

Prevalence of Diarrhoea in Children Under Five Years Admitted at KIUTH, Ishaka-Bushenyi District, Western Uganda

Badang Nicholas Macdonald

Faculty of Clinical Medicine & Dentistry Kampala International University Western Campus Uganda

ABSTRACT

Diarrhoea is a major public health concern globally, with 2.5 billion cases occurring annually among children under five. Nearly three-quarters of child deaths are due to diarrhoea, with 16,000 deaths daily in 2015 from preventable causes like pneumonia, diarrhoea, and malaria. This study aimed to determine the prevalence and factors influencing diarrhoea in children under five admitted to Kampala International University Teaching Hospital. A cross-sectional and descriptive study was conducted, with 238 mothers randomly sampled from the population whose children were admitted. Results showed a prevalence of 24.4% among children under five admitted to Kampala International University Teaching Hospital, influenced by factors such as vaccination status, early introduction of supplementary foods, early weaning, and child age. Mothers do not practice exclusive breastfeeding, but introduce their children to other foods at a very early age, coupled with early weaning. The study highlights the need for better prevention and treatment strategies for diarrhoea in under five children.

Keywords: Diarrhoea, Public health concerns, Children, deaths and Exclusive breastfeeding.

INTRODUCTION

Diarrhoea is one of the major public health concerns worldwide; the World Health Organization and other previous reports [1-3] estimates that 2.5 billion cases of diarrhoea occur yearly among children under five years of age. The same report further indicates that nearly three-quarters of child deaths are due to diarrhoea [3]. In 2015, it was reported that 16,000 children under five die every day from mostly preventable causes such as pneumonia, diarrhoea, and malaria, with 80% of these cases occurring in Africa and South Asia (46% and 38% respectively) [4]. In Africa, a study conducted by the Centre for Infectious Disease Research and Policy (CIDRAP) in 2015 showed that Nigeria had the highest variance of disease rates among African countries, with estimates ranging from 1.6 deaths per 1000 children to 9.5 deaths per 1000 children [5, 6]. According to this study, all severe cases of diarrhoea occurred in Ethiopia and the Democratic Republic of Congo [6]. In Rwanda,

according to the National Institute of Statistics of Rwanda NISR [7], the prevalence of children under five years who had symptoms of diarrhoea in the two weeks preceding the survey was 12%. This was higher than acute respiratory infections, and the percentage of those seeking treatment from a health facility/provider was 44%, an increase compared to previous surveys [7, 8]. According to records from Nyarugenge district by Rwanda Health Management Information System (RHIS), diarrheal diseases among children less than five years attending Nyarugenge district's health centres were nearly 40% [9]. Uganda was ranked ninth among the countries with the highest number of diarrhoea cases under five, resulting in 29,000 deaths due to diarrhoea [2]. HIV and malaria compromise the immune system leading to poor immunity and escalated risk to diarrhea [10, 11]. According to Ayiko et al. [12], diarrhoea is ranked sixth among the top ten causes of

Badang

INOSR APPLIED SCIENCES 10(3):119-131, 2023

under-five years' morbidity and mortality in Uganda, accounting for 3.4% of under-five-year mortality. The AHSPR 2013 report further shows an increase in the trend from 1.84% in 2011 to 3.4% in 2013. Overall, these children experience an average of 3.2 episodes of diarrhoea per child per year [13]. Demographic and Health Survey [14] conducted by the Uganda Bureau of Statistics (UBOS) indicate that in Uganda, the prevalence was 20% in 2011 and 23% in 2016. This shows an increasing trend in diarrhoea cases in the country. It is, therefore, necessary to identify the associated factors leading to the increase in diarrhoea using Kampala International University Teaching Hospital as a case study. This study was conducted at Kampala International University Teaching Hospital and generated information to necessitate the development of an appropriate program with the aim of reducing the number of diarrhoea cases in the area. Globally, in 2015, 5.9 million children under the age of 5 years died, with the majority of these children in the African region [15]. Most of these mortalities occurred as a consequence of diarrhoea and acute respiratory infections [16].

METHODOLOGY

Study Design

The research design was a cross-sectional and descriptive study, employing both quantitative and qualitative approaches. This design allowed the collection of data that represented the population and was obtained at a single point in time. Quantitative methods were utilized for gathering numerical data, while qualitative methods were used for collecting non-numerical data.

