

Early post-discharge outcomes of children under five years admitted with Diarrhoea in three Regional Referral Hospitals (Amana, Temeke, and Mwananyamala) in Dar es Salaam

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Research Article

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Posted Date: October 13th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-10856155/v1>

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Additional Declarations: No competing interests reported.

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ABSTRACT

Background: Diarrhoea remains a leading cause of morbidity and mortality among children under five, and evidence shows that many diarrhoea-related deaths occur after hospital discharge rather than during admission. In Tanzania, data describing what happens to these children once they leave the hospital are limited. Thus, this study aimed to assess the post-discharge outcomes of children under five years admitted and treated for diarrhoea at Amana, Temeke, and Mwananyamala Regional Referral Hospitals.

Methods: A hospital-based prospective cohort study was conducted among 180 children under 59 months who were admitted with diarrhoea, discharged, and followed for 60 days. Caregivers were interviewed using a structured questionnaire, and children's anthropometric measurements were taken at admission and at 60 days post-discharge. Follow-up assessed treatment adherence, growth, WASH practices, recovery, and recurrence of diarrhoea. Data were analysed using descriptive statistics and the Wilcoxon signed-rank test, with $p < 0.05$ considered statistically significant.

Results: Of the 180 caregivers enrolled, 150 (83.3%) adhered to zinc supplementation, and 171 (95%) reported receiving clear instructions on medication use before discharge. Children's nutritional status improved between admission and 60 days, with median weight-for-height Z score rising from -0.75 to -0.32 ($Z = -10.03$, $p < 0.001$) and median height-for-age Z score rising from 0.75 to 1.29 ($Z = -11.07$, $p < 0.001$). WASH conditions were generally favourable, with 149 (82.2%) households having good water status, 142 (78.9%) having good sanitation, and 126 (70%) having good hygiene practices. By 60 days, all 163 children who completed follow-up had recovered, although three children (1.7%) died of causes unrelated to diarrhoea, 9 (5.5%) were readmitted, and 35 (21.5%) experienced at least one recurrent episode of diarrhoea.

Conclusion: Most children admitted with diarrhoea experienced favourable post-discharge outcomes due to high caregiver adherence to treatment and good household WASH conditions, with a notable proportion of children experiencing recurrent diarrhoea and readmission, indicating that the post-discharge period remains a vulnerable time; thus, strengthening discharge education and establishing structured follow-up could further reduce post-discharge complications and diarrhoea-related deaths.

Keywords: Early post-discharge outcomes, Under five children, Regional Hospitals, Dar es Salaam

Background

Diarrhoea remains a major cause of morbidity and mortality among children under five, especially in both low- and middle-income countries like Tanzania. A study in 2017 by the WHO reported that every year, more than 1.7 billion cases of childhood diarrhoea occur worldwide and that around 443,832 children under five lose their lives to diarrhoea each year(1). Diarrhoea is responsible for the deaths of more than 90% of children under five years of age in low- and lower-middle-income countries, and regionally, South Asia and sub-Saharan Africa accounted for 88% of deaths for the same age group(2).

Despite diarrhoea being the leading cause of mortality among children under five, many of these deaths occur post-discharge(3,4). The study showed that children who are discharged from hospital have a higher risk of dying during the 12 months following discharge than comparable children in the community, and that diarrhoea is a significant predictor of excess mortality(4). One of the longitudinal studies done in Kenya found that nearly 1 in 7 children discharged from hospitals for diarrhoea treatment were readmitted or died within 60 days, often due to complications that could have been prevented with proper follow-up(4). Despite an increase in post-discharge mortality among children under five admitted with diarrhoea in Tanzania, data on post-discharge outcomes of children admitted for diarrhoea are sparse.

In Tanzania, few studies have examined post-discharge follow-up. Still, most of these studies have focused only on adherence to zinc supplementation by the caregivers for the children and recurrence of diarrhoea among under-five children who were admitted with diarrhoea which is still not enough in assessing follow-up because there are many aspects apart from zinc adherence that affect the health outcomes of the children after being discharged with diarrhoea.

