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Maternal Knowledge about Severe Acute Malnutrition Under Five Years of Children at Sher E Bangla Medical College and Hospital, Barishal, Bangladesh

Mahfuja Begum[1] *, Sazia Huq[2], Sangita Rani Mitra[1] & Nazmunnahar Happy[3]

[1]*Nursing Instructor, Barishal Nursing College, Barishal, Bangladesh*
[2]*Senior Lecturer, Department of Public Health, Northern University Bangladesh, Dhaka, Bangladesh*
[3]*Lecturer, Barishal Nursing College, Barishal, Bangladesh*

***Corresponding Author**:
Mahfuja Begum; Nursing Instructor, Barishal Nursing College, Barishal, Bangladesh;
Mail: mahfujarina76@gmail.com

Abstract

Malnutrition remains a critical public health issue, particularly in low- and middle-income countries (LMICs), contributing to over 50% of under-five mortality. Severe acute malnutrition (SAM) affects millions of children, leading to life-threatening complications and long-term developmental impairments. Maternal knowledge plays a pivotal role in preventing and managing SAM, yet gaps persist in awareness and healthcare access. This study assessed mothers' knowledge of SAM at Sher-e-Bangla Medical College Hospital (SBMCH), Barishal, Bangladesh. A descriptive cross-sectional study was conducted among 60 mothers of SAM-affected under-five children admitted to SBMCH's Nutrition Corner. Data were collected via semi-structured questionnaires and analyzed using SPSS version 16.0. Descriptive statistics and chi-square tests were employed to examine associations between socio-demographic factors and maternal knowledge. Ethical clearance and informed consent were obtained. The majority of mothers (57%) had primary education, while 31.7% of fathers were illiterate. Only 61.7% recognized a balanced diet combined with breastfeeding as optimal supplementary food, and 28.3% consistently practiced hand washing before food preparation. Despite 93.3% living near health centers, only 5% attended medical checkups. Television was the primary information source (56.7%), yet 38.3% had never heard about malnutrition. Significant associations were found between maternal knowledge and age (p= .002), education (p = .010), paternal education (p = .004), and income (p = .041). Maternal knowledge on SAM prevention is inadequate, influenced by education, income, and healthcare access. Targeted interventions, including community-based education and media campaigns, are urgently needed to improve nutritional practices and reduce SAM prevalence in rural Bangladesh.

Keywords:

Severe acute malnutrition (SAM), maternal knowledge, under-five children, Bangladesh, nutritional awareness, healthcare access.

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Introduction:

Malnutrition remains a major public health concern with significant developmental, health, and socio-economic consequences, particularly in low- and middle-income countries (LMICs) [1]. Globally, malnutrition affects millions of children under five years of age, with developing nations bearing the highest burden. Approximately 41% of under-five children in these regions suffer from chronic malnutrition, translating to an estimated 230 million children [2]. Malnutrition contributes to more than 50% of under-five mortality in developing countries, exacerbated by factors such as food insecurity, absolute poverty, poor maternal nutrition, and lack of awareness [3].

Severe acute malnutrition (SAM), defined as a weight-for-height measurement below 70% of the median, or three standard deviations below the mean National Center for Health Statistics (NCHS) reference values, is a critical manifestation of malnutrition [4]. Additional diagnostic criteria include bilateral pitting edema of nutritional origin or a mid-upper arm circumference (MUAC) of less than 110 mm (4). SAM affects approximately 13 million children under five worldwide and is associated with 1 to 2 million preventable child deaths annually [4]. Children with SAM face life-threatening complications such as hypoglycemia, hypothermia, severe infections, and electrolyte imbalances, necessitating specialized medical care [4]. The long-term consequences of SAM extend beyond survival, impairing physical growth, cognitive development, and immune function, thereby diminishing future productivity and quality of life [5,6].

