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PREVALENCE OF MALNUTRITION AMONG CHILDREN UNDER FIVE YEARS IN ATBARA HOSPITAL FROM APRIL TO SEPTEMBER 2024

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ABSTRACT

Background: Malnutrition remains a major public health concern, particularly in developing countries, where children under the age of five are most vulnerable.This study aims to assess the prevalence of malnutrition among children aged 6–59months attending Atbara Hospital from April to September 2024.

Methods: A cross-sectional study was conducted at Atbara Hospital, River Nile State, Sudan. Data were collected from medical records of children diagnosed with moderate acute malnutrition (MAM) and severe acute malnutrition (SAM) based on mid-upper arm circumference (MUAC), weight-for-height z-scores, and the presence of bilateral oedema. Monthly trends were analyzed to determine fluctuations in malnutrition prevalence over the study period.

Results: The findings indicate a significant increase in both MAM and SAM cases over the six-month period. MAM cases, identified using MUAC and weight-for-height z scores, rose steadily from 14 in April to 17 in September. Similarly, SAM cases, particularly those classified by MUAC <11.5 cm, increased from 1 in April to 44 in September. The prevalence of bilateral oedema remained low, with only a few cases reported throughout the study period. The increase in malnutrition cases was particularly pronounced during the rainy season, which is associated with higher rates of diarrheal diseases and food shortages. Additionally, the ongoing Sudanese conflict and the influx of internally displaced persons (IDPs) to the River Nile State have placed a significant burden on Atbara Hospital, leading to increased admissions of malnourished children.

Conclusion: The study highlights a concerning rise in malnutrition cases among children under five, emphasizing the need for urgent public health interventions.

Strengthening nutritional support programs, improving healthcare accessibility, and addressing the socio-economic factors contributing to malnutrition are essential to mitigating this growing crisis. Further research is needed to explore long-term solutions and the impact of conflict and displacement on child nutrition.

BACKGROUND

Malnutrition is a state of under or over nutrition, evidenced by a deficiency or an excess of essential nutrients.[1] Good nutrition is the basic need for children to thrive, grow, learn, play and participate. Access of every child to sufficient food may be the responsibility of parents and child to determine the fulfillment of this right. Malnutrition often steals dreams from their young lives and hangs their future in the balance.[2] It remains a major public health concern for children under the age of five years in many low- and middle-income countries because it is still the leading underlying cause of child mortality in these countries.[3] Children are more vulnerable to macro- and micronutrient deficiencies caused by high demand for food during their years of growth.[4] The effects of malnutrition in children under the age of five years include underweight, stunting, wasting with or without oedema (previously known as marasmus and kwashiorkor, respectively) and even death.[5] Malnutrition is the most severe consequence of food insecurity amongst children under the age of five years. Acute malnutrition can lead to morbidity, mortality and disability, as well as impaired cognitive and physical development with an increased risk of concurrent infections.[6] Physical and mental health development is a fundamental right of a child, and their optimum level of health can be accessed with good nutritional support.[7] Malnutrition is a health condition resulting from eating food that contains either insufficient or too many calories, carbohydrates, vitamins, proteins or minerals.[8] Nutrition among children under five plays an important role in the overall development of children physically and psychologically. Malnutrition is steel a major health problem in the developing countries.

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MATERIAL AND METHOD

A community-based cross-sectional study was conducted in Atbara Hospital which located in Atbara town in northern Sudan, from April 2024 to September 2024. Children from 6- 59 month with acute and moderate malnutrition who were selected using systematic random sampling technique were included in this study.To collect data, a structured questionnaire and anthropometrical measurements were used. Data entry was done through Epi data 4.21, and for data analysis statistical package for social sciences version 20.0 was employed. Bivariate and multivariable logistic regression analysis was used to identify the factors associated with malnutrition. The statistical significance was stated at p value <0.05 with 95% confidence intervals.

Study Area

Atbara hospital which located in Atbara town in northern Sudan.

