



Prevalence and Determinants of Severe Acute Malnutrition among Children Aged Under Five Years in Rural Communities of Kwali Area Council, Abuja, Nigeria

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Abstract

Context: Severe Acute Malnutrition (SAM) is a key public health problem in Nigeria, contributing to children's mortality. Understanding its local determinants is crucial for effective intervention.

Objective: This study aimed to determine the prevalence of SAM and to assess the effect of socio-economic, cultural/religious, and maternal/child-health-practice factors on SAM among children aged 6-59 months in the rural communities of Kwali Area Council, Abuja.

Materials and Methods: The study employed a community-based cross-sectional design involving 220 mother/caregiver-child pairs selected via a multi-stage sampling technique. Data were collected using structured questionnaires and anthropometric measurements. Nutritional status was determined using Mid-Upper Arm Circumference (MUAC), with SAM defined as MUAC < 11.5cm among children aged 6-59 months. Data were analysed in IBM SPSS Statistics version 29 using descriptive statistics, the Chi-square/Fisher's exact test for associations, and binary logistic regression done to identify independent determinants of SAM at a 5% significance level.

Results: The prevalence of SAM was 15.5% (34/220). At bivariate level, caregiver occupation ($p=0.034$), household drinking water source ($p<0.001$), food taboo ($p=0.011$), and immunization status ($p=0.001$) were significantly associated with SAM. Multivariable logistic regression ($n=214$) identified three significant independent determinants: food taboo (AOR=7.62, 95% CI: 1.86-31.17, $p=0.005$), incomplete immunization (AOR=4.92, 95% CI: 1.92-12.60, $p=0.001$), and an unimproved household drinking water source (AOR=4.06, 95% CI: 1.65-10.01, $p=0.002$).

Conclusion: The prevalence of SAM in Kwali (15.5%) remains above the national average of 7% and represents a serious public health concern. Food taboo practice, incomplete immunization, and an unimproved household drinking water source emerged as the three strongest, statistically significant, and modifiable determinants in this population, warranting targeted nutrition education, improved immunization coverage, and expansion of safe water access as priority interventions.

Keywords: Severe Acute Malnutrition, Under-Five Children, Prevalence, Determinants, Water Source, Kwali, Nigeria.

Introduction

Severe Acute Malnutrition (SAM) remains a formidable global public health challenge and a leading

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underlying cause of mortality among children under five years of age, particularly in low- and middle-income countries (LMICs)¹. It is defined by a set of critical anthropometric indicators: a weight-for-height z-score (WHZ) below -3 standard deviations, a Mid-Upper Arm Circumference (MUAC) of less than 115mm, or the presence of bilateral nutritional

oedema². The condition is a medical emergency, drastically increasing the risk of death from common childhood illnesses such as diarrhoea, malaria, and pneumonia due to compromised immune function³. Globally, an estimated 45% of all under-five deaths are attributable to undernutrition, with SAM being its most lethal form⁴.

The burden of SAM is disproportionately borne by sub-Saharan Africa and South Asia⁵. Nigeria, as the most populous country in Africa, exemplifies this crisis, bearing the second-highest global burden of stunted children and a significant load of acute malnutrition⁶. The 2018 Nigeria Demographic and Health Survey (NDHS) indicated that 7% of children under five are wasted, a figure that masks severe sub-national disparities and the high prevalence of SAM in specific regions⁷. This high prevalence contributes significantly to the country's under-five mortality rate, which remains one of the highest globally⁸.

The aetiology of SAM is complex and multifactorial, best understood through frameworks like the UNICEF conceptual model of malnutrition, which delineates immediate, underlying, and basic causes⁹. At the immediate level, SAM results from inadequate dietary intake and recurrent infectious diseases, which often create a vicious cycle of illness and nutrient depletion¹⁰. Underlying these are household food insecurity, inadequate childcare practices, poor access to clean water and sanitation, and insufficient health services¹¹. These, in turn, are underpinned by basic causes related to socio-economic, political, and cultural contexts, including poverty, low maternal education, unfavourable occupation and livelihood patterns, gender inequality, and cultural or religious practices such as food taboos^{12,13}.