Therefore, this study will help us to assess the post-discharge outcomes such as adherence to instructions given to caregivers after being discharged, growth outcomes of the children, following of WASH procedures among caregivers, recovery, and the recurrence of the disease, which leads to poor growth, which as a result leads to deaths, and endless effort in reducing diarrhoea related deaths among under-five children.

Methods

Study design and Settings

A prospective descriptive cohort study design was employed, in which children under five years admitted with diarrhoea were selected and followed up for 60 days post-discharge. The study was conducted for 7 months, from November 2025 to May 2026, at three RRHs in Dar es Salaam: Amana, Temeke, and Mwananyamala.

Source and Study Population

All children aged 3-59 months who were admitted with diarrhoea, after obtaining informed consent from their caregivers. All children in the age group with other health comorbidities such as HIV/AIDS, or anomalies that may influence the health outcomes of the children after discharge were excluded.

Sample Size determination and sampling procedure

The sample size was determined using the prevalence of diarrhoea in Tanzania 12.6%(5,6), a 95% confidence interval, a 5% margin of error, and a 10% non-response rate, yielding 180.

The sampling method was consecutive sampling, in which all eligible children admitted with diarrhoea during the study period who met the inclusion criteria were enrolled. This method ensured practical feasibility and maximized recruitment within the study timeframe.

Data Collection

Data were collected using a pretested and structured questionnaire, which was modified by review of different literatures(7–9) and the World Health Organization WASH tool(10). Socio-demographic characteristics of the caregiver and the child, household WASH conditions, were asked at the time of admission and anthropometric measurements (weight and height) were taken at the time of admission and 60 day after discharge to assess the nutritional status of the child, follow-up data was collected using checklist, whereby the caregivers were contacted on day 14 and 30 and 60 after discharge to assess the growth outcomes, recovery, recurrence and adherence to the treatment.

Data analysis plan

The data collected in this study were entered and analysed using SPSS version 25. The data were cleaned, and missing data were corrected; descriptive statistics were then used to summarize participants' characteristics and study variables. Categorical variables were presented as proportions and percentages, while continuous variables were presented as medians and interquartile ranges because the data were not normally distributed. To assess changes in continuous variables measured at admission and after 60 days of follow-up, weight, height, weight-for-height Z-score, and height-for-age Z-score, a non-parametric test, the Wilcoxon signed-rank test, was used, as the data did not follow a normal distribution, and a p-value of less than 0.05 was considered statistically significant.

Ethical considerations

Ethical approval was obtained from the Institutional Review Board of Muhimbili University of Health and Allied Sciences (MUHAS); additionally, permission was sought from the authorities of Amana, Mwananyamala, and Temeke hospitals.

Informed consent was sought from all caregivers of the children included in the study. The purpose, procedures, potential risks, and benefits of the study were clearly explained, and participation was entirely voluntary.

RESULTS

Social Demographic Characteristics of the Caregiver

A total of 180 caregivers whose children were admitted due to diarrhoea were included in the analysis. The median age of the caregivers was 28 ± 9 years (range, 20–52 years). More than one-third, 67 (37.2%), were aged between 20 and 29 years. The primary caregivers for most children were their mothers 172 (95.6%) of the participants. Approximately 108(60%) of the caregivers and 106 (58.9%) of their fathers had a secondary school education. Most caregivers were self-employed, 73 (40.6%). Additionally, most of the caregivers, 131(72.8%) were married (**Table 1**)

