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Original Research Article

Path Analysis of Utilisation and Perceived Effectiveness of Primary Health Care Services: Implications for Rural Development Policies in *Ogun* State, Nigeria

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Abstract

Primary health care (PHC) remains central to human capital development and productivity, particularly in rural regions where agriculture is the dominant livelihood. Effective and accessible PHC services contribute directly to agricultural and rural development by reducing morbidity, enhancing labour efficiency, and sustaining household wellbeing. This study aims to assess how accessibility, affordability and attitudes influence PHC utilisation, and hence their perceived effectiveness in *Ogun* State, Nigeria. We collect cross-sectional data from 120 randomly sampled users of PHC centres across communities, covering the three senatorial districts of the state using validated interview schedules. We use Structural Equation Modeling (SEM) to examine the interrelations among these constructs. Descriptive findings reveal that 86.7% of respondents experienced high accessibility to PHC services, and 90% experienced high affordability. However, we find an interesting paradox – an unfavourable attitude (67.5%) toward PHC services, but high utilisation (85.8%) and perceived effectiveness (92.5%) of these services among users. The SEM results demonstrate significant relationships, with accessibility ($\beta = 0.30$, $p < 0.01$) and affordability ($\beta = 0.45$, $p < 0.05$) positively affecting utilisation. Utilisation significantly influences perceived effectiveness ($\beta = 0.87$, $p < 0.01$). The study highlights the need to address negative attitudes towards the PHC services despite high levels of accessibility, affordability, and utilisation, suggesting improvements in service quality to enhance overall effectiveness.

Keywords: path analysis; perception; structural equation modelling; utilisation.

INTRODUCTION

The well-being of a nation is a key responsibility of the government, and one keyway to enhance this is through a carefully designed and effectively implemented healthcare system. Also, health is a fundamental driver of agricultural productivity and rural development. In many low- and middle-income countries, including Nigeria, the agricultural sector depends heavily on the physical well-being of rural households who constitute the majority of the farming population. Poor access to quality healthcare reduces farmers' ability to engage in productive labour, exacerbates poverty, and weakens local economies. Reisman (2007) maintained that a healthy population ensures a more secure and productive society, where individuals can contribute fully to community development and nation-building.

In 1962, the World Health Organisation (WHO) introduced the slogan "Health is Wealth" to emphasise the importance of effective healthcare systems in the success of national development (WHO, 1978; Sama et al., 2008). The right to health is recognised as a universal human right, supporting the ongoing demand for universal healthcare, particularly in developing countries where access to basic services is often limited. Consequently, the WHO champions

primary healthcare (PHC) as a cornerstone for achieving universal health coverage. According to WHO (1978), individuals and communities should have the right and responsibility to participate, both individually and collectively, in the planning and execution of their healthcare. The PHC is designed to be essential, scientifically sound, and socially acceptable, making healthcare accessible and affordable for all, promoting self-reliance and self-determination at every stage of development (WHO, 1978).

The PHC was defined in the Declaration of *Alma-Ata* at the International Conference on PHA, *Alma-Ata*, USSR, in 1978. The need for PHC arose due to the gross inequality in the health status of the people, particularly between developed and developing countries as well as within countries (WHO, 1978). This difference was deemed socially, economically and politically unacceptable; it therefore serves as a source of common concern for all countries. Historically, major attempts were made at evolving the Nigerian health system to a community-driven and people-oriented model. The first of these attempts occurred between 1975 and 1980 with the introduction of the Basic Health Service Scheme (BHSS; Dungy, 1979; Lambo and Ola (2010). The BHSS was structured along "basic health units" which consisted of 20 health clinics spread across each Local Government Area (LGA), which were backed up by four PHC centres and supported by mobile clinics serving an approximate population of 150,000 each. The non-involvement of local communities was the drawback of this attempt (Croke, et al., 2024).

