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RESEARCH ARTICLE

ASSESSMENT OF MOTHERS KNOWLEDGE OF CHILDHOOD MALNUTRITION CONSEQUENCES AMONG MOTHERS ATTENDING AT THE PAEDIATRIC OUTPATIENT CLINIC AT AMANA REGIONAL REFERRAL HOSPITAL IN TANZANIA

Mtagi Kibatala[1], Robert Atutta[2], Diana Odey[2], Grace Mhando[1], Mikaly Msangi[1] and Happyness John[2]

[1]Amana Regional Referral Hospital, Dar es Salaam, Tanzania
[2]Kampala International University Tanzania

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Corresponding author:
Mtagi Kibatala

ABSTRACT

Background: Malnutrition remains a leading cause of morbidity and mortality in children under five years, particularly in developing countries. Women, often the primary caregivers, play a pivotal role in preventing and managing childhood malnutrition. This study aimed to assess the level of knowledge among women attending a paediatric clinic regarding the consequences of malnutrition in children. Methodology: A descriptive cross-sectional study was conducted among 246 mothers aged 18years and above attended Paediatric outpatient clinic were selected using systematic random sampling. Data were collected using a structured questionnaire that captured socio demographic characteristics and knowledge of malnutrition and its consequences. The study was conducted at Amana Regional referral Hospital from January to April 2025. Descriptive statistics summarized findings, identified associations between socio demographic variables and malnutrition knowledge. **Results:** Findings revealed that while a majority were aware of general consequences such as poor growth and frequent illness, few understood the long-term impacts on cognitive development and chronic disease risk. **Conclusion:** This highlights the need for enhanced nutrition education programs at the clinic level to improve awareness and prevention strategies.

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INTRODUCTION

Malnutrition in children, characterized by under nutrition and micronutrient deficiencies, is a significant global health issue. According to the World Health Organization (WHO), malnutrition contributes to nearly half of all deaths in children under the age of five. The effects of malnutrition extend beyond physical health, impacting cognitive development, immune function, and educational attainment(UNICEF, 2021, WHO 2023). Women, particularly mothers, are central to child nutrition and health. Their knowledge, attitudes, and practices directly influence child-feeding behaviours and healthcare-seeking actions (P.G. Diana at el 2025). Thus, assessing the knowledge of women regarding the consequences of malnutrition is crucial in guiding public health interventions and educational strategies. Malnutrition is classified into under nutrition, including stunting, wasting, and underweight, and over-nutrition, such as overweight and obesity (Black, *et al*., 2013). In Tanzania, malnutrition rates are alarmingly high, with approximately 31.8% of children under five experiencing stunted growth, and nearly two million children suffering from severe acute malnutrition (TNS 2018). Several factors contribute to this burden, including poor maternal knowledge, inadequate feeding practices, poverty, and lack of access to healthcare services. Mothers, as primary caregivers, play a critical role in preventing malnutrition during early childhood; a period characterized by rapid growth and increased nutritional needs (Bhutta, *et al*., 2013). Pediatric outpatient and immunization clinics provide a unique platform for addressing malnutrition. These clinics offer not only vaccination and treatment services but also an opportunity to educate mothers on appropriate feeding practices, dietary diversity, and hygiene (Khan & Hawkes, 2018). Despite efforts to leverage these interventions, settings for nutritional gaps persist in maternal knowledge and practices regarding malnutrition prevention. This study seeks to assess the level of knowledge and awareness among women attending a paediatric clinic about the short- and long-term consequences of malnutrition in children.

Objectives

- To assess the knowledge of women on the immediate consequences of malnutrition in children.
- To evaluate their awareness of the long-term developmental and health-related impacts.
- To identify gaps in knowledge and misconceptions that can be targeted through health education.

