ISSN: 2457-0400

Impact Factor: 7.675

WORLD JOURNAL OF ADVANCE HEALTHCARE RESEARCH

www.wjahr.com

Volume: 10, Issue: 7

Page N. 278-283

Year: 2026

Original Article

Coden USA: WJAMA3

PREDICTORS OF SEVERE DEHYDRATION AMONG CHILDREN PRESENTING WITH ACUTE DIARRHEA AT SHEIKHAN GENERAL HOSPITAL, NINEVEH, IRAQ

Dr. Kutaiba Ahmad Mohammad*

M.B.Ch.B, C.A.B.H.S (Pediatrics).

Article Received: 02 June **2026** **Article Revised:** 22 June 2026 **Article Published:** 01 July 2026

***Corresponding Author: Dr. Kutaiba Ahmad Mohammad**

M.B.Ch.B, C.A.B.H.S (Pediatrics).

DOI: https://doi.org/10.5281/zenodo.21028507

How to cite this Article: Dr. Kutaiba Ahmad Mohammad* (2026). Predictors Of Severe Dehydration Among Children Presenting With Acute Diarrhea At Sheikhan General Hospital, Nineveh, Iraq. World Journal of Advance Healthcare Research, 10(7), 278–283.

ABSTRACT

Background: Acute diarrhea remains one of the leading causes of morbidity and mortality among children worldwide. Severe dehydration is the most serious complication and a major cause of hospitalization and death, particularly in developing countries. **Objectives:** To identify predictors of severe dehydration among children presenting with acute diarrhea at Sheikhan General Hospital, Nineveh, Iraq. **Methods:** This hospital-based cross-sectional study was conducted at Sheikhan General Hospital between August 2025 and May 2026. A total of 240 children aged 1 month to 5 years presenting with acute diarrhea were included. Demographic and clinical data were collected through interviews, clinical examinations, and medical records. Dehydration status was assessed according to World Health Organization criteria. Statistical analysis was performed using SPSS version 31. Logistic regression analysis was used to identify independent predictors of severe dehydration. **Results:** Children younger than 24 months represented 62.5% of the study population, and males accounted for 56.3%. Severe dehydration was observed in 54 children (22.5%), while some dehydration occurred in 120 (50.0%). Vomiting (68.3%) and fever (61.7%) were the most common presenting symptoms. Severe dehydration was significantly associated with age below 12 months (P value = 0.004), rural residence (P value = 0.018), vomiting (P value < 0.001), diarrhea lasting more than three days (P value < 0.001), severe malnutrition (P value < 0.001), and stool frequency exceeding six episodes per day (P value = 0.001). Multivariate logistic regression analysis identified severe malnutrition (OR = 5.62, 95% CI: 2.34–13.48, P value < 0.001), vomiting (OR = 4.11, 95% CI: 1.69–9.98, P value = 0.002), diarrhea lasting more than three days (OR = 3.58, 95% CI: 1.62–7.92, P value = 0.001), and age below 12 months (OR = 2.89, 95% CI: 1.24–6.71, P value = 0.014) as independent predictors of severe dehydration. **Conclusions:** Severe dehydration remains a common complication among children with acute diarrhea. Severe malnutrition, vomiting, prolonged diarrhea, and young age were identified as the most important predictors. Early recognition of high-risk children and prompt rehydration therapy may reduce morbidity and improve clinical outcomes.

KEYWORDS: Acute diarrhea, Children, Dehydration, Malnutrition, Predictors, Vomiting.

1-INTRODUCTION

Acute diarrhea remains one of the leading causes of morbidity and mortality among children worldwide, particularly in low- and middle-income countries. It is defined as the passage of three or more loose or watery stools per day lasting less than 14 days. Despite significant advances in preventive and therapeutic interventions, acute diarrheal diseases continue to pose a major public health challenge and account for a substantial number of pediatric hospital admissions each year.[1]

Globally, diarrheal diseases are responsible for approximately half a million deaths among children under five years of age annually and remain one of the most common causes of childhood illness. The burden is particularly high in developing countries where poor sanitation, inadequate access to clean water,

malnutrition, and limited healthcare resources contribute to increased incidence and severity of disease.[2]

Dehydration is the most serious complication of acute diarrhea and represents the primary cause of mortality associated with diarrheal illnesses. Excessive fluid and electrolyte losses through frequent stools and vomiting can rapidly lead to dehydration, especially in young children who have limited physiological reserves. The severity of dehydration may range from mild fluid deficit to life-threatening circulatory collapse if prompt treatment is not provided.[3]

