

RESEARCH ARTICLE

Time to Recovery and Treatment Outcomes among Children Aged 6-59 Months with Severe Acute Malnutrition Admitted to Gardo General Hospital, Puntland, Somalia: A Retrospective Cohort Study Design

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ABSTRACT

Severe Acute Malnutrition, characterized by an extremely low weight-for-height or length, represents a significant health challenge in Somalia, where complex crises contribute to elevated mortality rates among children under five years of age. Therefore, the objective of this study was to estimate the median recovery time and assess treatment outcomes for children aged 6-59 months with Severe Acute Malnutrition admitted to Gardo General Hospital in Gardo, Puntland, Somalia. An institution-based retrospective cohort study was conducted from July 2023 to July 2025, utilizing data collected from a systematically randomly selected sample of 250 children through the children's inquiry data form. Data entry was performed using the Kobo Toolbox and subsequently exported to R Programming version 4.4.0 for analysis. Descriptive statistics were used to examine demographic and care-related characteristics, anthropometric characteristics, and complication-related characteristics. Survival curves, such as Kaplan-Meier curves, were generated to estimate the median recovery time from severe acute malnutrition. The findings of this study indicated that 239(95.6%) children achieved successful treatment outcomes, 4(1.6%) children were transferred out, 4(1.6%) defaulted on their treatment, and 2 children (0.8%) remained in the program during the study period. Unfortunately, there was one recorded fatality, accounting for 1(0.4%) of the cases. In conclusion, this study underscores the significant health challenge posed by severe acute malnutrition in Somalia, highlighting the necessity for timely intervention and effective treatment strategies. With a notable recovery rate of 95.6%, the findings demonstrate the efficacy of treatment protocols at Gardo General Hospital, while also recognizing the ongoing need for support and resources to address the complexities of malnutrition in the region. These results offer valuable insights for healthcare policy and practice, with the aim of improving outcomes for vulnerable children in Puntland.

Keywords: *Severe acute malnutrition, Time to recovery, Children aged 6-59 months, Somalia*

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INTRODUCTION

Severe Acute Malnutrition (SAM) is defined as an extremely low weight-for-height or length, specifically falling below 3 z-scores of the median as per the World Health Organization (WHO) growth standards, or less than 70% of the median according to the National Centre for Health Statistics reference, in conjunction with the presence of nutritional edema (D'Innocenzo et al., 2019; WHO, 2013). In children between the ages of 6 and 59 months, a middle-upper arm circumference (MUAC) measuring less than 11.5 cm signifies severe acute malnutrition (Case, 2012). Malnutrition can be either acute or chronic, with acute malnutrition further divided into severe acute malnutrition and moderate acute malnutrition (MAM) (ENN, 2014).

SAM is the most prominent form of malnutrition. Children with SAM exhibit extreme wasting and weight-for-height z-scores of less than -10 mm and may also show signs of nutritional edema, which is identified by swelling in the face, feet, and limbs. Edema is a critical condition that demands immediate medical attention (WHO, 2013). Children afflicted with severe acute malnutrition exhibit compromised immune systems, rendering them susceptible to infections (D'Innocenzo et al., 2019). These infections contribute to diminished appetite and impede the body's capacity to effectively absorb nutrients, thereby exacerbating malnutrition and further impairing growth (Case, 2012). This condition also increases the risk of mortality, particularly in cases of severe wasting. The mortality risk of children with SAM is nine times higher than that of their healthy counterparts. Most fatalities among children with acute malnutrition are associated with infections such as malaria, diarrhea, pneumonia, tuberculosis (TB), and HIV/AIDS (Bhutta et al., 2013).

Severe acute malnutrition accounts for 21% of disability-adjusted life-years (DALYs) in children under the age of five (Black et al., 2008). Beyond its immediate nutritional impact, SAM leads to long-term consequences, such as reduced intelligence quotient (IQ) and impaired growth (Demographic, 2011). Malnutrition significantly weakens the immune system, making children more susceptible to various illnesses. Malnourished children face a heightened risk of mortality when afflicted with conditions such as diarrhea, pneumonia, measles, and malaria (Black et al., 2008).

