Social Class and Child Malnutrition in Nigeria

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Abstract- Child malnutrition remains a critical global health concern and a leading contributor to childhood morbidity and mortality in Nigeria, affecting long-term health outcomes and economic productivity. This study examines the effect of social class on malnutrition among children under five years using secondary data from the 2018 Nigeria Demographic and Health Survey (NDHS). Descriptive statistics, the Water/Sanitation, Assets, Maternal Education, and Income (WAMI) Index, and Ordinary Least Squares (OLS) regression were employed for analysis. Results indicate that the prevalence of underweight, wasting, and stunting among children was 33.11%, 46.88%, and 10.44%, respectively. The WAMI Index revealed that low-social-class households recorded the highest rates of child malnutrition. Among the variables examined, seven were statistically significant: child's sex and age, mother's and father's education, receipt of vitamin A, mother's age, and low social class. Children from low social classes had a 2.53% higher likelihood of being underweight compared to higher social classes, while the high class was excluded due to multicollinearity. These findings underscore the urgent need for socially inclusive policies that address nutritional inequality. Expanding maternal education, especially among low-income households, could significantly improve infant feeding practices, food security, and healthcare utilisation.

Keywords: Child Malnutrition, Social Class, Wami Index, Nigeria, Health Inequality

I. INTRODUCTION

Child Malnutrition stands at the heart of the global burden of disease, and it contributes significantly to disability-adjusted life years across the globe (Mertens and Penalvo 2021; Zhang et al., 2022; Liu et al. 2024). It manifests in two primary forms: over-nutrition and under-nutrition (WHO, 2021). Undernutrition arises when the diet lacks sufficient protein, calories, or essential nutrients, which leads to stunting, wasting, being underweight, or trace element deficiencies (WHO 2023; UNICEF, 2019). However, it is important to note that an underweight child, according to WHO (2020), may be stunted, wasted or both. Overnutrition, on the other hand, results from excessive calorie intake, causing obesity, overweight, and non-communicable diseases such as diabetes, myocardial infarction, stroke and cancer (WHO,2016).

In Nigeria, like many other developing countries, malnutrition has been established as one of the prominent causes of childhood morbidity and mortality (Adeyeye et al.,2023), as it affects virtually all aspects of child development, with effects that persist till adulthood. It can lead to long-term scarring consequences in terms of health, reduced human capital and diminished productivity, ultimately hindering national economic growth (Zewdie and Abebaw 2013; Li et al, 2023). The consequence of malnutrition is therefore of particular significance in Nigeria, given that the country has 43.6% of children under 5 years who are severely malnourished. More disturbing is the fact that Nigeria ranks third in terms of countries with high rates of malnutrition (World Population Review, 2024). Currently, Nigeria ranks 146th out of 166 countries in terms of progress towards meeting the Sustainable Development Goals (SDGs) (SDR,2023). Malnutrition statistics in Nigeria are considered to be generally unacceptable based on the WHO classification (NBS, 2014). The level of malnutrition has remained precarious, given its value of 9% in 1990 (NDHS, 1990) and 7% in 2018 (28 years later) (NBS, 2018). These statistics underscore the persistent challenges in addressing child malnutrition, which is caused by several profound factors, including inequalities in socioeconomic class.

Social class plays a critical role in determining child nutrition outcomes. It is defined as a measure of the position that an individual or family occupies regarding the prevailing average standards of cultural and material possessions, income and participation in a group activity of the community (Priyadariini et al., 2016). This classification has striking implications for child malnutrition because child malnutrition follows a socio-economic gradient (Adesuyi et al. 2021). In the same vein, Darmon and Drewnowski (2015) revealed that people with high socioeconomic status (SES) are more likely to cultivate healthier food habits, while the dietary profiles of people of lower SES are cheaper but of lower quality, thus contributing to their poorer health status. However, people of high socioeconomic status are also in danger of over-nutrition, a form of malnutrition, if they consume too many calories.

Despite numerous efforts to combat malnutrition, including initiatives such as the Scaling Up Nutrition (SUN) movement (2009), National Strategic Plan of Action for Nutrition (2014–2019), the Nutrition 774 Initiative (2023), and Multiple Micronutrient Supplementation Implementation Research (2022–2025) funded by the Bill & Melinda Gates Foundation. Although Nigeria has witnessed a downward trend in the prevalence of malnutrition, its incidence is still high when compared to acceptable thresholds of malnutrition on a global scale. The continued prevalence of malnutrition, especially at local levels, presupposes the ineffectiveness of these initiatives in targeting the most vulnerable or most affected sub-population in the country. Also, it has become imperative to focus on the social class to which a household belongs, as it is crucial in determining the nutritional status of a child. Also, considering the global rise in food costs and production challenges, it has become increasingly difficult for the majority of household heads to provide adequate nutrition to ward off malnutrition complications for their dependents, particularly children. Moreover, the situation is even more disturbing, as the middle class is gradually diminishing, pushing more households into lower social classes due to the effect of ongoing economic recovery policies in the country. Hence, this study is of significance as it will guide the government in designing and implementing socio-economic class-specific programs or interventions to address these disparities and target the hardest-hit social strata.

