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From petrol to protein: How fuel subsidy removal affects household nutrition in low-income Nigerian families

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Abstract

In June 2023, Nigeria removed long-standing fuel subsidies, resulting in a sharp rise in transportation costs, inflation, and food prices—placing a disproportionate burden on low-income households. This study investigates the nutritional consequences of this policy shift, particularly the impact on protein consumption and dietary diversity. Using a cross-sectional design, data were collected from 500 low-income households across urban and rural areas of Nigeria through surveys and focus group discussions. Findings reveal that fuel and transportation expenditures surged by over 80%, leading to reduced consumption of nutrient-rich foods such as proteins, fruits, and vegetables. Coping strategies included meal skipping, food substitution, and increased financial stress, with children and women disproportionately affected. The study concludes that while fuel subsidy removal may serve fiscal goals, it exacerbates food insecurity and malnutrition among vulnerable populations. It recommends the implementation of nutrition-sensitive social safety nets and targeted food assistance programs to cushion the impact on household well-being.

Keywords: Fuel subsidy removal, household nutrition, food security, low-income families, Nigeria, protein consumption, dietary diversity, inflation, economic policy, coping strategies

Introduction

In June 2023, the Nigerian government officially removed fuel subsidies, a long-standing policy that had kept petrol prices artificially low for decades. While this move was hailed by economists as a necessary step toward fiscal sustainability, its immediate socioeconomic impact has been profound, particularly among low-income households (World Bank, 2023) [36, 37]. The removal of the subsidy led to a more than 200% increase in fuel prices, triggering a sharp rise in transportation costs, food prices, and overall inflation (National Bureau of Statistics [NBS], 2023) [16, 20].

For low-income families, where food expenses already account for a significant portion of household budgets, this price shock has threatened food security and dietary quality. Several studies have shown that economic shocks and inflationary pressures disproportionately affect the nutritional intake of vulnerable populations, often leading to reduced consumption of nutrient-rich foods such as proteins, fruits, and vegetables (FAO, 2023; Otekunrin *et al*., 2022) [11, 28]. As households reallocate limited resources to meet escalating energy and transportation costs, essential dietary components may be sacrificed, thereby increasing the risk of malnutrition, especially among children and women (UNICEF, 2023) [33, 34].

Although fuel subsidy reforms have long been recommended by international financial institutions for their economic rationality, little attention has been paid to their unintended consequences on household-level welfare indicators such as nutrition. This study, therefore, seeks to explore how the recent fuel subsidy removal in Nigeria has impacted the nutritional practices and food security of low-income families. The research aims to bridge the gap between macroeconomic policy decisions and micro-level outcomes, emphasizing the human cost of economic reforms in fragile contexts.

Material and Method

Problem Statement

Nigeria's recent removal of fuel subsidies has triggered widespread economic and social ramifications, particularly for low-income households that are disproportionately vulnerable to price shocks. Fuel subsidies have historically functioned as a mechanism to stabilize transportation and food prices. Their removal, while aimed at curbing fiscal burdens and reallocating public spending, has led to a sharp rise in the cost of living (World Bank, 2023) [36, 37]. For many Nigerian families, especially those living below the poverty line, the increase in fuel prices translates into higher food prices, reduced disposable income, and compromised dietary quality (Adebayo *et al*., 2023) [3].

The nutritional implications of this policy shift are particularly alarming. As transportation costs rise, the price of staple and perishable food items—particularly protein-rich foods like meat, fish, and legumes—has surged, making them increasingly inaccessible to the poor (UNICEF, 2023) [33, 34]. This scenario risks exacerbating already high rates of malnutrition and food insecurity in the country, particularly among children and women of reproductive age (FAO, 2024) [12]. Prior to the subsidy removal, Nigeria was already struggling with undernutrition, with nearly 37% of children under five classifieds as stunted (NBS & UNICEF, 2022) [19]. The removal of fuel subsidies has the potential to deepen these health crises if nutritional access continues to deteriorate.

