ISSN No. 2321-2705 | DOI: 10.51244/IJRSI | Volume XII Issue XV November 2025 | Special Issue on Public Health

Assessment of Under-Five Malnutrition Knowledge among Mothers Attending Sinza Antenatal Clinic: A Cross-Sectional Study in Ubungo District, Dar Es Salaam, Tanzania.

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DOI: https://dx.doi.org/10.51244/IJRSI.2025.1215PH000220

Received: 23 November 2025; Accepted: 01 December 2025; Published: 12 December 2025

ABSTRACT

Background: Normal life activities necessitate a well-balanced diet and a healthy body, both of which should be developed during childhood. Malnutrition is a health problem that occurs when the body receives insufficient food nutrients. Childhood malnutrition remains a major public health challenge in Tanzania. Mothers' knowledge across specific domains such as dietary diversity, signs of malnutrition, feeding practices and prevention is critical for early detection and prevention.

Objective: To assess domain-specific knowledge of under-five malnutrition among mothers attending the Sinza antenatal clinic and to examine associations between knowledge level and socio-demographic factors.

Methods: A descriptive cross-sectional study was conducted among 103 mothers with children under five years attending Sinza antenatal clinic. A structured, pre-tested questionnaire assessed four knowledge domains: (1) definition and signs of malnutrition, (2) causes, (3) prevention and feeding practices including exclusive breastfeeding and complementary feeding timing, and (4) complications. The questionnaire comprised 10 scored items; each correct response scored 1 point for a maximum score of 10. Knowledge categories were defined a prior as high (≥75%, score ≥8), average (50–74%, score 5–7), and low. Ethical approval was obtained from the Muhimbili University of Health and Allied Sciences Institutional Ethical Board and written informed consent was obtained from all participants.

Results: The mean age of participants was 25.1 years (SD = 4.5). Overall, 65.0% of mothers scored in the high knowledge category, 11.7% in the average category, and 23.3% in the low category. Domain-specific findings included: definition and signs correctly identified by 70.9% of mothers; causes by 68.9%; prevention and feeding practices by 73.6% for exclusive breastfeeding and 84.5% for appropriate complementary feeding initiation; complications by 83.5%. Knowledge level was significantly associated with maternal age ($p = 0.000$), education level ($p = 0.002$), and number of children ($p = 0.001$).

Conclusion: Most mothers attending Sinza antenatal clinic demonstrated high overall knowledge of under-five malnutrition, but gaps remain in recognition of signs and optimal complementary feeding timing. Antenatal clinics represent an effective platform for targeted nutrition education, especially for first-time mothers and those with lower educational attainment. Integrating structured nutrition counselling into routine antenatal services could strengthen prevention and early detection of childhood malnutrition.

Keywords: Maternal knowledge; under-five malnutrition; antenatal clinic; nutrition education.

INTRODUCTION

Children are way forward of society and mothers are guardian of their future, hence parents are responsible to know and understand how to safeguard and promote their children safety and well-being by being aware on

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nutrition knowledge. Malnutrition could be a condition that develops when the body does not get the require food nutrients in their right proportions (1). Such food nutrients include minerals, vitamins, carbohydrate, proteins and fat and lipids it needs to maintain healthy tissues and organ functions. Malnutrition can even occur when an individual's diet does not provide him/her with adequate calories and proteins needed for maintenance and growth or they cannot fully utilize the food they eat because of illness (under nutrition), while those that suffer from over nutrition consumes an excessive number of calories (1,2).

Malnutrition has adverse effects on child growth and development. Some adverse consequences of malnutrition include low school performance, increased child morbidity and mortality rate and propagation of poverty at family and national level because most of the adults who are malnourished during childhood are incapable of thinking well or creating new innovations which can boost their economic status (3,4,5).

Globally approximately 162 million children under-five years old were stunted, 99 million were underweight, and 51 million were wasted. Between 8 to 11 million children under-five years of age die annually and quite 35% of those deaths were attributed to under-nutrition, these deaths were mostly preventable through economic development and public health measures translating into the unnecessary loss of about 3 million young lives a year (6,7).

In East Africa, malnutrition in children under-five years of age may be contrasted from country to country. For instance, the study done in Kenya shows that 48% of children under-five years of age were stunted, in Uganda national range is from 48% to 50% (8,9,10). Similarly, in Tanzania studies show that the prevalence range between 38%-42% (11,12).

Mothers and care givers of under-five children need to have knowledge on malnutrition in order to prevent under five from malnutrition (13,14). Studies done to assess the knowledge of mother on under-five malnutrition reported that awareness of mothers regarding nutrition of their children exists but it can be further improved with basic health education, awareness and proper counselling by the health workers (15-18).

