diarrhea infection in their children and the majority of the diarrhea cases reported were acute watery diarrhea (40%) and 15% were suspected bloody diarrhea. This emphasizes the decline in diarrhea-related hospitalizations as reported in Mexico by (Sánchez-Uribe et al., 2016) and shows improvement on previous Ugandan statistics that diarrhea is second only to malaria as an under-five killer as reported by (Nambuusi et al., 2019).

There is a positive correlation between food hygiene practices and diarrhea with 91.4%. This means that any poor food hygiene practices at home can result in diarrhea in children under the age of five years. Another contributing factor to diarrhea established by the research is poor disposal of children's fasces shown by a positive association between disposal of fasces and diarrhea using Pearson's correlation (2-tailed test)

7. Conclusions:

The prevalence of diarrhea in under-fives was 7.45%, a value lower than previous statistics with evidence of a significant decline in diarrhea-related hospitalizations and death. Factors found significant in diarrhea among under-fives included age between 1 and 2 years, male sex, poor adherence to exclusive breastfeeding, 3 or more children in a family with more than 2 children being below five years, low education status, and lack of employment of primary caretaker. Environmental factors included unsafe, unprotected drinking water sources and poor treatment measures for drinking water. The age of the mother and the presence of latrines at home were found to have no statistically significant association. However, poor food hygiene practices and disposal of children's faeces are strongly positively associated with diarrhea among children under the age of 5 years.

8. Study Limitations and anticipated problems:

The study's major problem was finance since the researcher did not have enough money to invest in the study. Some respondents were not willing to give their time to the researcher and others had bias about studies carried out in their area.

9. Recommendations

9.1. To the Caretakers of Under-fives:

Improve hand sanitation, particularly after visiting the latrine by increasing the use of hand washing stations equipped with soap and clean water. Ensure adherence to exclusive breastfeeding for at least 6 months for it has been proven to be of tremendous benefit to the child. Always attempt to protect their water sources such as wells and springs from possible contamination and as much as possible make sure that the sources are not situated downstream to the latrines. Always treat their drinking water by boiling and not placing it under the sun and keep their food covered with clean utensils.

9.2. To the Staff of Health facilities:

Increase awareness of diarrhea prevention practices such as hand washing after visiting the latrine, and before and after preparing meals for the family and the under-five children. Revitalize campaigns for exclusive breastfeeding. Engage in more community preventive interventions and use community health workers to ensure child health.

9.3. To the Local Leaders and Government entities:

Ensuring ownership and use of pit latrines in every homestead possibly with upgrading of all traditional pit latrines to the more sanitary ventilated-improved pit latrines. Protection of all collective water sources such as community wells and springs to minimize contamination. Engagement of local authorities to create awareness in the community about diarrhea among children under the age of 5 years.

10. Acknowledgment:

My sincere thanks to the Almighty God for giving me good health and guidance throughout this exercise.

Special thanks to the lecturers of Uganda Christian University Mildmay campus who dedicated their time to guide me through the course of the study, especially Mr. Turumanya Judah.

I also thank my family for the support they rendered to me, especially my beloved husband, my children Mark and Malcolm, my mother, and all my friends.

I also thank the community of Kyaka Refugee Settlement for accepting me to do my study in their area, may God bless them.

11. Common Abbreviations/ Acronyms:

BM Breast Milk
DHO District Health officer

11.1. Coli *Escherichia coli*

FIB Faecal Indicator Bacteria
JMP Joint Monitoring Programme
NGO'S Non Government Organization
ORS Oral rehydration salt
RF Replacement Feeding
RWC Refugee welfare committee
UNICEF United Nations International Children's Fund
VIP Ventilated improved Pit latrine
WASH Water hygiene and Sanitation
WHO World Health Organization

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13. References:

1. Hanaa , H. (2017). Prevalence of Diarrhea and Associated Risk Factors in Children Under Five Years of Age in Northern Nigeria: A Secondary Data Analysis of Nigeria Demographic and Health Survey 2013. Uppsala Universitat, Department of International Maternal and Child Health, IMCH.
2. Kakulu,R.K (2012).Diarrhoea among under-five children and household water treatment and safe storage factors in mkuranga district, Tanzania
3. Mashoto, K.O., Malebo, H.M., Msisiri, E. et al. Prevalence, one week incidence and knowledge on causes of diarrhea: household survey of under-fives and adults in Mkuranga district, Tanzania. BMC Public Health 14, 985 (2014). https://doi.org/10.1186/1471-2458-14-985
4. Mengistie, B., Berhane, Y., & Worku, A. (2013). Prevalence of diarrhea and associated risk factors among children under-five years of age in Eastern Ethiopia: A cross-sectional study. Open Journal of Preventive Medicine, 3(07), 446.
5. Nambuusi, B. B., Ssempiira, J., Makumbi, F. E., Kasasa, S., & Vounatsou, P. (2019). The effects and contribution of childhood diseases on the geographical distribution of all-cause under-five mortality in Uganda. Parasite epidemiology and control, 5, e00089. https://doi.org/10.1016/j.parepi.2019.e00089
6. Omona, S. M. (2020). Prevalence of diarrhoea and associated risk factors among children under five years old in Pader District, northern Uganda. Kampala
7. Sánchez-Uribe, E., Esparza-Aguilar, M., Parashar, U. D., & Richardson, V. (2016). Sustained Reduction of Childhood Diarrhea-Related Mortality and Hospitalizations in Mexico After Rotavirus Vaccine Universalization. Clinical infectious diseases : an official publication of the Infectious Diseases Society of America, 62 Suppl 2, S133–S139. https://doi.org/10.1093/cid/civ1205
8. Woldu, W., Bitew, B.D. & Gizaw, Z. Socioeconomic factors associated with diarrheal diseases among under-five children of the nomadic population in northeast Ethiopia. Trop Med Health 44, 40 (2016). https://doi.org/10.1186/s41182-016-0040-7