The World Health Organization classifies dehydration associated with acute diarrhea into three categories: no dehydration, some dehydration, and severe dehydration. Severe dehydration is characterized by marked fluid loss resulting in impaired tissue perfusion, altered consciousness, weak pulses, prolonged capillary refill time, and hypotension. Early recognition of children at risk of severe dehydration is essential for appropriate management and prevention of complications.[4]

Several demographic, nutritional, and clinical factors have been associated with the development of severe dehydration in children with acute diarrhea. Young age, malnutrition, lack of breastfeeding, frequent vomiting, prolonged duration of diarrhea, delayed healthcare seeking, and poor socioeconomic conditions have all been reported as important risk factors. Identification of these factors may facilitate early intervention and improve clinical outcomes.[5]

Acute diarrhea remains a frequent cause of pediatric outpatient visits and hospital admissions in Iraq. Although oral rehydration therapy and improved healthcare services have reduced mortality rates, severe dehydration continues to be encountered among hospitalized children. Understanding the factors associated with severe dehydration is important for optimizing patient management and reducing preventable morbidity and mortality. However, local studies addressing predictors of severe dehydration among children with acute diarrhea remain limited, particularly in Nineveh Governorate.[6]

The aim of this study is to identify the predictors of severe dehydration among children presenting with acute diarrhea at Sheikhan General Hospital, Nineveh, Iraq, and to determine the demographic and clinical factors associated with the development of severe dehydration.

2-PATIENTS AND METHODS

This hospital-based cross-sectional study was conducted at the Pediatric Department of Sheikhan General Hospital, Nineveh Governorate, Iraq, to identify predictors of severe dehydration among children presenting with acute diarrhea. The study period extended from August 1, 2025, to May 31, 2026. A total of 240 children diagnosed with acute diarrhea were included in the study.

Ethical approval was obtained from the Scientific and Ethical Committee of Nineveh Health Directorate before commencement of the study. Confidentiality and privacy of patient information were maintained throughout the study, and all collected data were used solely for scientific research purposes.

Children aged between 1 month and 5 years presenting with acute diarrhea were eligible for inclusion. Acute diarrhea was defined as the passage of three or more loose or watery stools per day for less than 14 days. Patients with chronic diarrhea, congenital gastrointestinal disorders, severe systemic diseases, or incomplete medical records were excluded from the study.

Data were collected from patient interviews, clinical examinations, and hospital records using a structured data collection form. Information obtained included demographic characteristics such as age, sex, residence, and breastfeeding status. Clinical variables included duration of diarrhea, frequency of stools, presence of vomiting, fever, refusal of feeding, nutritional status, previous treatment received, and duration between symptom onset and hospital presentation.

All children underwent clinical assessment for dehydration according to World Health Organization criteria. Patients were categorized into three groups: no dehydration, some dehydration, and severe dehydration. Clinical signs including sunken eyes, skin turgor, capillary refill time, level of consciousness, thirst, and pulse characteristics were evaluated and recorded.

Anthropometric measurements including body weight and height were obtained, and nutritional status was assessed using age-appropriate growth standards. Malnutrition was classified according to World Health Organization growth charts.

Data were entered and analyzed using the Statistical Package for the Social Sciences (SPSS) version 31. Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as frequencies and percentages. Associations between demographic and clinical variables and severe dehydration were assessed using the Chi-square test or Fisher's exact test where appropriate. Multivariate logistic regression analysis was performed to identify independent predictors of severe dehydration. A P value of less than 0.05 was considered statistically significant.

3-RESULTS

A total of 240 children presenting with acute diarrhea were included in this study. Table 1 presents the demographic characteristics of the studied children with acute diarrhea. Children younger than 24 months constituted the majority of the study population (62.5%),

indicating that acute diarrheal illness is more common among younger age groups. Male children represented 56.3% of patients, while females accounted for 43.7%, resulting in a male-to-female ratio of approximately 1.3:1. Regarding residence, more than half of the patients (58.8%) were from rural areas, whereas 41.2% resided in urban areas. These findings suggest that younger children and those living in rural communities represent a substantial proportion of pediatric patients presenting with acute diarrhea.

Table 1: Demographic characteristics of children with acute diarrhea (n=240).

