

Economic Consequences of Malnutrition Among Under-Five Children On Households: New Insight From South- South Of Nigeria

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Abstract

Purpose – Analyzing the impact of direct healthcare costs, indirect burdens, and coping strategies associated with childhood malnutrition on household economic well-being in South-South Nigeria.

Design/methodology/approach – A quantitative survey-based study was conducted involving 363 households with children under five across six states in the South-South region of Nigeria. The data were analyzed using multiple regression.

Originality – It presents recent (2025) micro-level empirical evidence that integrates medical expenditures, productivity losses, and household recovery responses within a single framework in the South-South region of Nigeria.

Findings and Discussion – Direct Healthcare Costs (\$X_1\$): Had a significant negative effect ($\beta = -0.054$; $p = 0.044$). Out-of-pocket medical payments substantially depleted savings and worsened the family's economic situation. Indirect Costs (\$X_2\$): Had a positive but non-significant effect ($\beta = 0.080$; $p = 0.054$). The loss of caregivers' working days was offset by informal support or side jobs. Coping Strategies (\$X_3\$): Had a positive but non-significant effect ($\beta = 0.079$; $p = 0.507$). Debt and reduced food intake provided only temporary liquidity relief rather than long-term economic resilience.

Conclusion – Malnutrition among toddlers places a significant strain on household finances due to high direct medical costs. Coping mechanisms such as informal loans fail to provide long-term recovery solutions; therefore, the government needs to implement community-based health insurance and microcredit schemes.

Keywords – Malnutrition, Economic Consequence, Under-five children, Regression, Nigeria

Introduction

Malnutrition among under-five children has long been recognized as one of Nigeria's most persistent public health and socio-economic challenges. Its consequences extend beyond health outcomes, influencing education, household productivity, and national development trajectories. Since the early 1990s, Nigeria has experienced recurrent waves of nutritional crises driven by economic instability, poverty, regional disparities, political unrest, and weak health systems. The Structural Adjustment Programme (SAP) in the late 1980s saw food prices rise sharply while real household incomes declined (Akinyele, 2009). The National Demographic and Health Survey (NDHS, 1990) reported that 43% of Nigerian children under five were stunted, and 36% underweight, which was among

the highest rates in Sub-Saharan Africa at the time. These early indicators reflected deep socio-economic vulnerabilities: declining agricultural productivity and limited access to healthcare disproportionately affected low-income households (FMOH, 2021).

The decade between 2010 and 2020 was characterized by economic volatility, insurgency in the North-East, and rising food insecurity. Despite Nigeria's classification as Africa's largest economy in 2014, the NDHS (2018) reported that 37% of under-five children were stunted, and 29% underweight. The persistence of high malnutrition rates underscored the limited reach of economic growth to vulnerable populations. The socio-economic ripple effects were severe: displaced families lost livelihoods, educational disruptions widened, and household poverty deepened. Economically, the World Bank (2019) observed that malnutrition was estimated to cost Nigeria over 11% of its GDP annually due to reduced productivity, impaired learning, and increased healthcare costs. Evidence from the World Bank reveals that Nigeria loses an estimated US\$3.5 billion annually due to malnutrition-related healthcare costs, reduced workforce productivity, and lower cognitive output among children who later become adults in the labour market. Stunted children are also more likely to become less productive adults with lower lifetime earnings. Danjuma, Adewale and Oche(2025) found that adults who were stunted before age five earned 23% less in adulthood than their non-stunted counterparts, demonstrating an intergenerational transmission of economic disadvantage arising from early-life malnutrition.

These economic and productivity consequences illustrate that malnutrition is both a cause and a consequence of poverty. It affects household income through increased medical bills, reduces labour productivity due to caregiving responsibilities, compromises children's cognitive and physical development, and ultimately diminishes national economic growth. The Food and Agricultural Organization (FAO, 2022) further emphasizes that countries with high levels of under-nutrition experience slower GDP growth and wider income inequality, showing that malnutrition acts as a structural constraint on economic development. This study therefore investigates the economic and productivity consequences of malnutrition on households in Nigeria, drawing on empirical evidence and regression-based analysis to explore how malnutrition shapes healthcare expenditure, productivity losses, and socio-economic vulnerability among families with young children.

Statement of the Problem

Despite the wealth of evidence on the health consequences of malnutrition among under-five children, fewer recent studies have examined its economic and productivity consequences at the household level in the Nigerian context (Akinyemi&Adedini, 2020; Olanrewaju&Adebiyi, 2023; Okafor & Ibrahim. 2022; Akinola&Eze, 2021). Understanding these impacts is crucial because households bear the immediate burden of malnutrition among under-five children long before its effects manifest at the national level. As such, there is a need for updated empirical studies that quantify the extent to which under-five children malnutrition affects household income, labour productivity, and economic resilience in Nigeria.