Table 1: Social demographic characteristics of the caregivers

Variable	n	%
Age of the Caregivers		
18-24	36	20
25-29	67	37.2
30-34	35	19.4
35 and above	42	23.3
Relationship with the caregiver		
Mother	172	95.6
Father	3	1.7
Grandparent	5	2.8
Mother's Level of Education		
No formal education	2	1.1
Primary school education	36	20
Secondary school education	108	60
Advanced school education	12	6.7
College/ University	22	12.2
Religion of the caregiver		
	94	52.2
Christian	86	48.8
Muslim		
Mothers' Occupation		
	31	17.2
Employed	73	40.6
Self employed	76	42.2
Unemployed		
Fathers Level of education		
No formal education	1	0.6
Primary school education	21	11.7
Secondary school education	106	58.9
Advanced school education	13	7.2

College/ University	39	21.7
Fathers' Occupation		
Employed	54	30
Self employed	123	68.3
Unemployed	3	1.7
Marital status		
Single	10	5.6
Married	127	70.6
Widowed	5	2.8
Cohabiting	17	9.4
Separated	21	11.6

Social Demographic Characteristics of the Child

A total of 180 children who were admitted due to diarrhoea were included in the analysis. Approximately 96 (53.3%) of the children were male, and the median age was 14 ± 10 months (range, 3–56 months). Most children, 137 (76.1%), were aged between 7 and 23 months. About 95 (52.8%) of the children were the first child in the family, most families, about 144 (80%), had only one child under the age of five. Furthermore, the age spacing of the children was more than two years (**Table 2**)

Table 2: social demographic characteristics of the child

Variable	n	%
Sex		
Male	96	53.3
Female	84	46.7
Age of the child		
1-6	10	5.6
7-23	137	76.1
24-59	33	18.3
Childbirth order		
1 st child	95	52.8
Second and Above	85	47.2

Number of children under five		
Less than 2	144	80
≥ 2	36	20
Child age spacing		
≤ 2 years	15	8.3
> 2 years	21	14.4

Adherence to treatment guidelines among caregivers with post-discharge children admitted due to diarrhoea.

Among caregivers whose children were admitted due to diarrhoea, about 150 (83.3%) were adherent to zinc supplementation. In comparison, 30 (16.7%) were non-adherent. Out of the caregivers who adhered to zinc supplementation, a majority of 121(80.7%) administered the supplements to their children for 10 consecutive days, whereas only 29(19.3%) provided zinc supplements for a 14-day duration.

Conversely, 24 (80%) of caregivers who were not adherent did so because the child appeared well and had recovered. Furthermore, 16.7% reported non-adherence due to the child experiencing side effects when given the drug, and 3.3% did not adhere because their children were deceased. Among the caregivers who were non-adherent due to medication side effects, about 80% of their children experienced vomiting, while 20% reported bloating after taking the medication.

Caregivers continued breastfeeding and, for those above 6 months, initiated complementary feeding; about 98 (54.4%) continued to breastfeed their children during the diarrhoea period, and 170 (94.4%) had initiated complementary feeding for their children.

The majority of the caregivers, about 173(96.1%), obtained these medications directly from the hospital, and about 171(95%) of the caregivers were given clear instructions on how to use the medications before initiating administration (**Table 3**)

Table 3: Adherence to treatment guidelines among caregivers with post-discharge children admitted due to diarrhoea

Variable	n	%
Zinc supplementation		
Adherent	150	83.3
Non adherent	30	16.7
Number of days Zinc was given		
10 consecutive days	121	80.7
14 consecutive days	29	19.3
Causes of non-adherence to Zinc		
The child was well	24	80
Other reason	6	20
Feeding Practices		
Continue breastfeeding	98	54.4
Complementary breastfeeding	170	94.4
Source of the medication		
Healthcare facilities	173	96.1
Pharmacy	7	3.9
Instruction on medication		
Instruction was given	171	95

Growth outcomes of the children admitted with diarrhoea

A total of 180 who were included in the study were the weight and height were measured upon admission to the hospital, the median weight of the children was 9.6 ± 2.45 kg (range, 4.5-26.5kg), were most of the children about 151 (83.9%) had normal weight for their age with their WHZ ranges from -2 to +2, and also in term of height, the median height of the children was 78.9 ± 9.87 cm (range, 62-110.4 cm), and most of them about 159 (88.3%) had normal height for their age with their HAZ ranges from -2 to +2.