Study Population

Children from 6- 59 month with acute and moderate malnutrition.

Sample and Sample Size

All children from 6- 59 months with acute and moderate malnutrition
attended in the records of Atbara hospital in the period between Apr to September

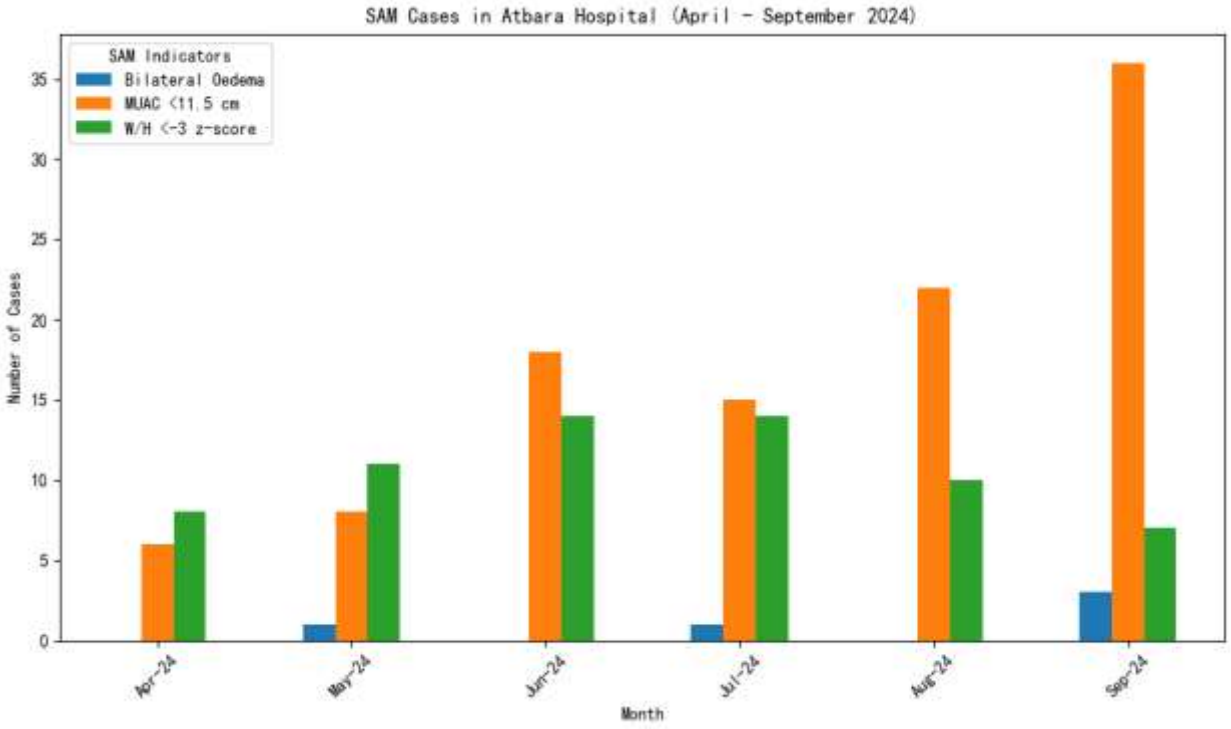
RESULTS & DISCUSSION

Moderate Acute Malnutrition (MAM)

The analysis of MAM cases revealed a steady increase in the prevalence over the six months. The number of cases determined using MUAC measurements (6–59 months) rose from 14 in April 2024 to a peak of 71 in September 2024. Similarly, cases identified by weight-for-height zscores (<-2 and >=-3) showed a parallel increase, starting at 14 in April and reaching 55 by September. The consistent upward trend indicates worsening nutritional conditions over the period, particularly during the later months.