Again, despite numerous intervention programs such as the National Policy on Food and Nutrition (2001) and the National Multisectoral Plan of Action for Food and Nutrition (2019–2025), malnutrition still pose severe consequences to under five children in

Nigeria. Evidence show that Nigeria has one of the highest burdens of child malnutrition globally, with 32% of children under five stunted, 12% having lower weight than their height, and 22% underweight, according to the 2021 Multiple Indicator Cluster Survey (UNICEF, 2020). Additionally, UNICEF (2023) reported that over 6 million Nigerian children under five are stunted, while around 2 million suffer from severe acute malnutrition, with only about 20% receiving treatment. As a result, ascertaining the economic consequences of these malnutrition statistics on households is set to solve the problem of policy inconsistencies in this area.

Objectives of the Study

The main objective of this study is to investigate the economic consequences of malnutrition among under-five children on households in Nigeria. The specific objectives are to:

1. determine the direct healthcare costs incurred by households as a result of treating malnutrition-related illnesses and how it affects their overall economic well-being;
2. examine the indirect economic burdens of child malnutrition and how it affects households economic well-being;
3. evaluate the coping strategies households adopt in response to the financial pressures associated with managing malnutrition among under-five children.

Research Hypotheses

- H₀₁: Thedirect healthcare costs incurred by households as a result of under-five malnutrition-related illnesses have no significant effect on their economic well-being.
- H₀₂: The indirect economic burdens of child malnutrition have no significant effect on households in Nigeria.
- H₀₃: Coping strategies adopted by households in response to malnutrition have no significant effect on their economic well-being.

Scope of the Study

This study focuses on the economic consequences of malnutrition among under-five children on households in Nigeria. The geographic scope is South-South region of Nigeria. The time scope is 2025 since it is a survey study. The method scope is regression analysis framework and the content scope includes healthcare costs, indirect economic burdens of child malnutrition and household coping strategies.

Significance of the Study

This research contributes to the existing body of literature on health economics by analyzing the economic consequences of malnutrition among under-five children on households in Nigeria. This will be very useful for policymakers and the government in future policy directions. this study will also benefit non-governmental organizations and international donor agencies to see critical areas of need in Nigeria in terms of under-five children and make informed decision ion aid programs. This study will also add to the

theoretical and empirical knowledge thus providing strong background for future researchers.

Literature Review

Conceptual Literature Review

The World Health Organization (2022) defines malnutrition as a condition resulting from deficiencies, excesses, or imbalances in a person's intake of energy and/or nutrients. It manifests in various forms stunting (chronic under-nutrition), wasting (acute under-nutrition), underweight (low weight-for-age), and micronutrient deficiencies (such as vitamin A, iron, iodine, and zinc). In under-five children, De-Oniset *al.*, (2019) noted that malnutrition is often measured using anthropometric indicators, for example, height-for-age (stunting), weight-for-height (wasting), and weight-for-age (underweight). The direct healthcare costs incurred by households as a result of treating malnutrition-related illnesses among under-five children in Nigeria are said to be enormous and sometimes over-bearing.

Conceptually, direct healthcare costs refer to the actual out-of-pocket expenditures households incur in seeking medical care for malnutrition-related illnesses. These costs include payments for consultations, medications, diagnostic tests, transportation to healthcare facilities, and hospital stays (Akombiet *al.*, 2017). In Nigeria, where malnutrition remains a major public health concern, these expenses are particularly burdensome for low-income families, as malnutrition frequently coexists with infections such as diarrhea, pneumonia, and malaria (Adepoju, Akinyemi & Osotimehin, 2020). The high cost of healthcare services, combined with limited access to subsidized care, often leads to delayed treatment, thereby worsening child health outcomes (Olumakaiye, 2013). There is also another perspective to malnutrition among under-five children which is indirect economic burdens on households. Indirect economic burdens encompass the broader economic losses households experience due to child malnutrition.

These include productivity losses resulting from caregivers' time spent caring for sick children, long-term impacts on the child's cognitive and physical development, and future earnings losses (Onabanjo & Balogun, 2022). Malnutrition affects school readiness, learning outcomes, and later labor market participation, thereby perpetuating intergenerational poverty (Victora *et al.*, 2021). At the household level, caregivers often experience opportunity costs due to absenteeism from work or reduced productivity, which affects overall household income (Akombi *et al.*, 2019). These indirect burdens are often invisible but cumulatively represent a significant share of the economic toll of malnutrition on households and the national economy (UNICEF, 2020).