While severe acute malnutrition typically affects all parts of a population, infants and young

While severe acute malnutrition typically affects all parts of a population, infants and young children are particularly at risk because of their increased nutritional needs for growth and development (Gerense et al., 2017). It is among the top causes of illness and death in infants and young children worldwide, with a higher prevalence in sub-Saharan Africa and South Asia (WHO, 2000). The most common age for SAM is between 6 and 18 months, a period characterized by rapid growth and brain development. However, it is becoming more common for SAM to occur in infants younger than six months, especially in deprived communities, as they begin introducing semi-solid and solid foods to children as early as two months old (Williams & Berkley, 2016).

Annually, over ten million children globally succumb to severe acute malnutrition before the age of five. A substantial proportion of severely malnourished children die at home without receiving hospital care, and even when medical attention is provided, the mortality rates remain alarmingly high (Ababa, 2003). In developing countries, children under five years of age who are severely malnourished and hospitalized experience an unacceptably high case fatality rate of 30–50% (Ashworth, 2003). Furthermore, of the estimated 555 million children worldwide under the age of five, approximately 19 million suffer from severe wasting. Over 90% of these children reside in developing nations, particularly in sub-Saharan Africa and Southeast Asia (Black et al., 2008).

In developing countries, severe acute malnutrition is the primary cause of pediatric hospital admission and is associated with elevated morbidity and mortality rates. It accounts for over half of the ten to 11 million annual deaths of children under five years of preventable causes (Collins et al., 2006; Trehan & Manary, 2015). In Africa, for example, 14.1 million children under the age of five are affected by wasting, with 4.3 million experiencing severe wasting. Sub-Saharan Africa (SSA) accounts for 13.2 million children suffering from acute malnutrition, ranking second only to South Asia, with a population of 27.8 million (Sphere, 2011). Within sub-Saharan Africa itself, there are 137 million children under five, and 12.3 million of them waste (Organization & Fund, 2020). Despite its global significance, child recovery initiatives have not sufficiently prioritized facility-based management of SAM (Collins et al., 2006).

In Somalia, the post-Deyr 2016 seasonal assessment by the Food Security and Nutrition Analysis Unit (FSNAU) identified 944,000 cases of acute malnutrition among children under five

years of age, with 185,000 classified as severe (FSNAU, 2016). Internally displaced persons (IDPs) are among the most severely affected groups facing a critical situation nationwide (FSNAU, 2016; UNICEF, 2016). Although the data show that boys have higher malnutrition rates than girls, the reasons for this disparity remain unclear (FSNAU, 2016). The incidence of severe acute malnutrition is worsened by a compromised social and health environment, further aggravated by underlying issues such as poverty, natural and human-made disasters such as famine or war, insufficient food quantity and quality, and outbreaks of infection and disease (Levitt et al., 2009). Over the years, the country has faced infectious disease outbreaks, high food insecurity, and a continuous cycle of complex crises, stemming from intricate social and political dynamics (Mohamed, 2024). Consequently, malnutrition accounts for approximately 45% of mortality among children under five in Somalia, with manifestations varying across different regions. In Puntland, a region within Somalia, 11% of children under five suffer from wasting, a condition marked by low weight relative to height, which is indicative of acute malnutrition (WHO, 2023).

Although numerous studies have examined the prevalence and determinants of severe acute malnutrition in Somalia (Abdiwali et al., 2022; Abdiwali Mahamed & Gebremichael, 2021; Ali et al.; Ali et al., 2023), there is a significant lack of research on the recovery time and treatment outcomes for children aged 6-59 months with this condition. This gap underscores the need for targeted studies to enhance our understanding of recovery dynamics. Therefore, this study aimed to estimate the median recovery time and examine treatment outcomes among children aged 6-59 months with severe acute malnutrition admitted to the Gardo General Hospital in Puntland, Somalia. By identifying treatment outcomes and estimating recovery durations, stakeholders can develop more effective treatment protocols and allocate resources more efficiently to support malnourished children in the region.