Globally, and as in Nigeria, achieving universal health coverage as conceived under the Sustainable Development Goals (SDGs) involves taking health service delivery to all parts of the globe where people can be found. This also is the vision of WHO for achieving all health-related SDGs (WHO, 2020). The absence of a fully developed and functional PHC system continues to constitute a development challenge in Nigeria. The situation threatens the achievement of health-related Sustainable Development Goals (SDGs) as well as other health objectives (Alonge, 2020). The PHC has been found to be highly effective and efficient in treating the main causes and risk factors of health deficiencies. It is also capable of tackling emerging threats to public health and wellbeing into the future. The PHC is crucial for the realisation of health-related Sustainable Development Goals (SDGs) which are in turn inextricably linked with the other SDGs such as ending poverty, inclusive education, work and economic growth, reducing inequality and climate action (Alonge, 2020).

In August 1987, the Federal Government of Nigeria launched its PHC plan, which was based on the Alma Ata Declaration of 1978. According to Lucas (2008), one of the features of PHC is for it to be an element of the health system, as such it becomes an integral part of both the country's health system and serves as the first level of contact of individuals, the family and community with the national health system. The PHC was meant to focus on essential health care, based on scientifically sound principles while using socially acceptable methods and technology (WHO, 1978). The PHC is supposed to ensure equity i.e. to be universally accessible to individuals and families in the community, incorporate their full participation and available at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination. The WHO (1978) had declared that the existing gross inequality in the health status of the people particularly between developed and developing countries as well as within countries is politically, socially and economically unacceptable and is, therefore, of common concern to all countries.

A National Health Policy had earlier been promulgated between 1985 and 1992 (Olukoya and Ferguson, 2003) which described the goals, strategies, structure and direction of the Health Care system of Nigeria. From this time going forward, the implementation of PHC became the responsibility of Local Government Areas (LGAs) in Nigeria, with quality service delivery, accessibility and equity administration through the different health facilities, being the priorities. Meanwhile, the PHCs would also be supported by the State Ministries of Health, Federal, Private and diverse international donors and agencies such as United States Aids for International Development (USAID), WHO and United Nations International Children's Emergency Fund (UNICEF). This achieved success mainly through integrated services with the creation of over 50 PHC facilities in the Local Government Areas of Nigerian States. For example, mortality rate declined significantly to 109 out of 1000 deaths against 128 out of 1000 deaths (WHO, 2017). There was also improvement in life expectancy statistics, alertness on nationwide vaccination and free immunisation (WHO, 2017). However, it appears as though this change in leadership over the years has since reduced the successes attributed to PHC services in Nigeria (Amedari and Ejidike, 2021).

Adewole (2016) reported that only about 20% of the 30,000 PHC facilities across Nigeria are working, physical inspection has shown that not much changed between 2016 and 2021 with regards to this.

Ananaba (2018) reported that Nigeria has one of the worst modes of PHC delivery in the world. Several studies have identified few challenges confronting the PHC scheme in Nigeria, one of which is poor utilisation of services, caused mainly by the lack of infrastructure and personnel in some of the working facilities. Also, urban area and environs dwellers are reported to often prefer to use the secondary and tertiary health institutions instead of the PHC (Fayehun et al., 2022). Poor funding has also been identified (Josiah et al., 2024; Oga 2024) as most of these funds are used up in the payment of salaries and little to nothing is left to purchase supplies and equipment needed for good delivery of PHC services. The Federal Government established the Basic Health Care Provision Fund (BHCPF) in 2014 under Section 11 of the National Health Act; to provide funding to improve access to PHC. The Fund provides a basic minimum package of health services (BMPHS) aimed at increasing the fiscal space for health, strengthening the national health system, particularly at the PHC level and ensuring access to healthcare for all (Adeoye et al., 2024; Igbokwe et al. 2024). However, the BHCPF was later reduced from ₦54.05 billion to ₦44.56 billion, representing a 17.55% reduction. The overall health budget was reduced by 1.25% or ₦10.42bn. Thus, the health budget to budget size was also reduced from 4.88% to 4.76% (Okoroafor, 2022).

