Rotavirus infection among hospitalized children under five years of age with acute watery diarrhoea in Mogadishu Somalia: A Tertiary hospital Study.

Abstract

Introduction.

Acute gastroenteritis is a prevalent infectious disease that affects hundreds of millions of people annually and ranks among the leading causes of death worldwide. In Africa, viral agents are the primary causes of diarrhea. Rotavirus A (RVA) is particularly noted as a common and severe cause of diarrhea in infants and young children globally, accounting for more than 50% of cases of gastroenteritis in this age group. Dehydration is a prominent complication and the leading cause of death related to RV infections, often more common than with bacterial infections. Vaccination against rotavirus is strongly recommended to prevent the associated morbidity and mortality.

Method.

This cross-sectional study aimed to assess the prevalence of rotavirus infection among hospitalized children under five years of age presenting with acute watery diarrhea in Mogadishu, Somalia. Conducted from April to June 2024 at the Pediatric Department of Mogadishu Somali Türkiye Training and Research Hospital, the study included 167 participants selected through simple random sampling. Data were collected using a structured questionnaire administered via Kobo Toolbox to capture demographic and clinical details. Laboratory tests, including enzyme immunoassay, were employed to detect rotavirus in stool samples. Following completion of data collection, statistical analysis was performed using software such as SPSS.

Result.

The prevalence of rotavirus among children hospitalized with gastroenteritis was observed to be 33.5%. Analysis revealed notable associations with several risk factors: children whose primary drinking water source was bottled water exhibited an unadjusted prevalence ratio 2.415 times higher compared to those using tap water. Severe dehydration was significantly linked with a lower unadjusted prevalence ratio of 0.342 compared to mild dehydration. Furthermore, children who missed their vaccinations demonstrated an unadjusted prevalence ratio 6 times higher, indicating a statistically significant association.

Discussion

The study identified a 33.5% prevalence of rotavirus among children with gastroenteritis. It found that drinking bottled water significantly increases the risk of infection compared to tap water. Severe dehydration was less common in rotavirus-positive cases, while fever and vomiting were strongly associated with the infection. Missing the rotavirus vaccination emerged as a major risk factor, though being vaccinated did not significantly affect the risk. Interestingly, factors such as gender, residence, and socio-economic status did not show a significant association with rotavirus infection, suggesting

that specific symptoms and vaccination status are more critical in understanding the prevalence and risk factors for rotavirus among these children.

Keywords: Rotavirus, infection, hospitalized children, under five years of age, acute watery diarrhea, Mogadishu, Somalia.

Introduction

Acute gastroenteritis is a prevalent infectious disease that affects hundreds of millions of people annually and ranks among the leading causes of death worldwide. [1],[2]. Rotavirus is a non-enveloped virus belonging to the family Reoviridae. Its genome comprises 11 segments of double-stranded RNA. Classification of rotavirus into serotypes is based on the two surface capsid proteins: VP4 (P serotype) and VP7 (G serotype). [3], [4]. Globally, rotavirus infection stands as the foremost cause of severe diarrhea among children under five years old, resulting in an estimated 215,000 deaths annually in this age group. Additionally, it leads to millions of hospitalizations and clinic visits worldwide.[5],[6]. Rotavirus is the primary cause of diarrhea-related illness and death globally, particularly affecting children under the age of five. [1] [2] [7] [8] [9] [10] [11]. Rotavirus (RV) is a highly contagious and easily transmitted infection, making it the foremost cause of diarrhea in children under 5 years of age globally. [12],[5],[13], [14]. Rotaviruses are the leading cause of severe diarrhea in young children worldwide. According to World Health Organization (WHO) estimates from 2013, around 215,000 children under the age of five die annually due to rotavirus infections.[15] [16]. Rotavirus infection can result in severe acute gastroenteritis that often requires hospitalization. Without timely treatment for dehydration, it can potentially lead to fatal outcomes. [1]. According to the annual report from the United Nations International Children's Emergency Fund (UNICEF), diarrhea is responsible for approximately 2,195 child deaths per day worldwide. This exceeds the combined mortality cases of AIDS, malaria, and measles.[17]. The WHO recommends including rotavirus vaccines in all national immunization programs. This is especially prioritized in South and Southeast Asia and sub-Saharan Africa, where the majority of deaths from rotavirus occur.[15] [18]. The region's high prevalence of diarrhea is largely attributed to factors such as inadequate access to safe drinking water, improper methods of human fecal waste disposal, densely populated and poorly constructed housing, and generally low hygiene standards [17]. Globally, the prevalence of rotavirus diarrhea among children under five years old ranges widely, from 6% to 56%. In India specifically, the reported incidence of rotavirus diarrhea varies even more significantly, ranging from 5% to 70%.[19]. According to WHO estimates in 2004, over five million children under the age of 5 died from rotavirus infections. Approximately half of these deaths occurred in India, Nigeria, the Democratic Republic of the Congo, Ethiopia, China, and Pakistan. [10]. Studies indicate that globally, there is a similar prevalence of rotavirus (RV) infection, ranging from 30% to 50% among hospitalized children with diarrhea. However, it's noteworthy that over 90% of children who suffer fatal RV infections reside in low-income countries [12]. In China, from 2015 to 2018, a prospective surveillance study on viral diarrhea among children under five years of age at a sentinel hospital in Anhui Province revealed that rotavirus A infections were the most prevalent (26.71%) among children with acute gastroenteritis. This marked a decline from the infection rate of 39.98% observed during 2008-2009.[2]. According to global and national estimates from WHO, the proportion of hospitalizations due to rotavirus diarrhea varies widely, ranging from 16% to 66%, with a median proportion of 38%.[10]. Microorganisms that cause diarrhea