Area of Study

Kampala International University Teaching Hospital is situated in Ishaka town, a municipality within Bushenyi district. As of the 2014 census, the population of Bushenyi Ishaka municipality was 41,219. Ishaka is approximately 62 kilometers west of Mbarara town and has a population of 16,646, with females constituting 8,840 (UBOS, 2014). KIU-TH boasts a bed

Uganda is among the countries where the burden of childhood diarrhoea is heavily concentrated [17]. The incidence varies greatly with seasons and a child's age, being highest in the rainy season and among children aged 6-11 months [14]. Some of the risk factors include undernutrition, environmental pollution, population increase, poor water quality, malaria, and climate change [18-20]. Poor sanitation, lack of access to clean water supply, and inadequate personal hygiene are responsible for 90% of diarrheal disease occurrences in Uganda [17]. Diarrhoea prevalence increases with age and peaks at 12-23 months (33%), then declines at older ages [17]. However, there are no documented data about Ishaka, Bushenyi district that explain associated factors leading to an increase in the number of diarrhoea cases in children under five years, which is also the same case at Kampala International University Teaching Hospital. These factors have not been well understood, and this remains a problem. This study will help identify maternal and child factors associated with the increasing cases of diarrhoea among children under five years of age admitted at Kampala International University Teaching Hospital.

capacity of 700, offering both outpatient and inpatient services.

Study Population

The study population encompassed all mothers with children under five years who were admitted at KIU-TH.

Inclusion Criteria

The inclusion criteria consisted of children under five years who were admitted at KIU-TH, along with mothers of these children who had provided consent.

Exclusion Criteria

Mothers with children above five years who were admitted at KIU-TH were excluded from the study.

Sample Size Determination

The sample size was determined using the Kish-Leslie formula [21] and incorporated a prevalence (p) of 23%, as reported by UDHs (2016) for children with diarrhea less than five years.

$$n = z^2 * p * (1 - p) / E^2$$

Badang

INOSR APPLIED SCIENCES 10(3):119-131, 2023

Where:

n = sample size

z = 1.96 (approximate 95% confidence level)

p = prevalence (23%)

E = 5% (0.05), the margin of error.

$n = 1.962 * 0.23 * (1 - 0.23) / 0.05^2$

n = 272

Therefore, the minimum sample size for this study was 272.

Sampling Technique Procedure

A consecutive sampling technique was employed, wherein every patient meeting the inclusion criteria was selected until the required sample size was reached. All mothers with children under five years who met the inclusion criteria were approached and invited to participate in the study.

Data Collection Tools, Methods, and Management:

Data collection involved the distribution of structured and closed-ended questionnaires to the mothers. The questionnaire comprised sections on demographics, maternal factors, and child factors. It was developed in English and translated into Runyankole. Prior to actual data collection, the questionnaire was pretested on mothers with children above 5 years of age to ensure its appropriateness. Data was further

Social-demographic characteristics of the study population

A total of 272 children from the age of 6 months to 4 years were studied with a response rate of 87.5%.

Table 1 below shows the distribution of the study population by demographic characteristics. The results were based on the 238 respondents having the child's age, status of vaccination and weaning age of the child. The majority of the

reviewed by both the researcher and the field supervisor for completeness and errors.

Data Analysis

Data was entered using Microsoft Excel version 13 and analyzed using STATA version 14.0. Information was presented in the form of graphs, pie charts, narratives, and tables to provide descriptive statistics. The percentage of diarrhea in children under 5 years admitted at KIU-TH was analyzed, along with a 95% confidence interval, and presented using tables, pie charts, and narratives. Child factors associated with diarrhea in children under 5 years admitted at KIU-TH were assessed using Binary logistic regression, with both bivariate and multivariate analyses conducted. Maternal factors associated with diarrhea in children under 5 years admitted at KIU-TH were also evaluated using Binary logistic regression, with both bivariate and multivariate analyses. The measure of association was reported as odds ratios (ORs) with corresponding 95% CIs and p-values.

Quality Control

To ensure quality control, questionnaires were pretested, and assistants were trained, with necessary adjustments made as required.

RESULTS

children with diarrhoea were of 1 year of age (25%), this study also showed that children with incomplete vaccination had diarrhoea were 147(61.8%) and those who had completed vaccination were only 91(38.2%), the study also showed that weaning age child below 1 year with diarrhoea were 174(73.1%) and those with weaning age above 1 year were only 64(26.9%).

Table 1: Socio-demographic findings for child

Variables	Frequency	Per cent
Age		
6-11months	49	20.6
1year	61	25.6
2years	42	17.6
3years	51	21.4
4years	35	14.7
Vaccination		
Complete	91	38,2
incomplete	147	61.8
Weaning age		
<1year	174	73.1
>1year	64	26.9

Table 2: Socio-demographic findings for mothers

Variables	Frequency	Per cent
Age		
Below 25 years	19	8
Above 25years	219	92
Education		
Primary	56	23.5
Secondary	54	22.7
Tertiary	81	34
University	47	19.7
Exclusive breastfeeding		
3-4months	159	66.8
5-6months	56	23,5
>6months	23	9.7

Table 2 above shows socio-demographic findings for mothers (age, education level and breastfeeding status) and from this study showed that the majority of children with diarrhoea were from mothers above 25 years of age 219(92%),and those from mothers below 25 years were only 19(8%).mothers whose education level was tertiary level had the

highest number of children with diarrhoea 81(34%), also showed that mothers who breastfed exclusively between 3-4months their children had the highest number of diarrhea 159(66.8%) followed by those between 5-6months 56(23.5%) then those above 6months were only 23(9.7%).