Several studies have demonstrated a strong link between child nutrition and socioeconomic status (Perkins et al., 2017; Singh et al., 2019; Miranda et al., 2020; Levesque et al., 2021). Some studies indicate that children in the lower social class experience higher levels of undernutrition compared to children in the high social class (Devkota and Panda, 2016; Das and Gulshan, 2017; Abdullahi et al., 2020; Chowdhury et al., 2021). The methodology employed in the aforementioned studies included correlation analysis, probit and logistic models while categorising the household into different classes with the standard of living index and the updated BG Prasad scale. However, this study will be using ordinary least squares as it is best suited for child malnutrition studies because of its simplicity and interpretability, and it effectively estimates the linear relationships between child malnutrition and key predictors.

The main objective of this paper is to examine the effect of social class and child malnutrition. Other specific objectives are to identify the prevalence of Child Malnutrition among Under-Five Children in Nigeria, analyse the malnutritional status of a child with a special focus on social class strata and examine the determinants of child malnutrition.

II. METHODOLOGY

Children under 5 years old in Nigeria are the focus of the study. The study employed secondary data derived from the 2018 Nigeria Demographic and Health Survey (NDHS). In total, the survey sampled approximately 42,000 households to ensure representation across the country. Data extracted include socioeconomic characteristics, household characteristics, Anthropometric child characteristics, maternal characteristics, socioeconomic status indicators, sanitation and health variables, and livestock ownership. The study employed several analytical techniques to achieve its stated objectives. These include Descriptive Statistics, Water/Sanitation, Assets, Maternal Education and Income (WAMI) Index, and Ordinary Least Squares (OLS).

2.1 Water/Sanitation, Assets, Maternal Education and Income (WAMI) Index

The WAMI index has been used extensively in the measurement of socioeconomic status. It has been estimated for urban, rural and peri-urban areas as well as developed in the cross-country analysis of socioeconomic status. The WAMI Index, as explained by Psaki et al (2014), is computed from four main indicators: these are water/sanitation, assets, maternal education (or participant education) and income. Each indicator has scores ranging from 0 to 8, giving a maximum obtainable score of 32 for all the indicators taken together. The final score is, in turn, divided by 32 and accordingly, the values of the WAMI index range from 0 to 1. The distribution of the indicators and their associated scores is shown in detail in Table 1. To categorise the households into different social classes, the resulting scores were rescaled into three categories using percentiles. The 30th percentile is taken as the threshold for low SLI, the 70th percentile as the high, while values in between the percentiles represent the Middle SLI. Accordingly, a household is classified as belonging to low SLI if its score ranges between 0-0.25, middle SLI if it is between 0.251-0.5624 and high SLI if the score is >0.5624.

Table 1: Computation of the WAMI Index

S/N	Indicators	Scores	Range
1	Water and Sanitation	Well or pipe or hand-pump (owned) =4;Well or pipe or hand-pump (public) =2;Others =0 Flush toilet (owned) =4;Flush toilet (pubic/shared) or own pit toilet =3;Shared or public pit toilet =2;Others (Dunghill,stream,refuse dump) =0	0-8
2	Assets[1]	For each of the assets listed below, a household is given a value of 1 if an asset is owned and 0 if otherwise. The assets are: Television, Refrigerator, Car/Truck/ Motorcycle/ Livestock (goat, cow or sheep), Phone, Land ownership, Sofa set, Mattress, electricity	0-8
3	Maternal Education	Maternal education of 0- 16 years is considered, after which the total years of education are divided by 2. All years of education till elementary class completion are taken as 1.	0-8
4	Income	Monthly income (₦) <30,000=1; 30,000-59,999=2 60,000-99,999=3; ≥100,000=4 The resulting score in each income category is multiplied by 2	0-8
	WAMI Index	The total score for indicators 1 to 4 is summed up for each household, and the resulting score is divided by 32	0-1

[1]DHS data have limited listing of assets. It does not have data on household ownership of sofa and mattress. The study therefore replaced these two items with gas and radio, being the available assets in the category.

2.2 *Anthropometric Measures*

The technique that uses human body measurements to conclude the nutritional status of individuals and populations is known as Anthropometry, and it is widely used in nutritional studies. According to WHO (2010), the most common indicators of under-nutrition are wasting, underweight and stunting, while over-nutrition is commonly measured using overweight and obesity. Wasting results when a child has low weight for his/her height (WHZ), while underweight relates to the weight of a child being insufficient for the age (WAZ). The third indicator, stunting, results when a child's height is too low for the age (HAZ). Unlike wasting, children are considered overweight if their weight is heavier than their height. Malnutrition among children is usually determined by assessing the anthropometric status of the child relative to a reference standard (Kandala *et al.,* 2001; WHO, 2010). The study employed the anthropometric data provided in the NDHS data, which were estimated based on the World Health Organisation (WHO) child growth standards of 2006 (Turck *et al*.,2013).

