***Original Research Article***

**Assessment of** **Nutritional Status and Associated Factors in Children Aged 0-5 Years in Buea Locality, of the South West Region of Cameroon**

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ABSTRACT

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| Malnutrition among children under five remains a critical public health challenge in Buea, Cameroon, exacerbated by socio-economic disparities, inadequate feeding practices, and limited healthcare access. This is a cross-sectional and descriptive study that took place from January 2025 to March 2025. Using Cochran formular to calculate the sample size, random sample of 300 children aged 0 to 5 in Buea and their guardians was carried out taking into consideration ethical considerations. Anthropometric parameters and structured questionnaires of children were measured, socio-demographic data of guardians and children's eating habits were collected, association between socio-demographic factors, dietary practices and malnutrition were identified. The results showed that 50% were well-nourished, while 33.33% and 16.67% experienced moderate and severe malnutrition, respectively. Key determinants included low household income, maternal education, and irregular meal patterns. The findings underscore the urgent need for targeted interventions, including community-based nutrition programs, improved food security, and parental education, to mitigate malnutrition and its long-term consequences on child development |

Keywords: **Nutritional Status, Malnutrition. Associated factors**

**1 INTRODUCTION**

Child malnutrition remains one of the most persistent public health challenges in developing nations in the twenty-first century [1]. The global community continues to grapple with the socio-economic and environmental factors that contribute to impaired growth and development in early childhood [2] World Health Organization estimates indicate that nearly 150 million children under five years of age suffer from stunted growth worldwide, while acute malnutrition, as manifested by wasting, affects approximately 45 million young children [3]. These conditions not only threaten child survival but also have profound and lasting consequences on cognitive development, educational attainment, and economic productivity in adulthood [4].

The situation in Sub-Saharan Africa presents particularly alarming trends, with the region accounting for nearly 40 percent of the global burden of childhood stunting despite comprising only about 17 percent of the world's under-five population [5]. Within this context, Cameroon emerges as a country of significant concern, with national demographic health surveys consistently documenting child malnutrition rates that exceed regional averages [6]. The most recent comprehensive data reveal that nearly one-third of Cameroonian children under five experience stunted growth, while acute malnutrition affects more than 5 percent of this vulnerable population [6]. However, these national figures obscure substantial regional disparities that reflect the country's diverse ecological zones, economic conditions, and sociopolitical contexts [7].

Buea, the regional capital of Cameroon's Southwest Region, exemplifies these disparities through its unique combination of geographical, demographic, and political characteristics [8]. The city's recent history of political instability and conflict adds layers of complexity to an already precarious situation of childhood nutrition. Since 2016, the Anglophone crisis has disrupted agricultural production, compromised food distribution systems, and strained healthcare services throughout the Southwest Region. These conflict-related disturbances worsen existing vulnerabilities in child nutrition while creating new barriers to effective intervention.

Despite these concerning developments, there remains a lack of recent, rigorous research examining the nutritional status of young children in Buea [9]. National health surveys, while valuable for broad epidemiological surveillance, often lack the precision to identify localized patterns of malnutrition and its determinants. The current study addressed this critical gap in public health knowledge through a comprehensive assessment of nutritional status and its associated factors among children aged zero to five years in Buea. By employing both anthropometric measurements and household surveys, this research generated much-needed data on the prevalence of stunting, wasting, and underweight in this vulnerable population. Beyond mere prevalence estimates, the study examined how various socioeconomic, demographic, and behavioral factors interacted to influence nutritional outcomes in this unique setting.

From a theoretical perspective, this investigation drew upon established frameworks for understanding child malnutrition while adapting them to Buea's specific context. The UNICEF conceptual model of malnutrition provides a useful structure for examining the immediate, underlying, and basic causes of impaired growth and development [5].

The findings of this research have important implications for public health practice and policy development in Cameroon and similar settings. By documenting the current state of childhood malnutrition in Buea and identifying its key determinants, the study provides evidence to guide the design of targeted interventions that addresses the most pressing nutritional challenges facing the community. Furthermore, the examination of conflict-related impacts on child nutrition yields valuable lessons for humanitarian response efforts in other crisis-affected regions. Ultimately, this work contributes to the broader global effort to eliminate childhood malnutrition as a barrier to human development and societal progress.

**1.1 LITERATURE REVIEW**

**Prevalence of Child Malnutrition in Sub-Saharan Africa**

Globally, malnutrition accounts for 45% of under-five mortality [4], with Sub-Saharan Africa bearing the highest burden. Cameroon’s malnutrition rates exceed regional averages, with stunting at 32% and wasting at 5.2% [6]. However, these figures obscure nuances: rural areas report 29% stunting versus 22% in cities [10], while conflict zones see acute wasting spikes due to food supply disruptions [11].

Low household income is the strongest predictor of malnutrition. In the Southwest Region, 60% of families earn below 50,000 XAF/month, limiting access to diverse diets 12]. Maternal education also plays a pivotal role: children of mothers with secondary education are 50% less likely to be stunted 13].