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Figure (1):Further details of MAM cases



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Figure:(2): Sum of MUAC (6-59 months) Sum of W/H<-2 &>=-3 z score (6-59 months)

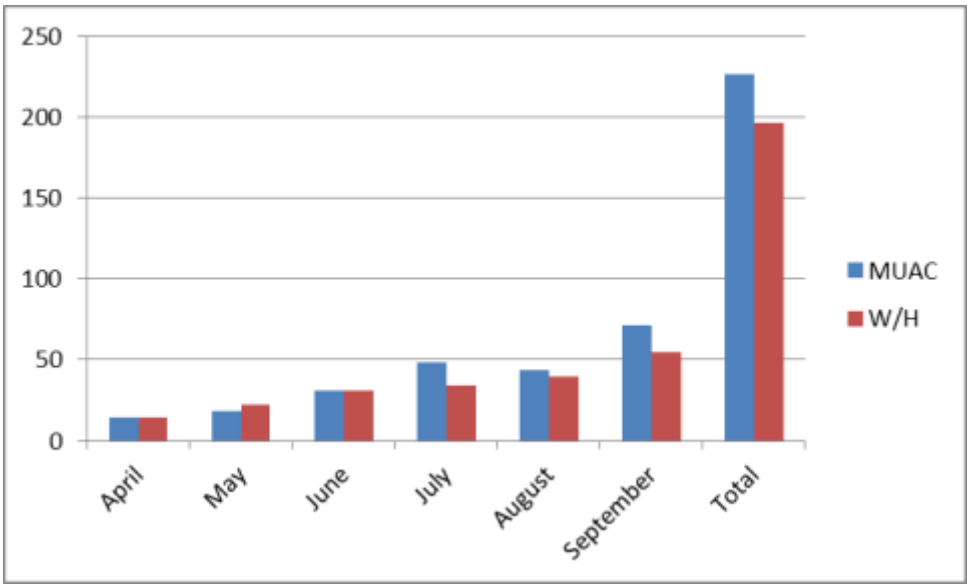
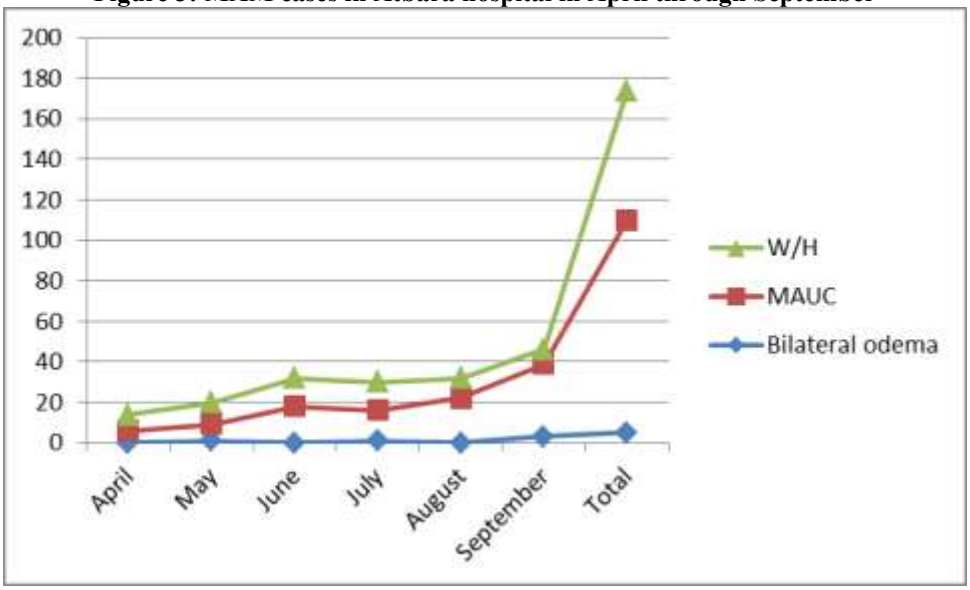