Despite the economic rationale for subsidy reforms, insufficient attention has been paid to their downstream effects on food consumption and household dietary behavior. Current empirical studies are limited in exploring how subsidy removal affects not only household budgets but also specific nutritional outcomes among vulnerable groups. Furthermore, there is a paucity of localized, data-driven evidence focusing on how low-income families adapt their food consumption strategies in response to rising fuel and food prices (Ezeani & Salami, 2023) [10].

Therefore, this research seeks to critically examine the nutritional impact of fuel subsidy removal on low-income households in Nigeria, with a particular focus on protein intake. By addressing this gap, the study aims to provide evidence-based recommendations that can inform nutrition-sensitive policy responses in the face of economic reforms.

Literature Review

1. Introduction to the Literature Review

The objective of this literature review is to critically examine existing scholarship and empirical evidence on the intersection between fuel subsidy reforms and household nutrition, particularly within the context of low-income Nigerian families. This review seeks to uncover how economic policy shifts—specifically the removal of fuel subsidies—affect access to nutritious food, especially protein-rich diets that are essential for healthy living. It aims to explore patterns, gaps, and emerging insights that can inform both academic discourse and evidence-based policymaking.

A fuel subsidy is a government policy that lowers the retail price of petroleum products by covering a portion of the cost, thereby making fuel more affordable for consumers (World Bank, 2023) [36, 37]. In Nigeria, these subsidies have historically served as a social buffer to curb inflationary pressures and stabilize the cost of living. However, due to fiscal constraints and the need to redirect public resources, the Nigerian government discontinued fuel subsidies in 2023, leading to significant economic adjustments (IMF, 2023) [15].

Household nutrition refers to the availability, accessibility, and consumption of food necessary to meet the dietary needs of all members within a household. Adequate household nutrition is not only a matter of food quantity but also of dietary quality, including sufficient intake of protein, vitamins, and minerals (FAO, 2024) [12]. For low-income families—typically defined as households earning below the national poverty line—access to balanced diets is often limited by financial constraints, making them especially vulnerable to economic shocks (NBS, 2023) [20].

This topic is highly relevant to Nigeria's current socioeconomic and public health realities. Following the fuel subsidy removal, the nation has experienced a surge in inflation, particularly in the transportation and food sectors, exacerbating food insecurity among poor households (UNICEF, 2023) [33, 34]. Nigeria already faces one of the highest rates of malnutrition in Sub-Saharan Africa, with 37% of children under five classifieds as stunted and 7% as wasted (NBS & UNICEF, 2022) [19]. As fuel prices rise and food costs escalate, low-income families may reduce their consumption of protein-rich foods—like eggs, meat, fish, and legumes—opting instead for cheaper, calorie-dense but nutrient-poor alternatives. This shift can lead to long-term nutritional deficiencies, particularly among children, pregnant women, and the elderly.

Given these pressing issues, understanding the nutritional implications of fuel subsidy removal is critical for developing responsive policies that safeguard the health and well-being of vulnerable populations.

2. Overview of Fuel Subsidy Policies in Nigeria

Fuel subsidies have played a significant role in Nigeria's political economy since the 1970s, following the oil boom that positioned Nigeria as a major petroleum exporter. The original rationale behind the introduction of fuel subsidies was to protect Nigerian consumers from global oil price volatility, ensure affordable energy access, and promote economic equity by cushioning the poor from the high cost of fuel (Akinola & Okonkwo, 2022) [6]. By subsidizing the difference between the international market price and the domestic pump price of petroleum products, the government sought to foster social stability and national cohesion in a resource-rich but economically divided society (Adedokun, 2023) [4].

Over the decades, however, the fuel subsidy program became increasingly unsustainable. Corruption, smuggling, and inefficiencies plagued the system, resulting in massive fiscal leakages. According to the Nigerian Extractive Industries Transparency Initiative (NEITI), between 2005 and 2021, over ₦13.7 trillion was spent on fuel subsidies, often without transparent auditing or measurable developmental outcomes (NEITI, 2022) [22]. By 2022, with mounting debt, foreign exchange shortages, and declining oil revenues, subsidy payments were crowding out investments in critical sectors like health, education, and infrastructure (World Bank, 2023) [36, 37].