Mothers play a pivotal role in preventing and managing malnutrition in children, as they are the primary caregivers responsible for feeding practices, hygiene, and overall nutritional well-being. Adequate maternal knowledge regarding exclusive breastfeeding, appropriate weaning foods, dietary diversity, and food hygiene is crucial in mitigating SAM [5]. However, in many rural settings, including Bangladesh, low literacy rates and limited access to health education contribute to poor nutritional awareness among mothers [6]. This knowledge gap perpetuates malnutrition cycles, increasing children's vulnerability to infections and developmental delays.

The consequences of SAM are further compounded by high case fatality rates (CFRs), particularly in hospital settings where inappropriate management leads to mortality rates as high as 20–30% [7], far exceeding the World Health Organization (WHO) threshold of 5% [8]. Studies in Africa indicate that malnourished children with bacteremia experience significantly higher CFRs compared to their well-nourished counterparts [9]. Malnutrition-induced immunodeficiency, termed nutritionally acquired immunodeficiency syndrome (NAIDS), exacerbates susceptibility to infections due to impaired gut barrier function, reduced immunoglobulin A (IgA) secretion, and compromised T-cell responses [10]. Additionally, protein-energy malnutrition in early life leads to thymic atrophy, long-term immune suppression, and increased vulnerability to respiratory infections, diarrheal diseases, and vaccine-preventable illnesses [11].

Bangladesh faces a severe malnutrition crisis, with 48.6% of under-five children stunted, 13.3% wasted, and 37.4% underweight [12]. SAM contributes to nearly 45% of under-five deaths globally, with over 90% of affected children residing in Asia and Africa [13]. In Bangladesh, one in 15 children dies before reaching their fifth birthday, and approximately 250,000 infants die within their first month of life annually [12]. These statistics underscore the urgent need for targeted interventions to improve maternal knowledge and nutritional practices.

Given that children represent the future of society, safeguarding their health and nutrition is paramount for national development. Preventing SAM through maternal education can significantly reduce infant and child mortality while fostering long-term physical and cognitive development. This study aims to assess the knowledge of mothers regarding SAM at the Nutrition Corner of Sher-e-Bangla Medical College Hospital (SBMCH), Barishal, Bangladesh. The findings will provide critical data for policymakers and health authorities to design effective awareness campaigns, ultimately reducing the burden of SAM in rural communities.

Methodology:

This study employed a descriptive cross-sectional design to assess mothers' knowledge about severe acute malnutrition (SAM) among under-five children admitted to the Nutrition Corner of Sher-e-Bangla Medical College Hospital (SBMCH), Barishal. The study population included all SAM-affected under-five children in Barishal district, though due to logistical constraints, sampling was limited to hospitalized cases at SBMCH. Using the formula for estimating a single proportion with 95% confidence level ($z=1.96$), 4% prevalence of severe wasting ($p=0.04$ from BDHS 2011), and 5% margin of error ($d=0.05$), the calculated sample size was 59, which was rounded up to 60 participants through purposive sampling of mothers meeting inclusion criteria.

The study was conducted at SBMCH's Nutrition Corner, a tertiary care facility within Sher-e-Bangla Medical College - a 1000-bed government hospital affiliated with Dhaka University that offers MBBS degrees and postgraduate training across its 33-hectare campus. Data collection occurred over four months (January to April 2015) using pre-tested, semi-structured questionnaires administered through face-to-face interviews with mothers of SAM-affected under-five children, supplemented by case sheet reviews. Inclusion criteria focused on mothers of hospitalized SAM patients who consented to participate, while excluding unwilling mothers or those with physical/mental communication barriers.

All collected data underwent rigorous checking for completeness and consistency before being cleaned, coded, and analyzed using SPSS version 16.0. Descriptive statistics including frequencies, percentages, means and standard deviations were used to summarize the findings, while chi-square tests helped determine associations between categorical variables. This methodological approach ensured systematic assessment of maternal knowledge about SAM while maintaining scientific rigor in data collection and analysis within the hospital's nutrition rehabilitation setting. Prior to commencing the study, ethical clearance was granted

from the Institutional Review Board (IRB) of SBMCH. In addition, participants' written and verbal consent was sought before collecting data after explaining the purpose of the study. The questionnaire was translated into Bengali for better understanding by participants to prevent data errors.