are typically transmitted through contaminated water and food. There are three main groups of microorganisms known to cause diarrhea: viruses (such as rotaviruses, caliciviruses, astroviruses, and adenoviruses), bacteria (including diarrheagenic E. coli, Shigella species, Salmonella species, Campylobacter jejuni), and parasites (such as Entamoeba histolytica and Giardia lamblia). In Africa, viral agents are the primary causes of diarrhea. Rotavirus A (RVA) is particularly noted as a common and severe cause of diarrhea in infants and young children globally, accounting for more than 50% of cases of gastroenteritis in this age group. [17]. Clinically, the initial symptoms of rotavirus (RV) infection typically include fever, nausea, and diarrhea. Subsequently, abdominal muscle cramps and recurrent episodes of watery diarrhea may occur, lasting anywhere from 3 to 8 days. Dehydration is a prominent complication and the leading cause of death related to RV infections, often more common than with bacterial infections. [12], [20]. Currently, there is no specific treatment for rotavirus (RV) infection aside from fluid and electrolyte replacement therapy to prevent complications such as dehydration. Vaccination against rotavirus is strongly recommended to prevent the associated morbidity and mortality. [12]. [1].[2],[6],[4].

Rotavirus infection is a significant health concern among hospitalized children under five years of age presenting with acute watery diarrhea at a tertiary hospital in Mogadishu, Somalia. Rotavirus is highly contagious and spreads easily from person to person through contaminated hands and objects. Unlike bacterial and parasitic causes of diarrhea, antimicrobial therapies are not effective against rotavirus infections [5]. The previous study reported a positivity rate of 17.8% for rotavirus infections [5]. Understanding and addressing the burden of rotavirus-related morbidity and mortality in this vulnerable population is crucial. The study aims to contribute valuable insights into the prevalence and clinical aspects of rotavirus infections in this vulnerable population, with the ultimate goal of informing better strategies for diagnosis, treatment, and prevention in Mogadishu, Somalia.

Methods.

This study employs a cross-sectional design to determine the prevalence of rotavirus infection among children under five years of age hospitalized with acute watery diarrhea in Mogadishu, Somalia. The study population comprises children admitted to the **Pediatric Department of Mogadishu Somali Türkiye Training and Research Hospital**, data was collected over period from April 2024 to June 2024. A total of 167 participants will be selected using a simple random sampling method. Data collection involves the use of structured questionnaires to gather demographic and clinical information, alongside laboratory tests such as enzyme immunoassays for detecting rotavirus in stool samples. The data collection procedure includes obtaining ethical approval and necessary permissions, enrolling eligible children after obtaining informed consent from parents or guardians, collecting demographic and clinical data through structured questionnaires, and collecting and testing stool samples for rotavirus. The results will be recorded and confidentiality will be maintained throughout the process. Data analysis will be conducted using statistical software such as SPSS. Descriptive statistics will summarize the demographic and clinical characteristics of the study population, while the prevalence of rotavirus infection will be calculated with a 95% confidence interval. Logistic regression analysis will identify independent predictors of rotavirus infection. This comprehensive approach ensures a robust understanding of the prevalence and predictors of rotavirus infection in the target population.