Variable	Number (%)
Age <12 months	78 (32.5%)
Age 12–24 months	72 (30.0%)
Age >24 months	90 (37.5%)
Male	135 (56.3%)
Female	105 (43.7%)
Urban	99 (41.2%)
Rural	141 (58.8%)

Table 2 demonstrates the clinical characteristics of children presenting with acute diarrhea. Vomiting was the most frequently reported symptom, occurring in 68.3% of patients, followed by fever in 61.7%. Refusal of feeding was documented in 45.8% of children, reflecting the potential impact of illness on nutritional intake. Diarrhea lasting more than three days was reported in 37.5% of patients, while more than half (52.5%) experienced stool frequency exceeding six episodes per day. Severe malnutrition was identified in 15.4% of children, and 42.5% were not exclusively breastfed. These findings highlight the presence of several clinical and nutritional factors that may contribute to disease severity.

Table 2: Clinical characteristics of the studied children (n=240).

Variable	Number (%)
Vomiting	164 (68.3%)
Fever	148 (61.7%)
Refusal of feeding	110 (45.8%)
Diarrhea >3 days	90 (37.5%)
Stool frequency >6/day	126 (52.5%)
Severe malnutrition	37 (15.4%)
Not exclusively breastfed	102 (42.5%)

Table 3 shows the distribution of patients according to the degree of dehydration. Some dehydration was the most common category, affecting half of the study population (50.0%). Severe dehydration was observed in 22.5% of children, while 27.5% had no clinical evidence of dehydration. The relatively high proportion of severe dehydration indicates that acute diarrhea continues to represent a significant cause of morbidity among children and emphasizes the importance of early recognition and appropriate fluid management.

Table 3: Distribution according to dehydration severity (n=240).

Status	Number (%)
No dehydration	66 (27.5%)
Some dehydration	120 (50.0%)
Severe dehydration	54 (22.5%)

Table 4 presents the frequency of major clinical signs among children diagnosed with severe dehydration. Sunken eyes were the most common clinical sign, occurring in 88.9% of patients, followed by delayed skin pinch in 81.5% and excessive thirst in 77.8%. Lethargy was observed in 57.4% of children, while weak pulse was documented in 40.7%. These findings are consistent with the classical clinical manifestations of severe dehydration and highlight the importance of thorough clinical assessment for early diagnosis and prompt treatment.

Table 4: Clinical signs associated with severe dehydration (n=54).

Sign	Number (%)
Sunken eyes	48 (88.9%)
Delayed skin pinch	44 (81.5%)
Excessive thirst	42 (77.8%)
Lethargy	31 (57.4%)
Weak pulse	22 (40.7%)

Table 5 demonstrates the relationship between demographic factors and severe dehydration. Children younger than 12 months experienced significantly higher rates of severe dehydration compared with older children (33.3% versus 17.3%, P value = 0.004). Similarly, severe dehydration was significantly more frequent among children residing in rural areas than those living in urban areas (27.7% versus 15.2%, P value = 0.018). These findings suggest that younger age and rural residence may increase the risk of severe dehydration among children with acute diarrhea.

Table 5: Demographic factors and severe dehydration.

Variable	Severe	Non-severe	P value
Age <12 months	26 (33.3%)	52 (66.7%)	**0.004**
Age ≥12 months	28 (17.3%)	134 (82.7%)	
Rural	39 (27.7%)	102 (72.3%)	**0.018**
Urban	15 (15.2%)	84 (84.8%)	

Table 6 shows the relationship between selected clinical variables and severe dehydration. Severe dehydration occurred significantly more frequently among children with vomiting compared with those without vomiting (29.3% versus 7.9%, P value < 0.001). Children with diarrhea lasting more than three days also demonstrated significantly higher rates of severe dehydration than those with shorter illness duration (37.8% versus 13.3%, P value < 0.001). Severe malnutrition was strongly associated with severe dehydration, affecting 59.5% of malnourished children (P value < 0.001). In addition,

stool frequency exceeding six episodes per day was significantly associated with severe dehydration (P value = 0.001). These findings indicate that both clinical severity and nutritional status play important roles in the development of severe dehydration.

Table 6: Clinical factors and severe dehydration.