Figure 3: MAM cases in Atbara hospital in April through September



Inferential Statistics

Indicator	Spearmans	P-Value	Interpretation
Bilateral Oedema	0.5	~0.30	Weak positive trend,not significant
MUAC <11.5 cm	0.943	< 0.01	Strong, significant increasing trend
W/H < –3 z-score	–0.214	> 0.5	Weak decreasing trend,not significant

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Additional Observations & Inferences

1. MUAC cases are rising sharply - likely reflecting worsening nutritional status or improved case detection.
2. W/H cases peaked in June–July then declined - may indicate seasonal factors , nutrition interventions).
3. Bilateral oedema remains low but increased in September - suggests possible emergence of kwashiorkor .

Sever Acute Malnutrition (SAM)

The SAM data highlighted a similar upward trend, albeit with fewer total cases compared to MAM. However, cases based on MUAC measurements (<11.5 cm) surged significantly, from 1 in April to 44 in September. The weight-for-height z-score (<-3) cases also rose, starting at 1 in April and reaching 21 by September. These findings underscore the severe impact of malnutrition in the region, with an increasing burden of SAM cases requiring urgent intervention.

DISCUSSION

This study reveals a critical and escalating trend of malnutrition, particularly moderate acute malnutrition (MAM) and severe acute malnutrition (SAM), among children aged 6–59 months at Atbara Hospital. The findings highlight a significant public health burden requiring urgent intervention. The steady rise in MAM cases, particularly those based on MUAC and weight-for-height z-scores, aligns with previous studies emphasizing the role of poverty, limited dietary diversity, and inadequate maternal education in driving malnutrition in low-income settings.[16] The sharp increase in SAM cases, especially in September 2024, underscores the need for enhanced nutritional surveillance and emergency preparedness in this vulnerable population.[17] Malnutrition is intricately linked to seasonal variations, particularly the rainy season, which often exacerbates food insecurity and contributes to increased cases of diarrheal diseases. During the rainy season, flooding and poor sanitation conditions can lead to outbreaks of waterborne diseases such as diarrhea, which impair nutrient absorption and weaken immune defenses, further exacerbating malnutrition.[18] The rise in malnutrition cases during this period may also reflect reduced agricultural productivity and food availability, highlighting the cyclical nature of malnutrition in agrarian-dependent regions.[19] The ongoing Sudanese conflict has further compounded these challenges, contributing to widespread displacement and an influx of internally displaced persons (IDPs) into the River Nile State. Atbara Hospital, the main referral hospital in the state, bears the burden of serving the largest catchment population, including thousands of displaced families.

The influx of IDPs has placed immense strain on already limited healthcare resources, with malnutrition cases rising due to disrupted livelihoods, overcrowded living conditions, and inadequate access to food and clean water.[20] Conflict-affected children are particularly vulnerable, as displacement often disrupts healthcare services, immunization schedules, and access to essential nutritional support.[21] The concentration of IDPs in the River Nile State also highlights the interplay between displacement, food insecurity, and malnutrition. Studies have shown that displaced populations often experience severe malnutrition due to a lack of access to basic resources and increased exposure to infectious diseases.[22] Atbara Hospital's role as the primary healthcare facility for such a large population underscores the urgent need for targeted interventions, such as mobile health units and emergency food distribution, to address the growing burden of malnutrition in the region. Furthermore, this study underscores the importance of strengthening health systems to mitigate the effects of malnutrition in conflict-affected and resource-limited settings. Establishing robust nutrition programs, enhancing sanitation facilities, and integrating maternal and child health services with nutrition interventions are critical steps to curb malnutrition. Collaborative efforts involving local governments, international organizations, and community-based initiatives are essential to address the root causes of malnutrition and improve child health outcomes in Sudan.[23] In light of the findings, future research should focus on exploring the specific impacts of displacement and conflict on child malnutrition, particularly in regions with high IDP populations. Addressing sociocultural barriers, improving healthcare access, and implementing sustainable nutrition strategies are crucial to reversing the alarming trends observed in this study.

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