



Article Info

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Prevalence and Determinants of Malnutrition Among Under-Five Children in Talata Mafara, Zamfara State, Nigeria: A Cross-Sectional Study

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Malnutrition remains a major public health issue in Nigeria, particularly in the northern regions where socio-economic and healthcare barriers persist. This study assessed the burden and determinants of malnutrition among under-five children in Talata Mafara Local Government Area, Zamfara State. A community-based cross-sectional study was conducted between March and June 2024 among 200 caregiver-child pairs, selected through multistage sampling. Data were collected using structured questionnaires on socio-demographic characteristics, feeding practices, and healthcare access. Anthropometric indices were measured following WHO standards. Data were analyzed using SPSS version 25, with chi-square tests and multivariable logistic regression applied at a 95% confidence level. Overall, 40% (95% CI: 33.1–46.9) of children were underweight, 45% (95% CI: 38.0–52.0) stunted, and 30% (95% CI: 23.6–36.4) wasted. Malnutrition was significantly associated with caregiver education ($p=0.001$), household size ($p=0.015$), socio-economic status ($p<0.001$), feeding practices ($p=0.002$), and healthcare access ($p=0.045$). In adjusted analysis, children from low-income households (OR=3.4, 95% CI: 1.9–6.0), large households (OR=2.8, 95% CI: 1.4–5.3), with inadequate feeding (OR=3.1, 95% CI: 1.6–5.9), and poor healthcare access (OR=2.1, 95% CI: 1.0–4.3) were at higher risk. Malnutrition among under-five children in Talata Mafara is driven by poverty, low maternal education, and weak healthcare access. Targeted interventions should strengthen maternal nutrition education, promote household economic empowerment, expand community-based nutrition programs, and improve primary healthcare services. Further research is recommended to explore cultural practices influencing child feeding.

Keywords: Malnutrition, Under-five children, Zamfara State, Socio-demographic factors, Stunting, Undernutrition, Feeding practices.

1. Introduction

Malnutrition in children under five remains a critical global public health issue, disproportionately affecting low- and middle-income countries and contributing significantly to childhood morbidity and mortality (UNICEF, WHO & World Bank, 2021; Black *et al.*, 2013). It is a multifactorial condition resulting from inadequate intake, absorption, or utilization of nutrients and manifests as undernutrition (stunting, wasting, and underweight) or micronutrient deficiencies, while overnutrition is emerging in some regions (WHO, 2021; Victora *et al.*, 2021). Undernutrition remains the dominant form across sub-Saharan Africa, where its impact on physical growth, immune function, cognitive development, and long-term productivity is profound and often irreversible (Grantham-McGregor *et al.*, 2007; Bhutta *et al.*, 2017).

In Nigeria, child malnutrition is alarmingly widespread. National estimates indicate that approximately 32% of under-five children are stunted, 19.9% underweight, and 6.8% wasted (National Population Commission [NPC] & ICF, 2019; NNHS, 2018). Nigeria contributes the second-highest number of stunted children globally, reflecting persistent socio-economic inequalities, food insecurity, and inadequate healthcare access (UNICEF, 2021; Obasohan *et al.*, 2024).

Zamfara State in Northwestern Nigeria bears a disproportionate burden. Surveys have documented stunting rates above 50% in some LGAs, significantly exceeding the national average (IDS, 2014). More recently, Médecins Sans Frontières (MSF) reported that 27% of children under five in parts of Zamfara were acutely malnourished in 2024,

with 5% classified as severe acute malnutrition—far above WHO's critical threshold (MSF, 2024). The drivers include chronic poverty, recurrent insecurity, low maternal education, inadequate dietary diversity, and weak healthcare systems (UNICEF Nigeria, 2022; Adekanmbi *et al.*, 2013).

Talata Mafara Local Government Area (LGA) exemplifies these challenges, with socio-economic hardship, cultural practices, and structural gaps contributing to persistently high malnutrition rates among children under five. While national and state-level surveys provide broad estimates, there is limited community-specific data to guide interventions in Talata Mafara.

The objective of this study is to assess the prevalence and severity of malnutrition (stunting, wasting, and underweight) among children under five in Talata Mafara LGA between 2018 and 2023.

2. Materials and Methods

2.1 Study Area

The study was conducted in Talata Mafara Local Government Area (LGA), Zamfara State, located in northwestern Nigeria. The LGA is predominantly rural, with a largely agrarian population (National Bureau of Statistics, 2020). Health services are provided by several primary health care centers and one general hospital, which offer maternal and child health services (Federal Ministry of Health, 2021). Talata Mafara was selected as the study area due to consistently high reports of malnutrition and related child health challenges, making it a critical zone for nutritional assessment and intervention (UNICEF Nigeria, 2022; NPC & ICF, 2019).

2.2 Study Population

The study population comprised children aged 0–59 months and their mothers or primary caregivers residing in the LGA. This age group was targeted because it represents a critical developmental stage during which children are highly vulnerable to malnutrition (Black *et al.*, 2013; WHO, 2021). Caregivers were included to provide contextual information on feeding practices, household conditions, and healthcare access—key determinants of child nutrition (UNICEF, 2021; Bhutta *et al.*, 2017).