Result

Demographic factors:

The study on rotavirus among children with gastroenteritis highlights that female children (58.7%) and those aged 12-23 months (39.5%) are most affected. Urban residents (55.7%) are the largest group, and a significant number of children consume bottled (30.5%) or unfiltered water (29.3%), which may be risk factors. Middle-income families constitute the majority (55.1%) of the cases. These findings suggest that gastroenteritis predominantly affects urban, young children from middle and low-income families, emphasizing the importance of addressing water quality and access to healthcare in these demographics. **(table 1).**

Table 1 demographic factors.

Variables	*Sub Variables*	*f*	*%*
Gender	male	69	41.3
	female	98	58.7
Residence	Rural	30	18.0
	Urban	93	55.7
	Rotative	9	5.4
	Camps	35	21.0
Age in months	0–5 months	23	13.8
	6–11 months	59	35.3
	12–23 months	66	39.5
	24–59 months	19	11.4
Primary Source of **Drinking Water**	Tap Water	42	25.1
	Filtered Water	25	15.0
	Bottled Water	51	30.5
	Un Filtered Water	49	29.3
Economic Status Of The Family	LOW Income	60	35.9
	Middle Income	92	55.1
	High Income	15	9.0

***** *Demographic factors*

Patient Symptom Assessment.

The study on gastroenteritis among children reveals that most cases involve moderate dehydration (56.9%), with some severe (27.5%) and mild (15.6%) cases. Elevated temperatures are seen in 35.9% of children, mostly between 37.6-38.6°C. Vomiting occurs in 34.1% of cases, typically lasting less than 3 days. Diarrhea lasts 3-5 days in 50.9% of children, with 17.4% experiencing it for over 5 days. The frequency of diarrhea is usually under 5 times per day (69.5%). These findings indicate that moderate dehydration and short-duration vomiting and diarrhea are common, with temperature and symptom severity varying among children. This data underscores the importance of timely intervention and tailored treatment to manage gastroenteritis symptoms and prevent severe dehydration. **(Table 2).**

Table 2 *Patient Symptom Assessment.*

Variables	*Sub Variables*	*f*	*%*
Dehydration	mild	26	15.6
	moderate	95	56.9
	severe	46	27.5
Temperature	yes	60	35.9
	no	107	64.1
If yes Temperature	<37.5	7	11.6
	37.6–38.6	45	75
	>38.7	8	13.3
Vomiting	yes	57	34.1

	No	110	65.9
If there is vomiting mark the duration	<3 days	49	86.0
	>3 days	8	14.0
Vomiting frequency per day	<5 per day	47	82.5
	>5 per day	10	17.5
Diarrhoea duration	<3 days	53	31.7
	3–5 days	85	50.9
	>5 days	29	17.4
Diarrhoea frequency per day	<5 per day	116	69.5
	>5 per day	51	30.5

**Patient Symptom Assessment.*

Prevalence and Risk Factors Rotavirus Among Gastroenteritis Children.

The study finds a rotavirus prevalence of 33.5% among children with gastroenteritis. **(chart 1)**. Key risk factors include poor hygiene in bottle preparation (12.6%), lack of exclusive breastfeeding (50.9%), and the use of animal milk (35.3%). Hospitalization is needed for 41.9% of the children, with stays split between 1-4 days (48.6%) and 4-10 days (51.4%). The vaccination rate is low, with only 16.2% vaccinated. Bottle feeding is common (67.7%), and zinc is the most used treatment (57.5%), followed by antibiotics (37.1%). These findings underscore the critical role of proper feeding practices, vaccination, and hygiene in managing and preventing rotavirus infections. The high percentage of non-vaccinated children and the prevalent use of bottle feeding highlight areas needing public health intervention to reduce the incidence and severity of gastroenteritis. **(Table 3).**