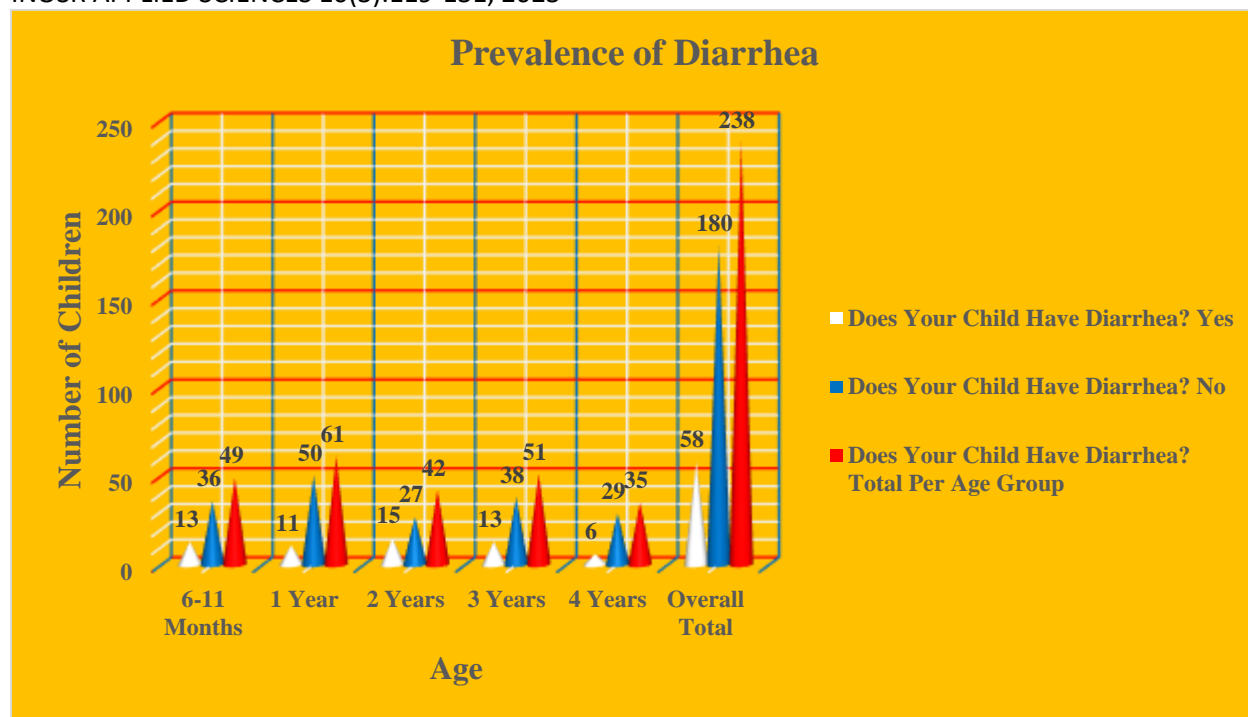


Figure 1: Prevalence of Diarrhea in Children under the Age of Five as Studied at Kampala International University Teaching Hospital October 2021

The figure shows that diarrhoea was more prevalent in children of 2 years who account for 15(25.8%) of the overall total (58) of children with diarrhoea. The figure further depicts that children of 3 years

follow with 13(22.4%), then children of 6-11 months who account for 13(22.4%), then children of 1 year 11(18.9%) and children of 4 years having the least prevalence of 6(10.5%).

Table 3. Total Prevalence of Children with Diarrhea Under Five Years Admitted at KIU-TH

Category	Diarrhoea	
	Yes	No
Percentage for Each Category	24.4%	76.6%

Table 3 above shows the total percentage of children under five years admitted at Kampala International University

Teaching Hospital with diarrhoea which is 24.4%.