METHODS

Study location

This study was conducted at Gardo General Hospital in Puntland, Somalia, a vital healthcare facility that addresses the diverse medical needs of the community. The hospital offers a comprehensive range of services, including emergency care, inpatient and outpatient services, maternal and child health care, nutritional support, immunization, laboratory diagnostics, and pharmacy services. It plays a critical role in the

management of severe acute malnutrition, admitting approximately 300 - 400 children annually for treatment. The facility serves an estimated 2000–2500 patients per month.

Study Period

Data were collected from July 8, 2025, to July 18, 2025, at Gardo General Hospital.

Study Design

An institutional based retrospective cohort study was conducted. Retrospective cohort studies involve a backward-looking approach to investigate the association between exposure and outcome (George, 2023).

Target Population

All children aged 6–59 months with severe acute malnutrition who were admitted to Gardo General Hospital from July 8, 2023, to July 8, 2025. This group is of critical importance due to their need for adequate nutrition to support both physical and cognitive development. Severe acute malnutrition can have long-lasting effects on their health and future opportunities. By focusing on this specific cohort admitted to Gardo General Hospital during the specified period, the researchers aim to assess treatment outcomes and recovery times in a context where malnutrition is prevalent. Understanding the characteristics and outcomes for these children contributes to the development of targeted interventions and healthcare strategies to improve nutrition and health services in Puntland, Somalia.

Sample Population

All children aged 6–59 months with severe acute malnutrition who were admitted to Gardo General Hospital from July 8, 2023, to July 8, 2025. This group is of critical importance due to their need for adequate nutrition to support both physical and cognitive development. Severe acute malnutrition can have long-lasting effects on their health and future opportunities. By focusing on this specific cohort admitted to Gardo General Hospital during the specified period, the researchers aim to assess treatment outcomes and recovery times in a context where malnutrition is prevalent. Understanding the characteristics and outcomes for these children contributes to the development of targeted interventions and healthcare strategies to improve nutrition and health services in Puntland, Somalia.

Sample Size Determination

In this study, the sample size was calculated using a single population proportion formula. This calculation was based on an estimated recovery of $p = 0.796$, as indicated by previous findings (Teshome et al., 2019), with a 95% confidence

level and a 5% margin of error, the calculation resulted in a total sample size of approximately 250 participants.

$$n = \frac{z^2 p(1-p)}{e^2} \Rightarrow n = 250$$

Sampling Technique

A systematic random sampling technique was employed to select participants from a total population of N=429. A systematic random sample is characterized by the selection of every kth item, where k is calculated by dividing the total number of items in the sampling frame by the desired sample size. The process begins with the random selection of an initial starting point, followed by the selection of every kth item on the list. This sampling method offers several advantages, including moderate usage and cost, as well as high internal and external validity. Additionally, it is straightforward to implement and easy to verify. However, a notable limitation is that only the selection of the first subject is truly probabilistic, as subsequent selections result in certain subjects having no chance of being chosen (Acharya et al., 2013). With a required sample size of n=250, the sampling interval was calculated by dividing the total population by the desired sample size (N/n), resulting in an interval of approximately 2. Consequently, every second individual was included in the sample.

Data Collection Methods

All data were extracted from the children's inquiry data form using standardized tools. The checklist was adapted and modified based on various related studies and then organized to align with the study's objectives. Two data collectors from East Africa University, specifically from the Clinical Officer and Nursing departments, were recruited. A supervisor was assigned to oversee the data collection process.

Data Quality Control and Management

To ensure data quality, suitable data abstraction tools were developed. A pre-test was conducted on 5% of the sample size to facilitate necessary modifications. Data collectors received two days of training on the data abstraction checklist. During the data collection phase, rigorous supervision and monitoring were implemented daily. Ultimately, the completeness and consistency of all collected data were verified during the data cleaning process.

Data Processing and Analysis

The completeness of the data was rigorously verified and coded appropriately.