In May 2023, newly elected President Bola Ahmed Tinubu announced the removal of fuel subsidies during his inaugural address, marking a historic shift in Nigeria's energy policy. This decision aligned with long-standing recommendations from the International Monetary Fund (IMF) and World Bank, which have advocated for market-based fuel pricing as a pathway to fiscal consolidation and economic efficiency (IMF, 2023) [15]. The subsidy removal aimed to reduce budget deficits, free up public funds for infrastructure and social investment, and attract private sector participation in the downstream oil sector (Adegbite & Hassan, 2023) [5].

Despite these objectives, the policy has been met with intense controversy and resistance. Critics argue that the removal disproportionately affects the poor, who rely on affordable transport and energy for basic livelihoods. The immediate aftermath saw fuel prices more than triple, sparking inflationary pressures across all sectors, especially food and transportation (Premium Times, 2023) [29]. Labor unions and civil society organizations have staged protests, demanding palliatives and social safety nets to cushion the impact on vulnerable populations (Ogunyemi & Musa, 2023) [26]. There is also widespread skepticism regarding whether savings from subsidy removal will be transparently reinvested in the public interest.

Thus, while the removal of fuel subsidies is economically justified on paper, its social and nutritional consequences—particularly for low-income households—remain under-researched and poorly mitigated.

3. Economic Consequences of Fuel Subsidy Removal

The removal of fuel subsidies in Nigeria has had profound economic implications, particularly in the wake of the policy change enacted in 2023. One of the most immediate consequences has been a sharp increase in inflation, primarily driven by the surge in transportation and energy costs. According to the National Bureau of Statistics (2024) [17], headline inflation rose to 33.2% in early 2024, with food inflation peaking at 40.1%, a level not seen in over a decade. This surge is largely attributed to increased fuel prices, which have significantly raised the cost of transporting goods and services across the country.

Transportation and logistics, which are heavily reliant on petroleum products, have seen some of the steepest cost increases. The cost of intra-city transport reportedly doubled in many urban centers within weeks of the subsidy removal (Adebayo & Musa, 2023) [3]. These costs are directly transmitted to food prices, as Nigeria's largely road-based supply chains became more expensive to maintain. This cost-push inflation disproportionately affects essential commodities, including staple and protein-rich foods such as rice, beans, meat, and eggs, making them less accessible to the average Nigerian household (World Bank, 2023) [36, 37].

As energy costs rise, household purchasing power declines, especially among the urban and rural poor. Low-income families, who already allocate a significant portion of their earnings to food and transportation, face a double burden: their expenses increase while their real incomes remain stagnant or decline (Ezeani & Salami, 2023) [10]. A recent study by the Centre for Social Policy Research (CSPR, 2023) [8] found that more than 70% of low-income households reported reducing food quantity and quality in response to price hikes following the subsidy reform. This trend is particularly worrisome for nutritional security, as protein-rich foods are often the first to be eliminated from diets when budgets tighten.

The economic shock from the subsidy removal is not felt evenly across income groups. While wealthier households can absorb the increased cost of living or shift to private energy solutions such as solar and generators, low-income households have little flexibility or buffer. The policy, though aimed at long-term fiscal sustainability, has widened the inequality gap in the short term (UNDP, 2024) [32]. For vulnerable populations—including informal workers, subsistence farmers, and single-parent households—the economic strain is not only a matter of affordability but of survival.

In sum, the economic consequences of fuel subsidy removal have reinforced systemic inequities, undermined household resilience, and significantly strained consumer spending—particularly in food-related expenditures. These outcomes make it critical to design compensatory mechanisms and targeted social safety nets to cushion the most affected segments of the population.

4. Food Security and Nutrition in Nigeria: A Pre- and Post-Subsidy Perspective

Overview of Food Security Status and Malnutrition Rates in Nigeria

Nigeria faces persistent food insecurity, with millions of households unable to access adequate and nutritious food. According to the *State of Food Security and Nutrition in the World* report, about 22% of Nigerians were classified as severely food insecure in 2022, with many more experiencing moderate food insecurity (FAO, 2023) [11]. The National Bureau of Statistics and UNICEF (2022) also reported that 37% of Nigerian children under five suffer from stunting, while 7% suffer from wasting—figures that reflect widespread chronic undernutrition.