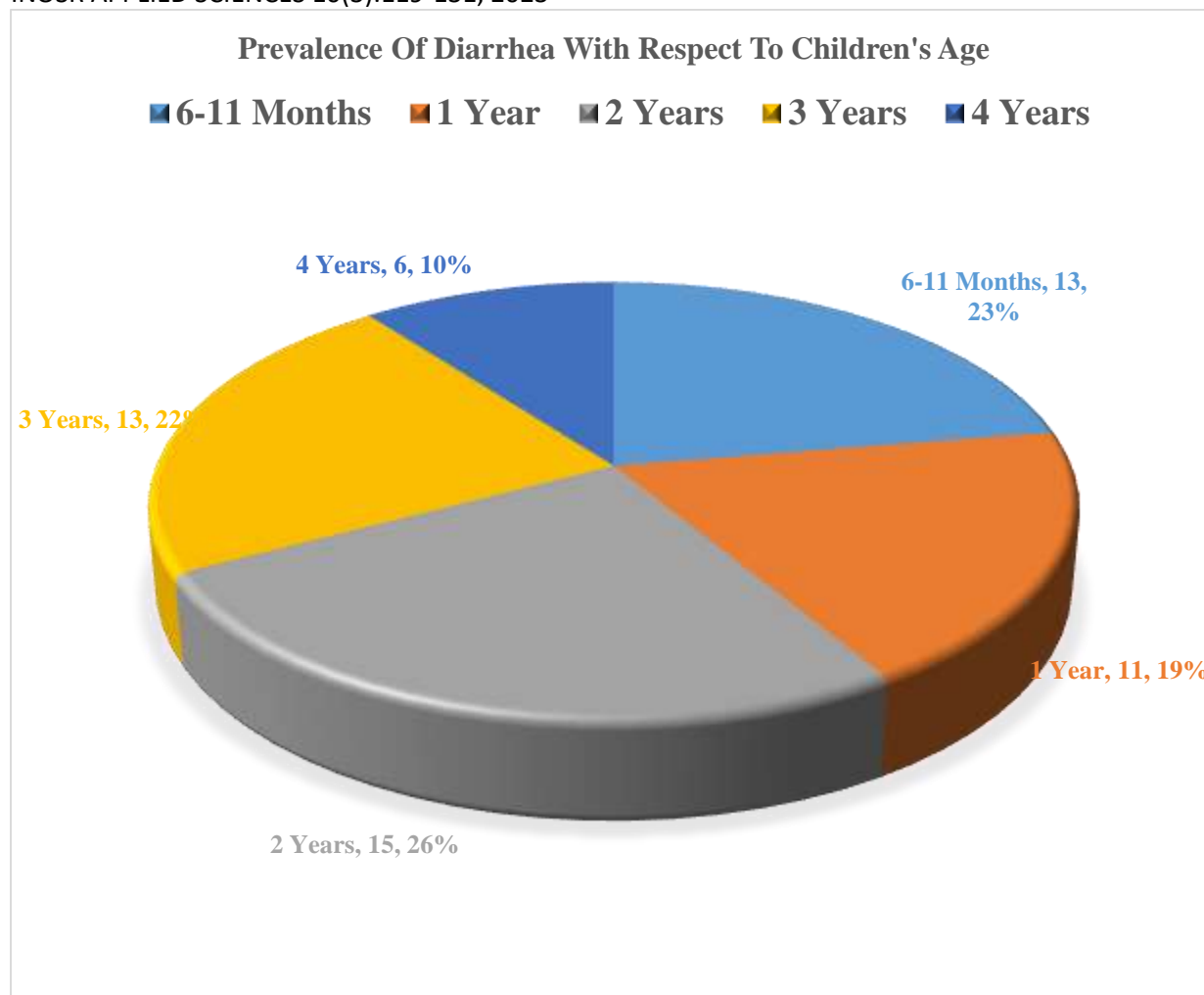


Figure 2: Percentage Prevalence of Diarrhea in Children under the Age of Five with respect to Age as Studied at Kampala International University Teaching Hospital October 2021

Figure 2 above shows that diarrhoea is more in children of 2 years who account for 26% of all the children who were reported to have diarrhoea at the time of the study, children of 6-11 months following in the trend with 23% and those of three years who are 22% of the total

children with diarrhoea. Diarrhoea is seen to be relatively lower in children aged 4 years who accounted for 10% of all the children with diarrhoea; comparative reference made to Figure 4 gives a clear picture of the incidence of diarrhoea among children under the age of five.

Binary and multivariate logistic analysis for child factors

Table 4: Binary logistic analysis of child factors associated with children under five years of diarrhoea.

		diarrhoea		OR(95%CI)	P-value
		yes	no		
Age of the child	6-11months	13	36	1	0.545
	1 year	11	50	0.819	0.737
	2 years	15	27	0.627	0.401
	3years	13	38	0.462	0.177
	4years	6	29	0.535	0.259
Incomplete vaccination	yes	23	68	1	
	no	35	112	0.947	0.837
Weaning age	below 1 year		46	128	2.57
	Above 1 year		12	52	0.857

Table 5: multivariate logistic analysis of child factors associated with children under five years of diarrhoea