Results:

This section provides the findings of this study in detail, which were collected from the study subjects through the application of the questionnaire.

Table 1 presents the socio-demographic characteristics of the respondents. The majority of the children were under six years old (70%), with a mean age of 4.96 ± 3.90 years. Most mothers were between 21–25 years (40%), followed by 38.3% who were under 20, with a mean age of 22.67 ± 3.66 years. The overwhelming majority of respondents were Muslim (93.3%), and only 6.7% were Hindu. In terms of educational background, 57% of mothers had primary education, while 18% were illiterate. A large proportion (96.7%) of the mothers were housewives. Regarding fathers' education, 35% had completed SSC, 31.7% were illiterate, and 21.7% had primary education. The average monthly family income was BDT 13,650 ± 3,321, with 50% earning between BDT 10,000–15,000. Most respondents (71.7%) lived in rural areas, and 70% resided in houses made of wood and tin. The primary source of drinking water was tube wells, reported by 98.3% of the respondents, while only 1.7% used pond or river water.

Table 1: Distribution of respondents based on the socio-demographic profile

Variables	Categories	n	%	Mean±SD
Children Age(in months)	<6	42	70.0	4.96 ± 3.903
	7-12	16	26.7	
	13-18	1	1.7	
	>19	1	1.7	
Mothers' age (years)	<20	23	38.3	22.67 ± 3.66
	21-25	24	40	
	26-30	12	20	
	>31	1	1.7	
Religion	Islam	56	93.3	
	Hindu	4	6.7	
Mothers' Education Level	Illiterate	11	18	
	Primary	34	57	
	SSC	14	23	
	HSC	1	2	
Mothers' Occupation	House Wife	58	96.7	
	Business	2	3.3	

Fathers' Education Level	Illiterate	19	31.7	
	Primary	13	21.7	
	SSC	21	35	
	HSC	7	11.6	
Family Monthly income (in Bangladeshi Taka)	<10,000	17	35	13,650 ± 3,321
	10,000-15,000	30	50	
	>15,000	13	25	
Residential Area	Rural area	43	71.7	
	Urban area	17	28.3	
Types of Houses	Wood and Tin	42	70	
	Semi building	13	21	
	Building	4	7	
	Earth building	1	2	
Source of Drinking Water	Tube well	58	98.3	
	Pond/River	2	1.7	

Table 2 highlights the breastfeeding practices and knowledge of supplementary food among the respondents. It shows that 40% of mothers were still breastfeeding their children, while a larger portion (60%) had stopped breastfeeding. Regarding knowledge of supplementary food, 61.7% of respondents identified the appropriate form as a combination of breastfeeding with khichuri and a balanced diet, whereas 38.3% considered only khichuri as supplementary food.

Table 2: Breastfeeding Status and Knowledge about Supplementary Food (N = 60)

Variables	**Frequency**	**Percentage (%)**
Breastfeeding Status		
Still breastfeeding	24	40.0
Not breastfeeding	36	60.0
Total	60	100.0
Knowledge of Supplementary Food		
Only khichuri	23	38.3
Breastfeeding with khichuri & diet	37	61.7
Total	60	100.0

Table 3 presents the respondents' awareness of nutritional food and hygiene practices. An overwhelming majority (91.7%) recognized family diet as appropriate nutritional food for children under five, while only 8.3% believed khichuri alone was sufficient. In terms of hygiene, only 28.3% of respondents reported always washing their hands with soap before preparing food, whereas 50% did so sometimes, and 21.7% never followed this practice.