Using a cut-off point of -2 standard deviation for all the undernutrition indicators as recommended by WHO, a child is considered wasted, stunted or underweight if the values of WHZ, WAZ or HAZ are below -2 standard deviation of the mean of the respective reference population or group (WHO, 2006). However, for over-nutrition, a child is considered overweight or obese if the WHZ score is greater than +2 SD or +3SD of the reference population, respectively. However, the Z-score is calculated as;

$$Zij = \frac{Xij - \mu j}{\sigma}$$

Where

Z = anthropometric indicator

Xij = unobserved value of the i[th] child

σ = mean of the reference population

μ = standard deviation of the reference population

2.3 Ordinary least squares model

As highlighted by Sharma et al. 2012, the model is specified as:

$$Y_1 = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_3 X_3 + u_1 \quad (1)$$

Here, Yi represents the dependent variable, α is the constant term, β_1 to βj are the parameter estimates, and Xij is the coefficient of the explanatory variables. μi denotes the error term. The error term is assumed to follow a normal distribution with a constant variance and zero mean. For this research, the ordinary least squares. The (OLS model) followed as adapted for the study is given as:

$$Y_i = \beta_o + \beta_1 CSEX_i + \beta_2 AGC + \beta_3 MEDUC_i + \beta_4\, HSIZ_i + \beta_5 MBMI_i + \beta_6 MAGE_i + \beta_7 CWE_i + \beta_8 FEDUC_i + \beta_9 VITA_i + \beta_{10} OLAND_i + \beta_{11} FOCP_I + \beta_{12} LEC_i + \beta_{13} MEC_i + \beta_{14} HEC_I + \mu_i \quad (2)$$

where Y*i* represent*s* an underweight child, which is regressed on key explanatory variables. The primary explanatory variables outlined in equation (2) are defined as follows: *CSEX* represents the sex of the child, *AGC* is the age of the child in years, *HSIZ* denotes the household size, *MEDUC* refers to mothers years of education, *MBMI* represents mothers body mass index in kg/m^2, *MAGE* signifies Mothers age in years, *CWE* a child's weight in Kg, *FEDUC* represent fathers education in years, *VITA* is the child who receives vitamin A supplementation, OLAND refers to land ownership, FOCP represents fathers occupation, LEC signifies the number of households in low social class, MEC represents the number of households in Middle social class and HEC is the number of households in High social class.

The choice of underweight as a measure of child malnutrition was used in the study because, apart from being one of the most common measures of child nutritional status, WHO (2020) revealed that an underweight child may be stunted, wasted, or both. Although being overweight represents an indicator of over-nutrition among children, it was not considered in the regression analysis due to the extremely low representation of children in this category.

IV. RESULT AND DISCUSSION

4.1 Sociodemographic Characteristics Of The Households of Children under Five years

This section focuses on selected sociodemographic characteristics which can significantly impact the malnutrition status of children under five. As shown in Table 2, the sex distribution of under-five children shows a slight imbalance, with slightly more males (50.6%) than females (49.4%). The mean age is 28.39 months, and children older than 36months constitute the largest group. Malnutrition varies with age; thus, younger children (0-6 months) and those in the 7-12 months range might be more vulnerable to malnutrition. For the perceived weight at birth, a substantial proportion of the children are average (52.5%), followed by large (33.8%) and small (13.7%). Children with low birth weight may be at a higher risk of malnutrition (Jana et al,2023; UNICEF/WHO/World Bank,2023) as a result of limited nutrient and energy reserves to meet the demands for growth and development. This condition weakens their immune system and increases their vulnerability to diseases and death. The birth order distribution in the provided data indicates the percentage of children based on their ordinal position within their respective families. Accordingly, 23.43% of the sampled children are the firstborn in their families, 48.67% in the 2[nd]-4[th] category and 27.90% in the fifth or higher position. Birth order is an important predictor of child nutritional status, and many studies have linked high birth order with poor nutritional outcomes (Mmopelwa, 2019; Dhingra,2021)

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Considering parental characteristics, most mothers fall within the age range of 35-49, with a mean age of 35.90±7.94. Since only 1.14% of the mothers are aged between 15 and 19, the risk of intrauterine growth restriction and poor child growth, which is associated with young maternal age (cited in Wemakor et al, 2018), is reduced. Paternal education was observed to be very low, with more than half of the mothers not having any formal education and 40.6% of fathers in this category. Despite an overall lower level of education, fathers exhibited a higher level of literacy compared to mothers. Parental education, particularly that of mothers, significantly predicts the health and nutritional outcomes of children, as education can influence health-related knowledge and better feeding practices. Additionally, the data indicate that the majority of the parents are engaged in non-agricultural occupations, particularly the mothers (73.3% versus 51.7%). Parental occupations provide an insight into the economic position of the household, which in turn impacts their overall well-being and that of the children.

Table 2: Sociodemographic Characteristics of The Households with Under-Five years Children

Variable	Frequency	Percentage
Sex of child		
Male	5,827	50.63
Female	5,682	49.37
Age(months)		
0-6	1,461	12.69
7-12	1,241	10.78
13-24	2,401	20.86
25-36	2,192	19.05
>36	4,214	36.61
Mean±SD	28.39±17.27	
Perceived Weight at Birth		
Small	4,517	13.70
Average	17,309	52.51
Large	11,138	33.79
Birth Order		
1^{st}	29,631	23.43
2^{nd}-4^{th}	61,540	48.67
5^{th} or higher	35,276	27.90
Mother's age		
15-19	1,444	1.14
20-34	50,603	40.02
35-49	74,400	58.84
Mean±SD	35.90±7.94	
Mother's level of education		
None	63,385	50.13
Primary	25,081	19.84
Secondary	30,307	23.97
Higher	7,674	6.07
Mother's Occupation		
Agriculture	26,260	26.75
Non-Agriculture	71,898	73.25
Father's level of education		
None	46,506	40.58
Primary	19,715	17.20

Secondary	33,630	29.34
Higher	14,756	12.88
Father's Occupation		
Unemployed	4,616	4.00
Agriculture	51,145	44.29
Non-Agriculture	59,719	51.71