Any errors identified were promptly corrected following a review of the original data. Data were collected using the KOBO Toolbox and subsequently exported to R Programming version 4.4.0 for analysis. The analysis began with descriptive statistics, examining demographic and care-related characteristics, anthropometric and complication-related characteristics, and comparing complications at admission with treatment outcomes for children. Survival curves, such as Kaplan-Meier curves, were generated to estimate the median recovery time from severe acute malnutrition.

Ethical Considerations

This study employed secondary data sourced from Gardo General Hospital. To ensure participant confidentiality, all data were anonymized, thereby preventing any identifiable information from being associated with individual cases. The study was conducted with a strong commitment to ethical integrity, and no conflicts of interest were reported among the researchers involved. This framework safeguarded the rights and welfare of children affected by severe acute malnutrition, thereby reinforcing trust among participants and stakeholders.

RESULTS

Socio-demographic and care-related characteristics

Table 1 demonstrates the socio-demographic and care-related characteristics of children diagnosed with severe acute malnutrition. The data indicates a slight male predominance, with 130 (52.0%) males compared to 120 (48.0%) females. Notably, recovery rates are high for both sexes, with males exhibiting a recovery rate of 94.6% and females at 96.7%. The age distribution reveals that the majority of children are between 6-12 months old, accounting for 118 (47.2%), followed by those aged 13-24 months at 99 (39.6%), while older age groups (25-36 months and ≥37 months) constitute a smaller proportion. Recovery rates are commendable across all age groups, with the highest recovery rate of 100% in the ≥37 months group, suggesting that older children may experience better outcomes. Seasonal admission patterns demonstrate that the highest number of admissions occurred in summer, with 82 (32.8%), followed by winter at 61 (24.4%), spring at 55 (22.0%), and autumn at 52 (20.8%).

Most admissions were new cases, totaling 242 (96.8%), with a minor fraction being readmissions at 2 (0.8%) or returns after defaulting at 6 (2.4%). In terms of residence, urban children accounted for 155 (62.0%) of the admissions, internally

displaced persons (IDPs) comprised 84 (33.6%), and only 11 (4.4%) were from rural areas. Recovery rates were highest among rural children at 100%, suggesting better outcomes for those from rural backgrounds. Regarding vaccination status, a significant proportion of children were not vaccinated, totaling 142 (56.8%), with 62 (24.8%) partially vaccinated and only 14 (5.6%) fully vaccinated. However, recovery rates remained high across all vaccination statuses, with fully vaccinated children showing a recovery rate of 92.9%. Finally, breastfeeding practices were nearly evenly divided, with 120 (48.0%) children reported as breastfed and 130 (52.0%) children not breastfed; interestingly, both groups exhibited high recovery rates.

Table 1:

Socio-Demographic and Care-Related Characteristics of Children with SAM Admitted to Gardo General Hospital, Somalia, 2025.

Status of children				
Variable	Labels	Total	Recovered	Censored
sex	Male	130(52.0)	123(94.6)	7(5.4)
	Female	120(48.0)	116(96.7)	4(3.3)
Age in months	6-12	118(47.2)	113(95.8)	7(5.4)
	13-24	99(39.9)	94(94.9)	5(5.1)
	25-36	22(8.8)	21(95.5)	1(4.5)
	≥37	11(4.4)	11(100.0)	0(0.0)
Season at admission	Autumn	52(20.8)	51(98.1)	1(1.9)
	Spring	55(22.0)	52(94.5)	3(5.5)
	Summer	82(32.8)	79(96.3)	3(3.7)
	Winter	61(24.4)	57(93.4)	4(6.6)
Admission status	New	242 (96.8)	231(95.5)	11(4.5)
	Re-admission	2(0.8)	2(100.0)	0(0.0)
	Return after	6(2.4)	6(100.0)	0(0.0)
	Default			
Residence	Urban	155(62.0)	146(94.2)	9(5.8)
	Rural	11(4.4)	11(100.0)	0(0.0)
	IDP	84(33.6)	82(97.6)	2(2.4)
Vaccination status	Fully vaccinated	118(47.2)	113(95.8)	7(5.4)
	Partially vaccinated	99(39.9)	94(94.9)	5(5.1)
	Not vaccinated	22(8.8)	21(95.5)	1(4.5)
	Not documented	11(4.4)	11(100.0)	0(0.0)
Breast feeding	Yes	120(48.0)	114(95.0)	6(5.0)
	No	130(52.0)	125(96.2)	5(3.8)
Residence	Rural	11(4.4)	11(100.0)	0(0.0)
	IDP	84(33.6)	82(97.6)	2(2.4)