Chart 1. *Prevalence Rotavirus Among Gastroenteritis Children*

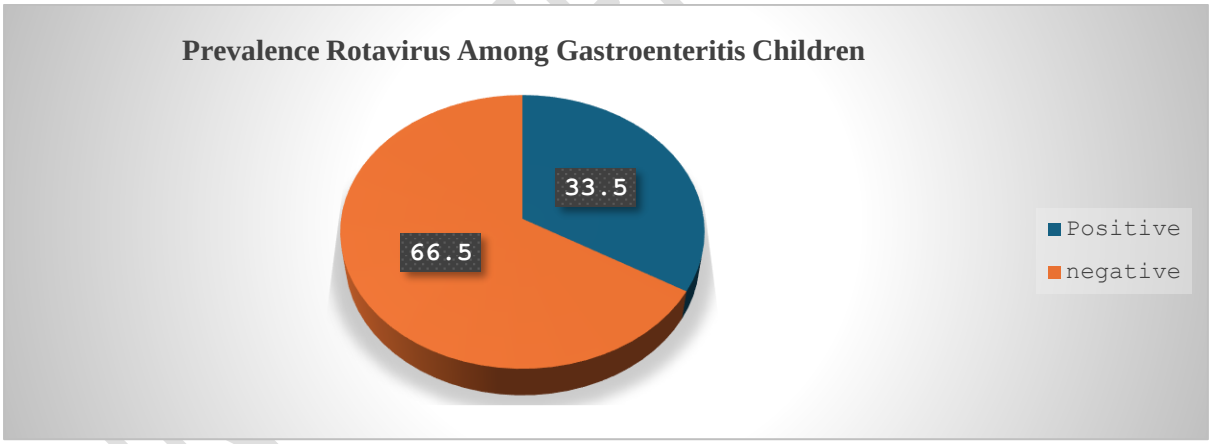

Table 3 *Risk Factors Rotavirus Among Gastroenteritis Children*

Variables	*Sub Variables*	*f*	*%*
Associated Risk Factor Of Rotavirus Among Gastroenteritis Children	Hygiene Practice Related to Bottle Preparation	21	12.6
	Lack Of Exclusive Breast Feeding	85	50.9
	Giving Child Animal Milk	59	35.3
	Others	2	1.2
Requirement Of Hospitalization	YES	70	41.9
	NO	97	58.1
IF YES Duration Of Hospital Stay……	1 - 4 Days	34	48.6
	4 - 10days	36	51.4
Rota vaccine	vaccinated	27	16.2
	Not vaccinated	123	73.7
	Missed vaccine	17	10.2

Feeding Pattern	Bottle feeding	113	67.7
	Non bottle feeding	54	32.3
Treatment	Zinc	96	57.5
	Probiotics	9	5.4
	Antibiotics	62	37.1

** Risk Factors Rotavirus Among Gastroenteritis Children.*

Parental Education

The study reveals that 57.5% of mothers are illiterate, while fathers have a more diverse educational background, with 16.2% being illiterate, 40.1% having secondary education, and 34.1% holding higher education. These disparities in parental education levels suggest varying levels of awareness and access to healthcare information and practices, which can impact the management and prevention of gastroenteritis. **(Table 4).**

Table 4 Parental Education

Variables	***Sub Variables***	***f***	***%***
Mother education	Illiterate	96	57.5
	Primary	27	16.2
	Secondary	31	18.6
	Higher education	13	7.8
Father education	Illiterate	27	16.2
	Primary	16	9.6
	Secondary	67	40.1
	Higher education	57	34.1

** Parental Education*

Rotavirus Risk Factors in Children.

