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Awareness and Recognition of the Signs and Symptoms of Malnutrition Among Mothers of Under-Five Children: Evidence from Western Ghana

[1]Thomas Asechaab and [2]Eric Kwasi Elliason

[1]Research Officer, Father Thomas Alan Rooney Memorial Hospital, Asankrangwa

[2]PhD Research Scholar, Desh Bhagat University, Punjab, India

Abstract

Early recognition of malnutrition in children is critical to preventing severe health outcomes, yet evidence suggests that many caregivers in low-resource settings are unable to identify its signs and symptoms. This study explored the level of awareness among mothers regarding the physical and behavioral indicators of malnutrition among under-five children at Asankrangwa Catholic Hospital in Western Ghana. Using a descriptive cross-sectional design, 205 mothers were surveyed through structured questionnaires. The results showed high awareness of weight loss (87.8%) and recurrent diarrhea (70.7%) as symptoms, but low recognition of other key signs such as stunted growth (47.3%), sunken eyes (37.1%), and edema (4.9%). Behavioral signs such as lethargy, irritability, and developmental delays were also poorly recognized. The findings highlight significant gaps in maternal knowledge that may delay early diagnosis and intervention. Strengthening community health education to include symptom recognition alongside feeding practices is essential to improve early care-seeking and reduce childhood malnutrition in rural Ghana.

Keywords: malnutrition, maternal awareness, under-five children, symptom recognition, child health, Ghana, rural healthcare

Introduction

Malnutrition remains a leading cause of illness and death among children under five, especially in sub-Saharan Africa where healthcare access, poverty, and limited health literacy intersect. Globally, nearly 45 million children suffer from wasting, and 149 million are stunted due to malnutrition, placing them at increased risk of infection, delayed development, and premature death (UNICEF, WHO & World Bank, 2021). In Ghana, despite improvements in child health programs, childhood malnutrition persists as a pressing public health concern. According to the Ghana Statistical Service (2022), 18 percent of

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children under five are stunted and 6 percent are wasted. These figures suggest that many children may not be identified and treated early enough, pointing to a gap in early recognition by caregivers.

The early detection of malnutrition depends largely on caregivers' ability to recognize its physical and behavioral symptoms. These include signs such as stunted growth, weight loss, persistent diarrhea, lethargy, visible ribcages, sunken eyes, and in more severe cases, edema (swelling), particularly in the lower limbs. However, these symptoms can easily be mistaken for other childhood illnesses or dismissed as normal variations in growth and behavior if caregivers lack adequate knowledge (Black et al., 2013). Among mothers, who are usually the primary caregivers, poor recognition of malnutrition symptoms can delay treatment and worsen health outcomes.

Studies in similar low-resource settings have shown that although mothers may be aware of the term "malnutrition," their ability to identify specific signs remains limited. For example, a study in Ethiopia found that while 70 percent of mothers had heard of malnutrition, less than 30 percent could identify key physical indicators such as edema or muscle wasting (Demilew & Abie, 2017). In Ghana, few localized studies have investigated the extent of mothers' awareness regarding the visible and invisible symptoms of malnutrition, particularly in rural regions like the Western Region where health resources and outreach programs are often limited.

The importance of maternal awareness cannot be overstated. Early recognition of malnutrition allows for timely intervention, which is especially critical in the first five years of life—a period that lays the foundation for long-term health, cognitive development, and survival. Health promotion programs often focus on feeding practices and preventive strategies but may fall short in training caregivers to detect early warning signs. Bridging this gap requires a deeper understanding of what mothers already know and where the deficits lie.

This study was conducted to assess the level of awareness and recognition of malnutrition signs and symptoms among mothers of under-five children attending Asankrangwa Catholic Hospital in the Western Region of Ghana. By identifying areas of both knowledge and misunderstanding, the findings aim to support the design of more targeted education programs to empower mothers in their role as frontline protectors of child health.

Methodology

Study Design

A descriptive cross-sectional study design was adopted for this research. This design was appropriate because it

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allowed the researchers to assess the knowledge of mothers at a single point in time and to describe patterns in their understanding of malnutrition signs and symptoms. The study employed a quantitative approach, allowing for statistical analysis of trends and relationships among variables.