Malnutrition in Nigeria is particularly severe in rural and low-income areas, where access to diverse, nutritious foods is constrained by poverty, poor infrastructure, and inadequate agricultural productivity (UNICEF, 2023) [33, 34]. Prior to the removal of fuel subsidies, efforts to improve household nutrition were already hampered by rising food prices, conflict in agrarian regions, and climate-induced disruptions to food production (WFP, 2023) [35].

Nutritional Trends Among Low-Income Households Before and After Subsidy Removal

Before the subsidy removal in mid-2023, low-income households in Nigeria were already dedicating a large portion of their income—up to 60%—to food purchases (NBS, 2022) [19]. However, fuel subsidies helped to stabilize the cost of transportation, and by extension, the prices of food and basic goods. Since the removal, transportation costs have surged by over 200% in some regions, contributing significantly to general food price inflation (World Bank, 2023) [36, 37].

Early data suggest a deterioration in dietary intake following the subsidy removal. A recent survey by ActionAid Nigeria (2024) [1] found that 68% of low-income families reduced their consumption of protein-rich foods—such as eggs, fish, and meat—within six months of the policy change, while 53% reported skipping meals more frequently. This trend suggests that fuel subsidy removal has directly impacted both the quantity and quality of food consumed by vulnerable groups.

Changes in Dietary Diversity and Protein Consumption Patterns

Dietary diversity—an important indicator of nutritional adequacy—has declined among Nigeria's poor. Previously, many low-income families were already relying heavily on starchy staples such as cassava, yam, and rice. Post-subsidy removal, the price of protein sources has soared, with items like fish and chicken becoming unaffordable for many households (Ezeani & Salami, 2023) [10].

Protein consumption, especially animal-based proteins, has significantly dropped. According to a 2024 study by the Nigerian Institute of Nutrition and Food Policy (NINFP), over 70% of surveyed low-income households reported cutting down on meat and legumes, opting instead for cheaper carbohydrate-based meals. This shift increases the risk of protein-energy malnutrition, especially among children and lactating mothers.

Role of Food Inflation in Exacerbating Hidden Hunger and Undernutrition

Food inflation in Nigeria has been relentless, peaking at 37.9% in early 2024—driven largely by energy and transport costs (NBS, 2024) [21]. This inflation disproportionately affects the poor, who spend most of their income on food. As a result, "hidden hunger"—a condition characterized by micronutrient deficiencies despite adequate calorie intake—is becoming more prevalent, particularly in urban slums and rural communities (UNICEF, 2023) [33, 34].

The removal of fuel subsidies has thus deepened the affordability crisis, not only reducing access to food but also degrading the nutritional quality of diets. This situation threatens to reverse progress toward national and global nutrition goals, including the Sustainable Development Goals (SDGs) related to zero hunger and good health and well-being (FAO, 2023) [11].

5. Household Coping Mechanisms and Consumption Patterns

Households, particularly those in low-income brackets, develop various coping mechanisms to navigate economic shocks such as the removal of fuel subsidies. These shocks directly affect disposable income, food affordability, and consumption patterns, prompting adjustments that often compromise dietary quality and nutritional adequacy (Ibrahim & Okonkwo, 2023) [14]. As food and transportation costs rise in tandem with fuel prices, many families are forced to prioritize quantity over quality in their food choices, often leading to the reduction or complete elimination of nutritionally rich but expensive items such as meat, fish, and dairy (Oni *et al*., 2023) [27].

A common coping strategy is food substitution, where households shift from animal protein sources to cheaper, carbohydrate-rich meals or plant-based proteins such as beans or groundnuts (Adebayo & Yusuf, 2022) [2]. This substitution effect, while offering some caloric relief, often leads to protein deficiency, especially among children and pregnant women, whose dietary needs are more demanding. Recent survey data from urban and peri-urban areas of southern Nigeria found that over 60% of households reported a reduction in meat consumption due to inflationary pressure linked to energy cost increases (World Bank, 2023) [36, 37].