Predictors	Diarrhoea		AOR	95% Interval	Confidence	P-Value
	Yes	No		Lower	Upper	
Child's Age						
6-11 Months	13	36	1			0.545
1 Year	11	50	0.819	0.256	2.624	0.737
2 Years	15	27	0.627	0.21	1.866	0.401
3 Years	13	38	0.462	0.151	1.418	0.177
4 Years	6	29	0.535	0.181	1.585	0.259
Incomplete vaccination						
Yes	23	68	1			
NO	35	112	0.947	0.566	1.586	0.837
Weaning Age						
Below 1Year	46	128	2.57			0.267
Above 1 Year	12	52	0.857	0.452	1.624	0.636

Table 5 shows the association of child factors with the incidence of diarrhoea; the odds of children getting diarrhoea are seen to decrease with age; there is a modest discrepancy in odds seen with the age of above 1 year however, this could be due to other factors; those with incomplete vaccination are observed to have higher odds of getting diarrhoea than those with complete vaccination;

Children weaned at the age below 1 year are seen to have diarrhoea more than those weaned at above 1 year; therefore the odds of getting diarrhoea are seen to reduce with increasing weaning age of the child, the older the child the more unlikely they are to get diarrhoea.

Maternal factors associated with diarrhoea in children under five years

According to Table 6 below mother's education, age and exclusive

breastfeeding had values with p-value < 0.2 thus were proceed to the multivariate stage.

-Table 6: Binary logistic analysis of maternal factors associated with diarrhea in children under five years

Variables		Diarrhoea		OR (95% CI)	P-value
		yes	no		
Mother's education	primary	11	45	1	0.257
	secondary	17	37	1.333	0.539
	Tertiary	16	65	0.511	0.107
	university	14	33	0.878	0.676
maternal age	>25years	11	08	1	0.796
	<25years	47	172	3.25	0.027
Exclusive breastfeedin g	3-4months	12	11	0.536	0.191
	5-6months	19	37	0.29	0.006
	>6months	27	132	0.444	0.008

Table 7: Multivariate Analysis for Maternal Factors associated with diarrhoea in children under the age of five admitted at Kampala International University Teaching Hospital.

Predictors	Diarrhoea		AOR	95% Interval	Confidence	P-Value
	Yes	No		Lower	Upper	
Mother's Education						
Primary	11	45	1			0.257
Secondary	17	37	1.333	0.532	3.342	0.539
Tertiary	16	65	0.511	0.226	1.157	0.107
University	14	33	0.878	0.477	1.617	0.676
Occupation						
Casual Laborer	19	50	1			0.83
Self-Employed	32	105	0.929	0.5	1.729	0.817
Civil Servant	7	25	0.772	0.331	1.799	0.549
Maternal age						
Above 25 years	11	8	1			0.796
Below 25 years	47	172	3.25	1.141	9.262	0.027
When do you normally Introduce Supplementary feeding to your children?						
3-4 Months	12	11	0.536	0.211	1.363	0.191
5-6 Months	19	37	0.29	0.12	0.7	0.006
Above 6 months	27	132	0.444	0.244	0.807	0.008

Table 7 shows the association of maternal factors with the incidence of diarrhoea in children. It is clearly shown that children of mothers with a lower education level (primary and secondary) had the highest odds of getting diarrhoea, however, the trend is seen to skew towards mothers who had attained university in which their children's odd ratio of getting diarrhoea is seen to be higher than that of mothers who went for tertiary institutions; Age of

the mothers is seen to show a counteracted skewness from conventional acceptance where we observe that children from mothers above 25 years have the highest odds of getting diarrhoea whereas those who are from mothers below 25 years seem to do quite better; Supplementary food introduction at the age of 3-4 months is seen to show greater odds of causing diarrhoea in children

DISCUSSION

Prevalence of Diarrhea

This study was a cross-sectional and descriptive study that focused on determining the prevalence and factors influencing acute watery diarrhea in children under the age of five admitted at Kampala International University Teaching Hospital-Ishaka, Bushenyi district, western Uganda. The study showed that the overall prevalence of diarrhea among children under five admitted at KIU-TH was 24.4% at the instant of data collection based on the responses given by the children's mothers. This prevalence was shown to be significantly associated with a number of factors, including health service-seeking behavior, weaning age, breastfeeding practices, and initiation of supplementary feeding, which showed the highest odds of influencing diarrhea in children under the age of five. The significance of these variables was computed using Pearson's correlation, of which health service-seeking behavior was significant with a value of 0.139* ($P=0.021$); frequency of breastfeeding was significant with a value of 0.286* ($P=0.000$); health service-seeking behavior was shown to be significant with a value of 0.131* ($P=0.021$) with a 2-tailed test at a 95% confidence level, $P<0.05$. It is widely recognized that diarrhea is a major cause of morbidity and mortality among children, especially children in developing countries. Low socioeconomic status, limited education, poor environmental sanitation, and low hygienic practices pose a serious threat to people's health, especially children's health. Risk factors for diarrhea vary with the child's age, the pathogens involved, and the local environment [22]. The prevalence of diarrhea among children under five in the Aragon district was 40.8% (CI: 0.353-0.454). This is higher than the 23% diarrhea prevalence in Uganda and the 24% prevalence in the northern region where Aragon is located [14]. The high prevalence of diarrhea in Aragon within two weeks is comparable with studies carried out in Ethiopia [23].