Although national and local programs promote breastfeeding, complementary feeding and micronutrient interventions, persistent gaps in caregiver knowledge limit impact. This study addresses a gap in the literature by assessing domain-specific knowledge (definition and signs, causes, prevention and feeding practices, and complications) among mothers attending an urban antenatal clinic in Dar es Salaam and by examining socio-demographic correlates of knowledge. Understanding these patterns can inform targeted education integrated into antenatal services.

METHODS

Study design and setting

A descriptive cross-sectional study was conducted at the Sinza antenatal clinic, Sinza Hospital, Ubungo District, Dar es Salaam, Tanzania. The clinic was selected purposively due to its high daily attendance of pregnant women.

Participants and sampling

The study population comprised mothers with at least one child under five years who attended the antenatal clinic between March 8, 2021 and April 8, 2022. A consecutive convenient sampling approach was used to recruit participants who met inclusion criteria and provided written informed consent. The final sample included **103** mothers.

Sample size calculation

The minimum sample size was calculated using the standard formula for cross-sectional studies with a 95% confidence level and a margin of error of 5%, using an expected knowledge prevalence (p) of 93% from prior Tanzanian data. A 10% allowance for non-response was added, yielding a target sample of 103 participants.

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Data collection instrument and scoring

A structured questionnaire in Swahili was developed and pre-tested with 20 participants to ensure clarity and cultural appropriateness. The questionnaire included four knowledge domains: Definition and signs (3 items), Causes (2 items), Prevention and feeding practices (3 items), Complications (2 items). Each item was scored as 1 = correct or 0 = incorrect, producing a total knowledge score ranging from 0 to 10. Knowledge categories were defined as high (score ≥8), average (score 5–7), and low (score ≤4). The questionnaire also collected socio-demographic data: age, marital status, education level, employment status and number of children.

Data collection procedures

Trained research assistants administered the questionnaire in a private area of the clinic and recorded responses directly to minimize missing data. Completed questionnaires were reviewed daily for completeness.

Data management and analysis

Data were entered and analysed using IBM SPSS version 20. Descriptive statistics (frequencies, percentages, means, standard deviations) summarized participant characteristics and knowledge scores. Associations between categorical variables and knowledge categories were tested using chi-square tests. A p-value < 0.05 was considered statistically significant.

Ethical considerations

Ethical approval was obtained from the Muhimbili University of Health and Allied Sciences Institutional Review Board (reference DA 282/298/01K/13). Permission to conduct the study was granted by the District Medical Officer. Written informed consent was obtained from all participants. Confidentiality and voluntary participation were maintained throughout the study.

RESULTS

Participant characteristics

A total of 103 mothers participated. The mean age was 25.1 years (SD = 4.5). The largest age group was 20–24 years (39.8%). Most participants were married (68.0%), had primary or secondary education (76.7% combined), and were self-employed (55.3%). More than half (55.3%) had one child.

Table 1. Demographic characteristics of participants (N = 103)

Characteristic	**N**	**%**
Age 15–19	11	10.7
Age 20–24	41	39.8
Age 25–29	37	35.9
Age 30–34	10	9.7
Age 35–39	4	3.9
Marital status		
Married	70	68.0
Single	32	31.1
Divorced	1	1.0
Education level		
Primary education	41	39.8
Secondary education	38	36.9
Diploma	22	21.4
Higher education	2	1.9
Employment status		

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Employed	10	9.7
Self-employed	57	55.3
Unemployed	36	35.0
Number of child(ren)		
One child	57	55.3
Two children	23	22.3
Three children	15	14.6
Four or more children	8	7.8

Knowledge scores and domain-specific findings

The mean total knowledge score was 6.2 (SD = 0.9). Overall knowledge categories were: high 65.0% (n = 67), average 11.7% (n = 12), and low 23.3% (n = 24).

Definition and signs: 70.9% correctly identified common signs such as weight loss and thin, inelastic skin. Causes: 68.9% identified causes including poor hygiene, poverty, unsafe water, inadequate diet and infections. Prevention and feeding practices: 95.1% recognized early initiation of breastfeeding within 30 minutes of birth; 73.6% identified exclusive breastfeeding for six months as preventive; 84.5% indicated appropriate initiation of complementary feeding after six months; 85.4% cited adequate breastfeeding and nutritious food; 62.1% recognized hospitalization for severe malnutrition. Complications: 83.5% identified reduced immunity, anaemia and risk of death as complications.