Ogun State is one of the states in south-western Nigeria. The state, with more than 40% of her population in the rural areas, has as its health goal to provide quality, accessible and affordable health care service to its people by ensuring that PHCis available within 5 km of the populations living homes. It however grew to a total of 470 as at 2017, having from only 15 in 2012. These were complemented by a total of 2,532 health workers including only 15 doctors and 318 staff nurse/ midwives. The facilities were also serviced by a total of 1998 beds across the 20 LGAs servicing a total of 14,298 in-patients and 364,025 out-patients (Central Department of Statistics, Ministry of Finance, 2017). However, many of these PHCs are on the verge of extinction, having suffered neglects manifesting in lack of human power and negligence. Official state records indicate that *Ogun* State has a large network of registered primary health facilities, with recent agency lists and state budget documents showing active accreditation and ongoing revitalisation programmes across LGAs (Central Department of Statistics, Ministry of Finance, 2017; *Ogun* State Government, 2025). These facilities are controlled by National Primary Health Care Development Agency (NPHCDA), *Ogun* State Chapter. The NPHCDA is a parastatal of Nigeria's Federal Ministry of Health (FMOH) with the mandate of developing Nigeria's PHC, it was established in 1992 and was subsequently merged with National Programme on Immunisation (NPI) in 2007. Since its inception, the NPHCDA has been tasked with the control of preventable diseases, improve access to basic health services, improve quality of care, strengthen the institution, develop high performing health workforce, strengthen partnership and strengthen community engagement (Sampson, 2024).

According to WHO (1978), the five (5) main principles or objectives that characterise an efficient and effective PHC are equitable distribution, community participation, inter-sectorial participation, appropriate technology, and health promotion. Effectiveness or functionality as regards PHC can then be further explained as the degree to which the PHC system successfully achieves its aims/objectives. The objective of the PHC is "ensuring the highest possible level of health and well-being and their equitable distribution by focusing on people's needs and as early as possible along the continuum from health promotion and disease prevention to treatment, rehabilitation and palliative care, and as close as feasible to people's everyday environment" (WHO, 2021). Hence the effectiveness of the PHC scheme will be based on the level of health and wellbeing of its users, the equitability of distribution, how timely the health interventions get to the patients, and how feasible it is to the local community. Invariably the effectiveness of the PHC scheme can only be judged by its users.

The PHC scheme comprises three principal user groups: community members who access services, health practitioners who deliver care, and policymakers at federal, state and local government levels (Obi et al., 2024; Onwujekwe et al., 2020). Strengthening citizen participation therefore requires active engagement of both lay citizens and policy actors in decision-making for local health programmes. Recent empirical work highlights that meaningful participation and local collaborations, including ward development committees, health facility committees and informal community networks, substantially improve PHC use and responsiveness by mobilising resources, advocating for facility upgrades and promoting local accountability (Obi et al., 2024). obtaining evidence on community perceptions of PHC effectiveness is thus an important step towards inclusive policymaking: it provides the voice-based data needed to align services with local priorities and to design interventions that increase both uptake and perceived quality. Efforts

have been made to investigate the effectiveness of the Nigerian PHC system. Using *Akwa-Ibom* State as a case study, Akwaowo et al. (2020) studied the allocation of resources for the PHC as a way of rejuvenating the PHC system, the study findings shows that proper allocation of resources will help fund the employment of more workers thereby improving the service delivery in our PHC facilities. More recently, Ogah et al. (2024) underscored that while PHCs remain pivotal to achieving equitable health outcomes, systemic issues such as weak governance structures, inconsistent quality assurance, and inadequate workforce capacity continue to undermine service effectiveness. Similarly, Onwujekwe et al. (2020) emphasised that strengthening health policy and systems research (HPSR) capacity among health institutions and decision-makers is critical for improving evidence-informed PHC planning and implementation across Nigeria.