The fact is that it is not common for all diarrhea cases to be captured at health facilities; it will depend on community healthcare-seeking behavior. Other diarrhea cases are managed at home or by traditional health attendants, the data will miss in the health records, thus underestimating the magnitude of diarrhea in the community. Traditional medicine is an ancient practice that involves the use of herbs to maintain good health [24, 25]. In this study, the observed prevalence might be the true prevalence of diarrhea.

Child Factors

The child factors with the incidence of diarrhea in this study showed that the odds of children getting diarrhea decrease with age; there is a modest discrepancy in odds seen with the age of above 1 year. However, this could be due to other factors; those with incomplete vaccination are observed to have higher odds of getting diarrhea than those with complete vaccination; Children weaned at the age of below 1 year are seen to have diarrhea more than those weaned at above 1 year; therefore, the odds of getting diarrhea are seen to reduce with the increasing age of weaning the child. The older the child, the less likely they are to get diarrhea. Similarly, the study done by Anne Node Mule[26] in Uganda showed that the weaning age of the child was significantly associated with diarrhea, whereby the occurrence of diarrhea decreased with the increasing weaning age of the child. This may be due to complications associated with early weaning like malnutrition that is accompanied by diarrhea. Children from this study that completed vaccination had a lower odds ratio compared to those with incomplete vaccination. This is in line with the study done by Okafor et al. [27], which also showed that children under five years who completed their vaccination had been fewer compared to those with incomplete vaccination. This may be because a child who has been taken for immunizations has a higher chance of also receiving vaccines against diarrhea, for instance,

the rotavirus and pneumococcal vaccine, where they are available. The age of the child is associated with diarrhea, and from this study, the older the child, the lower the risk of getting diarrhea. This is also in line with the study done by Nantege et al. [2] in Uganda that showed that the age of the child was significantly associated with diarrhea, whereby the occurrence of diarrhea decreased with the increasing age of the child. This occurrence was highest in the age group 12-23 months. Other studies have shown that the highest incidence and deaths due to diarrhea occur in children less than 2 years of age [17, 28]. From my study, this could be because as a child grows, immunity also matures, reducing cases of diarrhea. Also, as they grow, their sense of self-care for good hygiene improves, reducing chances of getting diarrhea.

Maternal Factors

The maternal factors in this study have been associated with a high prevalence and were shown to be significantly associated with a number of factors, including breastfeeding practices and initiation of supplementary feeding, which showed the highest odds of influencing diarrhea in children under the age of five. The significance of these variables was computed using Pearson's correlation, of which health service-seeking behavior was significant with a value of 0.139* ($P=0.021$); frequency of breastfeeding was significant with a value of 0.286* ($P=0.000$). Also, from this study about mother's age, children from mothers above 25 years with diarrhea were greater than those from mothers below 25 years. However, the age of the mother was positively associated with

child diarrhea in the northwest and north-central regions. The older the mother, the less the probability of the under-five child having diarrhea [28], but in this study, it was the opposite. Also, the study done in Nigeria [27] showed that the age of the mother was a significant predictor for the occurrence of diarrhea among children under five years of age, whereas odds of diarrhea were higher among children to mothers aged less than 24 years old. This was in line with a cross-sectional study conducted in Ghana to determine the risk factors associated with diarrhea morbidity among under-five children Farthing et al. [29]. These studies also show the opposite of studies; the reason may be because at home, these young mothers are still energetic and have fewer responsibilities, so they go to hospitals to seek medical attention on time. According to the study also conducted by Nantege [2] in Uganda, it was found that diarrhea occurrence in children under 5 years was associated with the mother's age; the higher the maternal age, the lower the prevalence of diarrhea in children below 5 years.

It is clearly shown that children of mothers with a lower education level (primary and secondary) had the highest odds of getting diarrhea. However, the trend is seen to skew towards mothers who had attained university education, in which their children's odds of getting diarrhea are seen to be higher than that of mothers who went for tertiary institutions compared to the study done by Augustine et al. [30]. The level of mother's education was also positively associated with the occurrence of diarrhea among children under five years of age.

REFERENCES

1. Eve, A., Aliero, A.A., Nalubiri, D., Adeyemo, R.O., Akinola, S.A., Pius, T., Nabaasa, S., Nabukeera, S., Alkali, B., & Ntulume, I. (2020). In Vitro Antibacterial Activity of Crude Extracts of *Artocarpus heterophyllus* Seeds against Selected Diarrhoea-Causing Superbug Bacteria. *The Scientific World Journal*.
<https://doi.org/10.1155/2020/9813970>
2. Nantege, R., Kajoba, D., Ddamulira, C., Ndoboli, F., & Ndungutse, D. (2022). Prevalence and factors associated with diarrheal diseases among children below five years in selected slum settlements in Entebbe municipality, Wakiso district, Uganda. *BMC Pediatr.* 22, 394 (2022).

