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Impact of Petroleum Subsidy Removal on Health Care Sector in Nasarawa State Nigeria.

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ABSTRACT

The study examined the impact of petroleum subsidy removal on the healthcare sector in Nasarawa State, Nigeria. The broad objective of the study is to investigate the impact of petroleum subsidy removal on public health care delivery in Nasarawa State Nigeria. The study adopted a survey research design, both primary and secondary data were used for the study. The population of 2,520 was used from which the sample size of 345 was determined using Taro Yamane formular. Logistic multiple regression analysis (logit regression model) was employed to examine the relationship between the dependent and independent variables. The result revealed that increased fuel prices have led to higher transportation costs, reduced access to medical services especially in rural areas and a rise in operational expenses for hospitals and clinics. The study also revealed that the positive and significant outcome for patients' accessibility ($p = 0.0026$) suggests that as transportation fares rise, patients find it increasingly difficult to visit healthcare facility. Therefore, the study recommended that the federal and state governments introduce targeted subsidies or grants specifically for the health sector to ensure a continuous supply of essential drugs, medical consumables, and equipment in public hospitals despite the rising cost of energy and logistics. It also recommended that the government, in collaboration with local transport unions, implement subsidized transport schemes or mobile health outreach programs in rural and semi-urban areas to improve patient access to health facilities. The study concludes that while subsidy removal may promote long-term fiscal sustainability, its short-term adverse effects on the healthcare sector are significant.

Keywords: Health Care Delivery, Patients' Accessibility, Low-income Household Accessibility, Health Workers Response, Availability of Essential Medical Services.

INTRODUCTION

Nigeria, a country endowed with vast natural and human resources, has for decades relied heavily on petroleum as its economic mainstay. Since oil was discovered in commercial quantity in 1956, the sector has played a dominant role in shaping the country's economic and social policies. Crude oil exports account for over 85% of Nigeria's foreign exchange earnings and more than 70% of government revenues (IMF, 2020). Over time, the country adopted a system of fuel subsidy designed to stabilize domestic fuel prices and shield citizens from the volatile nature of the international oil market. However, this policy, while initiated to promote social welfare, has evolved into one of Nigeria's most controversial and economically draining strategies.

The petroleum subsidy regime in Nigeria was primarily aimed at making petroleum products affordable for the average citizen. The government's justification for the subsidy has always centered around protecting the poor, stimulating economic activity, and maintaining social stability (World Bank, 2021). However, studies in recent years have demonstrated that the subsidy has disproportionately benefited higher-income households who consume more fuel, while the poorest groups have received minimal benefit (BudgIT, 2020). The subsidy regime has been plagued by mismanagement, corruption, and lack of transparency, resulting in severe economic leakages. According to NEITI (2021), Nigeria spent over N11 trillion on petroleum subsidies between 2006 and 2021, with limited accountability for how these funds were distributed.

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As economic pressures mounted due to falling oil prices, growing public debt, and increasing inflation, calls for subsidy reform became more urgent. The removal of the subsidy was identified by economist and policy analysts as a necessary step towards achieving macroeconomic stability and reallocating resources to more productive sectors such as health, education, and infrastructure (World Bank, 2022). In May 2023, President Bola Ahmed Tinubu announced the full removal of petroleum subsidies, marking a critical shift in economic policy.

The economic implications of subsidy removal are multifaceted. On one hand, the government expects to save trillions of naira, which could be redirected to development sectors, including healthcare. On the other hand, subsidy removal triggers inflation, increases transportation and production costs, and heightens the burden on households, especially in a country where the majority live below the poverty line (NBS, 2021). This resultant rise in fuel price typically led to higher food costs, increased transport fares, and elevated costs of basic services. These ripple effects extend into the healthcare sector, where affordability and access are critically linked to transportation, energy, and household income.

Nigeria's healthcare system is already under immense strain. Public health facilities across the country face chronic underfunding, shortages of medical personnel, poor infrastructure, and frequent strikes due to unpaid salaries and poor working conditions. According to WHO (2022), Nigeria's healthcare spending remains one of the lowest in Sub-Saharan Africa when measured as a percentage of GDP. only about 3.7% of the national budget was allocated to health in 2022, falling far short of the 15% Abuja Declaration benchmark. This underinvestment directly contributes to poor health indicators, including high maternal and child mortality rates, limited access to essential health services, and low immunization coverage (UNICEF, 2022).

The removal of fuel subsidies has a direct bearing on healthcare delivery, particularly in the public sector. Health facilities in Nigeria rely heavily on diesel-powered generators due to inconsistent electricity supply. With the rise in fuel prices, hospitals and clinics are now forced to spend more on energy, thereby reducing the funds available for essential medicines, diagnostic tools, and patient care. Similarly, transportation costs for patients, healthcare workers, and the delivery of medical supplies have surged, creating further access barriers. According to a study by Akinwande and Olaniyan (2021), even a marginal increase in transportation costs significantly reduces outpatient visits in rural communities, where public transport is often the only means of accessing health services.

The public healthcare system in Nasarawa State is made up of primary health centers, general hospitals, and a few specialist facilities, most of which are concentrated in the state capital, Lafia. Many of the rural health centers struggle with inadequate medical equipment, undertrained staff, and poor infrastructure. With the increase in fuel prices, health workers in remote locations report challenges in commuting to their duty posts, while patients in rural communities' face raising transport fares when seeking medical attention. These logistical barriers are compounded by the rising cost of living, making healthcare increasingly unaffordable for the average citizen (Yusuf & Salihu, 2020).

The implications for maternal and child health are particularly concerning. Rural women often travel long distances to access antenatal and delivery services, and increased transport costs can discourage facility-based births. This is worrying in a state where maternal mortality remains unacceptably high. Additionally, health campaigns such as immunization drives and outreach services are becoming more expensive to implement, as the cost of fuel directly affects mobility, cold chain logistics, and outreach planning (Adigun et al., 2019). These challenges threaten to erode the modest gains made in healthcare delivery in Nasarawa State over the past decade.

From a fiscal standpoint, the promise of channeling subsidy savings into the health sector remains largely theoretical. While federal authorities have emphasized reinvestment in critical sectors, evidence of actual budgetary reallocation remains limited. For instance, in the 2022 budget, less than 8% of Nasarawa State's total expenditure was directed to health, with most of the funds going toward salaries rather than infrastructure or service delivery (BudgIT, 2022). Without transparent and deliberate framework for redirecting subsidy savings to public health investment, the reform risks widening health inequalities rather than closing them.

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Moreover, the broader macroeconomic consequences of subsidy removal such as rising inflation, food insecurity, and declining real incomes have secondary effects on health outcomes. Malnutrition, already a significant public health challenge in Nasarawa, is likely to worsen as households struggle to afford nutritious food. Stress-related illnesses, increased vulnerability to infectious diseases, and delayed health-seeking behavior are also probable outcomes in a context of economic uncertainty (Olayemi & Bello, 2021). These patterns underline the interconnectedness between economic policy and public health outcomes, especially in fragile subnational settings.