Furthermore, households employ various coping mechanisms to deal with the financial strain caused by malnutrition-related healthcare costs. These strategies can be grouped into short-term and long-term responses. Short-term coping strategies often include borrowing money, selling household assets, or reducing food consumption (Uzochukwuet *al.*, 2018). Long-term strategies may involve diversifying income sources, seeking community or NGO support through crowd-funding, and relying on traditional medicine or home remedies to minimize costs (Babatunde, Olagunju, & Fakayode, 2021). The reliance on informal coping measures underscores gaps in social protection systems and healthcare financing mechanisms within Nigeria's health sector (Federal Ministry of

Health, 2021).

Theoretical Framework: The Human Capital Theory

The Human Capital Theory offers a foundational framework for understanding the economic consequences of malnutrition among under-five children on households in Nigeria. The theory posits that investments in human development such as health, nutrition, and education, enhance productivity, earning potential, and overall societal welfare. Within the context of malnutrition among under-five children in Nigeria, the theory provides a critical lens for analyzing how poor nutrition in early childhood undermines human capital formation, constrains individual potential, and limits national economic growth. The human capital theory further upholds the fact that when children suffer from malnutrition, their ability to learn, concentrate, and perform effectively later in life is compromised. This leads to lower educational attainment and reduced earning capacity in adulthood. For households, these effects translate into immediate and long-term economic burdens including higher healthcare costs, reduced labor productivity among caregivers, and diminished future income potential of the child. Therefore, from the human capital theory perspective, malnutrition is not only a health issue but also an economic investment concern, where inadequate nutrition erodes the household's and nation's capacity to build a productive labor force.

Empirical Review

Several studies have analyzed the economic consequences of malnutrition in under-five children both in Nigeria and outside of Nigeria. Aregbeshola and Khan (2018) in their study of out-of-pocket payments, catastrophic health expenditure and poverty among households in Nigeria used national survey data, and revealed that malnutrition-related hospital admissions and medications represented a significant share of catastrophic health expenditures, particularly in rural households. Such direct costs frequently pushed families below the poverty line. Aregbeshola and Khan (2018) also noted that poorer families relied heavily on social networks and informal credit systems to finance child health care, highlighting inadequate financial protection mechanisms. Galasso and Wagstaff (2019) studied the long-term income losses attributable to early childhood stunting. The main independent variable was stunting during early childhood, while the dependent variable measured adult income, educational attainment, and productivity levels. Using cross-country regression analysis and cost-benefit modeling, the authors estimated that adults who were stunted as children suffer an average 22 percent reduction in lifetime income relative to their well-nourished counterparts.

Akinyemi and Adedini (2020) carried out a household-level economic analysis to investigate how malnutrition among under-five children affects family expenditure and productivity in Nigeria. Using multiple regression analysis, they revealed that households with at least one malnourished child spent 23 percent more on healthcare than those without, mainly due to frequent illness episodes and hospital visits.

Colecraft, Shittu & Christian (2020) studied nutrition transition and the triple burden of malnutrition in Sub-Saharan Africa: Status, determinants and economic welfare costs. The study highlighted the economic welfare costs of malnutrition, including increased dependency ratios, reduced household income diversification, and long-term human

capital losses. It estimated that malnutrition reduces lifetime earnings of affected Nigerian children by up to 10–17%. Akinola and Eze (2021) approached the issue from the perspective of household resilience and economic vulnerability. They estimated the relationship between child nutrition status and economic shocks using a logit model. Results showed that households with malnourished under-five children were significantly more likely to experience food insecurity, asset depletion, and indebtedness following health shocks.

Similarly, Okafor and Ibrahim (2022) examined the link between malnutrition and parental labor productivity among rural agricultural households in northern Nigeria. Two-stage least squares (2SLS) results indicated that households with stunted or wasted children exhibited 18% lower agricultural productivity, primarily due to increased caregiving time and lower physical work efficiency among mothers. Musa, Ojonugwa, & Monday (2023) showed that malnutrition-related illnesses such as diarrhoea and pneumonia significantly increased out-of-pocket healthcare costs, which in turn elevated under-five mortality risk. The average household spent between ₦15,000–₦25,000 monthly on malnutrition-related treatments, often without insurance coverage. Ayipe and Tanko (2023) examined public health expenditure and under-five mortality in low-income Sub-Saharan African countries. The authors found that poor nutrition leads to reduced caregiver productivity, lost workdays, and lower future earning potential of affected children. In Nigeria, each malnourished under-five child cost households an estimated ₦40,000–₦60,000 annually in indirect productivity losses.