Source: Calculations from 2018 NDHS data

4.2 Prevalence of Child Malnutrition among Under-five Children

Table 3 presents the prevalence of the different manifestations of malnutrition among children under five in Nigeria. The percentage of children who are stunted in Nigeria is about 36.3%, indicating that a significant proportion of children are experiencing chronic malnutrition, which can have long-term effects on growth and development. Acute malnutrition, as depicted by wasting, is 6.8%, while the prevalence of underweight (both acutely and chronically malnourished) is 21.84%. Although the prevalence of overweight is relatively low (2.02%), it requires proper monitoring as it signals emerging health issues related to overnutrition, which can have health implications for adulthood. Being overweight affects only a small proportion of children under five in West Africa (2% in Nigeria and the highest prevalence of 6% in Guinea), and this could, however, increase if risk factors like household size, maternal overweight and height at birth are not considered in nutrition interventions (Diallo et al, 2023).

With regards to rural-urban disparities, all the forms of malnutrition are higher in the rural areas than the urban areas, with the highest observable difference noticed in stunting (42.8% against 26.0%). These results highlight the overall nutritional challenges faced by children in rural communities, possibly related to factors such as poverty, limited healthcare access, and insufficient dietary diversity. The malnutrition statistics estimated for Nigeria are generally unacceptable. Based on the WHO classification cited in NBS (2014), stunting is serious (or high) if levels fall within 30 to 39.9%, while wasting is precarious if between 5 and 10%. Underweight is very high if >15%, and only overweight falls within the acceptable range, below 15%. These classifications emphasise the gravity of malnutrition in Nigeria, particularly in terms of stunting and underweight. Table 3 also shows the results of the various combinations of malnutrition forms. Notably, the percentages of children who are both stunted and wasted (3.1%), wasted and underweight (5.24%) or stunted and overweight (0.78) are relatively low. However, the prevalence of stunting and underweight is relatively high at 18.15%, highlighting a significant proportion of children experiencing both long-term growth impairment and a lack of adequate weight.

Table 3: Prevalence of Malnutrition among under-5 Children in Nigeria

Nutritional status	Rural (%)	Urban (%)	All (%)
Stunting alone	42.82	26.00	36.26
Wasting alone	7.87	5.14	6.80
Underweight alone	26.34	14.75	21.84
Overweight alone	2.06	1.97	2.02
Stunting + Wasting	3.91	1.84	3.10
Stunting + Underweight	22.41	11.50	18.15
Wasting + Underweight	6.20	3.74	5.24
Stunting + Overweight	0.96	0.51	0.78

Source: Calculations from 2018 NDHS data

4.3 Analysing Nutritional status in relation to social class

Child malnutrition has been shown to follow a social class gradient; hence, this section will discuss social class differences concerning child malnutrition. Table 4 shows the prevalence rates of different child malnutrition indicators (stunting, wasting, underweight, and overweight) across social class

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categories computed by applying the WAMI Index. The prevalence of stunting is highest among children from low-income households (51.50%), followed by middle-income (30.11%) and high-income households (16.60%). This may be linked to chronic undernutrition, which significantly decreases as household moves from low social to high social classes as they improve their welfare. This suggests that children in poorer households experience prolonged nutritional deprivation as they child grow largely due to limited access to diverse and nutrient-rich diets, poor sanitation, and recurrent infections, this is in line with Danaei et al. (2016) who reported a strong inverse relationship between social class using household wealth index and stunting prevalence across 137 developing countries, emphasizing the role of economic disparities in long-term child growth outcomes, also Walters et al. (2024)found that children from lower-income households exhibited higher rates of stunting. While wasting prevalence is 9.09% in low-income households, 5.90% in middle-income households, and 3.87% in high-income households. The result shows a decrease as household wealth increases. This trend suggests that wealthier families who belong to a higher social class can provide more stable and adequate nutrition, reducing the incidence of acute weight loss in children. This is in tandem with UNICEF, WHO, and the World Bank (2020) reported wasting as a significant concern among low- and middle-income countries, with higher rates observed in economically disadvantaged populations. The table also shows 32.12% of children in low-social class households are underweight, compared to 17.47% in middle-social class households and 8.49% in high-social class households, this reveals an underweight status which is more prevalent among children from poorer households, reflecting both chronic and acute malnutrition, suggestive of economic constraints limit access to sufficient and nutritious food, leading to inadequate weight for age as confirmed by Bayati et al. (2025), in the study it was discovered that countries with lower Human Development Index (HDI) scores, indicative of lower socioeconomic status, experienced higher burdens of nutritional deficiencies, including underweight prevalence. The table also reveals that the prevalence of overweight is 2.06% in low-income households, 1.84% in middle-income households, and 2.34% in high-income households. This implies that, unlike the other indicators, overweight does not follow a clear social class gradient, and the p-value (0.397) indicates that the differences across social class are not statistically significant. This suggests that factors beyond economic status, such as dietary habits, lifestyle, urbanisation, and genetic predisposition, may likely influence overweight prevalence. This is in line with Popkin et al. (2012). The study established that overweight prevalence is rising in both poor and wealthy households due to increased consumption of processed foods and declining physical activity.