Furthermore, food insecurity and coping mechanisms often reflect existing gender dynamics within households. Women, particularly in low-income families, tend to be more food-insecure and often sacrifice their portions to ensure that children and male household members eat first (UN Women, 2023). This gendered pattern of intra-household food distribution is well-documented in Nigerian settings, where cultural norms and economic pressures intersect to disproportionately affect women's nutrition (Nwosu & Eze, 2023) [24].

Urban and rural households also exhibit distinct adaptation strategies in response to economic stress. Urban dwellers, reliant on market-purchased food, are more exposed to price fluctuations and often reduce food diversity due to higher cost-of-living indices (Ogunleye *et al*., 2022) [25]. In contrast, rural households may leverage subsistence farming and informal food-sharing networks, though they are not immune to rising input costs for production and transportation. However, rural families may have slightly more flexibility in sourcing local food alternatives, even though these may lack essential nutrients (FAO, 2024) [12].

The long-term implication of these coping mechanisms is a progressive erosion of dietary quality and resilience, which can lead to malnutrition, especially among vulnerable populations. These findings underscore the urgent need for nutrition-sensitive safety nets and targeted interventions that support household food security during periods of economic transition.

Methods

1. Study Design

The research utilized a cross-sectional design, collecting both qualitative and quantitative data from households in various low-income neighborhoods across Nigeria. This allowed for an in-depth understanding of the direct and indirect effects of fuel subsidy removal on household nutrition, focusing on both economic constraints and dietary changes.

2. Study Population and Sampling

The study focused on low-income households in urban and rural areas of Nigeria. A stratified random sampling technique was employed to select households from different regions, ensuring diversity in socio-economic and demographic factors. In total, 500 households were sampled, with 300 from urban areas and 200 from rural settings. Within each household, one primary respondent (usually the head of the household or the primary caregiver) was selected to participate in the survey. The inclusion criteria required households to fall below the national poverty line, ensuring that the sample was representative of low-income families.

3. Data Collection Instruments

A questionnaire was developed to assess household income, spending patterns, and dietary habits before and after the subsidy removal. The questionnaire included questions on household expenditure on food, fuel, healthcare, and other basic needs. The section on fuel expenditure captured changes in the amount of money spent on transportation and cooking fuels following the subsidy removal.

4. Data Analysis

Quantitative data were analyzed using descriptive statistics to summarize household income and expenditure patterns, and dietary changes. A paired t-test was used to compare pre- and post-subsidy removal data on fuel expenditure and food spending.

5. Ethical Considerations

The study adhered to ethical guidelines by obtaining informed consent from all participants. Privacy and confidentiality were strictly maintained, and participants were informed of their right to withdraw from the study at any point. Ethical approval was obtained from the relevant research ethics committees prior to the commencement of the study.

Results

1. Demographic Characteristics

The demographic characteristics of the study sample are summarized in Table 1. The sample consisted of 500 households, with 300 from urban areas and 200 from rural areas. The average age of the household head was 42 years, with a range from 25 to 65 years. Most households (72%) were headed by males, while 28% were headed by females. The average household size was 6 members, with the majority of households (65%) having between 5 to 7 members

Table 1: Changes in Household Expenditure Before and After Fuel Subsidy Removal

Demographic Characteristic	Urban	Rural	Total
Number of Households	300	200	500
Gender of Household Head			
Male	215 (72%)	125 (62%)	340 (68%)
Female	85 (28%)	75 (38%)	160 (32%)
Average Age of Household Head	43 years	41 years	42 years
Household Size			
1-4 members	90 (30%)	40 (20%)	130 (26%)
5-7 members	195 (65%)	120 (60%)	315 (63%)
8+ members	15 (5%)	40 (20%)	55 (11%)

This table compares household expenditure on fuel and food before and after the removal of the fuel subsidy. The analysis revealed significant shifts in how households allocated their financial resources.

Expenditure Category	Before Fuel Subsidy Removal	After Fuel Subsidy Removal	% Change
Fuel Expenditure (₦)	4,500	8,200	+82%
Food Expenditure (₦)	12,000	13,500	+12.5%
Healthcare Expenditure (₦)	2,000	2,200	+10%
Transportation Expenditure (₦)	3,500	7,000	+100%

Key Findings

- Fuel expenditure more than doubled, rising by 82% from ₦4,500 to ₦8,200 per month.
- Food expenditure also increased, though at a lower rate (12.5%), suggesting that households prioritized fuel costs over food costs despite the increase in the cost of both.
- Transportation costs surged significantly, reflecting the higher price of fuel and the associated rise in transportation fares.