The anthropometric measurement was assessed after 60 days, were the median weight of the children after 60 days period was 10.2 ± 2.6 kg (ranges, 5.4-26.8 kg), were most of the children

about 141 (86.5%) had normal weight, with 19 (11.7%) being underweight for their age, with their WHZ score ranges below -2, in terms of height of the children after 2 months the median height for the children was 80.2 ± 10.2 cm (ranges, 63.6-111.6 cm) and most the children about 156 (95.7%) had normal height for their age and about 4.3% were stunted with their HAZ score less than -2 (**Table 4**)

Table 4: Growth outcomes (change in height) of the children admitted with diarrhoea

Characteristics	Admission	After 60 days
Weight (kg)		
Median $\pm$ IQR	9.6 $\pm$ 2.45	10.2 $\pm$ 2.6
Range	4.5-26.5	5.4 – 26.8
Height		
Median $\pm$ IQR	78.9 $\pm$ 9.87	80.2 $\pm$ 10.2
Range	62 – 110.4	63.6 – 111.6
Weight for height Z score (WHZ)		
Normal (-2 to +2), <i>n</i> (%)	151 (83.9)	141 (86.5)
Underweight (< -2), <i>n</i> (%)	16 (8.9)	19 (11.7)
Overweight (> +2), <i>n</i> (%)	5 (2.8)	3 (1.8)
Height for age Z score (HAZ)		
Normal (-2 to +2), <i>n</i> (%)	159 (88.3)	156 (95.7)

Regarding the weight 60 days after discharge, children improve their weight as measure in weight for height z score (WHZ) at 60 days post-discharge compared to the time of admission ($Z = -10.03$, $p < 0.001$). Among the 163 children, the median WHZ score significantly increased from -0.75 (IQR: -1.61, 0.05) at admission to -0.32 (IQR: -1.16, 0.31) at 60 days, whereby most of the children, about 141(86.5%), showed an increase in their WHZ score, and 21(12.9%) showed a decrease in their WHZ score.

Regarding height 60 days after discharge, children improved their weight as measured by height-for-age z-score (HAZ) at 60 days post-discharge compared with admission ($Z = -11.07, p < 0.001$). Among the 163 children, the median HAZ score increased significantly from 0.75 (IQR: 0.41, 1.04) at admission to 1.29 (IQR: 0.93, 1.85) at 60 days, with most children, about 162 (99.4%), showing an increase in HAZ score (**Table 5**)

Table 5: Growth outcomes (change in weight) of the children admitted with diarrhoea

Weight-for-height Z score (WHZ)				
	Median	IQR	<i>Z</i>	<i>p</i>
At admission	- 0.75	(-1.61, 0.05)		
Day 60 post-discharge	- 0.32	(-1.16, 0.31)		
Overall change score			- 10.03	< 0.001
<i>Positive rank (Improvement)</i>	<i>n</i> = 141	(86.5 %)		
<i>Negative ranks (Decline)</i>	<i>n</i> = 21	(12.9%)		
Height-for-age Z-score (HAZ)				
At admission	0.75	(0.41, 1.04)		
Day 60 post-discharge	1.29	(0.93, 1.85)		
Overall change score			- 11.07	< 0.001
<i>Positive rank (Improvement)</i>	<i>n</i> = 162	(99.4%)		
<i>Negative ranks (Decline)</i>	<i>n</i> = 1	(0.6%)		

Assessment of household Water, Sanitation and hygiene (WASH) during the post-discharge period of children admitted with diarrhoea.