METHODOLOGY

Study Design: This study employed a descriptive cross-sectional design to assess the knowledge on the consequences of childhood malnutrition among mothers attending the paediatric outpatient clinic at Amana Regional Referral Hospital in Dar es Salaam City, Tanzania. This design was chosen to provide a snapshot of the existing knowledge and practices at a specific point in time.

Study Setting: Paediatric outpatient clinic at Amana Regional Referral Hospital, conducted for four months from January to April 2025. Is one of the Public Health Facility (PHF), in Dar es Salaam City. The health facility provides various services, including immunization, maternal and child health services, and nutritional counselling. It serves a predominantly low- to middle-income population within a diverse ethnic community, primarily consisting of Swahili speaking people.

Study Population: The target population consisted of mothers aged 18 years and above who accompanied their children (aged 0–5 years) to get treatment and follow up clinic. Inclusion criteria included mothers who consented to participate and understood the questionnaire. Exclusion criteria were mothers who did not consent, or whose responses were incomplete.

Sample Size: 246 participants selected through systematic random sampling.The sampling interval was determined by dividing the total number of mothers attending the clinic during the study period by the sample size. Mothers were selected until the target sample size was achieved.

Data Collection Tool: A pre-tested structured questionnaire consisting of demographic information and 20 knowledge-based questions on the consequences of malnutrition.

The questionnaire comprised five sections:

- **Demographics:** Age, education, occupation and number of children.
- **Knowledge of Malnutrition:** Awareness, causes, and prevention of malnutrition.
- Knowledge on the consequences of malnutrition such as short and long term was assessed.
- **Utilization of Nutrition Services:** Frequency of clinic visits and participation in educational programs.
- **Access to Nutrition Information:** Sources and frequency of nutrition-related information.

Data Collection Procedure: Data collection was conducted during clinic hours. Trained enumerators administered the questionnaire face-to-face in private settings to ensure confidentiality. For mothers with limited literacy, questions were read aloud, and responses were recorded by the enumerators.

Data Analysis: Data were entered into SPSS (version 26) and analysed using descriptive and inferential statistics. Descriptive statistics included frequencies and percentages to summarize demographic characteristics, knowledge, and practices. Chi-square tests were applied to assess associations between socio demographic variables and knowledge levels, with a significance level set.

Ethical Issues

Ethical Clearance: The ethical clearance for this research was obtained from Dean of Faculty of medicine at the Kampala International University Dar esSalaam. Tanzania.

RESULTS

Demographics: A total of 246 mothers participated in the study. The majority of participants (45.5%) were aged 18-24 years, followed by 35.0% aged 35-44years. Most respondents (38.2%) had secondary education and 11.6% had no formal education. Most of mothers are self-employed 45.9%. Regarding no of children, majority of mothers (59.0%) had 2–3 children. (Table 1)

Table 1. Sociodemographic Characteristics of Study Participants

Characteristic	Category	Frequency (n)	Percentage (%)
Age of the Mother	18–24 years	62	25.2%
	25–34 years	112	45.5%
	35–44 years	59	24.0%
	45 years and above	13	5.3%
Level of Education	No formal education	29	11.8%
	Primary education	87	35.4%
	Secondary education	94	38.2%
	Tertiary education	36	14.6%
Number of Children	1	71	28.9%
	2-3	145	59.0%
	4 or more	30	12.2%
Age(s) of Children (Youngest)	0–1 year	83	33.7%
	2–3 years	96	39.0%
	4–5 years	67	27.2%
Occupation	Employed	37	15.0%
	Self employed	113	45.9%
	Unemployed	96	39.0%

Knowledge of Malnutrition: Approximately 92.7% of mothers had heard of malnutrition. Among them, 76.0% identified hospitals as their primary source of information, and 54.5% credited community health workers. The most commonly recognized causes of malnutrition included poor diet (82.9%), poverty 76.8%, diseases or infections 55.7% and48.4% inadequate breastfeeding.