Access to safe drinking water is a particularly critical, and sometimes underappreciated, underlying determinant: contaminated water sources expose young children to repeated diarrhoeal illness, which both reduces nutrient absorption and increases nutrient losses, directly precipitating acute malnutrition³². Similarly, a caregiver's primary occupation shapes both household income stability and the time available for optimal childcare and feeding practices, making it a socio-economic determinant distinct from income or education alone³³.

While these broad determinants are well recognized, their specific configurations and relative importance

vary considerably across different geographical, cultural, and socio-economic contexts^{14,15}. In Northern Nigeria, cultural practices such as food taboos and early marriage have been identified as significant risk factors, while in the southern regions, sub-optimal infant feeding practices are often more prominent^{18,19}. This heterogeneity underscores the critical need for localized evidence to inform targeted interventions.

The Kwali Area Council within the Federal Capital Territory of Nigeria presents a unique setting. Despite being in the nation's capital, its rural communities are characterized by high poverty levels, subsistence farming, and limited access to basic social services²⁰. Anecdotal reports from health facilities and non-governmental organizations suggest a high burden of child malnutrition in Kwali. However, a paucity of recent, community-based empirical data has hindered the development of effective, context-specific public health responses.

This study, therefore, sought to bridge this critical knowledge gap by determining the prevalence of SAM and elucidating its key socio-economic, cultural/religious, and maternal/child-health-practice determinants among children under five in the rural communities of Kwali Area Council.

Materials and Methods

This study was conducted in the rural communities of Kwali Area Council, one of the six area councils in the Federal Capital Territory (FCT), Abuja, Nigeria. The council is predominantly rural, with subsistence farming and petty trading as common occupations alongside full-time caregiving. The study was carried out over five months, from May to September 2025.

The study population consisted of mothers/caregivers and their children aged 6-59 months. The sample size was calculated as 218 using Fisher's formula²⁴, equation 1, assuming a 17.16% SAM prevalence^{25,26}, a 5% margin of error with 95% confidence level. A multi-stage sampling technique was employed. First, Kwali was divided into four zones (north, south, east and west), then each ward within the four zones was assigned a unique identification number, and one ward per zone was selected using simple random sampling (balloting without replacement). The wards are Gumbo, Pai, Wako, and Ashara. Second, four communities were randomly selected via balloting from each ward

based on a compiled list, totaling sixteen communities. These communities were Hasawa, Saidu, Jika, Jangadi, Pukafa, Ganagana, Gwari, Bassa, Mada, Bobota, Dabi, Baraje, Cashew, Oversea, Zamfara, and Sumali. Finally, a systematic sampling of households was done within these communities, where more than one eligible participant was present; one individual was selected using simple random sampling until the sample size was achieved. The Fisher's formula used is mathematically represented as follows:

$$n = \frac{z^2 \cdot p(1-p)}{d^2} \dots \dots \dots \text{equation 1}$$

Where, n = the sample size; d = margin of error, which is 0.05 for a CI at 95%; z = the standard normal deviation for a given level of confidence (95% confidence = 1.96); p = proportion of SAM estimated from the review of literature.

A total of 220 valid mother/caregiver-child records were obtained and retained for analysis after data cleaning (see Data Management below).

Primary data were collected using both key informant interviews and a pre-tested structured questionnaire administered by trained research assistants. The questionnaire was pre-tested in two communities (Gwari and Jika) of the Area Council with 20 respondents randomly selected. The results of the pre-test is not part of the study, but are used to confirm the reliability and validity of the instrument used. The questionnaire covered socio-demographic characteristics, socio-economic status, cultural practices, and maternal and child health practices. Anthropometric measurements were taken for each child using standard procedures (accurately measuring physical dimensions like height, weight, and circumferences) and equipment (UNICEF SECA weighing scale, height board, and MUAC tape). The nutritional status of children was classified based on MUAC measurements: SAM (wasting) was defined as $\text{MUAC} < 11.5 \text{ cm}$.