Table 2: Household Nutritional Intake Before and After Fuel Subsidy Removal

The following table highlights the differences in household dietary patterns before and after the removal of the fuel subsidy. The data were derived from 24-hour dietary recall surveys.

Food Group	Before Fuel Subsidy Removal (grams/day)	After Fuel Subsidy Removal (grams/day)	% Change
Cereals & Starches	250	230	-8%
Fruits & Vegetables	120	100	-16.67%
Proteins (Meat, Fish)	80	60	-25%
Dairy Products	50	45	-10%
Sugars & Sweets	30	25	-16.67%

Key Findings

- A noticeable decline in the intake of proteins (meat, fish) by 25%, indicating that households were cutting back on more expensive protein-rich foods.
- The intake of fruits and vegetables also dropped by 16.67%, reflecting limited access to nutritious foods as a result of higher fuel costs and reduced disposable income.
- The overall reduction in food intake, particularly in protein and micronutrient-rich foods, suggests that the subsidy removal led to poorer nutritional outcomes for many households.

Table 3: Coping Strategies Adopted by Households Post-Subsidy Removal

This table summarizes the coping strategies employed by households to manage the impact of fuel subsidy removal on their food security and nutrition. Data were gathered through FGDs.

Coping Strategy	% of Households Adopting the Strategy
Reducing Meal Frequency	40%
Substituting Expensive Foods	35%
Cutting Back on Non-Essential Expenses	25%
Borrowing Money	15%
Increasing Child Labor	10%

Key Findings

- The most common coping strategy was reducing meal frequency, with 40% of households reporting that they were eating fewer meals each day to save on food costs.
- Substituting more expensive foods, such as proteins and vegetables, with cheaper alternatives was adopted by 35% of households.
- A smaller proportion of households (15%) resorted to borrowing money to meet their nutritional needs.
- The strategy of increasing child labor, where children were sent to work for extra income, was less common (10%) but still a concerning trend in some households.

Table 4: Qualitative Insights from Focus Group Discussions

Table 4 presents qualitative insights derived from the FGDs regarding the emotional and social impact of the fuel subsidy removal on household nutrition.

Theme	Frequency of Mention	Key Insights
Increased Financial Stress	95%	Most participants noted that fuel price hikes resulted in significant financial strain, affecting their ability to purchase nutritious food.
Lack of Access to Healthy Foods	85%	Many households reported difficulty accessing fruits, vegetables, and proteins due to rising costs.
Shift to Less Nutritious Foods	80%	Households frequently substituted nutrient-dense foods with cheaper, less nutritious alternatives, leading to a reduction in dietary diversity.
Negative Impact on Child Health	70%	Participants expressed concern that children were particularly affected by the changes, as they were receiving less balanced meals.

Key Findings

- A majority of respondents (95%) highlighted the increased financial stress caused by the subsidy removal, which directly influenced food choices.
- The lack of access to healthy foods was a common theme, with 85% of participants mentioning the difficulty in obtaining a balanced diet.
- There were significant concerns about the impact on children's health, with 70% of participants mentioning that children were bearing the brunt of the nutritional decline.

Summarily

The results suggest that the removal of fuel subsidies led to increased household expenditure on fuel and transportation, leaving fewer resources available for nutritious food. Households responded by adopting coping strategies such as reducing meal frequency and substituting expensive foods with cheaper alternatives. The decrease in dietary diversity, especially in protein and vegetables, points to a negative impact on household nutrition, with children being particularly vulnerable to the nutritional decline.

Discussion

The findings from this study highlight the multifaceted impact of fuel subsidy removal on household nutrition in low-income Nigerian families. The analysis of both quantitative and qualitative data offers a comprehensive understanding of how households adjusted their food consumption patterns, financial behaviors, and coping mechanisms in response to increased fuel prices.