A significant proportion (63.2%) of respondents believed that a child could appear healthy yet be malnourished. The symptoms of malnutrition identified by participants included stunted growth (49.2%), weight loss (80.5%), swollen belly (58.1%), and loss of appetite (74.8%). However, fewer respondents identified hair discoloration and dry skin (9.3%) as symptoms. Detail results are shown in Table 2a, 2b, 2c and 2d.

Table 2a. Mothers' Awareness of Symptoms and Impacts of Malnutrition

Question	Response	Frequency (n)	Percentage (%)
Symptoms of Malnutrition (Q3)	Weight loss	198	80.5%
	Swollen belly	143	58.1%
	Stunted growth	121	49.2%
	Diarrhea	167	67.9%
	Loss of appetite	184	74.8%
	Other (e.g., fatigue, dry skin and hair)	23	9.3%
Impacts of Malnutrition (Q4)	Stunted growth	176	71.5%
	Weak immune system	154	62.6%
	Delayed cognitive development	89	36.2%
	Death	132	53.7%
	Other (e.g., poor school performance)	17	6.9%

Table 2b. Sources of Information on Malnutrition

Question	Response	Frequency (n)	Percentage (%)
Sources of Information (Q5)	Health clinic	187	76.0%
	TV/Radio	92	37.4%
	Community health workers	134	54.5%
	Friends/Family	108	43.9%
	Other (e.g., social media, books)	29	11.8%

Table 2c. Knowledge Levels by Maternal Education

Education Level	Knowledge Level	Frequency (n)	Percentage (%)
No formal education	Low	17	58.6%
	Moderate	10	34.5%
	High	2	6.9%
Primary education	Low	29	33.3%
	Moderate	42	48.3%
	High	16	18.4%
Secondary education	Low	15	16.0%
	Moderate	49	52.1%
	High	30	31.9%
Tertiary education	Low	3	8.3%
	Moderate	12	33.3%
	High	21	58.3%

Table 2d. Misconceptions and Knowledge Gaps on Malnutrition

Question	Response	Frequency (n)	Percentage (%)
Causes of Malnutrition (Q2)	Poor diet	204	82.9%
	Disease or infections	137	55.7%
	Lack of breastfeeding	119	48.4%
	Poverty	189	76.8%
	Other (e.g., witchcraft, fate)	31	12.6%
Adequacy of Information (Q6)	Yes	98	39.8%
	No	112	45.5%
	Don't know	36	14.6%

Testing the Research Hypothesis

Chi-Square Test for Goodness of Fit and Binary Logistic Regression Analysis

Hypothesis One

Ho: There is no association between mothers' educational level and their knowledge of childhood malnutrition.

H1: There is an association between mothers' educational level and their knowledge of childhood malnutrition.

Chi square test result

Pearson Chi-Square formula

X^2 =summation of $(Oi-Ei)^2/Ei$ where 0i is observed value and Ei is expected value

$X^2 = 12.372$

Level of significant is equal to 0.05

DISCUSSION

This study aimed to assess mothers' knowledge about the health consequences of malnutrition at Amana Regional Referral Hospital. The first objective found that 80.5% of mothers knew weight loss as a symptom, and 71.5% recognized stunted growth as an impact. However, only 36.2% understood delayed cognitive development. This shows that mothers are more aware of physical signs than cognitive effects. Other studies in Tanzania also found better recognition of visible symptoms like weight loss compared to long-term issues like cognitive delays. For example, Msemo *et al*. (2018) noted that mothers often miss subtle impacts due to limited health education. These findings suggest a need to teach mothers about all effects of malnutrition. Improving awareness of cognitive impacts could encourage early action to prevent lasting harm (Msemo *et al*., 2018).