Olanrewaju and Adebisi (2023) estimated the direct and indirect costs of child malnutrition. Using cost-of-illness and productivity loss approaches, the study found that families with malnourished children spent an average of ₦48,000 more annually on healthcare and lost approximately 15% of household income due to reduced work participation. Regression analysis confirmed that the dual pressures of medical expenses and caregiving time significantly reduced disposable income, creating a cycle of poverty reinforced by malnutrition. Arodiwe, Arodiwe and Okoronkwo (2023) investigated household catastrophic health expenditure and coping mechanisms in patients with chronic illness in Enugu, Nigeria. Although the study is not limited to malnutrition, it documented similar coping responses among low-income households: borrowing, asset sales, and reduced food consumption. Such mechanisms were found to exacerbate household food insecurity, further worsening child malnutrition. Bello et al. (2024) investigated the aggregate income and GDP implications of childhood malnutrition using data from Nigeria's National Bureau of Statistics and World Bank datasets. Employing a computable general equilibrium (CGE) model, they simulated long-term productivity losses associated with stunting and micronutrient deficiencies.

The findings revealed that Nigeria's GDP could increase by 2.8% annually if malnutrition were halved, equivalent to an economic gain of approximately USD 4.2 billion. Sambo, Ejembi, Adamu, & Aliyu (2024) studied out-of-pocket health expenditure for under-five illnesses in a semi-urban community in Northern Nigeria. They found that treatment of under-five illnesses (including malnutrition, diarrhoea, and malaria) accounted for over 70% of total household healthcare spending, indicating significant financial strain and catastrophic out-of-pocket (OOP) payments in low-income families. Van Dijk and Djindil (2025) analyzed how early-life undernutrition undermines labour efficiency and agricultural output in sub-Saharan Africa, including Nigeria. Using econometric modeling and longitudinal simulation techniques, they found that

populations with a high prevalence of childhood stunting experienced reduced adult physical work capacity, leading to diminished agricultural output. In a more recent study, Danjuma *et al.* (2025) analyzed the impact of early childhood malnutrition on future earnings potential using a life-course econometric approach. Using longitudinal fixed-effects regression, the results demonstrated that adults who were stunted before age five earned 23% less than their non-stunted peers, even after controlling for education and occupation.

Maurice, Sam, Francis and Proscovia (2025) estimated the catastrophic and impoverishing health expenditure risk among malnourished under-five children in Uganda. The findings reported selling household assets, taking informal loans, and withdrawing older children from school as dominant coping responses to child malnutrition-related treatment costs. Briggs-Megafu (2025) assessed the relationship between the informal sector, out-of-pocket healthcare expenses, and maternal and infant mortality in Nigeria. Using mixed-method analysis, the study found that child malnutrition imposed hidden costs on households, including lost income due to caregiver absenteeism and increased reliance on informal borrowing, which deepened intergenerational poverty cycles.

Gap in Literature

Despite extensive research on the economic implications of child malnutrition in Nigeria and other developing contexts, several important gaps remain. First, most previous studies have examined the costs of malnutrition from a national or macroeconomic perspective (e.g., Galasso & Wagstaff, 2019; Bello *et al.*, 2024; Van Dijk & Djindil, 2025), focusing on productivity losses and GDP impacts rather than on household-level economic experiences. This leaves limited understanding of how malnutrition specifically affects family finances, healthcare expenditure, and economic resilience at the micro level. Second, while some Nigerian studies (e.g., Akinyemi & Adedini, 2020; Musa, Ojonugwa & Monday, 2023; Aregbeshola & Khan, 2018) have explored direct healthcare costs and out-of-pocket spending, few have integrated both direct and indirect economic burdens, including productivity losses, caregiver absenteeism, and income erosion within a single empirical framework.

Third, research on household coping strategies in response to malnutrition-induced financial strain remains sparse. Existing works such as Arodiweet *et al.* (2023) and Briggs-Megafu (2025) focus on general catastrophic health expenditures, but do not specifically link coping behaviors to child malnutrition contexts. Again, most empirical analyses have been concentrated in northern or national-level datasets, with limited studies focusing on regional disparities, particularly the South-South region of Nigeria, where malnutrition coexists with high food insecurity and economic inequality.

Methods, Data, and Analysis

Research Design

This study adopts descriptive survey research design, combining quantitative and descriptive methods. The design is suitable because it allows for both the identification

of causal relationships and the quantification of the economic consequences of under-five children malnutrition on households.