Anthropometric and complication-related characteristics

Table 2 presents the anthropometric and complication-related characteristics of children diagnosed with severe acute malnutrition admitted to Gardo General Hospital. The data reveal that a substantial proportion, 199 (79.6%), of the children had a Mid-Upper Arm Circumference (MUAC) below 11.5 cm, indicative of severe malnutrition, while 51 (20.4%) met the required threshold. Among those with a MUAC below 11.5 cm, the recovery rate was notably high at 96.0%, whereas those with a MUAC equal to or above 11.5 cm exhibited a recovery rate of 94.1%. Nutritional status, assessed using Z-scores, indicates that 125 (50.0%) children scored below -3.

Recovery rates were 100% for those scoring below -2, 96.8% for those below -3, and 93.3% for those below -4. Regarding edema, 241 (96.4%) children exhibited a grade of 0, indicating no visible swelling, with a recovery rate of 95.4%. Children exhibiting grades 1 to 3 demonstrated a 100% recovery rate for each grade. Complication rates are concerning, with 166 (66.4%) children experiencing diarrhea and a high recovery rate of 98.2%. Among those with a high fever, 51 (20.4%) showed a recovery rate of 94.1%. Vomiting was reported in 148 cases, with a recovery rate of 94.6%, while 155 (62.0%) children experienced a cough, demonstrating a recovery rate of 96.8%. Lastly, 79 (31.6%) children faced other complications, with a recovery rate of 94.9%.

Table 2:

Anthropometric and Complication-related Characteristics of Children with SAM Admitted to Gardo General Hospital, Somalia, 2025.

Status of children				
Variable	Labels	Total	Recovered	Censored
MUAC	Equal to 11.5 cm	51(20.4)	48(94.1)	3(5.9)
	Less than 11.5 cm	199(79.6)	191(96.0)	8(4.0)
Z score	< -2	20(8.0)	20(100)	0(0.0)
	< -3	125(50.0)	121(96.8)	2(2.4)
	< -4	105(42.0)	98(93.3)	7(4.6)
Oedema grade	0	241(96.4)	230(95.4)	11(4.6)
	1	1(0.4)	1(100.0)	0(0.0)
	2	5(2.0)	5(100.0)	0(0.0)
	3	3(1.2)	3(100.0)	0(0.0)
Diarrhea	Yes	166(66.4)	163(98.2)	3(1.8)
	No	84(33.6)	76(90.5)	8(9.5)
High fever	Yes	51(20.4)	48(94.1)	3(5.9)
	No	199(79.6)	191(96.0)	8(4.0)
Vomiting	Yes	148(59.2)	140(94.6)	8(5.4)
	No	102(40.8)	99(97.1)	3(2.9)
Cough	Yes	155(62.0)	150(96.8)	5(3.2)
	No	95(38.0)	89(93.7)	6(6.3)
Other complications	Yes	79(31.6)	75(94.9)	4(5.1)
	No	171(68.4)	164(95.9)	7(4.1)

Duration of recovery among children aged 6-59 months with Severe Acute Malnutrition

The Kaplan-Meier (KM) method was employed to estimate the distribution of survival time for children's recovery periods. As shown in Figure 1 below, the horizontal axis represents the time until recovery, while the vertical axis illustrates the survival probability $S(t) = P(T > t)$. Initially, the survival curve starts at $S(0) = 1$,

indicating that none of the children had recovered at the outset. The curve rises gradually until around the 6-day mark, suggesting a higher likelihood of children remaining unrecovered in the early stages. Beyond 6 days, the curve begins to decline, with the median recovery time being 9 days. This downward trend signifies a reduction in survival probability over time, demonstrating that more children recovered as time progressed.