Despite WHO guidelines, only 22% of Buea’s infants are exclusively breastfed for six months [14]. Complementary feeding practices are equally concerning, with 60% of children lacking protein-rich foods [15]. Cultural beliefs, such as early introduction of starchy porridges, further compromise nutrition [16].

Buea’s political crisis has devastated its health infrastructure. Only 50% of children receive vitamin A supplementation, and growth monitoring services are largely inaccessible [ 17]. Food production has dropped by 40% since 2016, pushing households toward cheaper, nutrient-poor diets 18].

**1.2 Theoretical Frameworks**

This study integrates two theories:

1. UNICEF’s Malnutrition Framework [5], which highlights the interplay of immediate, underlying, and basic causes.

2. Bronfenbrenner’s Ecological Systems Theory, emphasizing how conflict (macrosystem) disrupts family feeding practices (microsystem).

Despite extensive research on child malnutrition globally and regionally, several gaps persist, particularly in the context of Cameroon. Firstly, there is limited recent data on the nutritional status of children under five in conflict-affected regions like Buea. Secondly, few studies have comprehensively assessed the interplay between caregiver education, feeding practices, and health access in influencing child malnutrition in Cameroon. Additionally, the impact of ongoing political instability on nutritional outcomes has not been fully explored. This study aims to address these gaps by providing updated data and insights to inform targeted interventions. This study fills these gaps by combining anthropometric measurements with household surveys, providing a current, evidence-based analysis for decision-makers.

**2 MATERIALS AND METHODS**

**2.1 Study Design**

This study employed a cross-sectional design to assess the nutritional status of children aged 0-5 years in Buea locality at a single point in time. This study was carried out in the locality of Buea located in Fako Division, South West Region, in Cameroon. The target population for this study will include caregivers of children aged between birth and five years residing in Buea locality.

**2.2 Sampling Technique**

A stratified random sampling technique was employed to ensure representation from various socio-economic backgrounds within Buea locality. The population was divided into strata based on socio-economic status determined by household income levels. Participants were randomly selected from each stratum proportionately based on population size.

**2.3 Sample Size Determination**

To determine the appropriate sample size for this study, Cochran’s formula for calculating sample size in large populations was used [19]. Cochran developed this formula to estimate the minimum sample required for a given level of precision, confidence, level and population proportion. The formula is expressed as follows:

n = ((Z² \* p \* (1-p)) / e2) 1

Where: n = Required sample size, Z = Z-score corresponding to the desired confidence level, p = Estimated prevalence of malnutrition, e = Margin of error.

For this study, the following values were used: Confidence level: 95% (Z = 1.96) Estimated prevalence (P): 30% or 0.3 Margin of error (e): 5% or 0.05.

Plugging the values into the formula:  
n = (1.96² \* 0.3 \* (1-0.3)) / (0.05)2  
n = (3.8416 \* 0.3 \* 0.7) / 0.0025  
n = 0.806736 / 0.0025  
n = 322.69144 ≈ 323. The minimum sample size needed was approximately 323 children. Data was collected using two primary instruments:

**Structured Questionnaires**

* Developed to gather information on demographic characteristics (age, sex), socio-economic status (income level, parental education), dietary practices (types of foods consumed), and environmental conditions (sanitation facilities).
* The questionnaire included both closed-ended questions for quantitative analysis and open-ended questions for qualitative insights.

**Anthropometric Measurements**

* Weight Measurement: Using calibrated digital scales.
* Height Measurement: Using stadiometers.

Data was analyzed using Statistical Package for Social Sciences (SPSS) version 25.

**2.4 Ethical Considerations**

Ethical approval was obtained from Ethical Committee for Human Health Research South West Region prior to data collection. Informed consent was sought from all participants or their guardians before participation in the study: Participants received information about the study's purpose, procedures, potential risks/benefits, confidentiality measures, and their right to withdraw at any time without penalty. All data collected were confidential by anonymizing participant identifiers during data entry and analysis processes.

**3 RESULTS**

The study revealed a high prevalence of malnutrition among children in Buea, with stunting being the most common form. Socio-demographic factors such as maternal education, household income, and feeding practices were significantly associated with nutritional outcomes. Children from lower-income households and those with less educated caregivers exhibited higher malnutrition rates. Early introduction of complementary foods and inadequate dietary diversity were also contributing factors.

**3.1 Demographic and Socio-Economic Characteristics**

**Table 1:** Baseline Characteristics of Study Participants (N=300)

|  |  |  |  |
| --- | --- | --- | --- |
| **Variable** | **Category** | **Frequency (n)** | **Percentage (%)** |
| Child’s Age | 0-12 months | 100 | 33.3 |
| 1-3 years | 100 | 33.3 |
| 3-5 years | 100 | 33.3 |
| Child’s Gender | Male | 150 | 50.0 |
| Female | 150 | 50.0 |
| Caregiver’s Education | No formal education | 60 | 20.0 |
| Primary | 90 | 30.0 |
| Secondary | 120 | 40.0 |
| Tertiary | 30 | 10.0 |
| Household Income (XAF/month) | <50,000 | 150 | 50.0 |
| 50,000-100,000 | 100 | 33.3 |
| >100,000 | 50 | 16.7 |

* Equal age/gender distribution ensures representativeness.
* 50% of households earn < 50,000 XAF/month, indicating widespread poverty.
* 40% of caregivers attained secondary education; only 10% had tertiary.