1. Increased Household Expenditures

The most striking result is the significant increase in household expenditure on fuel and transportation, with fuel costs rising by 82% and transportation costs doubling (100%). This aligns with the broader economic trends observed in the country following the subsidy removal. As fuel prices surged, households were forced to allocate a larger portion of their limited resources to transportation and energy, leading to less disposable income available for other essential needs, including food. Despite the rise in food expenditure (12.5%), it was insufficient to offset the increased costs associated with fuel and transportation. This prioritization of fuel costs over food expenditure highlights the trade-offs faced by low-income households, where basic needs such as transportation and energy take precedence over nutrition.

2. Dietary Patterns and Nutritional Intake

The decrease in the intake of protein-rich foods (meat and fish) by 25%, and the reduction in fruits and vegetables by 16.67%, underscores the direct impact of increased fuel costs on dietary diversity. These food groups, which are essential for a balanced diet, are often the first to be reduced when financial constraints tighten. Protein-rich foods, in particular, are generally more expensive, and as fuel costs rise, families are likely to cut back on these items in favor of cheaper, less nutritious alternatives like starches and cereals. This dietary shift contributes to the overall reduction in nutritional quality, which may have long-term implications for both individual and public health.

The decline in the intake of dairy products (10%) and sugars and sweets (16.67%) further suggests that households were not only reducing their intake of micronutrient-rich foods but also cutting back on discretionary spending on non-essential items. The reduction in food intake, particularly in protein and micronutrients, points to poorer nutritional outcomes, potentially leading to an increase in malnutrition-related health issues, especially among vulnerable populations like children.

3. Coping Strategies

The coping strategies adopted by households reveal the difficult choices families had to make to manage the economic strain caused by fuel subsidy removal. Reducing meal frequency (40%) was the most common strategy, reflecting a direct response to food insecurity. By eating fewer meals per day, households were attempting to stretch their food resources, though these likely exacerbated nutritional deficiencies, particularly for children, who

require consistent and balanced meals for proper growth and development.

Substituting expensive foods (35%) with cheaper alternatives was another common strategy, and this reflects the shift in dietary patterns observed in the previous section. While this may provide short-term financial relief, it is unlikely to improve the nutritional status of household members in the long term, as cheaper foods are often lower in essential nutrients.

The use of more drastic measures such as borrowing money (15%) and increasing child labor (10%) was less common but nonetheless concerning. Borrowing money to meet nutritional needs may indicate a reliance on informal credit or loans, which could lead to greater financial instability in the future. The involvement of children in labor is particularly troubling, as it deprives them of education and places them at risk of exploitation, further compounding the negative impact of the subsidy removal on family well-being.

4. Qualitative Insights

The qualitative data from the focus group discussions provided valuable context for understanding the emotional and social ramifications of the subsidy removal. A majority of participants (95%) reported increased financial stress, which significantly impacted their ability to purchase nutritious foods. This finding aligns with the quantitative results, which show a significant rise in fuel and transportation expenditures, underscoring the direct link between financial strain and food insecurity.

The difficulty in accessing healthy foods (85%) was another prevalent theme, with many households reporting that rising food costs made it more challenging to maintain a balanced diet. This lack of access to nutritious foods is concerning, as it may lead to long-term health consequences such as stunted growth in children and increased susceptibility to chronic diseases in adults.

The concern about the negative impact on children's health (70%) was particularly striking. Participants noted that children were often the most affected by the reduced dietary diversity, as parents prioritized other household needs over providing balanced meals for their children. This finding highlights the vulnerability of children to the negative effects of fuel subsidy removal, as they are more dependent on adults for their nutritional intake and are particularly sensitive to changes in diet.

5. Implications for Policy and Public Health

The results of this study suggest that the removal of fuel subsidies has significant implications for household nutrition, particularly in low-income families. Given the direct link between rising fuel costs and decreased food access, policymakers must consider the broader socio-economic impacts of fuel price hikes on food security. The findings underscore the need for targeted interventions to mitigate the negative effects of subsidy removal, such as food assistance programs, nutritional education, and social safety nets for vulnerable populations.