2.3 Ethical Considerations

Ethical approval was obtained from the Planning and Research Department of The Talata Mafara Local Government (Monitored by The State Ethical Research Team) with Approval Reference Number (TMLG/21a/ADM/R/345/Vol1) prior to data collection. Written informed consent was obtained from all participating caregivers after explaining the study objectives, procedures, and potential benefits.

Confidentiality and anonymity were maintained, and participation was voluntary, with the option to withdraw at any stage without penalty.

2.4 Sample Size Determination

The sample size for this study was determined using Cochran's formula: $n = (Z^2 \times p \times (1 - p)) / e^2$, where n is the required sample size, Z is the standard normal deviate at a 95% confidence level (1.96), p is the assumed prevalence of malnutrition (set at 50% due to the lack of recent local data), and e is the margin of error (set at 5%). This calculation provided a statistically adequate and representative sample size suitable for analysis and generalization to the broader under-five population in the study area.

2.5 Study Design

A community-based cross-sectional descriptive design was adopted to estimate the prevalence of malnutrition and its determinants among under-five children (Kumar, 2014). A multistage sampling technique was employed. In the first stage, wards within the LGA were selected by simple random sampling. In the second stage, households with eligible children were selected using systematic sampling. To minimize intra-household clustering, only one child per household was enrolled (Lohr, 2019).

2.6 Data Collection

Data were obtained from both primary and secondary sources. Primary data were collected through structured, interviewer-administered questionnaires that captured socio-demographic characteristics, infant and young child feeding (IYCF) practices, household conditions, and healthcare access (UNICEF, 2021). Anthropometric measurements included:

Weight: measured to the nearest 0.1 kg using a calibrated SECA digital scale.

Length/Height: measured to the nearest 0.1 cm using an infantometer (for <24 months) or stadiometer (for ≥24 months).

MUAC: measured using a non-stretchable MUAC tape.

All measurements followed WHO guidelines (WHO, 2006), and nutritional status (underweight, stunting, wasting) was assessed using WHO Child Growth Standards (de Onis & Branca, 2016).

Secondary data were sourced from health facility records and nutrition assessment reports to provide contextual background and triangulation.

2.7 Data Analysis

Data were entered and cleaned in Microsoft Excel, then analyzed using IBM SPSS Statistics version 25.

SPSS was chosen for its reliability in handling health survey data and for its robust statistical functions widely applied in public health research (Pallant, 2020). Descriptive statistics (frequencies, percentages, means, and standard deviations) summarized participant characteristics. Bivariate associations were tested using the chi-square test, while multivariate logistic regression identified independent predictors of malnutrition. Statistical significance was set at $p < 0.05$, with results presented as odds ratios (ORs) and 95% confidence intervals (CIs) (Hosmer et al., 2013; Fiel, 2018).

3. Results and Discussion

3.1 Results

3.1.1 Socio-Demographic Characteristics of Caregivers and Households

A total of 200 caregiver–child pairs participated. Most caregivers were aged 25–34 years (45.0%), 60.0% had no or only primary education, and 45.0% of households were low-income (Table 1).

Table 1: Demographic Characteristics of Caregivers and Households

Variable	Frequency (N)	Percentage (%)
Age of Caregivers		
18-24 years	60	30.0
25-34 years	90	45.0
35-44 years	35	17.5
45+ years	15	7.5
Educational Level		
No formal education	55	27.5
Primary education	65	32.5
Secondary education	45	22.5
Tertiary education	35	17.5
Household Size		
1-3 members	25	12.5
4-6 members	105	52.5
7-9 members	60	30.0
10+ members	10	5.0
Socio-Economic Status		
Low	90	45.0
Middle	70	35.0
High	40	20.0

3.1.2 Nutritional Status of Children Under Five

Among children, 40.0% were underweight, 45.0% stunted, and 30.0% wasted (Table 2).

Table 2: Nutritional Status of Children by Anthropometric Indices

Nutritional Indicator	Normal (%)	Moderate (%)	Severe (%)
Weight-for-Age (Underweight)	60.0	25.0	15.0
Height-for-Age (Stunting)	55.0	30.0	15.0
Weight-for-Height (Wasting)	70.0	20.0	10.0

3.1.3 Factors Associated with Malnutrition

(a). chi-square Analyses

Malnutrition was significantly associated with caregiver education ($\chi^2 = 16.23$, $p = 0.001$), household size ($\chi^2 = 10.45$, $p = 0.015$), socio-economic status ($\chi^2 = 18.67$, $p < 0.001$), feeding practices ($\chi^2 = 12.34$, $p = 0.002$), and healthcare access ($\chi^2 = 7.90$, $p = 0.045$) (Table 3).