Primary source of drinking water: Compared to tap water, bottled water is significantly associated with an unadjusted prevalence ratio 2.415 times higher (95% CI: 1.007 - 5.793, p=0.048). This suggests that drinking bottled water is a risk factor for rotavirus compared to drinking tap water. The other water sources (filtered and unfiltered) did not show a significant association. Dehydration: Compared to mild dehydration, severe dehydration is significantly associated with an unadjusted prevalence ratio 0.342 times lower (95% CI: 0.124 - 0.945, p=0.039). This suggests that severe dehydration cases are less frequent in rotavirus positive patients than in negatives. However, moderate dehydration did not show a significant association. Fever: The presence of fever is significantly associated with an unadjusted prevalence ratio 2.201 times higher (95% CI: 1.133 - 4.273, p=0.020) compared to the absence of fever. This indicates that fever is a symptom frequently associated with rotavirus infection. Vomiting: The presence of vomiting is significantly associated with an unadjusted prevalence ratio 2.514 times higher (95% CI: 1.285 - 4.917, p=0.007) compared to the absence of vomiting. This suggests that vomiting is a characteristic symptom of rotavirus infection. Rotavirus vaccination: Compared to vaccinated children, those who were not vaccinated had an unadjusted prevalence ratio 1.543 times higher, but this difference was not statistically significant (95% CI: 0.662 - 3.594, p=0.315). However, those who missed their vaccination had an unadjusted prevalence ratio 6.000 times higher, in a statistically significant manner (95% CI: 1.142 - 31.532, p=0.034). This indicates that missing the rotavirus vaccination is an important risk factor for contracting the infection. **(table 5).** Also The study investigated the association between gender, residence, age in months, economic status of the family, diarrhea duration, feeding pattern, parental education, and the presence of rotavirus among children

with gastroenteritis. Surprisingly, the research found that these factors showed no significant association with the presence of rotavirus. **(table 5).**

Table 5: Unadjusted Rotavirus Risk Factors in Children.

Variable	Sub variable	Rotavirus		Unadjusted prevalence ratio (95% confidence interval).	P value
		Positive	negative		
Primary Source of Drinking Water	Tap Water	19(45.2%)	23(54.8%)	**Reference**	
	Filtered Water	7(28.0%)	18(72.0%)	2.124 (0.733 - 6.154)	0.165
	Bottled Water	13(25.5%)	38(74.5%)	2.415 (1.007 - 5.793)	**0.048**
	Un Filtered Water	17(34.7%)	32(65.3%)	1.555 (0.667 - 3.623)	0.306
Dehydration	mild	8(30.8%)	18(69.2%)	**Reference**	
	moderate	22(23.2%)	73(76.8%)	1.475 (0.565 - 3.850)	0.428
	severe	26(56.5%)	20(43.5%)	0.342 (0.124 - 0.945)	**0.039**
Temperature (fever)	yes	27(45.0%)	33(55.0%)	2.201 (1.133 - 4.273)	**0.020**
	no	29(27.1%)	78(72.9%)	**Reference**	
Vomiting	yes	27(47.4%)	30(52.6%)	2.514 (1.285 - 4.917)	**0.007**
	No	29(26.4%)	81(73.6%)	**Reference**	
Rota vaccine	vaccinated	12(44.4%)	15(55.6%)	**Reference**	
	Not vaccinated	42(34.1%)	81(65.9%)	1.543 (0.662 - 3.594)	0.315
	Missed vaccine	2(11.8%)	15(88.2%)	6.000 (1.142 - 31.532)	**0.034**

***Table 6** Adjusted Risk Factors for Paediatric Rotavirus*

Variable	Sub variable	Adjusted prevalence ratio. (95% confidence interval)	P value
Age in months	0–5 months	**Reference**	
	6–11 months	1.648 (0.443 - 6.131)	0.456
	12–23 months	4.706 (1.244 -17.801)	**0.023**
	24–59 months	3.099 (0.489 -19.635)	0.230
Primary Source of Drinking Water	Tap Water	**Reference**	
	Filtered Water	2.618 (0.631 -10.862)	0.185
	Bottled Water	3.885 (1.182 -12.770)	**0.025**
	Un Filtered Water	2.131 (0.666 - 6.819)	0.202
Dehydration	mild	**Reference**	
	moderate	1.741 (0.458 - 6.620)	0.416
	severe	0.222 (0.039 -1.265)	**0.090**
Temperature (fever)	yes	2.850 (1.064 - 7.631)	**0.037**
	no	**Reference**	
Rota vaccine	vaccinated	**Reference**	
	Not vaccinated	1.390 (0.445 - 4.335)	0.571
	Missed vaccine	8.686 (1.089 - 69.255)	**0.041**
Feeding Pattern	Bottle feeding	.844 (0.321 - 2.216)	0.731
	Non bottle feeding	**Reference**	

Discussion

This study found an overall rotavirus prevalence of 33.5% among children with gastroenteritis. In comparison, previous research in Mogadishu reported a lower rotavirus positivity rate of 18.7% in men

and 16.6% in women, with no statistically significant difference (p=0.359). In China, rotavirus A infections were observed in 26.71% of children with acute gastroenteritis, while Iraq reported a higher prevalence of 43.3%. Sri Lanka had the highest prevalence, with 69.3% of children testing positive for rotavirus. Globally, this strain of rotavirus accounts for over 70% of infections in North America, Europe, and Australia, but only 30% in South America and Asia, and 23% in Africa.