Study Setting

The study was conducted at Asankrangwa Catholic Hospital, a faith-based healthcare facility located in the Amenfi West Municipality of Ghana's Western Region. The hospital serves a large catchment area that includes several rural and peri-urban communities. It was selected as the study site due to its accessibility to mothers with under-five children and its central role in providing maternal and child health services in the region.

Study Population

The study population included mothers who had children under the age of five and were either attending the child welfare clinic, outpatient department, or pediatric ward of the hospital during the data collection period. These mothers were considered most relevant to the research because they were directly responsible for monitoring the health and nutrition of their children.

Sample Size and Sampling Technique

A total of 205 mothers were selected using systematic random sampling. The sample size was determined using Yamane's formula with a 5 percent margin of error and a 95 percent confidence level. Every second eligible mother encountered during data collection was invited to participate in the study. If a selected participant declined, the next available eligible mother was approached to ensure consistency in the sampling process.

Data Collection Tool

A structured questionnaire was used to collect data. It included both closed-ended and Likert scale items designed to assess mothers' knowledge of the signs and symptoms of malnutrition. The questionnaire covered visual symptoms such as stunted growth, swelling, muscle wasting, pale skin, and behavioral indicators like reduced playfulness, fatigue, or loss of appetite. To ensure clarity and cultural appropriateness, the questionnaire was developed in English and translated into Twi for participants more comfortable in the local language.

Data collection was carried out by trained field assistants who administered the questionnaire either through self-completion or oral interviews, depending on the literacy level of the respondent.

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Each interview lasted approximately 15 to 20 minutes.

Validity and Reliability

To enhance the validity of the instrument, the questionnaire was pretested among a small sample of mothers at a nearby clinic with similar characteristics. Feedback from the pretest helped refine the wording and sequencing of questions. Reliability was assessed through internal consistency checks, and necessary revisions were made to improve comprehension.

Data Analysis

Data was coded and entered into IBM SPSS version 25 for analysis. Descriptive statistics such as frequencies, means, and percentages were used to summarize the responses. Cross-tabulations were used to explore the relationship between mothers' demographic characteristics and their ability to recognize specific malnutrition symptoms. Chi-square tests were conducted to assess the significance of associations, with p-values less than 0.05 considered statistically significant.

Ethical Considerations

The study received ethical approval from the hospital's research and ethics committee. Written informed consent was obtained from all participants before the interviews. Participants were assured that their responses would remain confidential and used only for research purposes. No personal identifiers were collected, and participants had the right to withdraw at any time without any consequence to their access to healthcare services.

Results

Table 1: Socio-demographic Characteristics of Mothers (N = 205)

Variable	Category	Frequency (n)	Percentage (%)
Age	Below 20 years	6	2.9
	20–29 years	89	43.4
	30–39 years	70	34.1
	40–49 years	40	19.5
Marital Status	Single	35	17.1
	Married	157	76.6

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	Divorced	13	6.3
Educational Level	No formal education	94	45.9
	Primary education	67	32.7
	Secondary education	33	16.1
	Tertiary education	11	5.4
Occupation	Trader	68	33.2
	Unemployed	59	28.8
	Farmer	47	22.9
	Civil servant	28	13.7
	Other	3	1.5

Source: Field Data (2025)

The data show that the majority of mothers were within the age range of 20 to 29 years (43.4%), indicating that a large portion were relatively young. A significant number (76.6%) were married, which may suggest stability in caregiving roles. Notably, nearly half of the respondents (45.9%) had no formal education, and only 5.4% had tertiary education, which has implications for health literacy and awareness of child health issues. Trading was the most common occupation (33.2%), followed by unemployment (28.8%) and farming (22.9%), reflecting the informal and subsistence-based nature of the local economy.