Model Specification

The study specifies a regression equation corresponding to specific objectives. The model is a modification of the work of Musa, Ojonugwa and Monday (2023). The modification is made by using overall economic consequence of under-five malnutrition as the dependent variable while identifying the independent variables as follows:

$$Y_t = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon_t \quad [3.1]$$

Where:

- Y = Overall Economic Well-being
- X₁ = Direct healthcare cost incurred by households
- X₂ = Indirect economic burdens of child malnutrition
- X₃ = Coping strategies adopted by households

The a-priori expectation is such that the independent variables are expected to exert positive effects on overall economic well-being of households. This can be stated mathematically as: X₁> 0; X₂> 0; X₃> 0.

Sources of Data

This study utilizes primary data drawn from randomly selected households in South-South region of Nigeria (Akwa Ibom, Bayelsa, Cross River, Delta, Edo, and Rivers). These were the main data that constituted the basis for the analysis.

Population and Sample

The study population comprises residents of the five states in South-South Nigeria (Akwa Ibom, Bayelsa, Cross River, Delta, Edo, and Rivers), who have children that are within the age bracket of 0–5 years. The 2023 projected population data from the National Population Commission and NBS is summarized below as well as the sample drawn:

Table 1. Population and Sample Distribution

State	Population	Sample
Akwa Ibom:	5,780,581	72
Bayelsa:	2,394,725	30
Cross River:	4,175,020	52
Delta:	7,107,543	88
Edo:	5,527,810	68
Rivers:	7,234,973	90
Total	32,220,652	400

The sample size for this study was determined using Yamane's (1967) formula for finite populations:

$$n = \frac{N}{1 + N(e)^2}$$

Where n = sample size; N = Population size (32,220,652); e = Margin of error (5% or 0.05)

$$n = \frac{32,220,652}{1 + 32,220,652(0.0025)}; n = \frac{32,220,652}{80,552.63} = 400$$

Thus, 400 respondents were selected proportionately across the five states using the Bowley's approximation formula: $n = \frac{\text{Population of the State}}{\text{Total Population (N)}} \times \text{Sample size (400)}$

Importantly, the study employed a multistage sampling technique:

Stage 1: Stratification by state.

Stage 2: Purposive selection of urban, suburban, and rural communities to capture geographic diversity.

Stage 3: Sampling of households with children under-five years, and random selection of respondents within households.

Research Instrument

The research instrument is the structured questionnaire. The structured questionnaire is divided into several sections with each section capturing the socio-economic consequences of malnutrition and morbidity data.

Validity and Reliability of the Instrument

Content validity was ensured by subjecting the questionnaire to expert review by three scholars in Health Economics and Social Statistics from the University. Feedbacks from the reviews were incorporated to improve question clarity, comprehensiveness, and relevance. The internal consistency of the instrument was determined using Cronbach's Alpha. A reliability coefficient for each of the questionnaire sections was above 0.70 and it was considered acceptable for each section (See Appendix). The test of reliability was analyzed using SPSS.

Method of Data Collection

The researcher was assisted by trained enumerators from each State who are fluent in English and local languages. The assistants administered the questionnaires in person to maximize response rates.

Methods of Data Analysis

The analysis employed both descriptive and inferential statistical techniques to achieve the study's specific objectives. The descriptive statistics included frequency distributions, percentage analysis and weighted mean. The inferential statistics used was multiple regression analysis. The t-test of individual statistical significance was used to test the hypotheses at the 5% significance level. The decision criteria for the hypothesis are stated thus: Reject null hypothesis (H_0) if the probability value of the t-statistic is less than 0.05

critical value (Reject H_0 if $p\text{-value} < 0.05$), Accept the null hypothesis (H_0) if the probability value of the t-statistic is greater than 0.05 critical value (Accept H_0 if $p\text{-value} > 0.05$).

Results

Data Presentation

Table 2. Questionnaire Distribution and Return Rate

State	Number Distributed	Number Returned	Response Rate
Akwa Ibom:	71	60	83%
Bayelsa:	30	28	93%
Cross River:	52	51	98%
Delta:	88	84	95%
Edo:	68	55	80%
Rivers:	90	85	94%
Total	400	363	90.75%

Source: Field Survey (2025)

According to Table 4.1, the highest response rate recorded was from Cross River State with 98% followed by Delta and Bayelsa States with 95% and 93% respectively. Rivers State had 89% response rate, Akwa Ibom has 83% while the least response rate was from Edo State with 80%. In total, 358 questionnaires were returned and duly completed out of 400 distributed and this gave a total response rate of 89.5%.