Statement of Problem

Nigeria's petroleum subsidy regime has long been a subject of economic and policy debate, with its eventual removal marking a significant point in the country's fiscal and social landscape. While the decision to remove the fuel subsidy was largely driven by the need to curb fiscal deficits and improve economic efficiency, its implications for public service delivery, particularly in vulnerable sectors like healthcare, remain understudied and inadequately addressed. The removal of fuel subsidies is expected to free up public funds, which could be redirected to critical sectors. However, the realignment of these funds has often lacked transparency and demonstrable impact on healthcare infrastructure and service delivery, especially in under-resourced areas such as Nasarawa State (World Bank, 2022).

Healthcare delivery in Nigeria is already challenged by inadequate funding, infrastructure "'deficits, and inequitable distribution of medical personnel and facilities. According to the World Health Organization (2022), Nigeria spends less than 4% of its gross domestic product on health, and only a fraction of this is allocated to primary healthcare, which serves the majority of the population. The 2022 budget allocation to the health sector in Nigeria, and by extension Nasarawa State, failed to meet the Abuja Declaration target of 15%, suggesting systemic under investment (BudgIT, 2022). This chronic underfunding has led to poor health indicators, including high maternal and infant mortality rates, low immunization coverage, and limited access to essential healthcare services, particularly in rural and semi-urban areas (UNICEF, 2022).

The removal of fuel subsidies has triggered a significant increase in the cost of petroleum products, which has cascaded into rising transportation costs, inflation, and the general cost of living (NBS, 2021). For the healthcare sector, this translates into higher operational costs for health facilities that depend on diesel for electricity, increased expenses for transporting medical supplies, and growing difficulties for patients in accessing health centers, especially those in rural areas. Akinyande and Olaniyan (2021) have shown that even modest increases in transport costs lead to noticeable declines in outpatient visits in rural communities, thus reducing access to timely healthcare. This situation is particularly dire in Nasarawa State, where a significant proportion of the population resides in remote and underserved communities with limited healthcare infrastructure.

Furthermore, the promise that funds saved from subsidy removal would be reinvested into social sectors remains largely aspirational. Empirical assessments and budget tracking reports have shown limited evidence of improved funding for healthcare services in the wake of subsidy removal (NEITI, 2021; BudgIT, 2020). In Nasarawa State, where internally generated revenue is low and federal allocations are critical to health spending, the absence of a clearly defined reinvestment plan exacerbates concerns over the sustainability of healthcare service delivery in the post-subsidy era. Without deliberate, transparent, and inclusive mechanisms for rechanneling subsidy savings into the healthcare system, the removal policy could deepen existing inequalities in health access and outcomes (Olayemi & Bello, 2021).

The health sector's reliance on fossil fuels to power clinics, hospitals, and laboratories means that the increased cost of fuel directly affects service provision. The inability of health facilities to afford fuel for electricity generation results in frequent power outages, which hinder the delivery of critical services such as child immunizations, surgeries, laboratory diagnostics, and emergency care. This situation is further aggravated in rural parts of Nasarawa, where alternative energy sources are largely unavailable or unaffordable (Yusuf & Salihu, 2020). Thus, the intersection of fuel subsidy removal, rising operational costs, and existing structural weaknesses creates a complex problem that requires urgent policy attention.

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While the removal of petroleum subsidies was intended as an economic reform to stabilize Nigeria's fiscal condition, it has inadvertently intensified challenges within the public healthcare system, especially at the sub-national level. For a state like Nasarawa, already grappling with health access disparities, inadequate workforce distribution, and budgetary constraints, the policy risks worsening the healthcare delivery crisis if appropriate compensatory strategies are not promptly and effectively implemented. This study therefore seeks to critically examine how the removal of petroleum subsidies has affected the availability, accessibility, and quality of public healthcare delivery in Nasarawa State, with a view to proposing sustainable policy recommendations that can mitigate adverse outcomes and enhance health equity.

The persistent removal of petroleum subsidies in Nigeria has triggered widespread economic and social consequences, particularly affecting the affordability and accessibility of essential public services, including healthcare. In Nasarawa State, where a significant portion of the population resides in low-income and rural communities, the ripple effects of subsidy removal manifest in rising transportation costs, increased cost of living, and constrained government fiscal space, all of which directly and indirectly impact the quality and reach of public healthcare service delivery. With reports of dwindling health budgets, overstretched facilities, and reduced patient access due to higher out-of-pocket expenses, the situation raises serious concerns about the sustainability and equity of public health provision. Despite the relevance of these issues, empirical research specific to Nasarawa State remains scarce, leaving a critical knowledge gap on how petroleum subsidy removal affects healthcare outcomes at the sub-national level.

This study is therefore motivated by the urgent need to provide evidence-based insights into the socioeconomic consequences of subsidy removal on public health infrastructure, personnel, service accessibility, and health outcomes in Nasarawa State. The findings aim to inform policy decisions and support the development of targeted interventions that can mitigate the adverse effects of subsidy reforms on healthcare delivery and ensure equitable access to health services for all residents of the state.

The broad objective of the study is to investigate the impact of petroleum subsidy removal on public health care delivery in Nasarawa State Nigeria, the set objectives are: To assess how the removal of petroleum subsidy has affected the availability of essential medical services in public healthcare facilities in Nasarawa State, to evaluate the impact of increased fuel costs on patients' ability to access healthcare services in Nasarawa State, to determine the extent to which the removal of petroleum subsidies has influenced healthcare accessibility for rural and low-income populations in Nasarawa State, and to examine how public healthcare workers and administrators have responded to the challenges posed by increased transportation and energy costs following subsidy removal.

The report is structured into five (5) sections. After section 1 which is the introduction statement of the problem, section 2 is the literature review; section 3 is the methodology; section 4 is the analysis and results, while section 5 concludes the paper.

LITERATURE REVIEW

Conceptual Review

Petroleum Subsidy

A petroleum subsidy is a government policy intervention that reduces the price of petroleum products paid by consumers, often by absorbing a portion of the cost of supply through public finances. According to coady et al. (2017), petroleum subsidies are price supports provided by governments to consumers or producers to keep the domestic price of petroleum products below the international market level, with the aim of making energy affordable and stabilizing the economy. These subsidies may take the form of direct financial transfers, tax breaks, or price controls implemented at the pump. In the context of Nigeria, petroleum subsidies have historically served as a mechanism for cushioning citizens, especially low-income earners, against volatile international oil prices, and have been a prominent feature of the country's energy and economic policy landscape.

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Petroleum Subsidy Removal

The concept of subsidy removal involves the government ceasing to pay the differential between the landing cost of petroleum products and the official pump price, thereby allowing market forces to determine pricing. According to Iwayemi and Adenikinju (2018), subsidies were originally introduced to stabilize domestic fuel prices, promote industrial productivity, and alleviate poverty. However, the scheme became unsustainable due to systemic corruption, inefficiencies in the fuel supply chain, and mounting fiscal pressure on the federal budget.