Public health interventions should also focus on addressing the nutritional gaps that are emerging as a result of these economic shifts. Programs aimed at promoting affordable, nutrient-dense foods and increasing the availability of local produce could help to alleviate some of the dietary deficiencies observed in this study. Additionally, efforts to support families in coping with financial stress, such as providing access to affordable healthcare and financial support, would be critical in mitigating the negative health impacts of subsidy removal.

Recommendations

Based on the findings of this study, several recommendations can be made to mitigate the negative impact of fuel subsidy removal on household nutrition, particularly for low-income Nigerian families:

1. **Implementation of Targeted Food Assistance Programs**

Given the significant financial strain caused by rising fuel costs, which have led to reduced household expenditure on nutritious foods, it is essential for the government to implement targeted food assistance programs. These programs could include direct food distribution, subsidized food items, or cash transfers aimed specifically at vulnerable households. Such interventions would help alleviate food insecurity and ensure that families can maintain a balanced diet despite economic challenges.

2. **Promotion of Affordable Nutrient-Dense Foods**

To counter the reduction in the intake of fruits, vegetables, and proteins, the government and relevant stakeholders should prioritize the promotion of affordable, locally produced, nutrient-dense foods. This could involve supporting local farmers, providing subsidies or incentives for the production of healthy foods, and increasing the availability of these foods in low-income areas. Encouraging the consumption of affordable, locally sourced alternatives would not only enhance nutrition but also support local economies.

3. **Nutritional Education and Awareness Programs**

Nutritional education programs are crucial for helping households make informed decisions about their food choices, especially during times of financial stress. These programs should focus on teaching families how to prepare healthy, balanced meals on a budget, highlighting the importance of a diverse diet that includes essential nutrients. Public health campaigns could also raise awareness about the long-term health implications of poor nutrition, particularly for children, to foster healthier eating habits in the population.

4. **Strengthening Social Safety Nets**

In light of the increased financial stress experienced by households, there is a need for stronger social safety nets. Government programs that provide financial support to low-income families can help buffer the negative effects of rising fuel prices. Expanding and enhancing social protection measures such as unemployment benefits, child allowances, and healthcare subsidies would enable households to better cope with economic shocks and prioritize nutrition.

5. Investment in Public Transportation and Infrastructure

Since transportation costs more than doubled for many households following the subsidy removal, there is a pressing need for investment in affordable public transportation systems. Improved transportation infrastructure would reduce the burden on low-income families, allowing them to allocate more of their income towards food and other essential needs. Additionally, providing transportation subsidies or discounts for low-income families could alleviate some of the economic pressure they face.

6. Monitoring and Evaluation of Subsidy Removal Impact

Ongoing monitoring and evaluation of the impact of fuel subsidy removal on household nutrition are crucial to understanding the long-term effects of this policy. Regular assessments could help policymakers make data-driven decisions and adjust policies to minimize adverse outcomes. Surveys, focus groups, and dietary assessments should be conducted periodically to track changes in food security, nutrition, and household well-being.

Conclusion

The removal of fuel subsidies has had significant repercussions for low-income Nigerian households, particularly in terms of food security and nutrition. The findings of this study reveal that while fuel and transportation expenditures surged dramatically, households struggled to maintain adequate levels of nutritional intake, leading to a decline in dietary diversity. The coping strategies adopted by households, such as reducing meal frequency and substituting more expensive foods with cheaper alternatives, further exacerbated the nutritional challenges faced by many families.

The negative impact on children's health, as highlighted by the study, underscores the urgency of addressing the consequences of fuel subsidy removal. Children are particularly vulnerable to the reduced availability of balanced meals, which could have long-term implications for their growth and development.

To mitigate these adverse effects, it is essential for policymakers to implement targeted interventions that address the financial and nutritional challenges faced by low-income families. Food assistance programs, the promotion of affordable healthy foods, and strengthening social safety nets will be crucial in ensuring that households can maintain access to nutritious foods, despite the economic strain caused by fuel price hikes.

Ultimately, this study emphasizes the need for a more holistic approach to fuel subsidy removal, one that considers its broader social and health impacts. By prioritizing nutrition and providing support to vulnerable households, the negative consequences of this policy change can be alleviated, improving the overall well-being of the population.

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