Despite all past works done by multiple scholars while researching into the PHC in Nigeria, a major gap is the fact that in most cases, the primary users which are the rural community have not been taken into consideration in the majority of these works. By centring rural community voices in PHC evaluation, this study addresses an important evidence gap with implications beyond Nigeria. One, it demonstrates a replicable methodology for capturing user perspectives in resource-constrained agrarian settings globally. Second, the study contributes empirical evidence on community-driven quality indicators that can inform participatory health governance frameworks across similar low- and third, middle-income contexts, and offers practical insights for aligning PHC delivery with the experienced realities of farming populations who constitute the majority of primary care users in sub-Saharan Africa and South Asia. This demand-sided and community-centered approach to health systems strengthening represents an essential but overlooked dimension of achieving universal health coverage in agricultural economies worldwide. This study seeks to fill this gap, and hence the need to study the effectiveness and utilisation of PHC from the user's perspective.

The study will seek to proffer answers to the following research questions.

1. What are the perceived accessibility and affordability of PHC services among respondents, and how are these perceptions influenced by their socioeconomic characteristics?
2. How do affordability and accessibility of PHC services shape respondents' attitudes towards utilising these services?
3. Does the respondents' attitude toward the use of PHC services influence their actual utilisation of these services?
4. How do respondents perceive the effectiveness of PHC services, and how is this perception shaped by their utilisation of the services?

METHODOLOGY

This study took place in six communities with PHC centres in selected local government areas (LGAs) of Ogun State. The State lies between latitude 6°54′35.4″ N and longitude 3°15′11″ E, sharing borders with Lagos, Oyo, Osun, and Ondo States, and the Republic of Benin. Ogun State has twenty LGAs. The study targeted community residents who utilised the PHCs in these areas. Purposive sampling selected two communities from each senatorial district, totaling six. The PHCs were selected from Osiele and Odeda in Ogun Central, Ijebu-Ode and Odogbolu in Ogun East, while Ifo and Imeko Afon were selected in Ogun West. From each selected PHC facility (one per senatorial district), we obtained patient attendance registers documenting recent service users (within the preceding three months). Using these facility-based lists as sampling frames, we randomly sampled an equal number (20) of PHC users from each community, resulting in 120 respondents. From each community, 20 PHC users were randomly selected, resulting in 120 respondents.

This study is anchored on the **Theory of Reasoned Action (TRA)** and its extension, the **Theory of Planned Behaviour (TPB),** developed by Fishbein and Ajzen (2010). The theories explain how individual behaviour is influenced by attitudes, perceived social expectations (subjective norms), and, in TPB, perceived behavioural control. They have been widely applied in public health to predict service utilisation, including vaccination, dietary habits, and health-seeking behaviour. In this study, **attitudes** reflect users' favourable or unfavourable perceptions of PHC services; **subjective norms** relate to community or peer expectations to use such services; and **perceived behavioural control** includes access, affordability, and facility readiness. Although over 60% of respondents expressed unfavourable attitudes, the high utilisation and perceived effectiveness of PHCs suggest that strong normative pressure and perceived access (control) may have overridden personal reservations, consistent with TPB propositions.

Our survey assessed the current state of PHCs, awareness of PHC services, community attitudes, the relationship between socio-economic factors and access, utilisation of services, and the

effectiveness of PHCs in the selected communities. A comprehensive open-closed questionnaire collected socio-demographic data and respondents' perceptions of PHC utilisation and effectiveness. In the study, various constructs were processed to provide an understanding of respondents' perceptions and experiences regarding PHC services. Demographic variables such as age, sex, monthly income, community status, religion, education level, occupation, ethnicity, marital status and household size were initially collected through structured questionnaires. Age and monthly income were measured at the interval level, while other demographic factors were measured as nominal.

Attitudes towards PHCs were measured by exposing respondents to twenty content- and construct-validated attitudinal statements, including positive and negative items. Respondents rated these statements using a five-point Likert scale, with scores assigned from 5 (strongly agree) to 1 (strongly disagree) for positive statements, and the reverse for negative statements. The total score from these items was summed to create a composite attitudinal score. This score was then realised, normalised and percented using an appropriate formula (Hasson and Arnetz, 2005; Olutegbe et al., 2023; Upton et al., 2022). We then used a pre-determined benchmark to categorise respondents' attitudes into unfavourable (below 50) and favourable (50 and above). For accessibility, affordability, and utilisation of PHC services, we used varying measurement approaches. Accessibility items were rated as "Very Easy," "Moderately Easy," and "Not Easy," with scores of 2, 1, and 0, assigned respectively. These scores were summed to form a composite accessibility score, which was then realised and normalised. The same approach was applied to affordability using fifteen PHC services as items. A 50% score mark was employed to categorise accessibility, affordability, and utilisation into low and high. Effectiveness was operationalised by exposing respondents to fifteen PHC services, measured as Highly Effective (HE), Moderately Effective (ME), and Ineffective (I), with scores of 2, 1, and 0 were assigned to HE, ME, and I, respectively. The scores for each were added and an effectiveness score was obtained, realised and normalised. After normalisation, we categorised respondents into two groups of high and low levels of effectiveness, using 50% score mark as benchmark.