The dataset comprised 220 mother/caregiver-child records covering socio-demographic characteristics, primary occupation, religion, household drinking water source, cultural practices, and maternal and child health practices. All 220 records were checked for completeness and internal consistency before analysis. Age eligibility for the SAM analysis was confirmed directly from each child's recorded age in months, and all 220 children fell within the 6-59 month eligible range (age range 7-59 months).

Caregiver primary occupation was categorised as reported (Housewife, Farming, Petty Trading) for descriptive purposes, and dichotomised as "Income-Generating" (Farming or Petty Trading) versus "Non-Income-Generating (Housewife)" for statistical testing. Household drinking water source was categorised as reported (Borehole, Well/Rainfall, River/Stream) for descriptive purposes, and dichotomised as "Improved" (Borehole) versus "Unimproved" (Well/Rainfall or River/Stream) for statistical testing, consistent with the WHO/UNICEF Joint Monitoring Programme (JMP) classification of drinking-water sources³⁴. Health-seeking behaviour, for which no direct survey item existed, continued to be operationalised as a proxy using place of delivery (health facility vs. home/traditional birth attendant). Breastfeeding practice was classified as "Exclusive" where the first feed given to the child was breastmilk, and no prelacteal feed was reported, and "Mixed/Non-exclusive" otherwise. Immunization status was classified as "Complete" where five or more vaccine doses were recorded.

Descriptive statistics were presented as frequencies, percentages, and means $\pm$ standard deviation. Bivariate analysis was conducted to examine the association between each independent variable and SAM: continuity-corrected (Yates) Chi-square was used for 2×2 tables in which all expected cell counts were 5 or more, and Fisher's exact test was used where any cell had an expected count below 5. Consistent with the study's objectives, which call for assessing the combined, independent effect of socio-economic, cultural/religious, and maternal/child-health factors on SAM, all eleven objective-relevant variables (maternal education, household income, caregiver occupation, household water source, access to a health facility, marriage timing, religion, food taboo, breastfeeding practice, immunization status, and health-seeking behaviour) were entered simultaneously into a single binary logistic regression model (Method=Enter), presented as Adjusted Odds Ratios (AOR) with 95% Confidence Intervals (CI). Statistical significance was set at $p < 0.05$. Model fit was assessed using the Hosmer-Lemeshow goodness-of-fit test and Nagelkerke/Cox & Snell pseudo- R^2 .

Ethical approval was granted by the FCT Health Research Ethics Committee with an approval number: FHREC/2025/01/98'10-04-25. Informed

consent was sought by explaining the purpose, procedures, potential benefits and risks of the study in the local language to all volunteer participants before data collection. Confidentiality was maintained as no names or identifiers were disclosed throughout the study.

Results

The socio-demographic profile of the study population (N=220) is presented in Table 1. Caregivers were overwhelmingly female (94.5%) and predominantly aged 40 years and above (62.3%), with a mean age of 40.3 ± 11.6 years; no caregiver fell in the 30-39 year band in this sample. The overwhelming majority of caregivers were married (95.5%) and practiced Islam (80.0%). Just over half of caregivers were housewives with no separate income-generating occupation (55.5%), while 34.1% farmed and 10.5% engaged in petty trading. Regarding education, 38.6% of caregivers had no formal education, and a combined 58.2% had no more than primary schooling. Household income

was low, with 80.8% of households earning ₦70,000 or less per month. Most households (88.2%) reported having access to a health facility, and two-thirds (66.4%) sourced drinking water from a borehole, with the remainder relying on well/rainwater harvesting (23.2%) or river/stream water (10.5%). All 220 children recruited fell within the 6-59 month age range to which the MUAC-based SAM definition applies (age range 7-59 months; mean 27.1 ± 13.9 months) and were included in the prevalence and determinant analysis. The overall prevalence of SAM was 15.5% (34/220). Prevalence was higher among male children (16.8%) than female children (14.3%), and was markedly higher among younger children, declining steadily from 27.3% among children aged 6-11 months to 2.9% among those aged 48-59 months (Table 2).