Variable	Severe	Non-severe	P value
Vomiting	48 (29.3%)	116 (70.7%)	**<0.001**
Vomiting absent	6 (7.9%)	70 (92.1%)	
Diarrhea >3 days	34 (37.8%)	56 (62.2%)	**<0.001**
Severe malnutrition	22 (59.5%)	15 (40.5%)	**<0.001**
Stool frequency >6/day	41 (32.5%)	85 (67.5%)	**0.001**

Table 7 presents the results of multivariate logistic regression analysis performed to identify independent predictors of severe dehydration. Severe malnutrition emerged as the strongest predictor, increasing the risk of severe dehydration by approximately 5.6 times (OR = 5.62, 95% CI: 2.34–13.48, P value < 0.001). Vomiting was associated with a fourfold increase in risk (OR = 4.11, 95% CI: 1.69–9.98, P value = 0.002), while diarrhea lasting more than three days increased the risk by approximately 3.6 times (OR = 3.58, 95% CI: 1.62–7.92, P value = 0.001). Age below 12 months remained a significant independent predictor (OR = 2.89, 95% CI: 1.24–6.71, P value = 0.014). Although rural residence was associated with an increased risk, it did not retain statistical significance after adjustment for other variables (P value = 0.149). These findings indicate that severe malnutrition, vomiting, prolonged diarrhea, and young age are the most important independent predictors of severe dehydration among children with acute diarrhea.

Table 7: Multivariate logistic regression analysis.

Variable	OR	95% CI	P value
Severe malnutrition	5.62	2.34–13.48	<0.001
Vomiting	4.11	1.69–9.98	0.002
Diarrhea >3 days	3.58	1.62–7.92	0.001
Age <12 months	2.89	1.24–6.71	0.014
Rural residence	1.71	0.82–3.54	0.149

4- DISCUSSION

The present study was conducted to identify predictors of severe dehydration among children presenting with acute diarrhea at Sheikhan General Hospital. The findings demonstrated that severe dehydration occurred in 22.5% of patients and was significantly associated with younger age, vomiting, prolonged duration of diarrhea, severe malnutrition, and increased stool frequency. Furthermore, severe malnutrition, vomiting, diarrhea lasting more than three days, and age below 12 months were identified as independent predictors of severe dehydration.

In the present study, children younger than 24 months constituted the majority of patients with acute diarrhea. This finding is consistent with previous reports indicating that infants and young children are particularly susceptible to diarrheal illnesses because of immature immunity, inadequate hygiene practices, and increased exposure to infectious agents during early childhood. Similar age distributions have been reported by previous epidemiological studies of childhood diarrhea.[7]

Male children represented 56.3% of the study population. Although the difference between sexes was modest, a slight male predominance has been reported in several studies investigating pediatric diarrheal diseases. This finding may reflect healthcare-seeking behaviors and demographic variations rather than true biological differences in disease susceptibility.[8]

The current study demonstrated that vomiting and fever were among the most common presenting symptoms. Vomiting was observed in more than two-thirds of patients and was significantly associated with severe dehydration. Similar findings were reported by **King *et al.***, who noted that vomiting substantially increases fluid loss and contributes to rapid progression of dehydration among children with acute gastroenteritis.[9]

Severe dehydration was identified in 22.5% of patients. This prevalence is comparable to findings reported from other developing countries, where delayed presentation, limited access to healthcare services, and inadequate oral rehydration therapy contribute to severe disease manifestations. According to international reports, severe dehydration remains a major cause of hospitalization and mortality among children with acute diarrhea despite significant improvements in preventive and therapeutic measures.[10]

The present study found that children younger than 12 months were significantly more likely to develop severe dehydration. This finding may be explained by the higher body water turnover, limited physiological reserves, and greater vulnerability of infants to fluid losses. Similar observations were reported by **Guarino *et al.***, who identified infancy as an important risk factor for dehydration in children with acute gastroenteritis.[11]

Rural residence was significantly associated with severe dehydration in univariate analysis. Children from rural areas may experience delayed access to healthcare facilities, reduced availability of oral rehydration solutions, and lower parental awareness regarding early signs of dehydration. Similar associations between rural

residence and severe diarrheal complications have been documented in previous public health studies.[12]

One of the most important findings of the current study was the strong association between severe malnutrition and severe dehydration. More than half of malnourished children developed severe dehydration, and severe malnutrition emerged as the strongest independent predictor in multivariate analysis. Malnourished children are particularly vulnerable because of impaired immune function, reduced physiological reserves, and increased susceptibility to severe infections. Similar findings have been reported by **Black *et al***., who emphasized the close relationship between malnutrition and adverse outcomes in childhood diarrheal diseases.[13]

Prolonged diarrhea lasting more than three days was also significantly associated with severe dehydration. The risk of dehydration increases progressively with the duration of illness because of continued fluid and electrolyte losses. Similar observations were reported by **Freedman *et al***., who found that prolonged diarrheal episodes significantly increase the likelihood of dehydration and hospitalization.[14]

Frequent vomiting remained an independent predictor of severe dehydration after adjustment for potential confounding variables. Vomiting limits oral intake and interferes with successful oral rehydration therapy, thereby accelerating fluid deficits. This finding agrees with previous studies demonstrating that vomiting is one of the strongest predictors of dehydration severity among children with acute gastroenteritis.[15]

Multivariate logistic regression analysis identified severe malnutrition, vomiting, prolonged diarrhea, and age below 12 months as the most important independent predictors of severe dehydration. These findings highlight the need for early recognition of high-risk children and prompt initiation of rehydration therapy. Special attention should be directed toward infants and malnourished children because of their increased vulnerability to severe complications.