Table 4: Nutritional status in relation to social class

WAMI CTGS	ST	WT	UT	OT
Low	51.50	9.09	32.12	2.06
Middle	30.11	5.90	17.47	1.84
High	16.60	3.87	8.49	2.34
P-Value	0.000***	0.000***	0.000***	0.397

Source: Calculations from 2018 NDHS data
[1]Acronyms CTG, ST, UT, WT, OT represents categories, stunting, underweight, wasting and overweight respectively.

4.4 The effects of social class on child malnutrition

The study employed an Ordinary Least Squares (OLS) model to examine the factors contributing to child malnutrition, with a particular focus on social class. Underweight was used as the key indicator of malnutrition, not only due to its widespread application but also because an underweight child may be stunted, wasted, or both (WHO, 2020). The OLS regression results, presented in Table 4, indicate that the model explains approximately 39.92% (R^2 = 0.3992) of the variation in underweight status. This means that about 40% of the variation in underweight among children can be attributed to the independent variables included in the model. Furthermore, the F-statistic (396.17, $p < 0.000$) confirms that the overall model is statistically significant.

The findings reveal that seven variables significantly influence child malnutrition: the sex of the child, age of the child, mother's years of education, father's education, Vitamin A supplementation, mother's age, and low social class. The sex of the child had a positive coefficient of 0.089, indicating that male children are more likely to be underweight than their female counterparts. This could be due to biological differences, as male children typically have higher metabolic rates, greater nutritional needs, and weaker immune responses in early childhood. These findings are in line with Thurstans et al. (2022), who observed that boys are generally more vulnerable to infectious diseases than girls, except in the cases of measles, whooping cough, and tuberculosis. Similarly, Fish (2008) noted that girls exhibit stronger immune responses and greater antibody production than boys. In addition to biological factors, sociocultural factors may contribute to these gender disparities. In some cultures, girls receive more parental attention or preferential feeding, resulting in better nutritional outcomes. However, this contrasts with Pampa et al. (2018), who found that girls were breastfed for shorter durations and that parents tended to prioritise boys when providing food items such as commercial infant food, fish, and health drinks.

The results also showed that age is a significant factor, implying that older children are more likely to be underweight. Specifically, for every one-year increase in age, the likelihood of being underweight rises by 2.5%. This may be due to poor complementary feeding practices after weaning or increased vulnerability to infections, which can lead to weight loss. This finding is consistent with Goson et al. (2022), who analysed data from 33,776 children in northern Nigeria and found that children aged 24–59 months had the highest underweight prevalence at 34.8%. A similar study by Okwori et al. (2021) reported that children aged 25–36 months had the highest percentage of severely underweight cases (65.6%), reinforcing the notion that as children grow, particularly beyond two years of age, their risk of being underweight increases. The coefficient for maternal education (-0.002) suggests a negative relationship between maternal education and the likelihood of a child being underweight. This means that for every additional year of maternal education, the likelihood of a child being underweight decreases by 0.2%. Educated mothers are more likely to practice proper infant feeding, maintain better hygiene in food preparation, and seek timely medical care, which significantly reduces malnutrition and child mortality (Holland & Rammohan, 2019; Salawu et al., 2022). This finding aligns with Paul & Saha (2022), who identified maternal education as a strong predictor of a child's nutritional status, and Haddad et al. (2023), who found that a one-year increase in maternal education leads to a 4–5% reduction in child malnutrition rates in developing countries.

Interestingly, the positive coefficient (0.024) for Vitamin A supplementation suggests that children who received Vitamin A were more likely to be underweight. This could be because Vitamin A alone does not address calorie deficiency, although it boosts immunity, it does not directly increase weight. This finding aligns with Hooper et al. (2022), who found that Vitamin A supplementation has a limited direct impact on weight gain unless combined with adequate caloric intake. The coefficient for maternal age (0.0001) indicates that for every additional year in the mother's age, the likelihood of a child being underweight increases by 0.01%. However, this effect size is minimal, suggesting that maternal age alone has little influence on child nutrition. While older mothers may have greater parenting experience, economic stability, and better knowledge of child nutrition, other factors, such as household income and access to resources, may play a more critical role. The negative coefficient (-0.006) for the father's education suggests that children with more educated fathers are less likely to be underweight. This finding is in agreement with Adesuyi et al. (2021), Bita et al. (2020), and Adeyanju & Fadupin (2024), who found that higher parental education levels, including fathers' education, were associated with lower rates of underweight and stunting among children under five.

The coefficient for low social class (0.025) indicates that children from lower social classes have a 2.53% higher likelihood of being underweight than those from higher social classes. This highlights the critical role of economic disparity in child malnutrition. Children from low-income households often experience food insecurity, poor sanitation, and increased exposure to infections, all of which contribute to malnutrition. This result conforms with Okutse & Athiany (2025), who established that socioeconomic inequality significantly influences under-five malnutrition rates, with children from the poorest households being disproportionately affected by stunting, underweight, and wasting.