Table 3: Nutritional Awareness and Hygiene Practices (N = 60)

Variables	Frequency	Percentage (%)
Knowledge about nutritional food		
Khichuri	5	8.3
Family diet	55	91.7
Hand washing with soap before preparing food		
Always	17	28.3
Sometimes	30	50.0
Never	13	21.7

Table 4 explores the respondents' access to health services and their awareness of malnutrition. It was found that 21.7% of the respondents had recent hospital admissions for reasons other than Severe Acute Malnutrition (SAM), while 78.3% did not. Despite the majority (93.3%) living within a reachable distance of a health center, only 5% had attended a medical checkup, highlighting a significant gap in utilizing available health services. Regarding malnutrition awareness, 60% of respondents had knowledge about malnutrition, and 61.7% recognized a balanced diet as a preventive measure, although 36.7% admitted they did not know how to prevent it. Television was the most common source of information (56.7%), while 38.3% had never heard about malnutrition through any medium.

Table 4: Health Services Access and Malnutrition Awareness (N = 60)

Variables	Frequency	Percentage (%)
Recent hospital admission for reasons other than SAM		
Yes	13	21.7
No	47	78.3
Attended health center for medical checkup		
Yes	3	5.0
No	57	95.0
Distance of health center from residence		
Near or long distance	56	93.3
Not reachable	4	6.7
Knowledge about malnutrition		
Yes	36	60.0
No	24	40.0
Knowledge about prevention of malnutrition		
Balanced diet	37	61.7
Others	1	1.7
Not known	22	36.7
Source of information about malnutrition (Multiple responses)		
TV	34	56.7

Variables	Frequency	Percentage (%)
Poster	2	3.3
Peer group	4	6.7
Mother's group meeting	1	1.7
Not heard	23	38.3

Table 5 explores the association between maternal knowledge and various socio-demographic characteristics. Statistically significant associations were observed with mother's age (p = .002), mother's education level (p = .010), father's education level (p = .004), and family monthly income (p = .041), indicating that younger mothers, those with higher education, and families with better income and paternal education tend to possess better knowledge. However, variables such as children's age (p = 1.008), religion (p = .254), mother's occupation (p = .965), type of residence (p = .229), housing type (p = .923), and source of drinking water (p = .710) showed no significant association with maternal knowledge.

Table 5: Association between maternal knowledge and their socio-demographic profile

Variables	Categories	n	%	Mean±SD	P Value
Children Age (years)	<6	42	70.0	4.96 ± 3.903	1.008
	7-12	16	26.7		
	13-18	1	1.7		
	>19	1	1.7		
Mothers' age (years)	<20	23	38.3	22.67 ± 3.66	**.002**
	21-25	24	40		
	26-30	12	20		
	>31	1	1.7		
Religion	Islam	56	93.3		.254
	Hindu	4	6.7		
Mothers' Education Level	Illiterate	11	18		**.010**
	Primary	34	57		
	SSC	14	23		
	HSC	1	2		
Mothers 'Occupation	House Wife	58	96.7		.965
	Business	2	3.3		
Fathers 'Education Level	Illiterate	19	31.7		**.004**
	Primary	13	21.7		
	SSC	21	35		
	HSC	7	11.6		

Family Monthly income (in Bangladeshi Taka)	<10,000	17	35	13,650 ± 3,321	**.041**
	10,000-15,000	30	50		
	>15,000	13	25		
Residential Area	Rural area	43	71.7		.229
	Urban area	17	28.3		
Types of Houses	Wood and Tin	42	70		.923
	Semi building	13	21		
	Building	4	7		
	Earth building	1	2		
Source of Drinking Water	Tube well	58	98.3		.710
	Pond/River	2	1.7		

Discussion:

The study, "Assessment of Maternal Knowledge About Severe Acute Malnutrition in Children Under Five Years at Sher-E-Bangla Medical College Hospital, Barishal, Bangladesh," reveals critical insights into maternal knowledge and practices concerning under 5 years of child nutrition.