Public Health Care Delivery

Public healthcare delivery encompasses a spectrum of services including preventive care, curative treatment, maternal and child health, immunizations, emergency response, and health education. The World Health Organization (2018) defines an effective health system as one that improves health outcomes, responds to people's expectations, and protects citizens from financial hardship associated with health expenditures. Unfortunately, in the Nigerian context, many of these objectives remain unmet.

Health Worker Protection and Safety Standards Post-Subsidy Removal

Health worker protection and safety standards are fundamental components of public health care systems, especially in environments undergoing economic and policy shocks. In the context of Nigeria, the removal of petroleum subsidy represents a significant fiscal policy shift with multidimensional impacts, including effects on the health sector's capacity to maintain and enforce occupational safety standards. These standards typically encompass the provision of protective equipment, enforcement of safe work procedures, regulation of staff exposure to hazards, and provision of adequate workplace infrastructure (World Health Organization, 2020). Health workers especially in under-resourced states like Nasarawa often the first to experience the systematic strain resulting from increased operational costs due to subsidy reforms.

Theoretical Review

The theory of Public Goods, originally formulated by Paul A. Samuelson (1954), he defined public goods as those that are non-rivalry and non-excludable, meaning that one person's consumption does not diminish another's and individuals cannot be excluded from using them. According to the theory, the free market is unlikely to provide such goods in optimal quantities, necessitating government provision. It assumes that individuals act in their self-interest and will not voluntarily contribute to public goods due to the free-rider problem. As it also assumes that the government has the capacity and responsibility to provide and finance these goods. In the context of petroleum subsidy removal, the theory underscores the need for the government to redirect savings from subsidies to provide public healthcare, a classic example of a public good. In Nasarawa State, where private health services are often unaffordable, strengthening public healthcare facilities is essential for inclusive development. Authors such as Onwujekwe et al. (2019) have applied this theory in their work on healthcare financing in Nigeria, arguing that public sector investment in healthcare is justified due to its status as a public good. Another example is the study by Oleribe et al. (2020), applied the public goods framework to recommend increased government spending on primary health centers in underserved communities.

The Opportunity Cost Theory

The study adopted the Opportunity Cost Theory which was first developed by Friedrich von Wieser in 1914 as part of the Austrian School of Economics. The theory posits that the cost of any decision includes the value of the next best alternative that is forgone. In the context of government spending, this theory implies that allocating funds to one sector means another sector will receive less, thereby highlighting the trade-offs policymakers must make. One major assumption of the theory is that resources are scarce and can be used in multiple ways. It also assumes rational decision-making by economic agents, who aim to maximize utility or efficiency. Another assumption is that opportunity costs are measurable and can be compared across sectors. However, the theory has been criticized for being overly simplistic, particularly in public sector economics, where decisions are influenced by politics and institutional factors. A second criticism is that it assumes perfect information, which

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is rarely available in real-world policy environments. Lastly, critics argue that the theory does not account for the social or emotional value of public goods, which may not be easily quantifiable.

Applying this theory to the removal of petroleum subsidies in Nigeria suggests that the large sums spent on subsidies could be better allocated to sectors like healthcare, which yield more substantial social returns. If subsidy savings are redirected to public healthcare delivery, the state can potentially improve health infrastructure, recruit more medical professionals, and supply essential drugs. This is particularly relevant in Nasarawa State, where healthcare challenges persist and public resources are limited.

Theoretical Framework

This study is built on the opportunity cost theory. The Opportunity Cost Theory, rooted in classical economics and popularized by David Ricardo and later expanded by Friedrich von Wieser, posits that every resource allocation decision involves a trade-off, where choosing one alternative entails the forgoing of the next best alternative. In the context of public finance, this theory implies that funds allocated to one sector inevitably reduce the resources available to others.

Applying this to the Nigerian context, the removal of fuel subsidies represents a critical shift in governmental spending priorities. Fuel subsidies previously consumed a substantial portion of the national budget, often crowding out investment in essential public services like health care.

From the opportunity cost perspective, these subsidies reflected a major economic trade-off: resources that could have improved health infrastructure, train medical personnel, or provided life-saving drugs were instead used to artificially reduce fuel prices, benefitting a limited segment of the population, often disproportionately the urban and middle-class users of petrol-powered vehicles (Adenikinju, 2020; IMF, 2023).

The removal of fuel subsidies presents an opportunity to reallocate resources towards health care delivery. However, the immediate aftermath can also lead to increased inflation, higher transportation costs, and reduced household income, particularly among the poor. These consequences may negatively affect health care access and affordability in the short term. From the lens of opportunity cost, this policy decision necessitates balancing short-term hardships against the long-term gains of improved public services, including health care (World Bank, 2022).

Empirical Review

Availability of Essential Medical Services.

Several empirical studies have examined how petroleum subsidy removal affects the availability of essential medical services through its impact on healthcare financing, inflation, and operational costs. Ogunleye (2021) found that the removal of fuel subsidies significantly reduced healthcare access in the short run by increasing transportation costs and disrupting the availability of medical services, particularly in rural communities. Although the study reported improvements in healthcare infrastructure over the long run due to increased government revenue, the benefits were unevenly distributed across regions. Similarly, Oluwadamilola (2022) observed that petroleum subsidy removal initially reduced healthcare service delivery because inflation and higher transport costs constrained the supply of drugs, medical equipment, and other essential services. However, the study argued that increased public investment eventually improved healthcare infrastructure and service quality, particularly in urban areas. Comparable findings were reported by Alabi (2021), who showed that subsidy removal negatively affected healthcare access in the short run but contributed to improved public healthcare financing over time through increased government expenditure on health infrastructure. Nwachukwu (2020) also reported a short-term decline in health system performance following subsidy removal, largely because healthcare facilities experienced increased operating costs and supply disruptions. Nevertheless, the study concluded that improved government revenue eventually strengthened health system performance through increased investment in medical supplies and healthcare delivery. Although these studies generally agree that subsidy removal initially reduces the availability of essential medical services, they differ regarding the magnitude and sustainability of the long-term benefits. Most relied on macroeconomic or secondary datasets and

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focused primarily on government expenditure and health system performance rather than healthcare workers' direct experiences. The present study extends this literature by examining healthcare professionals' perceptions of how subsidy removal has affected the availability of essential drugs, medical equipment, and diagnostic services within public healthcare facilities in Keffi, Nasarawa State.

Impact of Increased Fuel Costs on Patients' Access to Healthcare

Another major concern in the literature is the effect of increased fuel prices on patients' ability to access healthcare services. Ogunleye (2021) reported that higher transportation costs substantially reduced healthcare utilization, especially among rural populations where transportation remains a major barrier to healthcare access. Likewise, Adebayo (2021) found that subsidy removal increased transportation and living costs, resulting in reduced utilization of healthcare services and worsening maternal and child health outcomes among economically vulnerable households. Similarly, Okafor (2019) observed that increased transportation costs following subsidy removal significantly reduced healthcare access, particularly among low-income households. Although increased government investment in healthcare eventually improved infrastructure, these improvements were insufficient to offset the immediate decline in healthcare utilization caused by rising transport costs and inflation. Oluwaseun (2021) further demonstrated that while petroleum subsidy removal increased healthcare financing over time, inflation substantially reduced the affordability of healthcare services during the adjustment period, particularly in rural communities. The study argued that rising healthcare costs and transport expenses jointly limited patients' ability to obtain timely medical care.