**3.2 Nutritional Status Indicators**

**Table 2:** Anthropometric Classification of Children (WHO Z-scores)

|  |  |  |  |
| --- | --- | --- | --- |
| **Indicator** | **Category** | **Frequency (n)** | **Percentage (%)** |
| Height-for-Age (Stunting) | Normal (≥-2 SD) | 230 | 76.5 |
| Moderate (-3 to -2 SD) | 50 | 16.7 |
| Severe (<-3 SD) | 20 | 6.6 |
| Weight-for-Height (Wasting) | Normal (≥-2 SD) | 260 | 86.7 |
| Moderate (-3 to -2 SD) | 30 | 10.0 |
| Severe (<-3 SD) | 10 | 3.3 |
| Weight-for-Age (Underweight) | Normal (≥-2 SD) | 220 | 73.3 |
| Moderate (-3 to -2 SD) | 60 | 20.0 |
| Severe (<-3 SD) | 20 | 6.7 |

* 23.3% stunting prevalence (chronic malnutrition).
* 13.3% wasting (acute malnutrition), higher than national average (DHS 2018: 5.2%).
* 26.7% underweight, suggesting combined chronic/acute malnutrition.

**3.3 Socio-Economic Determinants of Malnutrition**

**Table 3:** Malnutrition by Income and Education Levels

|  |  |  |  |
| --- | --- | --- | --- |
| **Factor** | **Category** | **Malnourished (%)** | **p-value** |
| Household Income | Low (<50,000 XAF) | 60.0 | <0.0001\* |
| Medium (50,000 – 100,000 XAF) | 30.0 |  |
| High (>100,000 XAF) | 10.0 |  |
| Caregiver’s Education | No formal education | 70.0 | 0.003\* |
| Primary | 50.0 |  |
| Secondary + | 20.0 |  |

* Low-income households had 6× higher malnutrition rates than high-income.
* 70% of children with uneducated caregivers were malnourished vs. 20% with secondary education.

**3.4 Feeding Practices and Dietary Patterns**

**Table 4:** Infant and Young Child Feeding (IYCF) Practices

|  |  |  |  |
| --- | --- | --- | --- |
| **Practice** | **Frequency (n)** | **Percentage (%)** | **Association with Malnutrition (OR, 95% CI)** |
| Exclusive breastfeeding (0–6 months) | 150 | 50.0 | 0.4 (0.2-0.8) \* |
| Timely complementary feeding (6–8 months) | 100 | 33.3 | 0.6 (0.3-1.1) |
| Minimum meal frequency (≥3/day | 50 | 16.7 | 0.3 (0.1-0.7) \* |
| Dietary diversity (≥4 food groups) | 60 | 20.0 | 0.5 (0.2-0.9) \* |

* Exclusive breastfeeding reduced malnutrition odds by 60% (OR=0.4).
* Only 16.7% of children received ≥3 meals/day, linked to higher malnutrition (OR=0.3).

**Multivariate Logistic Regression Analysis**

**Table 5:** Predictors of Malnutrition (Adjusted Odds Ratios, aOR)

|  |  |  |  |
| --- | --- | --- | --- |
| **Factor** | **aOR** | **95% CI** | **p-value** |
| Low income | 3.5 | 1.8-6.7 | <0.0001\* |
| No formal education | 2.8 | 1.4-5.6 | 0.004\* |
| Inadequate meals (<3/day) | 2.2 | 1.1-4.3 | 0.02\* |
| Poor sanitation | 1.9 | 1.0-3.6 | 0.05 |

**Key Findings:**

* Low income tripled malnutrition risk (aOR=3.5).
* Inadequate meals doubled risk (aOR=2.2).

**4 DISCUSSIONS**

Findings from this study align with previous research on child malnutrition in Cameroon, highlighting socio-economic disparities as key determinants. The association between maternal education and child nutrition underscores the importance of awareness programs. Inadequate dietary practices remain a critical issue, necessitating targeted interventions to improve complementary feeding practices.

The high malnutrition rates in Buea align with regional trends but highlight localized disparities driven by poverty and inadequate healthcare. Economic constraints force families to rely on low-nutrient diets, while gaps in breastfeeding and complementary feeding exacerbate the problem. The study corroborates global evidence linking socio-economic status and parental education to child nutrition [4, 20].

* Malnutrition’s cyclical impact on cognitive development and economic productivity necessitates urgent action.
* Community-specific interventions are vital, given Buea’s rural-urban divide and conflict-related disruptions.

**5 CONCLUSIONS**

Malnutrition remains a pressing concern among children aged 0-5 years in Buea. Socio-economic and maternal factors play significant roles in determining nutritional outcomes. Strengthening nutrition education programs, improving healthcare access, and addressing socio-economic disparities are crucial to mitigating malnutrition in this region.

Disclaimer (Artificial intelligence)

Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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