Comparing sources of drinking water, bottled water is associated with a significantly higher risk of rotavirus infection, with an unadjusted prevalence ratio 2.415 times higher than tap water. This finding indicates that drinking bottled water is a risk factor for rotavirus compared to tap water, while other sources of water, such as filtered and unfiltered, did not demonstrate a significant association. Similarly, in Burkina Faso, rotavirus infection was significantly less frequent among breast-fed babies compared to those who were bottle-fed, further highlighting the influence of feeding practices and water sources on the risk of rotavirus infection. This suggests that both the source of drinking water and feeding practices play crucial roles in the transmission of rotavirus, emphasizing the importance of safe drinking water and breastfeeding in reducing the risk of infection.

Comparing dehydration levels in rotavirus cases, severe dehydration is significantly less frequent among rotavirus-positive patients than among rotavirus-negative patients, with an unadjusted prevalence ratio of 0.342 (95% CI: 0.124 - 0.945, p=0.039). In contrast, moderate dehydration did not show a significant association. This finding contrasts with observations in Sri Lanka, where the majority of rotavirus-positive cases had no dehydration or vomiting, and there were no significant differences in clinical characteristics between rotavirus-positive and negative cases. This comparison highlights that while severe dehydration may be less common in rotavirus-positive cases, the overall clinical presentation, including dehydration and vomiting, varies between different populations. These differences suggest that factors such as local healthcare practices and diagnostic criteria might influence the observed associations between rotavirus infection and dehydration.

Fever is significantly associated with rotavirus infection, with an unadjusted prevalence ratio 2.201 times higher (95% CI: 1.133 - 4.273, p=0.020) in patients with fever compared to those without. This suggests that fever is a common symptom of rotavirus infection. Similarly, in Burkina Faso, fever, along with vomiting, were the most frequently reported symptoms in patients with rotavirus diarrhea, and these patients often required hospitalization. These findings emphasize that fever is a frequent and notable symptom of rotavirus infection across different settings, reinforcing its role in the clinical presentation of the disease. The consistency of fever as a prominent symptom in both settings suggests that fever is a key indicator of rotavirus infection and highlights the need for timely clinical evaluation and management of affected individuals.

Vomiting is significantly associated with rotavirus infection, with an unadjusted prevalence ratio 2.514 times higher (95% CI: 1.285 - 4.917, p=0.007) in patients who experience vomiting compared to those who do not. This finding aligns with studies from various regions, including Tanzania, where vomiting was significantly associated with rotavirus infection. Similar associations have been reported in pre-vaccine studies conducted in rural Western Kenya, Northwestern Angola, Accra, Ghana, urban Bangladesh, and Sudan. Additionally, in India, a significantly higher proportion (93.5%) of rotavirus-positive children experienced vomiting along with loose stools compared to 61.2% of rotavirus-negative children ($p < 0.05$). These findings confirm that vomiting is a characteristic and consistent symptom of rotavirus infection across different geographic settings. The consistency of this symptom in multiple studies underscores its importance in identifying and diagnosing rotavirus infections, reinforcing the need for healthcare providers to consider vomiting as a key indicator of the disease.

In comparing rotavirus vaccination status, children who were not vaccinated had an unadjusted prevalence ratio 1.543 times higher for rotavirus infection than those who were vaccinated, though this difference was not statistically significant (95% CI: 0.662 - 3.594, p=0.315). In contrast, children who missed their vaccination had a significantly higher unadjusted prevalence ratio of 6.000 (95% CI: 1.142 - 31.532, p=0.034), indicating a substantial increase in the risk of infection for those who were not

vaccinated. This aligns with findings from Tanzania, where effective rotavirus vaccination was shown to significantly reduce the prevalence of rotavirus infection in children. These results highlight the critical role of rotavirus vaccination in reducing infection rates. While the general comparison between vaccinated and non-vaccinated children did not show significant differences, missing scheduled vaccinations was clearly associated with a higher risk of infection. This underscores the importance of ensuring complete vaccination to effectively control rotavirus infection and prevent outbreaks.