Breastfeeding Practices and Knowledge of Supplementary Feeding

One of the key findings was that 60% of mothers had discontinued breastfeeding, while only 40% were still breastfeeding their children. This early cessation of breastfeeding is concerning, as the World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of life, followed by continued breastfeeding alongside complementary feeding up to two years or beyond [14]. The high discontinuation rate in this study aligns with findings from other low-resource settings, where factors such as maternal employment, lack of awareness, cultural beliefs, and insufficient lactation support contribute to early weaning [15].

Additionally, the study found that 61.7% of mothers correctly identified a combination of breastfeeding, khichuri, and a balanced diet as the appropriate supplementary feeding method, while 38.3% believed that khichuri alone was sufficient. This indicates a moderate level of awareness, but a significant proportion still lacks comprehensive knowledge about optimal nutrition. Similar studies in Bangladesh [16]and Nepal [17] have also reported gaps in maternal knowledge regarding complementary feeding. While khichuri is a culturally appropriate and energy-dense food, it may lack sufficient micronutrients if not supplemented with vegetables, fruits, and protein sources [20]. This highlights the need for nutrition education programs that emphasize dietary diversity alongside traditional feeding practices.

Awareness of Nutritional Food and Hygiene Practices

The study further explored maternal awareness of nutritional food and hygiene practices, revealing that 91.7% of mothers recognized a family diet as appropriate for children under five, while only 8.3% believed khichuri alone was sufficient. This suggests that most mothers understand the importance of varied diets, but practical implementation may be hindered by economic constraints, food insecurity, or lack of access to diverse foods [19].

However, hygiene practices were found to be suboptimal. Only 28.3% of mothers reported always washing their hands with soap before food preparation, while 50% did so sometimes, and 21.7% never followed this practice. Poor hygiene is a major risk factor for diarrheal diseases and malnutrition, as contaminated food and water contribute to nutrient malabsorption and infections [20]. Studies in similar settings have shown that hygiene education, along with improved access to clean water and sanitation, significantly reduces malnutrition rates [21]. Thus, integrating handwashing promotion into maternal and child health programs is essential.

Access to Health Services and Awareness of Malnutrition

Despite 93.3% of respondents living within reachable distance of a health center, only 5% had attended a medical checkup, indicating a significant underutilization of health services. This finding is consistent with other studies in Bangladesh, where financial constraints, lack of perceived need, and cultural barriers prevent mothers from seeking healthcare [22]. Additionally, 78.3% of respondents had no recent hospital admissions, suggesting that many mothers may not recognize early signs of malnutrition or seek medical help until severe complications arise.

Regarding malnutrition awareness, 60% of mothers had some knowledge, and 61.7% recognized a balanced diet as a preventive measure. However, 36.7% admitted did not know how to prevent malnutrition, indicating gaps in nutrition education. The primary source of information was television (56.7%), while 38.3% had never heard about malnutrition through any medium. This underscores the need for community-based nutrition campaigns using multiple communication channels, including radio, mobile health messages, and community health workers [23].

Association Between Maternal Knowledge and Socio-Demographic Factors

The study identified significant associations between maternal knowledge and socio-demographic factors. Mother's age ($p = .002$), education level ($p = .010$), father's education ($p = .004$), and family income ($p = .041$) were strongly linked to better nutritional knowledge. This aligns with global evidence that educated mothers and higher household income correlate with improved child feeding practices [24]. Educated mothers are more likely to access health information, follow medical advice, and adopt better feeding practices [25].

However, children's age, religion, mother's occupation, residence type, housing, and water source showed no significant association with knowledge levels. This suggests that education and economic status are stronger determinants of nutritional awareness than cultural or environmental factors in this setting.

Conclusion:

This study reveals moderate maternal knowledge about malnutrition but identifies critical gaps in breastfeeding duration, supplementary feeding practices, hygiene, and health service utilization. Education, income, and access to information are key determinants of better knowledge. Future interventions should focus on community-based education, improved healthcare access, and multi-channel nutrition communication to reduce severe acute malnutrition in Bangladesh.

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