Table 5: Ordinary least squares regression analysis of predictors influencing child malnutrition

Variable	Coefficient (β)	Standard Error	p-value
Chdsex	0.089***	0.006	0.000
Child age	0.025***	0.000	0.000
Meduc	-0.002**	0.001	0.005
HHsize	0.001	0.001	0.330
BMI	-0.001	0.001	0.339
CWE	-0.014***	0.000	0.000
FEDUC	-0.006**	0.003	0.041
Vit A sup	0.024**	0.005	0.000
Oland	-0.009	0.009	0.306
HOCCUP	0.001	0.000	0.378
MAGE	0.001***	0.000	0.001
Mid	-0.006	0.009	0.517
Low	0.025**	0.012	0.039
_Constant	1.037***	0.027	0.000

Source: Authors' Computation,2025: Variables with $p \leq 0.05$ are considered statistically significant. Asterisks indicate significance levels:*** = significant at 1% level ($p \leq 0.01$),** = significant at 5% level ($p \leq 0.05$). High is omitted due to perfect collinearity with other variables in the model.

Multicollinearity check (VIF test)

To check the validity of the results in Table 5, the study conducted a Variance Inflation Factor (VIF) test to detect multicollinearity. Not correcting for multicollinearity can distort coefficient estimates, making it difficult to determine the actual effect of each predictor on the dependent variable. Distorted coefficients or biased estimates can lead to incorrect conclusions and ineffective policies. Bias in OLS estimates can result in wasted resources, ineffective policies, and failure to address key social and economic issues. Table 6 shows the Variance inflation factor, and the Mean VIF is 2.13; by implication, multicollinearity is not a serious issue, as it is well below the common threshold of 10. This means that the independent variables in my explanatory variable regression model are not excessively correlated, reducing the risk of inflated standard errors and unreliable coefficient estimates.

Table 6: Variance Inflation Factor

Variable	VIF	1/VIF
Chdsex	1.02	0.9793
Childage	4.50	0.2223
Meduc	2.76	0.3619
HHsize	1.21	0.8284
BMI	1.25	0.8008
CWE	4.67	0.2141
FEDUC	1.42	0.7034
Vit A sup	1.06	0.8354
Oland	1.03	0.9720
HOCCUP	1.00	0.9973
MAGE	1.20	0.8354
Mid	2.28	0.4385
Low	4.25	0.2355
Mean VIF	2.13	

Source: Authors' Computation,2025.

V. CONCLUSION AND RECOMMENDATIONS

This study has established that social class plays a critical role in shaping child malnutrition outcomes in Nigeria. The findings reveal that children from lower social classes are significantly more likely to be underweight, underscoring the persistent inequities in access to nutrition, healthcare, and essential resources. The analysis also highlighted that factors such as a child’s sex, age, parental education, Vitamin A supplementation, and maternal age influence malnutrition, with maternal education emerging as a crucial protective factor. The results indicate that children from economically disadvantaged households face higher risks of malnutrition due to limited access to nutritious food, poor sanitation, and higher exposure to infections. These disparities reflect broader structural inequalities, emphasising the need for targeted interventions that address the socioeconomic determinants of child nutrition. Hence, the government should scale up National Social Investment Programs like Conditional Cash Transfers, school meal programs, and food vouchers targeting low-income households. The government should expand female education programs like Better Education Service Delivery for all and Adolescent Girls Initiative for Learning and Empowerment. Also, the Government should integrate nutrition awareness into their curricula, particularly among low-income groups, as educated mothers are more likely to adopt proper infant feeding practices, ensure food security, and seek healthcare services. Additionally, nutrition programs should move beyond supplementation efforts and incorporate comprehensive dietary interventions that improve overall food quality and diversity for children.

REFERENCES

[1] Abdullahi, S. M., Yakubu, A. M., Bugaje, M. A., & Akuyam, S. M. (2020). Socio-economic variables of children with undernutrition and their controls in Ahmadu Bello University Teaching Hospital, Zaria. *Nigerian Journal of Paediatrics*, *47*(2), 74-78.

[2] Adesuyi, O. O., Kioko, U. M., & Oleche, M. O. (2021). Socio-economic disparities in under-five child malnutrition in Nigeria. *Global Journal of Health Science*, *13*(9), 1-76.

[3] Adeyanju, O. Z., & Fadupin, G. T. (2024). Household food security status of rural mothers and nutritional status of their children under five years old in Ibadan, Nigeria. *World Nutrition*, *15*(4), 52-58.

[4] Adeyeye, S. A. O., Ashaolu, T. J., Bolaji, O. T., Abegunde, T. A., & Omoyajowo, A. O. (2023). Africa and the Nexus of poverty and diseases. *Critical Reviews in Food Science and Nutrition*, *63*(5), 641-656.

[5] Bayati, M., Arkia, E., & Emadi, M. (2025). Socio-economic inequality in the nutritional deficiencies among the world countries: evidence from global burden of Disease Study 2019. *Journal of Health, Population and Nutrition*, *44*(1), 8.

[6] Bita, A. I. G., Chukuwchindun, B. A., Biwole, T. E., Omgba, A. N. A., Eyong, J. B., & Sanou, M. S. (2020). Qualitative Analysis of the Determinants of Malnutrition among Children Under-five in Households in the Mayo-Danay Division, Cameroon. *Budapest International Research in Exact Sciences (BirEx) Journal*, *3*, 755-766.

[7] Chowdhury, M. R. K., Khan, H. T., Rashid, M., Kabir, R., Islam, S., Islam, M. S., & Kader, M. (2021). Differences in risk factors associated with single and multiple concurrent forms of undernutrition (stunting, wasting or underweight) among children under 5 in Bangladesh: a nationally representative cross-sectional study. *BMJ open*, *11*(12), e052814.