- <https://doi.org/10.1186/s12887-022-03448-2>
3. Diarrhoeal disease, <https://www.who.int/news-room/fact-sheets/detail/diarrhoeal-disease>
4. Salam, R. A., Das, J. K., & Bhutta, Z. A. (2015). Current Issues and Priorities in Childhood Nutrition, Growth, and Infections1, 2, 3. The Journal of Nutrition. 145, 1116S-1122S. <https://doi.org/10.3945/jn.114.194720>
5. Shobiye, D. M., Omotola, A., Zhao, Y., Zhang, J., Ekawati, F.M., & Shobiye, H. O. (2022). Infant mortality and risk factors in Nigeria in 2013-2017: A population-level study. eClinicalMedicine. 51, 101622. <https://doi.org/10.1016/j.eclinm.2022.101622>
6. Studies: Diarrheal disease rates vary across Africa, world | CIDRAP, <https://www.cidrap.umn.edu/public-health/studies-diarrheal-disease-rates-vary-across-africa-world>
7. Statistical YearBook 2015 | National Institute of Statistics Rwanda, <https://www.statistics.gov.rw/publication/statistical-yearbook-2015>
8. MOH:Publications, https://www.moh.gov.rw/publications?tx_filelist_filelist%5Baction%5D=list&tx_filelist_filelist%5Bcontroller%5D=File&tx_filelist_filelist%5Bpath%5D=%2Fuser_upload%2FMoh%2FPublications%2FHealth_Data%2F&cHash=7ed6d475fb295b51fec921eaacba112d
9. Hbatu, M., Nsabimana, J., & Mureithi, C. (2017). Factors Contributing to Diarrheal Diseases among Children Less than Five Years in Nyarugenge District, Rwanda. J Trop Dis. 05, (2017). <https://doi.org/10.4172/2329-891X.1000238>
10. Alum, E. U., Obeagu, E. I., Ugwu, O. P.C., Aja, P. M., & Okon, M. B. (2023). HIV Infection and Cardiovascular diseases: The obnoxious Duos. *Newport International Journal of Research in Medical Sciences (NIJRMS)*, 3(2): 95-99. <https://nijournals.org/wp-content/uploads/2023/07/NIJRMS-3-295-99-2023.pdf>
11. Egwu, C. O., Aloke, C., Chukwu, J., Nwankwo, J. C., Irem, C., Nwagu, K. E., et al. (2023). Assessment of the Antimalarial Treatment Failure in Ebonyi State, Southeast Nigerian Journal of Xenobiotics, 13(1):16-26. doi: 10.3390/jox13010003. PMID: 36648839; PMCID: PMC9844335.
12. Ayiko, R., Mujasi, P.N., Abaliwano, J., Turyareeba, D., Enyaku, R., Anguyo, R., Odoch, W., Bakibinga, P., & Aliti, T. (2020). Levels, trends and determinants of technical efficiency of general hospitals in Uganda: data envelopment analysis and Tobit regression analysis. BMC Health Serv Res. 20, 916. <https://doi.org/10.1186/s12913-020-05746-w>
13. Annual Health Sector Performance Report: Financial Year 2012/2013 - Uganda|ReliefWeb, <https://reliefweb.int/report/uganda/annual-health-sector-performance-report-financial-year-20122013>
14. Uganda Bureau of statistics (UBOS). International, I.C.F.: Uganda Demographic and Health Survey 2011. (2012)
15. Children: improving survival and well-being, <https://www.who.int/news-room/fact-sheets/detail/children-reducing-mortality>
16. Christian, E. O., Okwesili, F. N., Parker, E. J., & Okechukwu, P. U. (2014). Acute Toxicity Investigation and Anti-diarrhoeal Effect of the Chloroform-Methanol Extract of the Leaves of *Persea americana*. *Iran J Pharm Res.*, Spring;13(2):651-8. PMID: 25237361; PMCID: PMC4157041.
17. Omona, S., Malinga, G.M., Opoke, R., Openy, G., & Opiro, R. (2020). Prevalence of diarrhoea and associated risk factors among children under five years old in Pader District, northern Uganda. BMC Infect Dis. 20, 37. <https://doi.org/10.1186/s12879-020-4770-0>