In this study, Structural Equation Modelling (SEM) was used to analyse the relationships between various socio-demographic variables and service utilisation, as a pathway to perceived service effectiveness of the PHCs. We use SEM to estimate the measurement model and the structural model (which assesses the relationships between these latent variables and observed factors). By using SEM, we aimed to represent the interrelationship of five factors such as affordability, accessibility, and attitude to influence service utilisation, service utilisation and perceived effectiveness. Among these, Attitude was specified as a latent variable measured by a subset of high-loading observed items (Att2, Att4, Att5, Att10, Att13, Att15, and Att16 in Figure 1) identified from an initial pool of 20 attitudinal statements (Table 1). These items were selected based on their factor loadings and conceptual relevance. In contrast to deriving a composite score through PCA, a confirmatory factor model was estimated as part of the SEM to validate Attitude as a reflective latent construct.

Accessibility and Affordability were treated as manifest (observed) variables, each constructed from standardised, normalised composite indices based on availability and cost of essential PHC services. Utilisation was modelled as a manifest outcome variable, reflecting frequency of service use, and hypothesised to be influenced by Attitude, Accessibility, and Affordability. Lastly, Effectiveness was also specified as a manifest variable, derived from respondents' ratings of how well PHC services met their needs. The model assumed that higher utilisation would lead to more positive perceptions of effectiveness. These relationships were tested through Structural Equation Modelling (SEM) using the lavaan package in R.

Based on the theoretical framework and existing literature on PHC utilisation, this study tested a series of interconnected hypotheses that trace the pathway from individual characteristics to health-seeking outcomes. We began by stating that sociodemographic characteristics including gender, religion, education, occupation, ethnicity, marital status, household size, and age, shape how community members perceive and interact with PHC services, specifically influencing their assessments of accessibility and affordability. We also hypothesised that accessibility would act as a catalyst, positively influencing affordability perceptions (recognising that proximity reduces indirect costs), shaping latent attitudes toward PHC services, directly enabling utilisation behaviour, and ultimately affecting perceptions of service effectiveness. We expected affordability to positively influence latent attitudes, directly enhancing utilisation and contributing to effectiveness perceptions. Further, we hypothesised that latent attitudes would translate into actual utilisation. Finally, we proposed a dynamic reciprocal relationship at the outcome level: utilisation experiences would inform perceptions of PHC effectiveness, while simultaneously, perceived effectiveness would reinforce