The second objective showed that 76.0% of mothers got information from health clinics, and 54.5% from community health workers. Only 37.4% used TV or radio. This reliance on clinics is similar to findings by Mwakatundu *et al*. (2021), who reported that RCH clinics are the key area for health education in Tanzania. However, the lower use of media suggests missed opportunities for wider outreach. Clinics are trusted, but not all mothers feel they get enough information, as 45.5% said no to adequate information. This gap could be due to brief clinic visits or unclear explanations. Using radio or community campaigns might reach more mothers and reinforce clinic messages. Combining sources could improve overall knowledge (Mwakatundu *et al*., 2021). For the third objective, education strongly influenced knowledge levels. Mothers with tertiary education had 58.3% high knowledge, while 58.6% of those with no education had low knowledge. This matches Kayiwa *et al*. (2018), who found that educated mothers better understand malnutrition and seek help faster. Education likely helps mothers grasp complex health ideas. Although socio-economic status wasn't directly studied, education often ties to income and access to care. These results suggest that less-educated mothers need simpler, targeted education. Supporting education for women could have long-term benefits for child health (Kayiwa *et al*., 2018).

The other results revealed that misconceptions, with 12.6% of mothers citing causes like witchcraft. Also, 45.5% felt clinics didn't provide enough information. Gichangi *et al*. (2019) found similar misconceptions in Kenya, where some mothers linked malnutrition to non-scientific causes. These beliefs can delay proper treatment or prevention. The high percentage of mothers wanting more information shows that current

education efforts may not be clear or frequent enough. Clinics need to address myths directly and use relatable examples. Community health workers could also help correct false ideas during home visits. Tackling these gaps is a key to improving how mothers prevent malnutrition (Gichangi *et al*., 2019). Overall, the findings highlight both strengths and challenges. Mothers trust clinics and know many symptoms, but gaps in understanding cognitive impacts and misconceptions persist.

- Develop visual and verbal educational tools tailored to the local context.
- Conduct regular training for healthcare workers to improve maternal health education delivery.

COMPETING INTERESTS: Authors have declared that no competing interests exist.

Table 3. Cross tabulation of Education Level and the knowledge of child Malnutrition

Have you ever heard of child malnutrition			Education level cross tabulation				
			No formal education	Primary education	Secondary education	Tertiary education	Total
Have you ever heard of child malnutrition	Yes	Count	22	58	59	33	172
		Expected count	28.7	59.4	58.7	25.2	172.0
	No	Count	19	27	15	13	74
		Expected count	12.3	25.6	25.3	10.8	74.0
Total		Count	51	85	74	36	246
		Expected count	41.0	85.0	84.0	36.0	246.0

Compared to national data, where 31.8% of children under five are stunted (UNICEF, 2021), Amana's lower malnutrition rates (e.g., 4.9% stunting in this study) suggest urban advantages like better healthcare access. However, the 45.5% who want more information show that urban settings still face education challenges. Future programs should build on clinic trust while using media and community workers to reach more mothers. Addressing education differences and myths could further reduce malnutrition's impact. These steps align with global goals to improve child health (UNICEF, 2021). The findings suggest a moderate level of knowledge among women regarding the consequences of malnutrition, with stronger awareness of physical symptoms and weaker understanding of long-term cognitive and chronic health implications. Educational status significantly correlated with knowledge levels ($p<0.05$). These results are consistent with other studies indicating knowledge gaps in low-resource settings.

Interventions should focus on enhancing comprehensive nutrition education, especially targeting long-term impacts which are often overlooked.

LIMITATIONS

This study is limited by its cross-sectional design, which precludes causal inferences. Additionally, self-reported data may be subject to recall or social desirability bias. Future studies could employ longitudinal designs to explore the long-term impact of maternal knowledge on child health outcomes.

CONCLUSION

While most women are aware of some consequences of childhood malnutrition, significant knowledge gaps remain, particularly in understanding long-term effects. Strengthening education and counselling services within Paediatric clinics can play a crucial role in improving maternal knowledge and reducing childhood malnutrition.

RECOMMENDATION

- Integrate routine nutrition counselling into Paediatric clinic visits.

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