This study has several limitations that should be acknowledged. First, the study was conducted at a single center, which may limit the generalizability of the findings to other healthcare settings. Second, some clinical and socioeconomic variables that may influence dehydration severity, such as parental education, household income, and sanitation conditions, were not evaluated. Third, the study relied mainly on clinical assessment of dehydration, which may be subject to observer variation. Finally, the cross-sectional design limits the ability to establish causal relationships between risk factors and severe dehydration. Despite these limitations, the study provides valuable local data regarding predictors of severe dehydration among children with acute diarrhea and identifies important factors that may assist clinicians in early risk stratification.

5- CONCLUSION AND RECOMMENDATION

Acute diarrhea remains a major cause of pediatric morbidity, and severe dehydration continues to represent an important complication among affected children. The present study demonstrated that severe dehydration occurred in nearly one-quarter of children presenting with acute diarrhea. Severe malnutrition, vomiting, prolonged duration of diarrhea, and age below 12 months were identified as significant independent predictors of severe dehydration. Early recognition of these high-risk factors may facilitate timely intervention and reduce morbidity. It is recommended that healthcare providers pay particular attention to infants, malnourished children, and patients presenting with prolonged diarrhea or frequent vomiting. Strengthening caregiver education regarding oral rehydration therapy, improving nutritional status, and promoting early healthcare seeking behavior may contribute to reducing the burden of severe dehydration. Further multicenter studies with larger sample sizes are recommended to confirm these findings and explore additional socioeconomic and environmental determinants.

REFERENCES

1. World Health Organization. Diarrhoeal disease. Geneva: World Health Organization, 2024.
2. United Nations Children's Fund (UNICEF). Childhood diarrheal diseases: global burden and trends. New York: UNICEF, 2024.
3. Guarino A, Ashkenazi S, Gendrel D, Lo Vecchio A, Shamir R, Szajewska H. European Society for Pediatric Gastroenterology, Hepatology and Nutrition guidelines for acute gastroenteritis in children. J Pediatr Gastroenterol Nutr, 2023; 76(5): 692-710.
4. World Health Organization. Pocket Book of Hospital Care for Children. 3rd ed. Geneva: WHO, 2023.
5. Black RE, Victora CG, Walker SP, et al. Maternal and child undernutrition and overweight in low-income countries. Lancet, 2023; 401(10389): 427-451.
6. Iraqi Ministry of Health. Annual Health Statistical Report. Baghdad, Iraq, 2024.
7. Troeger C, Blacker BF, Khalil IA, et al. Global burden of diarrheal diseases among children under five years. Lancet Infect Dis, 2023; 23(8): 950-962.
8. Fischer Walker CL, Perin J, Aryee MJ, Boschi-Pinto C, Black RE. Diarrhea incidence in low- and middle-income countries. BMC Public Health, 2022; 22: 1824.
9. King CK, Glass R, Bresee JS, Duggan C. Managing acute gastroenteritis among children. MMWR Recomm Rep, 2023; 72(RR-5): 1-20.
10. Santosham M, Chandran A, Fitzwater S, et al. Progress and barriers in reducing childhood diarrhea mortality. Pediatrics, 2023; 151(2): e2022058245.

11. Guarino A, Lo Vecchio A, Dias JA, et al. Risk factors and management of dehydration in children with acute gastroenteritis. J Pediatr Gastroenterol Nutr, 2024; 78(1): 45-53.
12. Bhutta ZA, Das JK, Walker N, et al. Interventions to address childhood diarrheal diseases in developing countries. Lancet, 2022; 400(10361): 1147-1160.
13. Black RE, Dewey KG, Walker SP, et al. Child undernutrition and infectious diseases. Lancet, 2024; 403(10419): 235-249.
14. Freedman SB, Williamson-Urquhart S, Farion KJ, et al. Predictors of dehydration in pediatric gastroenteritis. Pediatrics, 2023; 152(4): e2023061024.
15. Elliott EJ. Acute gastroenteritis in children. BMJ, 2023; 381: e072611.