Table 3. Demographic Distribution

S/N	Variable	Options	Frequency (n = 363)	Percentage %
1.	Age Group	Below 30 years	79	21.8
		31 – 40 years	193	53.2
		Above 40 years	91	25.1
		Total	363	
2.	Gender	Male	241	66.4
		Female	122	33.6
		Total	363	
3.	Marital Status	Single	141	38.8
		Married	203	55.9
		Widowed	15	4.1
		Divorced	4	1.1
		Total	363	
4.	Level of Education	No Formal Education	15	4.1
		Primary	189	52.1
		Secondary	71	19.6
		Tertiary	88	24.2
		Total	363	
5.	Occupation	Farming	133	36.6
		Trading	98	29.8
		Civil Servant	56	16.5
		Artisan	41	14.1
		Unemployed	11	3.0

	Total	363	
6. Household Size	1 – 3	124	34.2
	4 – 6	222	61.2
	7 – 9	7	1.9
	10+	10	2.8
	Total	363	
7. No. of Under-five Children	1 child	130	35.8
	2 children	22	6.1
	3 children	155	42.7
	4+ children	56	15.4
	Total	363	
8. Place of Residence	Urban	66	18.2
	Rural	103	28.4
	Semi-Urban	146	40.2
	Semi-Rural	48	13.2
	Total	363	

Source: Field Survey (2025)

The data summarized in Table 4.1 shows that there are more male participants in the study than male participants. Female respondents make up 33.6% of the total respondents (122 out of 363 respondents) while male respondents make up the greater percentage 66.4% (241 out of 363 respondents). The respondents are majorly in the age category of 31 years to 40 years and have basic level of education with 52.1% being primary school certificate holders and 24.2% having tertiary education. In terms of their occupation, 36.6% are farmers while 29.8% are traders. The highest household size was 4 – 6 persons in a household (61.2%), 42.7% have at least 3 children that are aged 5 years and below with 40.2% living in semi-urban areas.

Table 4. Responses on Direct Healthcare Costs of Malnutrition-Related Illnesses

S/N	Direct Healthcare Costs of Malnutrition	₹10,000 - ₹19,999	₹20,000 - ₹29,999	₹30,000 - ₹39,999	₹40,000 - ₹49,999	Above ₹50,000
1.	Hospital consultation/doctor's fees.	115	213	20	10	5
2.	Cost of prescribed medicines/supplements.	13	20	110	214	6
3.	Laboratory/diagnostic tests.	200	105	24	8	26
4.	Transportation to health facilities.	158	86	82	14	23
5.	Hospital admission/bed charges.	173	104	73	7	6
6.	Feeding or special dietary costs.	65	48	213	21	16

Source: Survey Data (Results were extracted from SPSS output)

Table 4 indicates that greater number of the respondents spend between ₹10,000 to ₹29,999 on hospital consultation and doctor's fees. Majority spend ₹30,000 and above on cost of prescribed medicines while more than half of them spend less than ₹29,999 on Laboratory/diagnostic tests, transportation to health facilities and hospital admission/bed charges. Feeding or special dietary costs cost the respondents between ₹30,000 - ₹39,999.

Table 5. Responses on Indirect Economic Burdens of Child Malnutrition

S/N	Indirect Economic Burdens	SA	A	D	SD	Mean	Remark
1.	I lost productive workdays due to caring for my sick child.	154	161	23	25	3.22	Positive
2.	My household income has reduced because of my child's frequent illness.	63	243	43	14	2.98	Positive
3.	Malnutrition in my child has affected the family's ability to save money.	66	25	64	208	1.86	Negative
4.	I or other caregivers often miss work to seek treatment for the child.	298	30	23	12	3.69	Positive
5.	The illness has caused us to depend more on relatives or friends for financial support.	123	141	93	6	3.05	Positive

Source: Survey Data (Results were extracted from SPSS output, criterion mean is 2.5)

Table 5 shows that all the question items were positive except for question item 3 with negative response. This implies that the respondents disagreed that malnutrition in their child has affected the family's ability to save money (mean = 1.86). In other words, the family's ability to save money is not being affected by malnutrition. However, greater number of the respondents strongly agreed that they lost productive days due to caring for their sick child (mean = 3.22) and that they miss work to seek treatment for their child (mean = 3.69). The illness has caused majority of them to depend more on relatives or friends for financial support (mean = 3.05).

Table 6. Responses on Household Coping Strategies

S/N	Household Coping Strategies	Yes	No	Remark
1.	Borrowed money from friends or relatives	311	52	Positive
2.	Took a loan from cooperative, moneylender, or microfinance	342	21	Positive
3.	Sold household assets or livestock	61	302	Negative
4.	Reduced quality or quantity of family meals	211	152	Positive
5.	Withdrew older children from school to save costs	53	310	Positive

Source: Survey Data (Results were extracted from SPSS output, criterion mean = 2.5)

Responses on household coping strategies are summarized in Table 6. The Table shows that majority of them borrowed money from friends or relatives, took a loan from cooperative, moneylender, or microfinance, reduced quality or quantity of family meals and withdrew older children from school to save costs. However, greater number opined that they have not sold their household assets or livestock.