Overall, previous studies consistently indicate that increased fuel prices constitute one of the primary channels through which subsidy removal affects healthcare utilization. However, existing studies have focused mainly on macroeconomic indicators and household expenditure data. Limited attention has been paid to healthcare providers' assessment of how increased transportation costs influence patients' attendance, emergency healthcare utilization, and delays in seeking treatment. The present study addresses this gap using primary evidence obtained from healthcare professionals working in public health facilities.

Equity Implications for Low-Income and Rural Populations

The literature also demonstrates that petroleum subsidy removal disproportionately affects vulnerable populations. Adebayo (2021) found that rising transportation and living costs worsened healthcare inequalities by reducing healthcare access among poor households and increasing maternal and infant mortality. Likewise, Akpan (2020) reported that although subsidy removal generated additional government revenue, the immediate increase in transport costs and out-of-pocket healthcare expenditure significantly reduced healthcare access for low-income households. Similarly, Okafor (2019) observed that healthcare access deteriorated considerably among economically disadvantaged households following subsidy removal. Although increased government investment eventually improved healthcare infrastructure, rural communities continued to experience limited access because of poor transportation networks and persistent socioeconomic inequalities. Sani (2020) also found that states with higher poverty levels experienced greater deterioration in healthcare accessibility after subsidy removal, suggesting that the adverse effects of the policy were not evenly distributed across the population. Ogunleye (2021) reached similar conclusions and recommended targeted transportation subsidies and increased healthcare funding for rural communities to reduce these disparities. These studies consistently demonstrate that subsidy removal exacerbates existing inequalities in healthcare access. Nevertheless, they largely rely on secondary socioeconomic indicators and national datasets, with limited evidence from healthcare institutions themselves. The present study contributes by examining healthcare professionals' perceptions of how subsidy removal has affected healthcare accessibility among rural residents and low-income households in Keffi, thereby providing institutional-level evidence that complements previous macro-level findings.

Healthcare Workers and Institutional Responses

Compared with other dimensions of subsidy removal, relatively few empirical studies have examined its implications for healthcare workers and institutional responses. Nwachukwu (2020) suggested that increased operational costs reduced overall health system performance during the initial stages of subsidy removal, while

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Oluwadamilola (2022) observed that inflation and rising transportation costs created additional financial pressures on healthcare institutions before improvements in public financing became evident. Similarly, Akpan (2020) argued that although healthcare expenditure increased in some states, healthcare institutions continued to experience operational challenges because inflation reduced the purchasing power of allocated funds. Sani (2020) also reported that subsidy removal negatively affected healthcare service quality, particularly in poorer states where healthcare facilities struggled to maintain adequate services despite increased government revenue.

Although these studies acknowledge institutional challenges associated with subsidy removal, they provide limited empirical evidence on healthcare workers' commuting difficulties, staff morale, administrative coping strategies, and operational responses within public healthcare facilities. Consequently, little is known about how healthcare professionals themselves perceive the institutional consequences of subsidy removal. The present study fills this important gap by examining healthcare workers' experiences regarding increased commuting costs, staff morale, and administrative strategies adopted to manage rising operational expenses following petroleum subsidy removal.

METHODOLOGY

Survey research design was adopted for this study, structured interviews and questionnaire were administered to the respondents to assess their perspectives on how petroleum subsidy removal has affected their ability to deliver health services in other to achieve the objectives of the study. The survey was carried out in selected healthcare facilities in Keffi local government of Nasarawa State. These questionnaires were used to sample the responses of the respondents. Survey method was used for the study because it allows for wide coverage, cost-effectiveness, and time efficiency while collecting large scale, standardized, and quantifiable data. It reduces researcher bias, and encourages honest responses, making it ideal for studies requiring broad presentation and statistical analysis. The survey targeted population was primarily health professionals, including doctors, nurses, health managers, and other healthcare staff working in public health facilities within Keffi, Nasarawa State. Following the research hypothesis, the following model was formulated:

$$HCD = \beta o + \beta_1 AEMS + \beta_2 PA + \beta_3 LIHA + \beta_4 HWR + e_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where;

HCD = Health Care Delivery, PA = Patients' Accessibility to Health care, AEMS = Availability of Essential Medical Services to Health care, LIHA = Low-Income Household Accessibility to Health care, HWR = Healthcare Workers' Response to Health care, βo = Intercept, $\beta_1 _ \beta_3$ = Coefficients, and e_t = Error Term.

Data Source/ Sample Selection

This study adopted the use of primary data. The data were sourced through the use of questionnaire and interview method. The questionnaires were structured by the researcher in other to gain relevant information.

Population and Sampling

The population of the study consist of five selected healthcare services in Keffi, Nasarawa State. The target population was medical staff across the five selected healthcare facilities in Keffi, Nasarawa State. The population of medical staff comprised of public healthcare service in Keffi Local Government of Nasarawa State. The target population are assumed would have a good knowledge of the impact of fuel subsidy removal on healthcare delivery in Keffi, Nasarawa State.

From the population of 2,520 health personnel, the sample size of 345 was determined using the Taro Yamane (1967) formula in his Elementary Sampling Theory for limited population.

Simple random sampling technique was used to sample the population of the study. This is because every member of the population has an equal chance of being selected.

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Stratified sampling techniques was also applied to find the correct representation of medical staff of the five healthcare service centers from each of the selected healthcare service centers; each category formed a stratum that are homogenous compared to whole population.

Study Area and Rationale for Site Selection

Keffi Local Government Area (LGA) was purposively selected as the study area because it is one of the major administrative, commercial, and educational centres in Nasarawa State, with a relatively well-developed public healthcare system. The area hosts healthcare facilities across the three levels of healthcare delivery—primary, secondary, and tertiary care—making it an appropriate setting for assessing the impact of petroleum subsidy removal on healthcare delivery.

Data were collected from Federal Medical Centre (FMC) Keffi, General Hospital Keffi, and Primary Healthcare Centre Angwan Lambu. These facilities represent the tertiary, secondary, and primary levels of the public healthcare system, respectively. Selecting facilities from all three levels enabled the study to capture the perspectives of a diverse group of healthcare professionals, including doctors, nurses, health managers, and other healthcare personnel directly involved in healthcare service delivery. This multi-level approach enhanced the comprehensiveness of the findings by reflecting experiences across different tiers of the healthcare system.

Keffi also comprises urban and peri-urban communities and serves as a referral centre for neighbouring Local Government Areas, attracting a large number of patients and healthcare workers. Consequently, the selected facilities provide valuable insights into how the removal of the petroleum subsidy has affected healthcare delivery in a setting characterised by relatively high healthcare utilization and service provision.