Table 2: Prevalence of Severe Acute Malnutrition (SAM) by Child Sex and Age Group (N=220)

Characteristic	Category	n	SAM Cases	Prevalence (%)
Overall	—	220	34	15.5
Child Sex	Male	101	17	16.8
	Female	119	17	14.3
Child Age Group	6-11 months	22	6	27.3
	12-23 months	76	19	25.0
	24-35 months	56	6	10.7
	36-47 months	31	2	6.5
	48-59 months	35	1	2.9

Table 1: Socio-demographic and Economic Characteristics of Study Participants

Characteristic	Category	Frequency (n=220)	Percentage (%)
Caregiver Sex	Female	208	94.5
	Male	12	5.5
Caregiver Age (years)	< 20	1	0.5
	20-29	82	37.3
	30-39	0	0.0
	≥ 40	137	62.3
Marital Status	Married	210	95.5
	Separated	4	1.8
	Divorced	2	0.9
	Widowed	2	0.9
	Single	2	0.9
Religion	Islam	176	80.0
	Christianity	44	20.0
Caregiver Education	None	85	38.6
	Primary	43	19.5
	Secondary	50	22.7
	Tertiary	42	19.1
Caregiver Occupation	Housewife	122	55.5
	Farming	75	34.1
	Petty Trading	23	10.5
Household Monthly Income (Naira)	₦70,000	177	80.8
	₦150,000	34	15.5
	₦300,000	8	3.7
	Missing	1	—
Access to Health Facility	Yes	194	88.2
	No	26	11.8
Household Drinking Water Source	Borehole	146	66.4
	Well/Rainfall	51	23.2
	River/Stream	23	10.5
Marriage Timing	Early (<18 years)	83	37.7
	Not Early (≥18 years)	137	62.3
Food Taboo Practice	No	206	93.6
	Yes	14	6.4
Child Sex	Female	119	54.1
	Male	101	45.9
Breastfeeding Practice	Exclusive	115	53.5
	Mixed/Non-exclusive	100	46.5
	Missing	5	—
Immunization Status	Complete	183	83.2
	Incomplete	37	16.8
Health-Seeking Behaviour ²	Good (facility delivery)	188	85.5
	Poor (non-facility delivery)	32	14.5

²Health-seeking behaviour was operationalised using place of delivery (health facility vs. home/TBA) as a proxy; see Materials and Methods.

Bivariate analysis (Table 3) identified four variables significantly associated with SAM: caregiver occupation ($p=0.034$), household drinking water source ($p<0.001$), food taboo practice ($p=0.011$), and immunization status ($p=0.001$). Children from households drawing drinking water from an unimproved source (well/rainwater or river/stream) had a markedly higher proportion of SAM (64.7% of SAM cases vs. 35.3% of non-SAM cases came from unimproved-water households). Children of housewife caregivers (without a separate income-generating occupation) were over-represented among SAM cases (73.5%) relative to non-SAM cases (52.2%). Household income, maternal education, religion, marriage timing, breastfeeding practice, and health-seeking behaviour were not significantly associated with SAM at the $p<0.05$ level at the bivariate stage. All eleven variables were nonetheless carried forward into the multivariable model below (Table 4), consistent with the study objectives, which call for assessing the independent effect of each domain of determinants while adjusting for the others rather than pre-selecting only

the bivariately significant ones.