Most households had good water status 149 (82.2%). About 147 (81.7%) households had access to safe water, and most obtained their water from taps, while a few sourced it from wells. Furthermore, 148 households (82.2%) fetched water within their own compounds or from nearby locations. In terms of distances, 144 families (80%) reported that their water sources were

located either inside their homes or nearby, most families 139 (77.2%) did not experience water scarcity, and 123 families (68.3%) treated their water by boiling, and 176 (97.8%) families safely covered their stored water (**Table 6**)

Table 6: Water status among the households with children admitted due to diarrhoea

Variable	n	%
Water status		
Good	148	82.2
Poor	32	17.8
Source of water		
Safest	147	81.7
Safe	23	12.8
Not safe	10	5.6
Distance to water source		
Own compound	148	82.2
Not on the own compound	32	17.8
Duration to the water source		
Home	144	80
More than minutes	36	20
Water scarcity		
Yes	41	22.8
Water treatment		
Yes	121	68.3
Water coverage		
Yes	176	97.8
Water acceptability		
Yes	178	98.9

The majority of the families about 142(78.9%), reported improved sanitation, most of the families 161(89.4%) utilized flushing toilets, however 119 families (66.1%) reported shared toilets use with other families in their household, and 61 families (33.9%) relied on private toilets

exclusively used by one family, the majority of the families, 160(88.9%), reported proper disposal in the toilet, most families 179(99.4%) reported that their toilet provided privacy, and about 174(96.7%), reported no leakage and most families 178(98.9%) reported that their toilets did not pose any health risks. (**Table 7**)

Table 7: Sanitation status among the households with children admitted due to diarrhoea

Variable	n	%
Sanitation status		
Good	142	78.9
Poor	38	21.1
Toilet type		
flushing	161	89.4
Pit latrine	19	10.6
Toilet use		
Shared	119	66.1
Private	61	33.9
Stool disposal		
Good	160	88.9
Poor	20	11.1
Toilet privacy		
Yes	179	99.4
Health risks		
Yes	2	1.1
Toilet leakage		
Yes	6	3.3

The results of hygiene status showed that 126(70%) had good hygiene practices, whereby all families 180(100%) reported washing their hands before and after eating, additionally, 174 families (96.7%) reported washing their hands after using the toilets, however only 78(43.3%) families washed their hand before food preparation, about 70(39.1%) families reported regularly washing their hands upon arriving home. All 180 (100%) families had water and soap available

for handwashing. However, the majority of the families, 118(65.6%), did not have a designated hand-washing place (**Table 8**)

Table 8: Hygiene status among the households with children admitted due to diarrhoea

Variable	n	%
Hygiene status		
Good	142	78.9
Poor	38	21.1
Hand washing before and after eating		
Yes	180	100
Hand washing before food preparation		
Yes	78	43.3
Hand washing upon arriving home		
Yes	70	39.1
Water and soap availability		
Yes	180	100
Designated place for hand washing		
Yes	62	34.4

Assessment of the recovery status of children within 60 days post-discharge

163(100%) had completely recovered by the end of the follow-up period. These children had regained their normal appetite and resumed their usual daily activities. Three children (1.7%) died during the follow-up period; however, none of the deaths were attributed to diarrhoea. Furthermore, 21(12.8%) children had experienced fever within the seven days preceding the follow-up interview. During the 60-day follow-up period, 9(5.5%) children were readmitted to the hospital. Among those readmitted children, 7(77.8%) were readmitted due to diarrhoea, and the other children were readmitted due to seizure and severe pneumonia (**Table 9**)

Table 9: Recovery status of children within 60 days post-discharge

Variable	n	%
Recovery status		
Good	163	100
Mortality		
Yes	3	1.7%
Fever for the past 7 days		
Yes	21	12.8
Children readmitted		
Yes	9	5.5
Readmitted due to diarrhoea		
Yes	7	77.8

Assessment of the recurrence rate of diarrhoea episodes within 60 days post-discharge