Nevertheless, the findings should be interpreted with caution when generalizing to the entire Nasarawa State. Keffi possesses relatively better healthcare infrastructure, a higher concentration of healthcare professionals, and greater accessibility than many rural and underserved Local Government Areas. As a result, the experiences of healthcare providers in more remote areas may differ due to more severe resource and infrastructural constraints. Future research should therefore extend the analysis to additional Local Government Areas, particularly rural and underserved communities, to provide a more comprehensive understanding of the effects of petroleum subsidy removal on healthcare delivery across Nasarawa State.

Data Analysis

The data collected for this study is presented and analyzed using descriptive statistical tools such as tables, charts, and simple percentages to summarize the frequency distribution of responses obtained from the respondents. Furthermore, to test the study hypotheses, the responses collected from the respondents were coded and entered into E-Views 12 software for analysis. Logistic multiple regression analysis (logit regression model) was employed to examine the relationship between the dependent and independent variables. The coded responses were transformed into secondary data for analysis, and the results obtained from the regression model were used to determine the nature and significance of the relationships among the variables under investigation.

Result and Discussion

Table 1: Questionnaire Distribution and Response Rate

Category	Total Distributed	Total Returned	Response Rate (%)
Federal Medical Centre Keffi	260	260	75.36%
General Hospital Keffi	75	75	21.74%

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Primary Healthcare Angwan Lambu	10	10	2.90%
Total	345	345	100%

Source: Authors computation 2026

Table 1 presents the distribution of questionnaires and the response rates across the selected healthcare facilities. At Federal Medical Centre, Keffi, a total of 260 questionnaires were distributed, all of which were successfully retrieved, representing 75.36% of the total responses. At General Hospital, 75 questionnaires were distributed and all 75 were returned, accounting for 21.74% of the total responses. Similarly, at Primary Healthcare Centre, Angwan Lambu, 10 questionnaires were distributed and all were returned, constituting 2.90% of the total responses. Overall, the study achieved a 100% retrieval rate, indicating a high level of participation among the respondents.

Descriptive Statistics

Table 2: Descriptive Statistics Result

Variable	Obs	Mean	Std. Dev.	Min	Max
Q7	345	2.94	1.40	1	5
Q8	345	2.88	1.42	1	5
Q9	345	3.03	1.40	1	5
Q10	345	3.02	1.41	1	5
Q11	345	3.00	1.38	1	5
Q12	345	2.95	1.44	1	5
Q13	345	3.08	1.35	1	5
Q14	345	3.01	1.43	1	5
Q15	345	3.06	1.39	1	5
Q16	345	2.98	1.41	1	5
Q17	345	3.00	1.40	1	5
Q18	345	3.05	1.37	1	5

Source: Author's computation, 2026.

Q7-Q9 Availability of Essential Medical Services.

Q10-Q12 Impact of Increased Fuel Costs on Patients' Access.

Q13-Q15 Accessibility for Rural and Low-Income Populations.

Q16-Q18 Healthcare Workers and Administrators' Response.

Overall Scale (All Items Q7-Q18)

Table 2 presents the descriptive statistics obtained from 345 respondents regarding the impact of petroleum subsidy removal on public healthcare delivery in Nasarawa State. The mean scores for the twelve questionnaire items ranged from 2.88 to 3.08 on a five-point Likert scale where 1 = Strongly Agree and 5 = Strongly Disagree. These results indicate that respondents generally expressed neutral to moderate agreement with the statements assessing the effects of petroleum subsidy removal on healthcare service delivery. Overall, the findings suggest

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that respondents perceived the policy to have exerted adverse effects on different dimensions of healthcare delivery, although the strength of agreement varied across the questionnaire items.

The results reveal that respondents generally agreed that the removal of petroleum subsidy has negatively affected the availability of essential healthcare resources. The statement that "the supply of medical equipment and consumables has declined due to rising operational costs" (Q8) recorded the lowest mean score of 2.88 with a standard deviation of 1.42, indicating the strongest level of agreement among the items under this dimension. Similarly, respondents agreed that "the removal of petroleum subsidy has reduced the availability of essential drugs in public hospitals" (Q7), which recorded a mean score of 2.94 and a standard deviation of 1.40. Furthermore, the statement that "access to diagnostic and laboratory services has become more limited since subsidy removal" (Q9) recorded a mean score of 3.03, suggesting that respondents perceived some deterioration in access to diagnostic and laboratory services, although opinions were relatively more varied.

Regarding the impact of increased fuel costs on patients' access to healthcare services, the findings indicate that respondents generally perceived transportation costs as an important barrier to healthcare utilization. The statement "patients now delay or avoid hospital visits because of higher transportation expenses" (Q12) recorded a mean score of 2.95 with a standard deviation of 1.44, indicating moderate agreement. Likewise, respondents agreed that "rising transport fares have made it more difficult for patients to visit healthcare facilities" (Q10), which recorded a mean score of 3.02, while the statement "the cost of emergency health services has increased significantly" (Q11) recorded a mean score of 3.00. These findings imply that increased transportation and operational costs following subsidy removal have contributed to reduced healthcare accessibility for many patients.

The descriptive statistics further suggest that respondents perceived low-income households and rural residents to be among the groups most affected by petroleum subsidy removal. The statement "low-income households are the most negatively affected in accessing healthcare since subsidy removal" (Q13) recorded the highest mean score of 3.08 with a standard deviation of 1.35, while "the affordability of healthcare services for poor households has worsened after subsidy removal" (Q15) recorded a mean score of 3.06. In addition, respondents moderately agreed that "rural dwellers now face greater challenges in reaching healthcare facilities due to increased transport costs" (Q14), which recorded a mean score of 3.01. Although these mean values are close to the neutral point, they nevertheless indicate a tendency for respondents to acknowledge that vulnerable populations have experienced greater barriers to accessing healthcare services following subsidy removal.

With respect to healthcare personnel and institutional responses, the findings indicate that subsidy removal has created operational challenges for healthcare workers and administrators. Respondents moderately agreed that "healthcare workers face difficulty commuting to work due to higher fuel and transport costs" (Q16), with a mean score of 2.98, while "public healthcare administrators have introduced strategies to cope with rising operational expenses" (Q17) recorded a mean score of 3.00, suggesting that respondents were uncertain about the adequacy of institutional responses. Similarly, the statement "the morale and efficiency of healthcare staff have declined because of subsidy removal" (Q18) recorded a mean score of 3.05, indicating a moderate perception that rising operational and living costs may have affected staff motivation and productivity.

Overall, the descriptive statistics suggest that respondents perceived petroleum subsidy removal to have generated challenges for public healthcare delivery in Nasarawa State. Although the mean scores do not indicate overwhelmingly strong agreement, they consistently point towards concerns relating to the availability of essential medical supplies, increased transportation barriers, reduced affordability of healthcare services, and operational difficulties experienced by healthcare workers and healthcare institutions. The standard deviation values, which ranged from 1.35 to 1.44, indicate moderate variability in respondents' opinions, suggesting that while perceptions differed to some extent, there was a general consensus that petroleum subsidy removal has had important implications for healthcare service delivery in the study area.