All eleven objective-relevant variables were entered simultaneously into a binary logistic regression model (Table 4, Figure 1). Of 220 children, 214 (97.3%) had complete data on all eleven predictors and were included in this model. Three variables remained independently and statistically significantly associated with SAM after adjustment. Households practicing food taboo had over seven and a half times higher odds of a child having SAM than households without this practice (AOR=7.62, 95% CI: 1.86-31.17, $p=0.005$). Children with incomplete immunization had almost five times higher odds of SAM than those fully immunized (AOR=4.92, 95% CI: 1.92-12.60, $p=0.001$). Children from households relying on an unimproved drinking water source had over four times higher odds of SAM than those with an improved (borehole) source (AOR=4.06, 95% CI: 1.65-10.01, $p=0.002$). Lack of access to a health facility was associated with higher odds of SAM (AOR=3.33, 95% CI: 1.00-11.04, $p=0.050$); however, because the confidence interval includes 1.00 and $p=0.05$, it is not statistically significant. Caregiver occupation showed a positive but non-significant trend after

adjustment (AOR=2.31, 95% CI: 0.84-6.35, $p=0.104$), a weaker association than at bivariate level, suggesting its bivariate signal was partly explained by its overlap with water source and other adjusted variables. Maternal education, household income, religion, marriage timing, breastfeeding practice, and health-seeking behaviour were not significantly associated with SAM in the adjusted model (all $p>0.4$).

Table 4: Multivariable Logistic Regression of Determinants of Severe Acute Malnutrition: Complete Predictor Model (n=214)

Determinant	Adjusted Odds Ratio (AOR)	95% Confidence Interval	p-value
Food Taboo (Yes vs No)	7.62	1.86 – 31.17	0.005*
Incomplete Immunization (vs Complete)	4.92	1.92 – 12.60	0.001*
Unimproved Drinking Water Source (vs Improved)	4.06	1.65 – 10.01	0.002*
Lack of Access to Health Facility (No vs Yes)	3.33	1.00 – 11.04	0.050
Non-Income-Generating Occupation (vs Income-Generating)	2.31	0.84 – 6.35	0.104
Early Marriage (vs Not Early)	1.75	0.68 – 4.50	0.244
Mixed/Non-exclusive Breastfeeding (vs Exclusive)	1.14	0.46 – 2.83	0.784
Islam (vs Christianity)	1.06	0.30 – 3.75	0.933
Low Maternal Education (vs High)	1.05	0.39 – 2.77	0.928
Poor Health-Seeking Behaviour (vs Good)	0.63	0.17 – 2.32	0.488
Low Household Income (vs High)	0.66	0.21 – 2.05	0.467

*Significant at $p<0.05$. Model: all eleven objective-relevant variables entered simultaneously (Method=Enter), $n=214$ (6 cases excluded listwise for missing data on one or more predictors). Omnibus Model $\chi^2(11)=41.23$, $p<0.001$; Cox & Snell $R^2=0.175$; Nagelkerke $R^2=0.300$; Hosmer-Lemeshow $\chi^2(8)=9.50$, $p=0.302$.

Table 3: Bivariate Analysis of Factors Associated with Severe Acute Malnutrition (SAM) (N=220)

Variable	Category	SAM (n=34) n(%)	No SAM (n=186) n(%)	p-value
Socio-Economic Factors				
Maternal Education	Low (None/Primary)	22 (64.7)	106 (57.0)	0.516
	High (Sec./Tertiary)	12 (35.3)	80 (43.0)	
Household Income	Low ($\leq$ ₦100,000)	27 (79.4)	150 (81.1)	1.000
	High ($>$ ₦100,000)	7 (20.6)	35 (18.9)	
Caregiver Occupation	Non-Income-Generating (Housewife)	25 (73.5)	97 (52.2)	0.034*
	Income-Generating (Farming/Trading)	9 (26.5)	89 (47.8)	
Access to Health Facility	No	7 (20.6)	19 (10.2)	0.143
	Yes	27 (79.4)	167 (89.8)	
Drinking Water Source	Unimproved (Well/Rainfall/River)	22 (64.7)	52 (28.0)	$<0.001^*$
	Improved (Borehole)	12 (35.3)	134 (72.0)	
Cultural & Religious Factors				
Religion	Christianity	5 (14.7)	39 (21.0)	0.544
	Islam	29 (85.3)	147 (79.0)	
Marriage Timing	Early ($<$ 18yrs)	13 (38.2)	70 (37.6)	1.000
	Not Early ($\geq$ 18yrs)	21 (61.8)	116 (62.4)	
Food Taboo	No	28 (82.4)	178 (95.7)	0.011*
	Yes	6 (17.6)	8 (4.3)	
Maternal & Child Health Factors				
Breastfeeding Practice	Mixed/Non-exclusive	17 (50.0)	83 (45.9)	0.797
	Exclusive	17 (50.0)	98 (54.1)	
Health-Seeking Behaviour	Poor	5 (14.7)	27 (14.5)	1.000
	Good	29 (85.3)	159 (85.5)	
Immunization Status	Incomplete	13 (38.2)	24 (12.9)	0.001*
	Complete	21 (61.8)	162 (87.1)	