Table 2. Knowledge category distribution by socio-demographic characteristics

Characteristic (p-value)	**High**	**Average**	**Low**
Age groups (p = 0.000)			
15–19 (n = 11)	8 (7.8%)	3 (2.9%)	0 (0.0%)
20–24 (n = 41)	14 (13.6%)	6 (5.8%)	21 (20.4%)
25–29 (n = 37)	2 (1.9%)	3 (2.9%)	32 (31.1%)
30–34 (n = 10)	0 (0.0%)	0 (0.0%)	10 (9.7%)
35–39 (n = 4)	0 (0.0%)	0 (0.0%)	4 (3.9%)
Education level (p = 0.002)			
Primary (n = 41)	18 (17.5%)	6 (5.8%)	17 (16.5%)
Secondary (n = 38)	6 (5.8%)	3 (2.9%)	29 (28.2%)
Diploma (n = 22)	0 (0.0%)	3 (2.9%)	19 (18.4%)
Higher (n = 2)	0 (0.0%)	0 (0.0%)	2 (1.9%)
Number of child(ren) (p = 0.001)			
One (n = 57)	23 (22.3%)	9 (8.7%)	25 (24.3%)
Two (n = 23)	1 (1.0%)	3 (2.9%)	19 (18.4%)
Three (n = 15)	0 (0.0%)	0 (0.0%)	15 (14.6%)
Four and above (n = 8)	0 (0.0%)	0 (0.0%)	8 (7.8%)

Chi-square tests indicated statistically significant associations between overall knowledge category and age ($p = 0.000$), education level ($p = 0.002$), and number of children ($p = 0.001$). Marital status and employment status were not significantly associated with knowledge level at $p < 0.05$.

DISCUSSION

This study assessed domain-specific knowledge of under-five malnutrition among mothers attending an urban antenatal clinic and identified socio-demographic correlates. The majority of mothers (65.0%) demonstrated high overall knowledge, a finding that suggests antenatal clinic attendees in this setting have substantial exposure to nutrition messages. This result is better than the findings from a study conducted in Bagalkot, India, where only 23% of mothers had good knowledge on under-five malnutrition (14). Domain analysis

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revealed strengths in awareness of prevention strategies such as early breastfeeding initiation and complementary feeding timing, and in recognizing complications such as reduced immunity and anaemia. However, nearly one-quarter of mothers had low overall knowledge, and gaps persisted in recognition of some signs and in detailed feeding practices.

The significant associations between knowledge and maternal age, education, and number of children indicate that experience and formal education contribute to better nutrition knowledge. First-time mothers and those with lower education levels are therefore priority groups for targeted counselling. Antenatal clinics provide repeated contact opportunities and are well positioned to deliver structured nutrition education that includes practical demonstrations on complementary feeding, hygiene in food preparation and recognition of early signs of malnutrition.

STRENGTHS AND LIMITATIONS

Strengths of this study include the use of a pre-tested, domain-focused questionnaire and the inclusion of a clearly defined scoring and categorization system. Limitations include the single-site design and the use of consecutive convenient sampling, which may limit generalizability. The cross-sectional design precludes causal inference between socio-demographic factors and knowledge. Social desirability bias may have influenced responses given the interviewer-administered format.

IMPLICATIONS FOR PRACTICE AND POLICY

Findings support integrating standardized nutrition counselling modules into antenatal care, with emphasis on first-time mothers and women with lower formal education. Health workers should reinforce practical skills such as preparing nutrient-dense complementary foods and hygiene practices. Programmatic monitoring should track knowledge retention and behaviour change postpartum.

CONCLUSION AND RECOMMENDATIONS

Conclusion: Most mothers attending the Sinza antenatal clinic demonstrated high knowledge of under-five malnutrition across several domains, but meaningful gaps remain among younger, less-educated and first-time mothers. Antenatal clinics are strategic venues for targeted nutrition education.

Recommendations

- Structured nutrition counselling should be integrated into routine antenatal visits, including demonstrations on complementary feeding and hygiene.
- Prioritization should be given to first-time mothers and women with lower education for intensified counselling and follow-up.
- The same study should be Conducted in larger, multi-site to assess generalizability and to evaluate the impact of antenatal nutrition interventions on maternal knowledge and child nutritional outcomes.

ACKNOWLEDGEMENTS

The author thanks the staff of Sinza antenatal clinic and all participating mothers for their cooperation. Appreciation is extended to the research assistants who collected data and to the Muhimbili University of Health and Allied Sciences Ethical Board for ethical oversight

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