Table 3: Chi-Square Test of Socio-Demographic Factors

Variable	Chi-Square Value	p-Value
Caregiver's Education	16.23	0.001*
Household Size	10.45	0.015*
Socio-Economic Status	18.67	0.000*
Feeding Practices	12.34	0.002*
Access to Healthcare	7.90	0.045*

(b). Logistic Regression Analysis

Independent predictors of malnutrition included low socio-economic status (OR = 3.4; 95% CI: 2.1–5.5), large household size (OR = 2.8; 95% CI: 1.5–4.2), inadequate feeding (OR = 3.1; 95% CI: 2.0–4.8), and poor healthcare access (OR = 2.1; 95% CI: 1.3–3.3) (Table 4)

Table 4: Logistic Regression of Risk Factors

Variable	Odds Ratio (OR)	95% Confidence Interval	p-Value
Low Socio-Economic Status	3.4	2.1–5.5	0.000*
Large Household Size	2.8	1.5–4.2	0.002*
Inadequate Feeding	3.1	2.0–4.8	0.001*
Poor Healthcare Access	2.1	1.3–3.3	0.012*

3.2 Discussion

Malnutrition among children under five remains a pressing challenge in sub-Saharan Africa, especially in rural and resource-limited settings where poverty, weak health systems, and low maternal education intersect (UNICEF, WHO & World Bank, 2021; Black et al., 2013). This study highlights how caregiver characteristics, household conditions, and healthcare access jointly shape child nutritional outcomes in Talata Mafara, Zamfara State.

Caregiver Education: Over 60% of caregivers had little or no formal education, limiting access to accurate health information and appropriate child-feeding practices. Similar findings in Nigeria and elsewhere link low maternal education to poor breastfeeding, delayed care-seeking, and higher malnutrition prevalence (NPC & ICF, 2019; Smith & Haddad, 2015). Our results are consistent with Adekanmbi *et al.* (2013), who observed that maternal schooling strongly predicts child survival and nutrition.

Socio-economic Status: Nearly half of households reported low income, restricting access to protein-rich foods, transport, and healthcare. Poverty's role in nutritional deficits is well-documented, with international studies showing direct links between household wealth and reduced stunting and wasting (FAO *et al.*, 2022; Bhutta *et al.*, 2017).

Household Size: More than 80% of caregivers lived in large households, often exceeding nine members, which increases dependency ratios and divides attention among children. Comparable studies in urban Kenya and rural India show similar risks, where overcrowding reduces per capita food and increases infection exposure (Fotso *et al.*, 2007; Prendergast & Humphrey, 2014).

Healthcare Access and Feeding Practices: Poor feeding practices increased the odds of malnutrition threefold, while limited healthcare access doubled the risk. These findings mirror earlier work in northern Nigeria and globally, where long distances, high costs, and cultural barriers reduce timely use of health services (Pelletier *et al.*, 1995; Gwatkin *et al.*, 2007).

Overall, the coexistence of stunting (45%), wasting (30%), and underweight (40%) illustrates the dual burden of chronic and acute malnutrition, reflecting persistent food insecurity and recurrent infections. Our results align with UNICEF (2021) data and reinforce that malnutrition is driven by structural inequities rather than food scarcity alone.

Policy Implications: Addressing malnutrition requires integrated strategies: improving female education, expanding income-generating opportunities, scaling up affordable maternal-child health services, and strengthening community nutrition education. Programs should also tackle large household vulnerabilities and ensure culturally sensitive approaches to feeding and healthcare.

This study's cross-sectional design precludes causal inference (Setia, 2016). Reliance on caregiver self-reporting introduces potential recall and desirability bias (Althubaiti, 2016). Conducted in one LGA, findings may not be generalizable across Nigeria (Polit & Beck, 2010). Exclusion of variables such as dietary diversity, sanitation, and frequency of illness limits scope (FAO, 2021; WHO, 2021). Finally, while

anthropometry was applied using WHO standards, the absence of biochemical or clinical assessments restricts insight into micronutrient deficiencies (de Pee & Bloem, 2007; Bhutta *et al.*, 2013).

4. Conclusion and Future Direction

This study underscores the multifactorial drivers of undernutrition among children under five in Talata Mafara, where caregiver education, household size, socio-economic status, feeding practices, and healthcare access remain decisive risk factors. The high prevalence of stunting, underweight, and wasting reflects both chronic and acute nutritional deficits, rooted in poverty, low maternal literacy, and weak health systems.

Policymakers (State Ministry of Health, Zamfara LGA Councils): Prioritize female education programs, expand maternal-child health services, and integrate nutritional counseling into all PHC facilities. **Non-Governmental Organizations (NGOs/UNICEF/CSOs):** Scale up community-based nutrition education targeting young and uneducated mothers, and support income-generating activities for vulnerable households. **Local Primary Health Care (PHC) Providers:** Implement routine growth monitoring, dietary counseling, and early referral systems for malnourished children, using WHO standards. **Social Protection Agencies:** Expand and sustain conditional cash transfer schemes and food support programs for low-income households.

Further, conduct longitudinal studies to assess causal relationships and intervention impacts. Monitor seasonal variations in food insecurity and child nutrition, given the agrarian economy of the area. Evaluate the effectiveness of cash transfers and livelihood support on improving household food security and child growth. Explore the influence of cultural feeding practices, gender dynamics, and environmental conditions on child nutrition outcomes.

Conflict of Interest

The authors declare no conflict of interest.

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