Table 1. Standardised estimates for the attitude scale

Attitudinal statements	lhs	Rhs	est.std	se	z	P-value
When encountered with health challenges my first point of contact is the PHC center	L_Atti	Att1	0.579	0.066	8.793	0.000
I believe the PHC center will provide me with the adequate health services needed to resolve my health issues	L_Atti	Att2	0.657	0.057	11.481	0.000
The PHC center do not have adequate staff	L_Atti	Att3	–0.448	0.077	–5.805	0.000
The health care delivery of the health practitioners is not good enough	L_Atti	Att4	–0.739	0.047	–15.857	0.000
The PHC center should be scrapped because it's not effective	L_Atti	Att5	–0.764	0.044	–17.523	0.000
There is a working policy that seeks to revitalize the effectiveness, efficiency and functionality of PHC in our local government.	L_Atti	Att6	0.522	0.071	7.349	0.000
There are interest groups (policy makers) who are gatekeepers for the effectiveness, efficiency and functionality of PHC in our local government.	L_Atti	Att7	0.554	0.068	8.175	0.000
The policies that govern the PHC system are adequate and effective	L_Atti	Att8	0.547	0.068	7.995	0.000
The PHC is adequately funded to ensure all year availability to the local community	L_Atti	Att9	0.604	0.063	9.628	0.000
The PHC does not need the support of the community to ensure continuous availability	L_Atti	Att10	–0.688	0.053	–13.058	0.000
Religious and cultural believes does not influence the availability of the PHC centers	L_Atti	Att11	–0.189	0.092	–2.049	0.040
The policies that govern the PHC aids the availability of the PHC centers	L_Atti	Att12	0.518	0.071	7.285	0.000
The PHC personnel does not possess the experience of their counterparts in secondary and tertiary health care	L_Atti	Att13	–0.671	0.055	–12.210	0.000
There exist a homely and indigenous atmosphere within the walls of the PHC centers	L_Atti	Att14	0.473	0.076	6.268	0.000
The local and trado-medical centers are more effective than the PHC center	L_Atti	Att15	0.645	0.058	11.157	0.000
The qualification level of health practitioners in the PHC do not encourage me to visit the PHC centers	L_Atti	Att16	–0.681	0.054	–12.548	0.000
The PHC is more affordable compared when compared with the secondary and tertiary healthcare centers	L_Atti	Att17	0.446	0.078	5.695	0.000
PHC offers a faster rate of consultation compared to the other healthcare centers	L_Atti	Att18	0.388	0.083	4.688	0.000
PHC is more affordable than the local and trado-medical centers	L_Atti	Att19	0.403	0.081	4.993	0.000
There is a high degree of mutual trust and understanding between patience and health attendants in PHC centers compared with other medical centers.	L_Atti	Att20	0.506	0.073	6.939	0.000

Note: lhs = left-hand side variable (outcome/indicator); rhs = right-hand side variable (predictor/factor); est. std = standardized estimate (standardized path coefficient or factor loading); se = standard error of the estimate; z = z-statistic (est.std/se) for testing statistical significance; PHC = primary health care.
Source: Authors' analysis using lavaan package in R from field survey (2023).

and drive continued utilisation, creating a feedback loop.

We employed Full Information Maximum Likelihood (FIML) to handle missing data. FIML allows for the use of all available data points without discarding cases with missing values, thus maximising the sample size. The model was fitted using the lavaan package in R, and the fit was assessed using a range of standard fit indices, including the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardised Root Mean Square Residual (SRMR). These indices were used to determine how well the hypothesised model fit the data. Also, the path diagram for the model was generated using the semPlot package in R. This diagram visually represents the relationships between the latent constructs and their observed indicators, as well as the structural paths connecting them. While the SEM framework offered a theoretically grounded structure for examining the hypothesised relationships, the

model fit indices were slightly below ideal thresholds. For instance, the Comparative Fit Index (CFI = 0.899) and Tucker-Lewis Index (TLI = 0.867) fell just short of the commonly accepted 0.90 benchmark, while the Root Mean Square Error of Approximation (RMSEA = 0.078) and Standardised Root Mean Square Residual (SRMR = 0.072) remained within acceptable ranges. These results suggest a marginal but tolerable model fit. The relatively small sample size (n = 120) may have limited estimation precision and contributed to these outcomes. As such, findings should be interpreted cautiously, and future research using larger samples and refined measurement strategies is encouraged to enhance the model's robustness and validity.