Table 2: Recognition of Physical Signs of Malnutrition (N = 205)

Sign or Symptom	Yes (n)	Yes (%)	No (n)	No (%)
Weight loss	180	87.8	25	12.2
Stunted growth	97	47.3	108	52.7
Pale skin or hair	100	48.8	105	51.2
Lethargy or tiredness	102	49.8	103	50.2
Recurrent diarrhea	145	70.7	60	29.3

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Edema (swelling of feet/hands)	10	4.9	195	95.1
Thin upper arms	83	40.5	122	59.5
Sunken eyes	76	37.1	129	62.9

Source: Field Data (2025)

The results indicate that while a large majority of mothers recognized weight loss (87.8%) and recurrent diarrhea (70.7%) as symptoms of malnutrition, awareness of other key signs was much lower. Only 47.3% identified stunted growth, and less than half recognized symptoms such as pale skin (48.8%) or tiredness (49.8%). Alarmingly, only 4.9% of mothers recognized edema—swelling in the hands or feet—as a symptom, despite this being a classical sign of kwashiorkor, a severe form of protein-energy malnutrition. Recognition of thin upper arms (40.5%) and sunken eyes (37.1%) was also low, reflecting limited awareness of less obvious but clinically significant indicators. These results reveal a serious knowledge gap in identifying physical signs of malnutrition beyond the most obvious ones like weight loss and diarrhea.

Table 3: Recognition of Behavioral Signs of Malnutrition (N = 205)

Behavioral Indicator	**Yes (n)**	**Yes (%)**	**No (n)**	**No (%)**
Loss of appetite	128	62.4	77	37.6
Child becomes inactive/weak	104	50.7	101	49.3
Delayed development (e.g., walking or talking)	72	35.1	133	64.9
Increased irritability or crying	96	46.8	109	53.2

Source: Field Data (2025)

Table 3 shows that while 62.4% of mothers recognized loss of appetite as a symptom of malnutrition, only about half (50.7%) associated weakness or inactivity with the condition. Less than half of the respondents recognized increased irritability (46.8%) or developmental delays (35.1%) as potential warning signs. This indicates that mothers were more aware of physical signs than behavioral ones, which could lead to delays in seeking medical attention when children show early, less visible symptoms. Given the importance of behavioral changes as early indicators, especially in infants and toddlers, this lack of awareness is a concern for early detection efforts.

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Table 4: Relationship Between Maternal Education Level and Recognition of Edema as a Sign of Malnutrition (N = 205)

Education Level	Recognized Edema (Yes)	Did Not Recognize (No)	Total
No formal education	1 (1.1%)	93 (98.9%)	94
Primary education	2 (3.0%)	65 (97.0%)	67
Secondary education	4 (12.1%)	29 (87.9%)	33
Tertiary education	3 (27.3%)	8 (72.7%)	11
Total	**10 (4.9%)**	**195 (95.1%)**	**205**

Chi-square (χ^2) = 14.84, df = 3, p = 0.002

There was a statistically significant association between maternal education and the ability to recognize edema as a symptom of malnutrition (p = 0.002). Mothers with tertiary education were much more likely to correctly identify edema (27.3%) compared to those with no formal education (1.1%). This suggests that educational attainment plays a critical role in enhancing maternal health literacy and awareness of complex or less obvious malnutrition symptoms.

Table 5: Relationship Between Maternal Age and Recognition of Stunted Growth (N = 205)

Age Group (years)	Recognized (Yes)	Did Not Recognize (No)	Total
Below 20	2 (33.3%)	4 (66.7%)	6
20–29	41 (46.1%)	48 (53.9%)	89
30–39	36 (51.4%)	34 (48.6%)	70
40–49	18 (45.0%)	22 (55.0%)	40
Total	**97 (47.3%)**	**108 (52.7%)**	**205**

Chi-square (χ^2) = 0.85, df = 3, p = 0.837

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There was no statistically significant association between maternal age and recognition of stunted growth (p = 0.837). Recognition of this symptom remained relatively uniform across age categories, suggesting that age alone does not influence awareness in this area. Other factors, such as education or exposure to nutrition counseling, may play a more pivotal role.

Table 6: Relationship Between Maternal Education and Recognition of Developmental Delay as a Symptom (N = 205)

Education Level	Recognized (Yes)	Did Not Recognize (No)	Total
No formal education	18 (19.1%)	76 (80.9%)	94
Primary education	23 (34.3%)	44 (65.7%)	67
Secondary education	20 (60.6%)	13 (39.4%)	33
Tertiary education	11 (100%)	0 (0%)	11
Total	**72 (35.1%)**	**133 (64.9%)**	**205**

Chi-square (χ^2) = 33.74, df = 3, p < 0.001

The relationship between maternal education and recognition of delayed development as a symptom of malnutrition was highly significant (p < 0.001). Mothers with higher levels of education were significantly more likely to associate developmental delay with malnutrition. All mothers with tertiary education recognized this symptom, compared to only 19.1 percent of those with no formal education. This highlights the importance of maternal education in the early detection of malnutrition-related developmental concerns.