Of the 163 who completed the follow-up period, 35(21.5%) experienced at least one episode of recurrent diarrhea during the 60-day follow-up. Of these, 14(7.8%) children experienced recurrence within the first 7days after discharge, 7(3.9%) children experienced recurrence between days 8 and 14, 5(2.8%) children experienced recurrence between days 15 and 30, and 9(5.5%) children experienced recurrence between days 31 and 60 after discharge (**Table 10**)

Table 10: Recurrence rate of diarrhoea episodes within 60 days post- discharge

Variable	n	%
Recurrence rate		
Yes	35	21.5
Within the first 7 days		
Yes	14	40
Within 14 days		
Yes	7	20
Within 30 days		
Yes	5	14.3
From day 31 to 60 days		
Yes	9	25.7

DISCUSSION

The study's main objective was to assess the post-discharge outcomes of children under five years admitted and treated for diarrhoea at Amana, Temeke, and Mwananyamala regional referral hospitals. The study included 180 caregivers whose children were admitted to three regional referral hospitals in Dar es Salaam; most caregivers were female, with a median age of 28 ± 9 years (range, 20–52 years). These findings are comparable with the study that was done by Atnafu et al(7). Most caregivers had secondary school education, and most were married and self-employed. These findings are comparable with the same study that was done by Atnafu et al(7).

The study included 180 children who were admitted with diarrhoea, and the majority of the children were male, aged between 7 and 23 months; the median age of the children was 14 months (range, 3–56 months). These findings are comparable with the study done by Karim et al(11) and are also the same as the study done by Atnafu et al(7).

The study found that more than 83.3% of the caregivers gave their children a 10- to 14-day course of zinc treatment; this is comparable with the study done by Karim et al(11). Also, this is similar to the study that was done in Mali, which found that more than 89% of the caregivers adhered to zinc supplementation(12). Higher adherence to zinc supplementation is attributed to the instructions given to caregivers on its use; about 95% of caregivers were given instructions on how to use zinc.

The study also found that majority of the caregivers were adherent to 10 days regimen of administration of zinc, this can be attributed due to the dosage that is given in most hospitals covers the 10 days duration, but also easy to follow the shorter duration regimen than longer duration regimen, based on the study the cause of non-adherent to zinc was caused by the parents assuming that the child was well recovered this is similar to the study that was done by Karim et al(11). Therefore, child improvement is one of the major causes of non-adherence to zinc supplementation.

The study found that most of the children were not underweight or stunted; the majority had normal weight for height and height for age, whereby only 8.9% of the children were underweight. Also, in the 60-period follow-up, the results showed that the majority of the children had normal weight for their height; this is contrast to the study that was done by Kabir et al(13), in Tanzania the low prevalence of malnutrition are attributed by different intervention that has been put in place by the

government among the children under five such as Integrated Management of Acute Malnutrition (IMAM), whereby The Ministry of Health has integrated the screening, prevention, and treatment of severe wasting directly into routine healthcare services across local government authorities, therefore these intervention has helped to reduce the prevalence of diarrhoea among children under five.

Regarding water status, the majority of the families have access to safe water, this is similar to the study done by Bennion et al(14) Most families have water sources near their homes. Good water status has been shown to reduce the prevalence of diarrhoea this is reported in a study done by Wolf et al(15) This showed a lower prevalence of diarrhoea in families with good water status.

Regarding the sanitation status, this study found that the majority of families about 78.9% have good sanitation status, whereby the majority have access to safe toilets and properly dispose of child waste; this is similar to the same study by Wolf et al(15) which showed that good sanitation and proper disposal of child waste help to reduce diarrhoea by risk by 47%(15).

This study showed that most families have good hygiene status: about 78.9% of families wash their hands and have access to water to clean their hands. Good hygiene practices have been shown to reduce the diarrhoea, this is similar to the study that was done by Wolf et al(15) Therefore, this showed that practicing good hand hygiene impacts the prevalence of diarrhoea.