RESULTS AND DISCUSSION

Socioeconomic characteristics of the respondents

Distribution of respondents by sex shows in Table 2 that 50.8% were female, while 49.2% were male. This finding is significant as it suggests that gender plays a role in the utilisation of PHC services. The result showed that 6.7% of the respondents were below the age of 20 years, about 36.7% of the respondents were between the ages of 21 to 30 years while 31.7% of the respondents were between

Table 2. Distribution showing the socioeconomic characteristics of respondent's

Variables	Data	%
Sex	Male	49.2
	Female	50.8
Age	<20	6.7
	21–30	36.7
	31–40	31.7
	41–50	19.2
	51–60	2.5
	>60 years	3.3
Income (₦)	<60,000	39.2
	60,000–120,000	45.8
	>120,000	15
Religion	Christianity	60
	Islam	29.2
	Traditional	10.8
Highest level of education	Primary Education	2.5
	Secondary Education	29.2
	Tertiary Education	61.7
	Adult Education	1.7
	No formal education	5
Occupation	Trader	12.5
	Civil Servant	41.7
	Artisan	18.3
	Farmer	2.5
	Student	10
	Others	15
Ethnicity	Hausa	3.3
	Ibo	22.5
	Yoruba	70
	Others	4.2
Marital status	Single	28.3
	Married	70
	Divorced	1.7
Household size	1–3	26.7
	4–7	68.3
	8–1	5

Source: Authors' analysis from field survey (2023)

31 to 40 years, and 19.2% were between 41 to 50 years. Mean age of the respondents was 36.02 years ± 10.89 which indicates a considerable involvement of young adults in the assessment of PHC services. The high proportion of respondents in the 21 to 30 age group suggests that this demographic group is actively engaged and interested in PHC services.

Majority (60%) of the respondents were Christians, 29.2% of the respondents were Muslims, and 10.8% of the respondents were traditional worshippers. The implication is that respondents had one religious affiliation or the other, and as a social organisation, religion could be an avenue for social interactions where members can share ideas and receive information. The study revealed that many (61.7%) PHC users had Tertiary Education, and 29.2% Secondary Education. Although this finding appears to deviate from studies reporting generally low educational attainment among rural dwellers, it aligns with more recent evidence from Nigeria and sub-Saharan Africa showing that PHC users increasingly possess at least secondary or tertiary education (Bain et al., 2022; Ogah et al., 2024; Ouma et al., 2025). Similarly, Fenta et al. (2024) and Kassa et al. (2024) reported that PHC utilisation is strongly associated with moderate to high educational status. This implies that PHC are well-read and knowledgeable and should be able to use PHC services.

Majority of the respondents were Civil Servant with 41.7%, 18.3% were Artisans, 12.5% were Traders, 10% were Students, 2.5% were farmers, while 15.0% had other occupations. This suggests that this occupational group has a large influence on the utilisation and evaluation of PHC services. Civil servants often have stable employment and access to employee healthcare benefits, which contributes to their engagement with and dependence on PHC services.

Majority (70%) of the respondents were Yoruba's, 22.5% of the respondents were Igbos, 3.3% of the respondents were Hausa's and 4.2% of the respondents belongs to other ethnic groups. Majority (70%) of the respondents were married, 28.3% were single, and 1.7% are divorced. This result is an indication of the high premium placed on marriage institution in the study area. The study revealed that 68.3% of the respondents had a household size of 4–7 individuals, 26.7% had 1–3 individuals, and 5% had 8–10 individuals. The mean household size of the respondents was 1.78 ± 0.522. This indicates the importance of catering for the healthcare needs of larger families and extended households. This finding underscores the need for PHC services that are designed to address the diverse health requirements of multiple family members.

Accessibility of respondents to Primary Health Care facilities

Results in Table 3 show that the most easily accessible factor was the distance between PHC and respondents' residence ($\bar{\chi} = 2.75$), suggesting that proximity strongly supports utilisation, while increased distance likely reduces it. Other top accessibility factors include favourable operational hours ($\bar{\chi} = 2.45$), and service prioritisation for children, pregnant/nursing mothers, elders, and the disabled ($\bar{\chi} = 2.39$). This indicates PHCs' responsiveness to vulnerable groups. The availability of medical supplies ($\bar{\chi} = 2.38$) and cultural sensitivity ($\bar{\chi} = 2.33$) also ranked high, further explaining that both service readiness and inclusiveness play important roles in encouraging PHC use, particularly among women.