[8] Danaei, G., Andrews, K. G., Sudfeld, C. R., Fink, G., McCoy, D. C., Peet, E., ... & Fawzi, W. W. (2016). Risk factors for childhood stunting in 137 developing countries: a comparative risk assessment analysis at global, regional, and country levels. *PLoS medicine*, *13*(11), e1002164.

[9] Darmon, N., & Drewnowski, A. (2015). Contribution of food prices and diet cost to socioeconomic disparities in diet quality and health: a systematic review and analysis. *Nutrition Reviews*, *73*(10), 643-660.

[10] Das, S., & Gulshan, J. (2017). Different forms of malnutrition among under-five children in Bangladesh: a cross-sectional study on prevalence and determinants. *Bmc Nutrition*, *3*, 1-12.

[11] Devkota, S., & Panda, B. (2016). Socioeconomic gradients in early childhood health: evidence from Bangladesh and Nepal. *International Journal for Equity in Health*, *15*, 1-16.

[12] Diallo R, Baguiya A, Balde MD, Camara S, Diallo A, Camara BS, Toure AO, Soumah AM, Kouanda S, Compaore E. Prevalence and factors associated with overweight in children under

5 years in West African countries. J Public Health Res. 2023 Jul 13;12(3):22799036231181845. doi: 10.1177/22799036231181845. PMID: 37465529; PMCID: PMC10350767.

[13] Fish, E. N. (2008). The X-files in immunity: sex-based differences predispose immune responses. *Nature Reviews Immunology*, *8*(9), 737-744.

[14] Goson, P. C., Ishaya, T., Ezeh, O. K., Oforkansi, G. H., Lim, D., & Agho, K. E. (2022). Factors Related to Underweight Prevalence among 33,776 Children Below 60 Months Old Living in Northern Geopolitical Zones, Nigeria (2008–2018). *Nutrients*, *14*(10), 2042.

[15] Haddad, S., Waltham-Smith, N., & Allen, A. (2023). Forms of education: rethinking educational experience against and outside the humanist legacy. *Discourse: Studies in the Cultural Politics of Education*, *44*(1), 162-172.

[16] Holland, C., & Rammohan, A. (2019). Rural women's empowerment and children's food and nutrition security in Bangladesh. World Development, 124, 104648. https://doi.org/10.1016/j.worlddev.2019.104648 .

[17] Hooper, L., Esio-Bassey, C., Brainard, J., Fynn, J., Jennings, A., Jones, N., ... & Lietz, G. (2022). Evidence to underpin vitamin A requirements and upper limits in children aged 0 to 48 months: a scoping review. *Nutrients*, *14*(3), 407.

[18] Jana, A., Dey, D., & Ghosh, R. (2023). Contribution of low birth weight to childhood undernutrition in India: evidence from the National Family Health Survey 2019–2021. *BMC Public Health*, *23*(1), 1336.

[19] Kandala, N., Lang, S., Klasen S., & Fahrmeir, L. (2001). Semiparametric analysis of the socio-demographic and spatial determinants of undernutrition in two African countries. Collaborative Research Centre, University of Munich, 386.

[20] Levesque, A. R., MacDonald, S., Berg, S. A., & Reka, R. (2021). Assessing the Impact of Changes in Household Socioeconomic Status on the Health of Children and Adolescents: A Systematic Review. *Adolescent research review*, 1-33.

[21] Li, S., Nor, N. M., & Kaliappan, S. R. (2023). Long-term effects of child nutritional status on the accumulation of human health capital. SSM - Population Health, 24. https://doi.org/10.1016/j.ssmph.2023.101533.

[22] Liu, R., Pi, L., Leng, F., & Shen, Q. (2024). Global disability-adjusted life years and deaths attributable to child and maternal malnutrition from 1990 to 2019. Frontiers in Public Health, 12, 1323263.

[23] Mertens, E., & Peñalvo, J. L. (2021). The burden of malnutrition and fatal COVID-19: a global burden of disease analysis. *Frontiers in nutrition*, *7*, 619850.

[24] Miranda, M., Bento, A., & Aguilar, A. M. (2020). Malnutrition in all its forms and socioeconomic status in Bolivia. *Public health nutrition*, *23*(S1), s21-s28.

[25] Mmopelwa, D. (2019). Household size, birth order and child health in Botswana (No. 19/10). CREDIT Research Paper. Dhingra S, Pingali PL. Effects of short birth spacing on birth-order differences in child stunting: Evidence from India. Proc Natl Acad Sci U S A. 2021 Feb 23;118(8):e2017834118. doi: 10.1073/pnas.2017834118. PMID: 33602815; PMCID: PMC7923660.

[26] NBS (2014). Report on the nutrition and health situation in Nigeria. Nutrition and health survey using SMART Methods, December 2014.

[27] NBS (2018). National Nutrition and Health Survey (NNHS). Report on the Nutrition and Health Situation of Nigeria, June 2018.

[28] National Population Commission (NPC) [Nigeria] & Macro International. (1990). *Nigeria Demographic and Health Survey 1990.* NPC and Macro International.

[29] Okutse, A. O., & Athiany, H. (2025). Socioeconomic disparities in child malnutrition: trends, determinants, and policy implications from the Kenya demographic and health survey (2014-2022). *BMC Public Health*, *25*(1), 1-17.

[30] Okwori, E., Nnam, N. M., & Onu, O. R. (2021). Prevalence of Malnutrition among Children

Aged 6-59 Months in Kaduna State, Nigeria. *Nigerian Journal of Nutritional Sciences*, *42*(1), 114-121.