The majority of the children returned to their normal health status, as before the diarrhoea episodes, this is in contrast to the study that was done by Kabir et al(13). The discrepancy is attributed to greater adherence to zinc supplementation among caregivers in this study. The study showed that diarrhoea was the leading cause of readmission, followed by respiratory disease, these results are similar to the study that was done by Kabir et al(13) The number of children who died was 3(1.7%), and most of the deaths occurred within the first 30 days after discharge, which is close to the study that was done by Kabir et al(13). These findings need to emphasize the close monitoring of the children one month after discharge because most of the deaths occurred during this period.

This study also showed that the recurrence rate of diarrhoea after hospital discharge was about 21.5%, and diarrhoea was the leading cause of readmission. The low recurrence of diarrhoea may be attributed to good zinc adherence among caregivers; higher recurrence was mostly in the first

7 days following discharge, similar to the study by Kabir et al (13). Therefore, much emphasis and monitoring need to be placed on children after discharge from hospitals.

Limitations of the study

Caregivers' failure to recall adherence to medications and recurrence of diarrhoea limited the availability of clear data on adherence to medications. The short follow-up period also limited the ability to capture growth outcomes associated with the long-term effects of diarrhoea, and loss to follow-up further limited data on children's growth outcomes.

Conclusion

The study showed that most children experienced favorable outcomes within 60 days after discharge, and caregiver adherence to zinc supplementation was high, with most caregivers completing the recommended 10–14-day course. This high adherence contributed to the good recovery among the children.

Most of the children had normal nutritional status at admission and during 60 days of follow-up, with low proportions of underweight and stunted children. WASH status was good among households, with most families reporting access to safe water, improved sanitation facilities, and good hand hygiene practices. However, diarrhea remained the leading cause of readmission, with deaths occurring within the first month after discharge, highlighting that the post-discharge period remains a vulnerable time for children recovering from diarrhea.

Conduct longer-term follow-up studies. Follow children for 6–12 months after discharge to better understand the long-term effects of hospitalization for diarrhea on growth, nutrition, and survival.

Abbreviations

HAZ	Height-for-age Z-score
MUHAS	Muhimbili University of Health and Allied Sciences
ORS	Oral Rehydration Solution
RRH	Regional Referral Hospital

SPSS	Statistical Package for Social Sciences
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization
WHZ	Weight-for-height Z-score

Declarations

Ethics approval and consent to participate

The Institutional Review Board of Muhimbili University of Health and Allied Sciences provided ethical approval. The hospital administration provided permission letters to conduct data collection at each hospital, and nurses from each hospital supported data collection. Informed consent was obtained from all caregivers of the children included in the study. The purpose, procedures, potential risks, and benefits of the study were clearly explained, and participation was entirely voluntary. Caregivers who refused to participate or withdraw were assured that their refusal would not affect the quality of care their children receive. The study did not involve any invasive procedures or cause physical harm to the participants. To ensure confidentiality, we conducted one-to-one interviews, and all data, interview forms, and checklists were securely stored and accessed only by the research team.

Consent for publication

Not applicable

Availability of data and materials

The datasets generated and analyzed in the study are available at <https://doi.org/10.5281/zenodo.22149686>

Competing interests

All authors declare no competing interests

Funding

No funding was received for this study; the researchers covered all costs.

Authors contributions

RM conceived the research idea, developed the study proposal, designed the methods, conducted the data collection, management, and analysis, and wrote the first draft of the manuscript. KM supervised all steps from study title development to data analysis, provided input on data analysis and interpretation, and approved the final manuscript. All authors read and approved the final manuscript.

Acknowledgements

We would like to give special thanks to our supervisor, all caregivers who voluntarily participated in this study, the Department of Pediatric and Child Health, MUHAS, and the administration staff of Amana, Mwananyamala, and Temeke RRH, nurses, clinicians, and support staff of the hospital, for their cooperation and for facilitating data collection.

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