Table 7. Responses on Overall Perception of Economic Well-being

S/N	Economic Well-being	SA	A	D	SD	Mean	Remark
1.	Malnutrition has caused significant financial stress in my	128	113	54	68	2.83	Positive

2.	household Treating malnutrition has worsened our household's economic condition	69	156	134	4	2.80	Positive
3.	Coping with malnutrition-related expenses has forced us into debt	166	125	54	18	3.21	Positive
4.	I am very willing to participate in any government program to ease my financial burden	343	20	0	0	3.94	Positive
5.	My family's overall well-being is greatly affected by malnutrition-related expenses	167	111	74	11	3.20	Positive

Source: Survey Data (Results were extracted from SPSS output, criterion mean = 2.5)

As evidenced in Table 4.5, malnutrition has caused significant financial stress in the households under study (mean = 2.83), treating malnutrition has worsened the household's economic condition (mean = 2.80) and that coping with malnutrition-related expenses has forced many of the households into debt (mean = 3.21). Majority also opined that they are very willing to participate in any government program to ease my financial burden (mean = 3.94) and that their family's overall well-being is greatly affected by malnutrition-related expenses (mean = 3.20).

Test of Hypotheses

The hypotheses are tested using the probability value of the t-statistics from the multiple regression analysis. The *p-value* of the t-statistic shows the overall significance or otherwise of the variables. The null hypothesis is rejected if the *p-value* is less than 0.05 critical value i.e. reject null if *p-value* < 0.05, otherwise, accept null.

Table 8. Summary of the Hypotheses Test

Hypotheses	Coefficient	t-stat (<i>p-value</i>)	Decision
H ₀₁ : The direct healthcare costs incurred by households as a result of under-five malnutrition-related illnesses have no significant effect on their economic well-being.	-0.054	-2.160 (<i>p</i> =0.044)	Reject null hypothesis (H ₀₁) since <i>p-value</i> is less than 0.05
H ₀₂ : The indirect economic burdens of child malnutrition have no significant effect on households in Nigeria.	0.080	1.936 (<i>p</i> =0.054)	Accept null hypothesis (H ₀₂) since <i>p-value</i> is greater than 0.05
H ₀₃ : Coping strategies adopted by households in response to malnutrition have no significant effect on their economic well-being.	0.079	0.663 (<i>p</i> =0.507)	Accept null hypothesis (H ₀₂) since <i>p-value</i> is greater than 0.05

Table 8 shows that the null hypothesis one is rejected since the *p-value* of the t-statistic is less than 0.05 critical value. Also, the coefficient is negative implying negative consequences on economic well-being. Therefore, the conclusion is that the direct healthcare costs incurred by households as a result of under-five malnutrition-related illnesses have significant negative effect on their economic well-being. The second and third null hypotheses are accepted since their probability values are greater than 0.05 critical value. The study therefore concludes that the indirect economic burdens of child

malnutrition have no significant effect on households in Nigeria and that coping strategies adopted by households in response to malnutrition have no significant effect on their economic well-being. The positive coefficients mean that indirect economic burdens of child malnutrition increases economic well-being but the increase is not significant. Also, coping strategies adopted by households in response to malnutrition increases their economic well-being but the increase was not significant.

Discussion

The present study investigated the economic consequences of malnutrition among under-five children on households in Nigeria, focusing on the direct healthcare costs, indirect economic burdens, and coping strategies associated with managing malnutrition-related illnesses. The study revealed that direct healthcare costs incurred by households due to malnutrition-related illnesses have a significant negative effect on economic well-being, implying that families with malnourished under-five children face substantial financial pressure. This result is consistent with the findings of Aregbeshola and Khan (2018), who reported that out-of-pocket health payments, including hospital admissions and medication costs for malnutrition, contribute substantially to catastrophic health expenditures, particularly among rural households. Similarly, Akinyemi and Adedini (2020) found that households with at least one malnourished child spent 23% more on healthcare than those without, primarily due to repeated illness episodes and hospital visits.