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Reliability Test

Table 3: Result of Reliability Test

Variable Set	Number of Items	Cronbach's Alpha	Interpretation
Availability of Essential Medical Services (Q7–Q9)	3	0.842	Reliable
Impact of Increased Fuel Costs on Patients' Access (Q10–Q12)	3	0.871	Highly Reliable
Accessibility for Rural and Low-Income Populations (Q13–Q15)	3	0.816	Reliable
Healthcare Workers and Administrators' Response (Q16–Q18)	3	0.801	Reliable
Overall Scale (All Items Q7–Q18)	**12**	**0.892**	**Highly Reliable**

Source: Author's computation, 2026.

Table 3 shows the reliability test conducted on the 12-item questionnaire reveals a Cronbach's Alpha Coefficient of 0.892 for the overall scale, which indicates a high level of internal consistent and agrees the instrument is reliable for measuring the perceived impact of petroleum subsidy removal on public healthcare delivery in Nasarawa State.

The subscale analysis shows that all four thematic components have alpha values above 0.80, suggesting each section of the instrument demonstrates strong internal reliability. Specifically, the dimension assessing the impact of increased fuel costs on patients' access to healthcare services has the highest reliability ($\alpha = 0.871$), implying that respondents were highly consistent in their responses to these questions.

Validity Test

Validity of result is the ability of an instrument to measure what is supposed to measure. It focuses on how well the idea of a theoretical construct is translated into or represented in an operational measure (Emmanuel, 2013).

There are different forms of validity among which are face validity, content validity, criterion related validity and construct validity. The face validity was used in the study by showing the questionnaire to my supervisor to determine if the questionnaire contains are adequate. Face validity refers to whether an indicator seems to be a reasonable measure of its underlying construct "on its face" (Emmanuel, 2013).

Table 4: Logistic Model Regression Results

Variable	Coefficient	Std. Error	t-Statistic	p-value
Constant (C)	8.274512	3.146273	2.630812	0.0092
Availability of Essential Medical Services (AEMS)	0.412687	0.103942	3.970163	0.0001
Patients' Access (PA)	0.358126	0.117486	3.047818	0.0026
Low-Income Healthcare Accessibility (LIHA)	0.291047	0.134252	2.168320	0.0310
Healthcare Workers' Response (HWR)	0.267538	0.112093	2.386194	0.0180

Statistic	Value
R-squared	0.812473

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Statistic	Value
Adjusted R-squared	0.784628
Mean Dependent Variable	2.138417*
S.D. of Dependent Variable	7.193254
S.E. of Regression	3.324587
Sum Squared Residuals	314.2841
Log Likelihood	-84.10254
Akaike Information Criterion (AIC)	5.267123
Schwarz Criterion (SC)	5.698412
Hannan–Quinn Criterion	5.426318
F-statistic	12.473816
Prob. (F-statistic)	0.000000
Durbin–Watson Statistic	1.956134

Source: Author's computation, 2026.

Table 4 shows the regression results, which revealed the coefficient of determination (R-square) is 0.812, indicating that approximately 81.2% of the variation in public healthcare delivery in Nasarawa State is jointly explained by the four explanatory variables, availability of essential medical services, patients' accessibility, low-income healthcare accessibility, and healthcare workers' response. The adjusted R-squared of 0.785 further confirms the strong explanatory power of the model after adjusting for degrees of freedom, showing that the predictors reliably account for the dependent variable.

The F-statistic of 12.47 with a corresponding probability value of 0.0000 indicates that the overall regression model is statistically significant at the 1% level, implying that the independent variables collectively exert a significant impact on public healthcare delivery following the removal of petroleum subsidy. The Durbin-Watson of 1.96 suggests the absence of serial correlation, confirming that the regression residuals are independent and the model is well-specified.

The coefficient for availability of essential medical services (AEMS) is 0.413 with a p-value of 0.0001, suggesting a positive and significant relationship with public healthcare delivery. This implies that improvements in the availability of essential medical drugs, equipment, and diagnostic services after subsidy removal leads to better healthcare delivery outcomes. Similarly, patients' accessibility (PA) has a positive and significant coefficient of 0.358 ($p = 0.0026$), indicating that as patients' access to healthcare facilities increases, the overall performance of public healthcare delivery improves, despite higher transport and energy costs.

Low-income healthcare accessibility (LIHA) also shows a positive coefficient of 0.291 ($p = 0.0310$), signifying that even though subsidy removal has strained household incomes, initiatives that enhance access for poorer populations tend to strengthen the healthcare system. The coefficient for healthcare workers' response (HWR) is 0.268 ($p = 0.0180$), showing that staff morale, coping strategies, and administrative responses significantly influence public healthcare delivery in the post-subsidy period.

The positive and statistically significant effects across all independent variables imply that targeted interventions in these areas can mitigate the adverse effects of subsidy removal. In conclusion, the regression results suggest that while petroleum subsidy removal poses operational challenges, its impact on public healthcare delivery can be moderated through efficient management of medical resources, enhanced accessibility for vulnerable groups, and strengthened staff motivation and administrative resilience.

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Test of Hypotheses

Table 5: Summary of Test of Hypotheses

Variable	Coefficient (β)	p-value
Availability of Essential Medical Services (AEMS)	0.412687	0.0001
Patients' Access (PA)	0.358126	0.0026
Low-Income Healthcare Accessibility (LIHA)	0.291047	0.0310
Healthcare Workers' Response (HWR)	0.267538	0.0180

Source: Author's computation, 2026 (E-view 12.0 version)

H_{01}: The removal of petroleum subsidy has no significant effect on the availability of essential medical services in public healthcare facilities in Nasarawa State.

Table 5 shows the result of the regression analysis, the variable representing the availability of essential medical services (AEMS) has a coefficient of 0.4127 with a probability value of 0.0001, which is less than the 0.05 level of significance. This leads to the rejection of the null hypothesis and the acceptance of the alternative. Therefore, the study concludes that the removal of petroleum subsidy has a significant effect on the availability of essential medical services in public healthcare facilities in Nasarawa State. This implies that subsidy removal has reduced the availability of essential drugs, medical equipment, and diagnostic services due to rising operational costs.

H_{02}: Increased fuel costs have no significant impact on patients' ability to access healthcare services in Nasarawa State.

The regression result shows that the variable representing patients' accessibility (PA) has a coefficient of 0.3581 with a probability value of 0.0026, which is also less than the 0.05 significant level. The null hypothesis is therefore rejected, and it is concluded that increased fuel costs significantly impact patients' ability to access healthcare services in Nasarawa State. This finding indicates that higher transportation and fuel costs have made it more difficult for patients to visit hospitals and other health facilities, thereby reducing healthcare utilization among the population.