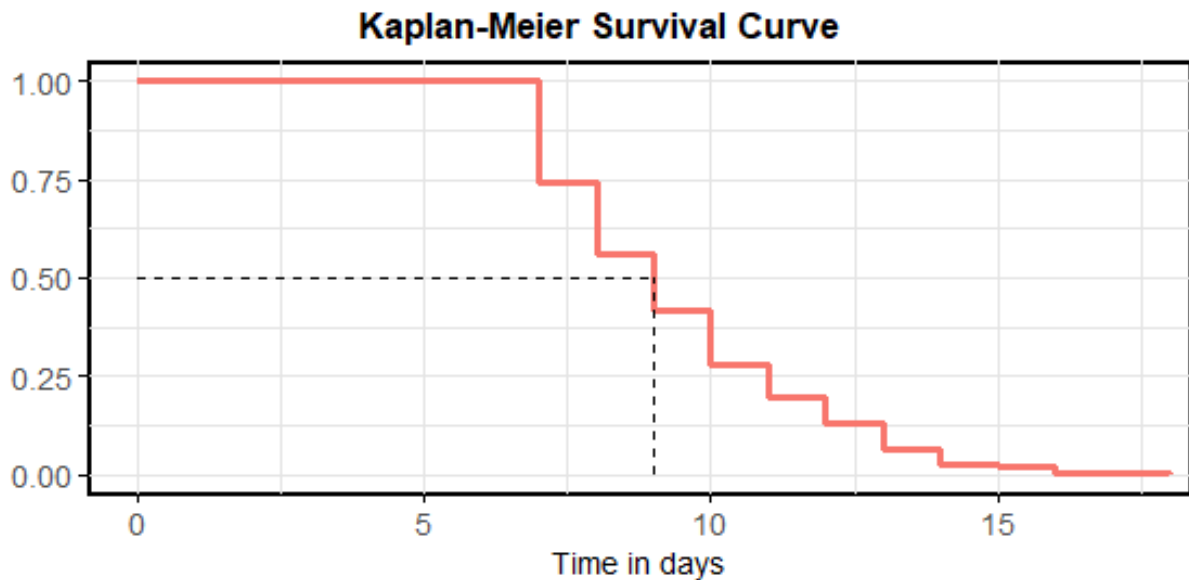


Figure 1: Kaplan-Meier Curve illustrating the duration until recovery from Severe Acute Malnutrition among pediatric patients admitted to Gardo General Hospital

Treatment outcomes

The treatment outcomes for children with severe acute malnutrition reveals that 239 (95.6%) children successfully treated. Furthermore, 4(1.6%) children were transferred out, 4(1.6%) children discontinued their treatment, and 2 children (0.8%) remained enrolled in the program during the study period. Unfortunately, there was one recorded fatality, accounting for 1(0.4%) of the cases.