18. Alum, E., Uti, D., Agah, V., Orji, O., Ezeani, N., P.C., U., Omang, W., & Itodo, M. (2023). Physico-chemical and Bacteriological Analysis of Water used for Drinking and other Domestic Purposes in Amaozara Ozizza, Afikpo North, Ebonyi State, Nigeria. 38, 1-8. <https://doi.org/10.2659/njbmb.2023.151>
19. Egwu, C. O., Alope, C., Chukwu, J., Agwu, A., Alum, E., Tsamesidis, I, et al. (2022). A world free of malaria: It is time for Africa to actively champion and take leadership of elimination and eradication strategies. *Afr Health Sci.*, 22(4):627-640. doi: 10.4314/ahs.v22i4.68. PMID: 37092107; PMCID: PMC10117514.
20. Obeagu, E. I., Nimo, O. M., Bunu, U. M., Ugwu, O. P.C., & Alum, E.U. (2023). Anaemia in children under five years: African perspectives. *Int. J. Curr. Res. Biol. Med.*, (1): 1-7. DOI: <http://dx.doi.org/10.22192/ijcrbm.2023.08.01.001>.
21. Wiegand, H., & Kish, L. (1968). Survey Sampling. John Wiley & Sons, Inc., New York, London 1965, IX + 643 S., 31 Abb., 56 Tab., Preis 83 s. *Biometrische Zeitschrift.* 10, 88-89. <https://doi.org/10.1002/bimj.19680100122>
22. Gebru, T., Taha, M., & Kassahun, W. (2014). Risk factors of diarrhoeal disease in under-five children among health extension model and non-model families in Sheko district rural community, Southwest Ethiopia: comparative cross-sectional study. *BMC Public Health.* 14, 395. <https://doi.org/10.1186/1471-2458-14-395>
23. Melese, B., Paulos, W., Astawesegn, F. H., & Gelgelu, T. B. (2019). Prevalence of diarrheal diseases and associated factors among under-five children in Dale District, Sidama zone, Southern Ethiopia: a cross-sectional study. *BMC Public Health.* 19, 1235. <https://doi.org/10.1186/s12889-019-7579-2>
24. Alum, E. U., Ugwu, O. P. C., Aja, P. M., Obeagu, E. I., Inya, J. E., Onyeije, P. E., Agu, E., & Awuchi, C. G. (2023). Restorative effects of ethanolic leaf extract of *Datura stramonium* against methotrexate-induced hematological impairments. *Cogent Food & Agriculture*, 9:1. DOI: [10.1080/23311932.2023.2258774](https://doi.org/10.1080/23311932.2023.2258774). <https://doi.org/10.1080/23311932.2023.2258774>
25. Alum, E. U., Inya, J. E., Ugwu, O. P. C., Obeagu, I. E., Alope, C., Aja, P. M., et al. (2023). Ethanolic leaf extract of *Datura stramonium* attenuates Methotrexate-induced Biochemical Alterations in Wistar Albino rats. *RPS Pharmacy and Pharmacology Reports*, 2(1):1-6. doi: 10.1093/rpsppr/rqac011.
26. Muli, Anne Ngonde (2018). Variables That Impact Incidence of Diarrhea Amongst Under-Five in Uganda. *Walden Dissertations and Doctoral Studies*. 5026. <https://scholarworks.waldenu.edu/dissertations/5026>
27. Okafor, I. P., Akinyemi, O. T., Wika-Kobani, B.N., Olubodun, T., & Eze, U.T. (2022). Childhood diarrhoea: a cross-sectional survey on maternal knowledge, hygienic practices and use of oral zinc for home management in a Nigerian community. *Pan Afr Med J.* 42, 123. <https://doi.org/10.11604/pamj.2022.42.123.33829>
28. Tareke, A.A., Enyew, E.B., & Takele, B.A. (2022). Pooled prevalence and associated factors of diarrhea among under-five years children in East Africa: A multilevel logistic regression analysis. *PLoS One.* 17, e0264559. <https://doi.org/10.1371/journal.pone.0264559>
29. Farthing, M.J., Salam, M.A., Lindberg, G., Dítě, P., Khalif, I.L., Salazar-lindo, E., Ramakrishna, B.S., Goh, K.L., Thomson, A.B., Khan, A.G., Krabshuis, J.H., & Lemair, A. (2013). Acute diarrhea in adults and children: a global perspective. *Journal of clinical gastroenterology*, 47 1, 12-20.

<https://www.inosr.net/inosr-applied-sciences/>

Badang

INOSR APPLIED SCIENCES 10(3):119-131, 2023

30. Augustine, J.M., Prickett, K.C., & Negraia, D. (2018). Doing it All? Mothers' College Enrollment, Time

Use, and Affective Well-being. J Marriage Fam. 80, 963-974. <https://doi.org/10.1111/jomf.12477>

CITE AS: Badang Nicholas Macdonald (2023). Prevalence of Diarrhoea in Children Under Five Years Admitted at KIU-TH, Ishaka-Bushenyi District, Western Uganda. INOSR APPLIED SCIENCES 10(3):119-131.