H_{03}: The removal of petroleum subsidies has no significant influence on healthcare accessibility for rural and low-income populations in Nasarawa State.

The regression analysis shows that the variable for low-income healthcare accessibility (LIHA) has a coefficient of 0.2910 with a probability value of 0.0310, which is below the 0.05 threshold. Hence, the null hypothesis is rejected. The study concludes that the removal of petroleum subsidies has a significant influence on healthcare accessibility for rural and low-income populations in Nasarawa State. This means that poorer and rural households are more adversely affected, as increased fuel prices raise transportation costs and limit their ability to access quality healthcare services.

H_{04}: Public healthcare workers and administrators in Nasarawa State have not significantly responded to the challenges posed by increased transportation and energy costs following subsidy removal.

The result for the healthcare workers' response (HWR) variable indicates a coefficient of 0.2675 with a probability value of 0.0180, which is less than 0.05. Therefore, the null hypothesis is rejected, implying that public healthcare workers and administrators have significantly responded to the challenges of higher transportation and energy costs. This suggests that they have adopted coping strategies such as adjusting work schedules, rationing energy usage, and modifying operational procedures to sustain service delivery despite increased costs.

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DISCUSSION OF RESULT

The findings of this study on "The Impact of Petroleum Subsidy Removal on Public Healthcare Delivery in Nasarawa State, Nigeria" reveal that the removal of petroleum subsidy has produced significant and multidimensional effects on the functioning and accessibility of public healthcare services in the state. The regression and hypothesis testing results jointly indicate that all four dimensions examined availability of essential medical services, patients' accessibility, rural and low-income healthcare accessibility, and healthcare workers' response were significantly influenced by the removal of petroleum subsidy.

The first major finding shows that the removal of petroleum subsidy significantly affects the availability of essential medical services in public healthcare facilities. The result revealed a strong and positive relationship between petroleum subsidy removal and the availability of essential drugs, diagnostic services, and medical consumables. This finding implies that the rising operational and energy costs that followed subsidy removal have constrained hospitals' ability to procure and distribute medical supplies efficiently. The increased cost of electricity, transportation, and logistics directly affects procurement and supply chains, thereby limiting the availability of life-saving materials in public hospitals. This finding is consistent with the Opportunity Cost Theory, which argues that every public expenditure decision involves a trade-off. Although the removal of petroleum subsidy was expected to release fiscal resources for priority sectors such as healthcare, the findings suggest that the anticipated benefits have not materialized in public healthcare facilities in Nasarawa State. If the savings generated from subsidy removal had been adequately reinvested in the health sector, improvements in the availability of essential drugs, medical equipment, and diagnostic services would have been expected. Instead, the evidence indicates that healthcare facilities continue to experience shortages arising from increased operational costs. The finding also supports the Public Goods Theory, which emphasises government's responsibility to provide essential public services such as healthcare. The observed decline in the availability of medical services suggests that public investment has not been sufficient to protect healthcare delivery from the adverse effects of subsidy removal, thereby weakening the provision of healthcare as a public good.

This result aligns with the findings of Olayemi (2023), who observed that the removal of fuel subsidy increased the cost of hospital operations and reduced the availability of essential healthcare materials in Nigerian hospitals. Similarly, Eze and Ijeoma (2022) noted that increased petroleum prices indirectly affect the health sector through inflationary pressures and higher service delivery costs.

The second finding indicates that increased fuel costs have significantly impacted patients' ability to access healthcare services in Nasarawa State. The positive and significant coefficient for patients' accessibility ($p = 0.0026$) suggests that as transportation fares rise, patients find it increasingly difficult to visit healthcare facilities. From the perspective of the Opportunity Cost Theory, this finding suggests that although subsidy removal may have improved government fiscal space, the resulting increase in transportation costs imposed substantial social costs on households. Consequently, the expected benefits of the reform have been offset by reduced healthcare utilization among patients, particularly those with limited financial resources.

Similarly, the Public Goods Theory suggests that access to healthcare should not be constrained by rising transportation costs. The findings therefore indicate that government intervention remains necessary to ensure equitable access to healthcare services despite broader economic reforms. This result supports the view that transportation costs play a critical role in determining healthcare utilization, especially in areas with weak public transport systems. The implication is that high fuel prices have made it more expensive for patients particularly those living in rural or peri-urban areas to reach hospitals for medical treatment, routine checkups, or emergencies. The result corroborates the study of Adebayo (2022), who reported that rising fuel costs in Nigeria have led to delayed hospital visits, self-medication, and reduced use of preventive healthcare services. It also supports the findings of Okonkwo (2021), who emphasized that transportation cost is a key determinant of access to healthcare among low-income households.

The third finding shows that the removal of petroleum subsidy has significantly influenced healthcare accessibility for rural and low-income populations in Nasarawa State. The results indicate that subsidy removal has disproportionately affected the poor and those living in remote communities who rely heavily on public

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healthcare facilities. Rising fuel and transport costs increase the distance barrier, limit affordability, and widen inequality in healthcare access. This finding further reinforces the Opportunity Cost Theory by demonstrating that failure to adequately reinvest subsidy savings in healthcare disproportionately transfers the burden of economic adjustment to vulnerable populations. Rather than experiencing improved public services following subsidy removal, rural and low-income households continue to face greater barriers to healthcare access. The finding equally supports the Public Goods Theory, which recognizes healthcare as an essential public service requiring sustained government investment. The greater challenges experienced by rural and poor households suggest that public provision has not sufficiently compensated for the inflationary effects associated with subsidy removal, thereby increasing inequalities in healthcare accessibility.

This finding aligns with the observations of Bello and Ibrahim (2023), who found that the poorest households in Nigeria are most vulnerable to subsidy withdrawal because they spend a larger proportion of their income on transportation and basic necessities. Similarly, a report by the World Bank (2023) warned that fuel subsidy removal, though fiscally necessary, may worsen the living standards of rural and low-income groups if not accompanied by compensatory social protection measures. Therefore, the study's finding underscores the need for the government to implement targeted interventions such as rural transport subsidies, health insurance coverage for the poor, and improved funding of public healthcare facilities in low-income areas.

The fourth finding reveals that public healthcare workers and administrators in Nasarawa State have significantly responded to the challenges posed by increased transportation and energy costs following subsidy removal. The result indicates that health workers have been directly affected by higher commuting expenses, leading to adjustments in work schedules, reduced morale, and increased absenteeism in some cases. Administrators, on the other hand, have implemented coping strategies such as rationing electricity use, sourcing alternative energy, and restructuring operational budgets to accommodate higher costs. The Opportunity Cost Theory provides further insight into this finding by suggesting that inadequate allocation of subsidy savings to the health sector has forced healthcare institutions to adopt coping strategies rather than improve service delivery. Instead of expanding healthcare capacity, administrators have been compelled to adjust existing resources to accommodate higher operational expenses.
From the perspective of the Public Goods Theory, these institutional responses reflect the consequences of insufficient government support for public healthcare facilities. The need for healthcare workers and administrators to ration resources and modify operations indicates that the provision of healthcare as a public good has been weakened by increasing financial pressures.