Discussion

This study provides critical insight into the extent of maternal awareness of malnutrition symptoms among mothers of under-five children in Western Ghana. While most respondents were able to recognize common symptoms like weight loss and diarrhea, awareness of other vital clinical indicators such as stunted growth, edema, and behavioral changes remained limited. These gaps in recognition have serious implications for timely intervention and child survival, particularly in rural and resource-constrained settings.

The majority of mothers (87.8%) identified weight loss as a symptom of malnutrition, and 70.7% correctly associated recurrent diarrhea with the condition. These findings are consistent

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with studies conducted in other sub-Saharan African countries, where wasting and diarrhea are often cited as the most familiar signs of poor nutritional status (Adugna, 2022; Asemahagn, 2016). However, the findings also revealed that less than half of the respondents could identify stunted growth (47.3%), thin upper arms (40.5%), or sunken eyes (37.1%) as signs of malnutrition. These are internationally recognized symptoms and their under-recognition indicates a limited understanding of both moderate and chronic forms of malnutrition (UNICEF, WHO, & World Bank, 2021).

One of the most notable concerns is the extremely low awareness of edema, a hallmark of kwashiorkor, with only 4.9% of respondents correctly identifying it. A cross-tabulation between maternal education and edema recognition showed a statistically significant association ($p = 0.002$), with higher education levels strongly linked to better recognition. This finding is consistent with earlier studies that emphasize the role of formal education in enhancing health literacy and symptom awareness (Aheto et al., 2015; Shrestha et al., 2020). For instance, while only 1.1% of mothers without formal education recognized edema, 27.3% of those with tertiary education did. This underscores the influence of maternal education in empowering mothers to act as early detectors of health risks in their children.

Behavioral symptoms, including developmental delay, weakness, and irritability, were also poorly recognized. Only 35.1% of respondents identified delayed development as a possible sign of malnutrition. This aligns with Ghosh et al. (2021), who found that many caregivers attribute such delays to spiritual or genetic causes rather than nutrition-related conditions. A cross-tabulation analysis in this study revealed a strong, statistically significant relationship between maternal education and recognition of developmental delay ($p < 0.001$). Notably, all mothers with tertiary education (100%) were able to recognize it, compared to just 19.1% among those with no formal education. These findings point to a serious knowledge gap that could delay critical interventions for children experiencing cognitive and physical setbacks due to poor nutrition.

Interestingly, maternal age did not show a significant association with recognition of stunted growth ($p = 0.837$). This suggests that awareness of certain symptoms is not necessarily improved by experience or age, reinforcing the idea that structured educational interventions are more effective in improving maternal health knowledge (Darteh et al., 2014).

The consistent pattern across the data indicates that although mothers interact frequently with healthcare services, their understanding of the broader

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symptomatology of malnutrition remains partial. This may be due to a focus in public health messaging on prevention—such as promoting exclusive breastfeeding—rather than equipping mothers with the diagnostic tools to detect early signs of malnutrition (Osei-Kwasi et al., 2022; Feleke et al., 2021). Enhancing health communication to include pictorial representations of symptoms, practical scenarios, and community role-play could support better knowledge retention, especially among mothers with limited formal education (Nankumbi & Muliira, 2015).

Taken together, these findings affirm that maternal education is a critical determinant of symptom recognition. Programs aimed at reducing malnutrition must therefore integrate not only feeding guidelines but also symptom detection training, especially in rural communities where the burden of malnutrition is often highest.

Conclusion

The study found that while mothers attending Asankrangwa Catholic Hospital were able to identify some of the more obvious signs of malnutrition, such as weight loss and diarrhea, their awareness of other critical symptoms—including edema, stunted growth, and behavioral indicators—was low. This lack of recognition limits the likelihood of early detection and timely intervention, placing children at greater risk of complications. The findings underscore the urgent need for maternal health education programs that not only teach proper feeding practices but also train mothers to identify the full range of malnutrition symptoms. Targeted, culturally sensitive, and pictorial-based health communication can enhance maternal knowledge and contribute significantly to the reduction of childhood malnutrition in rural Ghana and similar settings.

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