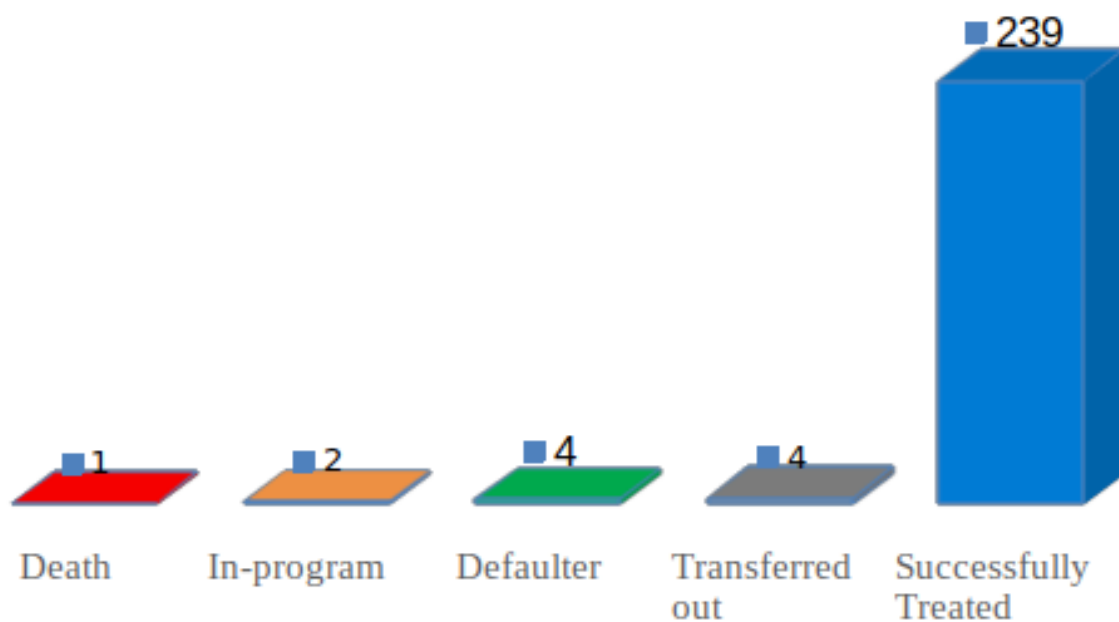


Figure 2: Treatment outcomes for children with severe acute malnutrition admitted to Gardo General Hospital, 2025

Complications at admission with the treatment outcomes

As illustrated in Table 3, an analysis was conducted on the complications at admission and the treatment outcomes for children aged 6-59 months with severe acute malnutrition admitted to Gardo General Hospital. The findings demonstrate a definitive association between specific complications at admission and their subsequent treatment outcomes. Among the pediatric patients presenting with diarrhea, there were 166 cases; notably, there were no fatalities and only one defaulter. Furthermore, a significant association was observed between diarrhea and treatment outcomes, as indicated by a chi-square p-value of 0.04.

In contrast, children without diarrhea exhibited a high success rate, with 76 out of 84 cases resulting in successful treatment. A similar trend is observed with vomiting, where its presence correlated with increased complications, as evidenced by 148 total cases, including one death and three defaults. In cases of high fever, although only 51 children were affected, the outcomes were concerning, with one death recorded among those without high fever. Cough was another prevalent complication, with 155 cases, but the treatment outcomes varied, including two transfers out. Interestingly, the "other complications" category indicated that children with additional issues accounted for 79 cases, with one death and 75 successful treatments.

Table 3:

Complications at Admission and the Treatment Outcomes for Children Aged 6-59 Months with Severe Acute Malnutrition Admitted to Gardo General Hospital.

Variable		Treatment outcome					Total	P-Value
		Death	Defaulter	In-program	Transferred out	Successfully treated		
Diarrhea	Yes	0	1	0	2	163	166	0.04
	No	1	3	2	2	76	84	
Vomiting	Yes	1	3	2	2	140	148	0.62
	No	0	1	0	2	99	102	
High fever	Yes	0	2	0	1	48	51	0.56
	No	1	2	2	3	191	199	
Cough	Yes	0	1	2	2	150	155	0.24
	No	1	3	0	2	89	95	
Other complications	Yes	1	0	1	2	75	79	0.29
	No	0	4	1	2	164	179	

DISCUSSION

This study aimed to examine the median recovery time and treatment outcomes for children aged 6-59 months diagnosed with severe acute malnutrition admitted to Gardo General Hospital in Gardo, Puntland, Somalia. The findings indicated that the median recovery time was approximately 9 days, suggesting that 50% of the malnourished children achieved recovery within this period, while the remaining half required a longer duration. This result aligns with a previous study conducted in Zambia (Irena et al., 2011). However, it is a longer time compared to studies conducted in Ethiopia (Asres et al., 2018;

Hassen et al., 2019; Mekuria et al., 2017; Wagnew et al., 2018).