[31] Pampa, B., Arupkumar, C., Urmila D., Krishnadas, B., Saikat, B.& Kazi, M. A. (2018). Gender Preferences in the Distribution of Food among 6 - 24 Months Children in an Urban Community of Kolkata. Acta Scientific Nutritional Health 2: 17-21.

[32] Paul, P., & Saha, R. (2022). Is maternal autonomy associated with a child's nutritional status? Evidence from a cross-sectional study in India. PLoS ONE, 17.

[33] Perkins, J. M., Kim, R., Krishna, A., McGovern, M., Aguayo, V. M., & Subramanian, S. V. (2017). Understanding the association between stunting and child development in low and middle-income countries: Next steps for research and intervention. *Social Science & Medicine*, *193*, 101-109

[34] Popkin, B. M., Adair, L. S., & Ng, S. W. (2012). Global nutrition transition and the pandemic of obesity in developing countries. *Nutrition Reviews*, *70*(1), 3-21.

[35] Priyadarisini, N. J., Rashmi, K.N., Kiran, N.U., & Badiger, S. (2016). Validation of the standard of living scale with comparison to other socio-economic scales in a semi-urban area of Mangalore: A pilot study. *Nitte University Journal of Health Science, 6* (1), 62-67.

[36] Psaki *et alet al*.(2011) Measuring Socioeconomic Status in Multi-country Studies: Results from the Eight-Country MAL-ED study. Population Health Metrics 2014 12:8.

[37] Salawu, M. B., Rufai, A. M., Salman, K. K., & Ogunniyi, I. A. (2022). The Influence of Women's Empowerment on Child Nutrition in Rural Nigeria (AERC Research Paper No. 496). African Economic Research Consortium, Nairobi.

[38] Sustainable Development Report (SDR) (2023). Rankings: The overall performance of all 193 UN Member States. Available at dashboards.sdgindex.org/rankings. Retrieved 31st January, 2023.

[39] Singh, S., Srivastava, S., & Upadhyay, A. K. (2019). Socio-economic inequality in malnutrition among children in India: an analysis of 640 districts from National Family Health Survey (2015–16). *International journal for equity in health*, *18*(1), 1-9.

[40] Thurstans, S., Opondo, C., Seal, A., Wells, J. C., Khara, T., Dolan, C., ... & Kerac, M. (2022). Understanding sex differences in childhood undernutrition: a narrative review. *Nutrients*, *14*(5), 948.

[41] Turck, D., Michaelsen, K.F., Shamir, R., Braegger, C., & Campoy, C.(2013). World Health Organisation 2006 child growth standards and 2007 growth reference charts: A discussion paper by the Committee on Nutrition of the European Society for pediatric gastroenterology, hepatology, and nutrition. *J Pediatr Gastroenterol Nutr 57*, 258-264.

[42] United Nations Children's Fund. (2019). Levels and trends in child malnutrition: key findings of the 2019 edition. UNICEF/WHO/World Bank Group joint child malnutrition estimates. World Health Organisation.

[43] Wemakor, A., Garti, H., Azongo, T., Garti, H., & Atosona, A. (2018). Young maternal age is a risk factor for child undernutrition in Tamale Metropolis, Ghana. BMC research notes, 11, 1-5.

[44] World Health Organisation, & United Nations Children's Fund. (2020). *Levels and trends in child malnutrition: key findings of the 2020 edition. UNICEF/WHO/World Bank Group joint child malnutrition estimates*. World Health Organisation.

[45] World Health Organisation (WHO). (2023). United Nations Children's Fund (UNICEF) & International Bank for Reconstruction and Development/The World Bank. *Levels and trends in child malnutrition: UNICEF/WHO/World Bank Group joint child malnutrition estimates: key findings of the 2023 edition. UNICEF and WHO*, 5-25.

[46] World Bank (2023). Nutrition. World Bank Publication available at

https://www.worldbank.org/en/topic/nutrition/overview.

[47] World Bank (2006). Repositioning nutrition as central to development: A strategy for large Scale Action. Washington, DC. http://hdl.handle.net/10986/7409

[48] World Health Organisation (WHO) (2010). *Nutritional Landscape Information*

[49] *System (NLIS) country profile indicators: Interpretation guide*. WHO Library Cataloguing –in-Publication Data.

[50] WHO (2021). Malnutrition. WHO Fact Sheet. Available at https://www.who.int/news-room/fact-sheets/detail/malnutrition. Retrieved 25th April, 2023.

[51] WHO (2016) *Global database on child growth and malnutrition.*. http://WWW.who.Int/nutgrowthdb/about/introduction/en/index2.HTML

[52] World Population Review (2024). Malnutrition Rate by Country 2024. Available at https://worldpopulationreview.com/country-rankings/malnutrition-rate-by-country

[53] Zewdie, T., & Adebaw, D. (2013). Determinants of child malnutrition: Empirical evidence from Kombolcha district of Eastern Hararghe zone, Ethiopia. *Quarterly Journal of International Agriculture 52* (4), 357-372.Zhang, X., Zhang, L., Pu, Y., Sun, M., Zhao, Y., Zhang, D., ... & He, S. (2022). Global, regional, and national burden of protein-energy malnutrition: a systematic analysis for the global burden of disease study. Nutrients, 14(13), 2592.