Also The study investigated the association between gender, residence, age in months, economic status of the family, diarrhea duration, feeding pattern, parental education, and the presence of rotavirus among children with gastroenteritis. Surprisingly, the research found that these factors showed no significant association with the presence of rotavirus.

Conclusion.

The prevalence of rotavirus among children with gastroenteritis in our study was 33.5%. Our analysis revealed significant associations with certain risk factors: drinking bottled water, compared to tap water, showed a significantly higher risk of rotavirus infection (prevalence ratio 2.415, 95% CI: 1.007 - 5.793, p=0.048). Interestingly, while overall rotavirus vaccination status did not demonstrate a significant difference (prevalence ratio 1.543, 95% CI: 0.662 - 3.594, p=0.315), our findings underscored the importance of vaccination compliance. Children who missed their rotavirus vaccination had a significantly higher prevalence ratio (6.000, 95% CI: 1.142 - 31.532, p=0.034), highlighting the protective effect of vaccination against rotavirus infection in this population. These results emphasize the critical role of water source and vaccination status in managing and preventing rotavirus-associated gastroenteritis among children.

Recommendation.

- **Promotion of Rotavirus Vaccination**: Given that missing the rotavirus vaccination significantly increases the risk of infection, healthcare providers should prioritize and promote timely vaccination schedules for all eligible children. This includes educating parents and caregivers about the importance of vaccination in preventing rotavirus-associated gastroenteritis.
- **Improvement of Drinking Water Quality**: Since consuming bottled water was associated with a higher prevalence of rotavirus compared to tap water, efforts should be directed towards ensuring access to safe drinking water sources, especially in urban and camp settings where bottled water consumption is prevalent. This may involve improving infrastructure for water treatment and distribution or providing access to affordable and safe alternatives.
- **Early Recognition and Management of Symptoms**: Given the association of fever and vomiting with increased rotavirus prevalence, healthcare providers should emphasize early recognition and prompt management of these symptoms, particularly in children presenting with acute gastroenteritis. This includes ensuring adequate hydration and timely medical intervention to reduce the severity and duration of illness.
- **Age-Specific Interventions**: Considering the heightened vulnerability of children aged 12–23 months to rotavirus infection, targeted interventions such as age-appropriate vaccination strategies and enhanced surveillance during peak rotavirus seasons could help mitigate the burden of disease in this age group.
- **Socioeconomic Considerations**: Recognizing that middle and low-income families are disproportionately affected, interventions should also address socioeconomic disparities in healthcare access and affordability of preventive measures. This may involve subsidies for vaccines, improved healthcare access in rural and rotative areas, and community education on hygiene and disease prevention.

Ethical approval:

As a researcher investigating rotavirus infection among hospitalized children under five years of age with acute watery diarrhea at Mogadishu Somali Türkiye Training and Research Hospital, ethical approval from the hospital's Ethical Committee has been obtained. This approval ensures that the study adheres to rigorous ethical standards in conducting research involving human subjects.

Reference.

[1] M. M. Osman, “Prevalence of Rotavirus , Adenovirus , and Hepatitis A Virus in a Tertiary Care Hospital in Somalia Prevalence of Rotavirus , Adenovirus , and Hepatitis A Virus in a Tertiary Care Hospital in Somalia Somali ’ de Bir Üçüncü Basamak Hastanesinde Rotavirus ,” no. November, 2023, doi: 10.46683/jmvi.2023.82.

[2] L. Yuan, G. Gianna, A. Lum, J. Zhao, and W. Li, “Epidemiology of Acute Rotavirus Diarrhea Among Hospitalized Children Under Five Years of Age in Hefei , China , During 2015 - 2018,” vol. 13, no. 7, 2020, doi: 10.5812/jjm.105556.Brief.

[3] M. Nasr and F. Shaheen, “Rotavirus gastroenteritis among hospitalized children under 5 years of age in the Eastern Mediterranean Region : a review,” vol. 25, no. 6, 2019.