The prolonged recovery period identified in this study may be attributed to multiple factors. Primarily, variations in medical treatment protocols are significant contributors. Treatment guidelines may differ based on local resources, the training of healthcare personnel, and the availability of therapeutic foods. Gardo General Hospital, similar to many healthcare facilities in resource-constrained settings, may encounter difficulties in maintaining consistent access to specialized nutritional interventions, which can directly impact recovery durations. Additionally, socio-economic conditions in Puntland influence

The study revealed that 239 (95.6%) of the children achieved successful treatment outcomes, while 4 (1.6%) children were transferred out, 4 (1.6%) defaulted on their treatment, and 2 children (0.8%) remained in the program during the study period. Regrettably, there was one recorded fatality, accounting for 1 (0.4%) of the cases. This result contrasts with a study conducted in Ethiopia, which targeted 341 children aged 6-59 months with severe acute malnutrition admitted to East Amhara hospitals, finding that 74.49% recovered, 9.68% were transferred out, 8.8% defaulted, and 5.28% died (Simachew et al., 2020). This disparity could be attributed to differences in medical treatment protocols, caregiving practices, healthcare settings, sample sizes, education and awareness, access to follow-up care, and various socio-economic and environmental factors.

The analysis identified a significant correlation between the presence of diarrhea at admission and treatment outcomes, as indicated by a chi-square p-value of 0.04. This finding underscores the importance of timely and effective management of concurrent illnesses in malnourished children. Diarrhea can intensify dehydration and nutrient loss, thereby complicating recovery from severe acute malnutrition. Consequently, it is imperative to integrate management protocols for common co-morbidities, such as diarrhea, into the treatment of SAM. Healthcare providers must be adequately trained to promptly recognize and address these issues to enhance overall treatment efficacy.

In conclusion, this study underscores the critical importance of timely interventions and customized treatment protocols in the management of severe acute malnutrition. Future research should investigate the underlying factors influencing recovery times and consider strategies to improve treatment protocols, caregiver training, and access to follow-up care in similar contexts. Enhancing community education, improving access to healthcare, and integrating management for associated health issues may further improve outcomes for vulnerable children in Puntland.

Limitations of the study

Due to the reliance on retrospective data, this study did not include certain potentially significant variables, such as dietary diversity and the educational and economic status of caregivers. Furthermore, as the research was conducted at a single center, the findings cannot be generalized to a broader population.

Conclusion

The findings indicated a median recovery duration

of 9 days. A substantial proportion of children, 239(95.6%), diagnosed with severe acute malnutrition were successfully treated. There was one recorded fatality, representing 1(0.4%) of the cases. The presence of diarrhea at the time of admission was associated with the treatment outcomes, underscoring the significance of timely and appropriate medical intervention.

Recommendations

Based on the findings of this research, the study recommends:

- To implement specific protocols for managing common complications, such as diarrhea, vomiting and high fever, in order to enhance treatment outcomes.
- To initiate educational campaigns aimed at informing communities about the indicators of malnutrition and the critical importance of timely medical intervention, particularly for children under the age of five.
- To develop efforts to increase vaccination coverage among children, particularly those admitted with severe acute malnutrition, to mitigate the risk of infections that may complicate their recovery.
- Advocate for breastfeeding through community-based initiatives and support networks, emphasizing its critical role in improving recovery outcomes for children experiencing malnutrition.

Authors contribution

All authors made substantial contributions to the conceptualization, research design, data collection, analysis, and interpretation of the results. They also participated in drafting the manuscript, conducting critical evaluations, and selecting an appropriate journal for submission. Each author reviewed and approved the final version of the paper, assuming full responsibility for its content.

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Conflict of interest

The authors have declared that there are no conflicts of interest concerning the research, authorship, or publication of this paper.

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Data availability

Requests that are deemed appropriate may be directed to the corresponding author to obtain access to the data that support the findings of this study.

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