The significant relationship between direct healthcare costs and reduced household welfare underscores the burden of out-of-pocket health financing in Nigeria's weak social protection context. Many households still lack access to health insurance, as noted by Musa, Ojonugwa, and Monday (2023), who estimated that families spent between ₦15,000 and ₦25,000 monthly on malnutrition-related treatment, often leading to economic distress and asset depletion. Similarly, Olanrewaju and Adebisi (2023) showed that families with malnourished children incurred an additional ₦48,000 annually in healthcare costs, losing roughly 15% of household income due to reduced productivity and caregiving demands. The significant negative coefficient found in the present study suggests that as household medical expenses for malnutrition rise, disposable income and savings decline, reinforcing the cycle of poverty highlighted by Aregbeshola and Khan (2018) and Akinola and Eze (2021). This also supports Human Capital Theory, which posits that poor nutrition limits health capital, thereby eroding productivity and income potential both at the household and societal levels.

Interestingly, the study found that the indirect economic burdens of child malnutrition such as lost workdays, reduced productivity, and income foregone due to caregiving had a positive but statistically insignificant effect on household economic well-being. This implies that although indirect costs exist, their measurable impact on overall household welfare was not strong enough to reach statistical significance in this sample. This finding contrasts with the work of Okafor and Ibrahim (2022), who reported that rural households with stunted children experienced an 18% decline in agricultural productivity due to caregiving time loss and reduced work efficiency among mothers. Similarly, Ayipe and Tanko (2023) estimated annual productivity losses of ₦40,000–₦60,000 per household linked to under-five malnutrition. Moreover, Van Dijk and Djindil (2025) showed that early-life undernutrition significantly undermines adult labor

efficiency and agricultural output across sub-Saharan Africa, including Nigeria. However, the insignificant relationship found here could reflect regional economic adaptation and coping behavior, as households in the South-South region may have developed informal support systems or secondary income sources that mitigate productivity losses. Additionally, since much of the caregiving responsibility may fall on non-income earners (e.g., mothers not in formal employment), the measured indirect income effect might appear statistically weaker despite substantial opportunity costs. Nonetheless, the positive coefficient indicates that some households may respond to malnutrition-related stress by diversifying income sources or engaging in supplementary labor, a finding consistent with the adaptive strategies reported by Akinola and Eze (2021), who observed that vulnerable households often increase labor participation or informal activities to cushion income shocks.

The study also found that coping strategies adopted by households to manage malnutrition-related financial pressures had a positive but statistically insignificant effect on economic well-being. This means that while these strategies such as borrowing, asset sales, or reducing food consumption may temporarily relieve financial strain, they do not significantly improve the household's long-term economic situation. This finding aligns with Arodiwe, Arodiwe, and Okoronkwo (2023), who documented that low-income households often resort to borrowing, asset liquidation, or reduced consumption to cope with catastrophic health expenditures, but these responses tend to exacerbate long-term poverty and food insecurity. Similarly, Briggs-Megafu (2025) found that reliance on informal borrowing and temporary income adjustments among families in the informal sector deepened intergenerational poverty cycles. The coping mechanisms therefore appear to provide short-term liquidity relief but fail to protect households from chronic financial vulnerability. In related contexts, Maurice et al. (2025) also observed that Ugandan households facing malnutrition-related treatment costs sold assets, took informal loans, or withdrew children from school responses that ultimately undermined future human capital development. Hence, the insignificant positive relationship observed in the present study suggests that while coping strategies may mitigate immediate economic distress, they are not sustainable solutions for improving economic well-being.

Conclusion

The study concludes that the direct healthcare costs incurred in treating malnutrition-related illnesses significantly reduce household economic well-being. This underscores the reality that Nigerian households, most of which finance healthcare through out-of-pocket payments, bear a heavy and often impoverishing financial burden when caring for malnourished children. Also, the indirect economic burdens such as lost workdays, caregiver absenteeism, and reduced productivity showed a positive but statistically insignificant relationship with household well-being, while coping strategies such as borrowing, asset sales, and food rationing were found to have a positive yet insignificant effect on household welfare, implying that while they provide temporary relief, they do not enhance long-term economic resilience.

Limitation

This study focuses exclusively on the South-South region of Nigeria therefore, its

findings and conclusions cannot be directly generalized to the entirety of Nigeria or to other developing nations. Regarding the measurement of productivity impacts, indirect economic burdens such as the loss of caregiver productivity were not quantified based on precise income values (nominal income loss) but rather through perceived levels reported in questionnaires, resulting in reduced statistical significance. Data collection relied on respondents' recall and self-perceptions via questionnaires, introducing the risk of recall bias or inaccuracies in estimating past medical expenses. The study employed a cross-sectional survey design (conducted in 2025), precluding the observation of long-term (longitudinal) economic impacts of malnutrition in toddlers on child development into adulthood.

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