[4] O. Maiklang, V. Vutithanachot, C. Vutithanachot, P. Hacharoen, T. Chieochansin, and Y. Poovorawan, “Prevalence of group a genotype human rotavirus among children with dirarrhea in Thailand, 2009-2011,” *Southeast Asian J. Trop. Med. Public Health*, vol. 43, no. 4, pp. 904–916, 2012.

[5] P. Palihawadana, G. Kang, J. Navaratnasingam, and G. Galagoda, “Rotavirus infection among hospitalized children under five years of age with acute watery diarrhea in Sri Lanka,” *Vaccine*, pp. 1–5, 2018, doi: 10.1016/j.vaccine.2018.03.062.

[6] A. M. Hussein, “Rotavirus infection among hospitalized children with acute watery diarrhea in Rotavirus Infection Among Hospitalized Children with Acute Watery Diarrhea In Basrah – Iraq,” no. January 2000, 2016.

[7] D. Mahamba *et al.*, “Prevalence and Factors Associated with Rotavirus Infection among Vaccinated Children Hospitalized for Acute Diarrhea in Mwanza City, Tanzania: A Cross Sectional Study,” *Open J. Pediatr.*, vol. 10, no. 03, pp. 392–403, 2020, doi: 10.4236/ojped.2020.103040.

[8] C. D. Ojobor, C. V. Olovo, L. O. Onah, and A. C. Ike, “Prevalence and associated factors to rotavirus infection in children less than 5 years in Enugu State, Nigeria,” *VirusDisease*, vol. 31, no. 3, pp. 316–322, 2020, doi: 10.1007/s13337-020-00614-x.

[9] D. Mugisha, E. Nalumansi, A. Mulindwa, and J. Rubambarama, “Rotavirus Infection in Hospitalized children under five years in three Sentinel Surveillance Site Hospitals in Uganda,” pp. 1–5, 2019.

[10] O. Article, “Rota virus Diarrhea in Hospitalized Children,” vol. 24, no. 2, pp. 114–117, 2014.

[11] K. Thaluk, “Prevalence of Rotavirus Diarrhea among Hospitalized Under-five Children,” 2014.

[12] T. Nazari, A. Karimi, and R. M. Ghanaiee, “Assessment of Rotavirus Infection in Hospitalized Children with Diarrhea,” vol. 11, no. 1, pp. 1–7, 2023.

[13] O. Article, “September-December, 2016/Vol 36/Issue 3 Original Article □□□ □□□□□□□□□□□□□ □□□□□□□□□□□□□□□□□□□□□□□□□□□□,” vol. 36, no. 3, pp. 273–276, 2016.

[14] V. Access *et al.*, “Rotavirus disease and vaccines in Africa,” pp. 1–2, 2012.

[15] T. W. Myat *et al.*, “introduction,” vol. 39, no. 47, pp. 6907–6912, 2024, doi: 10.1016/j.vaccine.2021.10.014.

[16] A. Chissaque *et al.*, “Rotavirus A infection in children under five years old with a double health problem: undernutrition and diarrhoea – a cross-sectional study in four provinces of Mozambique,” *BMC Infect. Dis.*, vol. 21, no. 1, pp. 1–13, 2021, doi: 10.1186/s12879-020-05718-9.

[17] T. I. Omotade, T. E. Babalola, C. H. Anyabolu, and M. O. Japhet, “Rotavirus and bacterial diarrhoea among children in Ile-Ife, Nigeria: Burden, risk factors and seasonality,” *PLoS One*, vol. 18, no. 9 September, pp. 1–16, 2023, doi: 10.1371/journal.pone.0291123.

[18] M. O. Babalola, D. O. Olaleye, and G. N. Odaibo, “Epidemiology of Group A Rotavirus Diarrhea among Children Hospitalized for Acute Gastroenteritis in Ondo State , Nigeria,” pp. 338–349, 2021.

[19] R. S. Shetty, V. G. Kamath, D. M. Nayak, and A. Hegde, “ScienceDirect Rotavirus associated acute gastroenteritis among under-five children admitted in two secondary care hospitals in southern Karnataka , India,” *Clin. Epidemiol. Glob. Heal.*, vol. 5, no. 1, pp. 28–32, 2016, doi: 10.1016/j.cegh.2016.06.002.

[20] I. J. O. Bonkoungou *et al.*, “Epidemiology of rotavirus infection among young children with acute diarrhoea in Burkina Faso,” 2010.