*Significant at $p<0.05$. Continuity-corrected (Yates) Chi-square reported for 2×2 tables where all expected cell counts were ≥ 5 ; Fisher's exact test used where any cell had an expected count <5 (Access to Health Facility, Food Taboo, Health-Seeking Behaviour). Marital status is descriptively presented in Table 1 only; with 95.5% of caregivers in a single category, the remaining categories ($n\leq 10$ combined) were too sparse to support a stable Chi-square test and are not reported in this table.

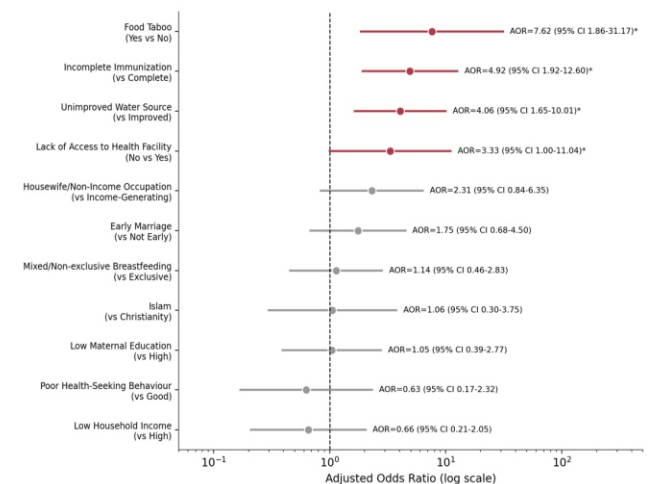


Figure 1: Adjusted Odds Ratios (95% CI) for All Eleven Determinants of SAM in the Complete Predictor Model (n=214; * $p<0.05$)

The overall model was statistically significant (Omnibus Likelihood Ratio $\chi^2(11)=41.23$, $p<0.001$) and explained a substantial share of the variance in SAM status (Cox & Snell $R^2=0.175$; Nagelkerke $R^2=0.300$). The Hosmer-Lemeshow goodness-of-fit test was non-significant ($\chi^2(8)=9.50$, $p=0.302$),

indicating the model's predicted probabilities fit the observed data adequately. The model correctly classified 84.1% of cases overall, though sensitivity for identifying SAM cases specifically remained modest (7 of 34 SAM cases correctly classified at the standard 0.5 cut-off), a common limitation of logistic models applied to a relatively infrequent outcome.

Discussion

This analysis found a SAM prevalence of 15.5% among children aged 6-59 months in the rural communities of Kwali Area Council. This is substantially higher than Nigeria's national wasting prevalence of approximately 7%⁷, and above the WHO "serious" public health threshold, underscoring that malnutrition remains a significant local burden requiring continued attention². Prevalence was markedly concentrated among younger children (27.3% at 6-11 months, falling to 2.9% at 48-59 months), consistent with the well-documented vulnerability window around the introduction of complementary feeding and the cumulative effect of repeated infections in the second year of life¹⁷.

Caregiver occupation, religion, and household drinking water source were included alongside the other socio-economic, cultural, and health-practice variables in the multivariable model, which explained a substantial share of the variance in SAM status (Nagelkerke $R^2=0.300$) and surfaced one of the strongest and most policy-relevant findings in this study: household reliance on an unimproved drinking water source (well/rainwater harvesting or river/stream) was independently associated with over four times higher odds of SAM (AOR=4.06, $p=0.002$). This is highly consistent with the established WASH-nutrition pathway, in which contaminated water drives recurrent diarrhoeal illness and environmental enteric dysfunction, both of which impair nutrient absorption and precipitate acute wasting³². Given that a third of households in this sample rely on an unimproved source, this finding identifies a concrete, infrastructure-level intervention target alongside the more commonly emphasised nutrition-education interventions.