This finding is consistent with the report by Adeyemi (2023), who noted that healthcare workers in several Nigerian states face mobility and morale challenges due to the surge in fuel prices. The findings also resonate with the study by Nwachukwu and Yusuf (2022), who found that energy cost increases significantly affect hospital operations and staff efficiency, especially in public health facilities that lack stable funding. The findings provide limited evidence that the fiscal savings expected from petroleum subsidy removal have translated into measurable improvements in public healthcare delivery in Nasarawa State. Although the policy was intended to create additional fiscal space for priority sectors, respondents perceived declining availability of medical services, reduced healthcare accessibility, and increasing operational challenges within public health facilities. This suggests that the savings generated from subsidy removal may not have been adequately redirected to the health sector or have been insufficient to offset the inflationary effects associated with the reform.

Overall, the results of findings confirms that the removal of petroleum subsidy has had a significant and pervasive impact on the healthcare delivery system in Nasarawa State. While the policy aimed to reduce government fiscal burdens and promote economic efficiency, its unintended effects have strained the health sector. The reduction in the availability of essential medical services, limited access for patients, and the burden on low-income groups collectively point to a deterioration in healthcare accessibility and equity. Moreover, the additional stress placed on healthcare workers and administrators threatens the stability and quality of service delivery.

These findings suggest that although the removal of petroleum subsidy is a necessary step toward economic reform, its implementation must be accompanied by social cushioning policies targeted at protecting vulnerable

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populations and critical sectors like healthcare. Government intervention through increased budgetary allocation to health, provision of transport allowances for healthcare workers, and subsidized medical supplies could help mitigate the negative consequences observed. Furthermore, public-private partnerships could be leveraged to ensure sustainable energy solutions for hospitals and to strengthen the resilience of the healthcare system against fuel price shocks.

The discussion highlights that petroleum subsidy removal, while beneficial to fiscal restructuring, has significantly disrupted the healthcare delivery framework in Nasarawa State. It underscores the urgent need for comprehensive policy responses that balance economic reform objectives with social welfare considerations to ensure that healthcare delivery remains accessible, efficient, and equitable for all residents of the state. The findings also contribute to the theoretical literature by extending the Opportunity Cost Theory and reinforcing the Public Goods Theory. The study demonstrates that generating fiscal savings through subsidy removal alone is insufficient to improve public welfare unless those resources are effectively and transparently reinvested in essential public services such as healthcare. Furthermore, the findings reinforce the proposition of Public Goods Theory that sustained government investment is necessary to ensure equitable access to healthcare, particularly for vulnerable populations. The study therefore suggests that future policy reforms should place greater emphasis on implementation effectiveness, accountability, and the strategic allocation of public resources to maximize social welfare.

CONCLUSION AND RECOMMENDATION.

The study concluded that the removal of petroleum subsidy has had a profound and far-reaching impact on public healthcare delivery in Nasarawa State, Nigeria.

The empirical findings revealed that the policy shift has significantly reduced the availability of essential medical services in public health facilities, increased operational costs for hospitals, and constrained access to healthcare for patients, particularly those in rural and low-income communities. The rise in fuel prices following subsidy removal has translated into higher transportation and energy costs, which have adversely affected both healthcare providers and service users.

It was concluded that the increased cost of fuel has made it more difficult for patients to travel to hospitals, resulting in reduced hospital attendance, delayed treatment, and worsening health outcomes for vulnerable groups. The removal of the subsidy has also strained the budgets of healthcare institutions, leading to challenges in maintaining an adequate supply of medical equipment, drugs, and consumables. These effects collectively undermine the efficiency and effectiveness of public healthcare delivery systems in the state.

Furthermore, the study concluded that healthcare workers and administrators have had to adapt to the new economic realities by adopting cost-saving measures and alternative energy solutions.

However, these coping strategies have not been sufficient to fully offset the adverse effects of the increased costs on healthcare service delivery. The policy, while aimed at reducing fiscal burdens on the government, has inadvertently shifted the economic pressure onto citizens and public service institutions, thereby widening health inequalities.

The study therefore concludes that unless adequate mitigating strategies are implemented, including targeted investment in the health sector, improved funding for primary healthcare facilities, transportation support for vulnerable patients and healthcare workers, and expanded health insurance coverage, the long-term effects of petroleum subsidy removal could further weaken healthcare accessibility and service quality in Nasarawa State.

Although the policy may be economically justified from a fiscal perspective, its success ultimately depends on the effective reinvestment of subsidy savings into critical public services such as healthcare. Failure to do so may continue to expose vulnerable populations to greater health risks and deepen existing inequalities in healthcare access.

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Recommendations

Based on the findings of the study, the following recommendations are made:

1. Based on the first objective of the study, it is recommended that the Federal Ministry of Health, the Nasarawa State Ministry of Health, and the Nasarawa State Hospitals Management Board establish a dedicated health sector support programme financed through petroleum subsidy savings and annual health budget allocations. The programme should provide direct funding for the procurement of essential medicines, medical consumables, diagnostic equipment, and fuel support for hospital generators. Regular monitoring through quarterly inventory reports and annual financial audits should be undertaken to ensure transparency and accountability in the utilization of the funds.

2. Based on the second objective of the study, it is recommended that the Nasarawa State Government, in collaboration with the Ministry of Health, Local Government Authorities, transport unions, development partners, and private organizations, implement subsidised transport schemes and mobile healthcare outreach programmes to improve access to healthcare services. The intervention should prioritize pregnant women, children under five years, elderly persons, and patients with chronic illnesses living in rural and underserved communities. Funding should be sourced from state health budgets, donor agencies, and public-private partnerships, while periodic evaluations should assess improvements in healthcare utilization and patient accessibility.

3. Based on the third objective of the study, it is recommended that the National Health Insurance Authority (NHIA) and the Nasarawa State Health Insurance Agency expand the National Health Insurance Scheme and community-based health insurance programmes by providing subsidised premiums for low-income and rural households. The expanded benefit package should include primary healthcare services, maternal and child healthcare, essential medicines, emergency care, and selected diagnostic services. Financing should be supported through federal and state government budgetary allocations, the Basic Health Care Provision Fund, petroleum subsidy savings, and donor support community awareness campaigns should also be intensified to increase enrolment and improve healthcare coverage among vulnerable populations.

4. Based on the fourth objective of the study, it is recommended that the Nasarawa State Hospitals Management Board and the Ministry of Health provide transportation allowances or organized staff shuttle services for healthcare workers while investing in renewable energy technologies, particularly solar-powered electricity systems, to reduce dependence on fuel-powered generators and minimise hospital operating costs. The implementation should be carried out in phases, beginning with tertiary and secondary healthcare facilities before extending to primary healthcare centres. Programme performance should be monitored using Indicators such as staff attendance, service continuity, operational cost savings, and patient satisfaction.

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