Food taboo practice remained the single strongest determinant in the model, with households practicing food taboo having almost eight times higher adjusted odds of a child having SAM (AOR=7.62, $p=0.005$). Food taboos, meaning

restrictions on specific foods for children, pregnant women, or lactating mothers, often rooted in cultural or religious belief, have been documented elsewhere in Northern Nigeria as a driver of poor dietary diversity and, consequently, malnutrition¹⁸. Although only a small proportion of households in this sample reported such practices (6.4%), the consistency and strength of the association across bivariate and multivariable analysis suggests this is a genuine, locally important risk factor warranting targeted nutrition education and community sensitisation, delivered with cultural sensitivity given its rootedness in local belief systems.

Incomplete immunization was independently associated with almost five times higher odds of SAM (AOR=4.92, $p=0.001$), consistent with the well-documented infection-malnutrition cycle in which under-immunized children face greater exposure to illnesses such as measles and diarrhoeal disease that precipitate rapid nutritional decline³³⁰. This strengthens the case for integrating growth monitoring and nutrition screening into routine immunization contacts, a strategy already recommended in the literature as a practical entry point for reaching at-risk children²⁹.

Lack of access to a health facility was associated with higher odds of SAM (AOR=3.33, 95% CI: 1.00-11.04, $p=0.050$). Although the point estimate is consistent with the well-established role of health facilities in providing growth monitoring, nutritional counselling, and early treatment of childhood illness¹⁹²⁹, the confidence interval includes 1.00 and the p -value sits exactly at the conventional 0.05 threshold; consequently, it is not statistically significant.

Caregiver occupation was significantly associated with SAM at the bivariate stage (children of housewife caregivers over-represented among SAM cases, $p=0.034$) but this association weakened and lost statistical significance after adjustment for the other ten variables (AOR=2.31, $p=0.104$). This pattern suggests that occupation's apparent bivariate effect was partly, though not entirely, explained by its overlap with other adjusted factors, most plausibly household water source and income, which are themselves connected to a household's broader livelihood pattern. This does not mean occupation is unimportant; rather, it may operate as an upstream driver of the water-source and immunization pathways that emerged as independently significant, rather than as a wholly separate, direct determinant.

Religion, maternal education, household income, marriage timing, breastfeeding practice, and health-seeking behaviour showed no significant association with SAM either bivariate or after adjustment in this dataset. This should be interpreted as an absence of detectable independent effect in this specific sample and model, not as definitive evidence that these factors are irrelevant to child nutrition in this population more broadly.

Taken as a whole, the fully adjusted model explained a substantial share of the variance in SAM status (Nagelkerke $R^2=0.300$), and the overall omnibus test was strongly significant ($\chi^2=41.23$, $df=11$, $p<0.001$), indicating that the eleven variables considered together provide a meaningful account of SAM risk in this population. Unmeasured factors such as dietary diversity, sanitation practices beyond drinking water source, and household food security likely also contribute to the remaining unexplained variation.

Conclusion

The prevalence of SAM among children under five in Kwali Area Council (15.5%) remains well above the national average of 7%, confirming that malnutrition is a serious ongoing public health concern in this community. This analysis identified three statistically significant, independently modifiable determinants of SAM: food taboo practice, incomplete immunization, and an unimproved household drinking water source. These findings support a multi-pronged intervention strategy: community-based nutrition education addressing harmful food taboos, strengthened routine immunization coverage, investment in safe borehole water access for households currently relying on unimproved sources, and continued expansion of health facility access, with the water-source finding in particular representing a concrete, actionable target for this community.

Conflicts of Interest

The authors have declared that they have no competing interests.

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