Table 3. Distribution showing accessibility of respondents towards Primary Health Care

Factors	Percentage			Ranking	
	NE	ME	VE	Mean	Sd
Distance between PHC center and current residence	8.30	8.30	83.30	2.75	0.60
The road network (how it links with another major route)	10.00	54.20	35.80	2.26	0.63
The road type (Tarred/Untarred)	20.00	37.50	42.50	2.23	0.76
Current state of the road (Potholes, degradation)	17.50	39.20	43.30	2.26	0.74
Preference to children, pregnant/nursing mothers, elders and disabled	8.30	44.20	47.50	2.39	0.64
Number of medical supplies in the PHC center	6.70	48.30	45.00	2.38	0.61
Days/Hours of full functional operation	10.80	33.30	55.80	2.45	0.68
Number of medical personnel	15.00	46.70	38.30	2.23	0.70
State of security within the locality	15.80	45.80	38.30	2.23	0.70
Cultural diversity	12.50	42.50	45.00	2.33	0.69

Note: NE = Not Easy, ME = Moderately Easy, VE = Very Easy
Source: Authors' analysis from field survey (2023)

Table 4. Distribution showing affordability of respondent towards Primary Health Care

Services	Affordability		Utilization		Perceived effectiveness	
	Mean	Sd	Mean	Sd	Mean	Sd
Child Delivery	2.82	0.52	2.75	0.63	1.86	0.40
Antenatal	2.51	0.58	2.44	0.72	1.47	0.56
Postnatal	2.51	0.59	2.20	0.82	1.48	0.62
First aid services	2.49	0.59	2.32	0.80	1.48	0.58
Dental Services	2.23	0.75	1.87	1.00	1.25	0.70
Immunization	2.58	0.55	2.33	0.81	1.53	0.61
Education and Sensitization	2.48	0.69	2.15	0.84	1.45	0.66
Family Planning	2.51	0.61	2.31	0.90	1.45	0.58
Childcare	2.55	0.63	2.37	0.77	1.79	0.48
Maternal care	2.46	0.69	2.28	0.84	1.39	0.56
Treatment of Endemic diseases	2.40	0.69	2.02	0.85	1.39	0.68
General Health Check up	2.47	0.67	2.38	0.83	1.44	0.61
Supply of Pharmaceutical Products	2.46	0.62	2.22	0.86	1.44	0.66
Nutrition and Diet Management	2.35	0.64	2.18	0.85	1.30	0.63
Sanitation and Proper Hygiene	2.48	0.66	2.22	0.93	1.53	0.67

Source: Authors' analysis from field survey (2023)

Affordability, utilisation and perceived effectiveness of respondents towards Primary

Table 4 shows that Child Delivery ($\bar{\chi} = 2.82$), Immunisation ($\bar{\chi} = 2.58$), and Child Care ($\bar{\chi} = 2.55$) are the most affordable services, highlighting the prioritisation of maternal and child health in PHCs. These same services, along with General Health Check-ups, also rank highest in utilisation, indicating strong demand. However, perceived effectiveness tells a more nuanced story, Child Delivery, though widely used and affordable, has only moderate effectiveness ($\bar{\chi} = 1.86$). This implies that although respondents find these services accessible and necessary, there may be concerns about the quality or outcomes associated with them. Further, we found notable gaps when comparing services. Antenatal care, though affordable ($\bar{\chi} = 2.51$) and widely utilised ($\bar{\chi} = 2.44$), shows low perceived effectiveness ($\bar{\chi} = 1.47$), pointing to possible dissatisfaction with care quality or outcomes. Similarly, Immunisation ($\bar{\chi} = 1.53$) and Family Planning ($\bar{\chi} = 1.45$), while accessible and affordable, are perceived as less effective, indicating concerns beyond cost or access. In contrast, Dental Services rank consistently low in affordability, utilisation, and effectiveness ($\bar{\chi} = 1.25$).

Table 5. Summary tables for accessibility, affordability, attitude, utilization and perceived effectiveness of PHC services

Level	F	%	Minimum	Maximum	Mean	Std. Devn.
Accessibility			0.00	100.00	67.50	20.20
High	104	86.70				
Low	16	13.30				
Affordability			0.00	100.00	74.22	17.96
High	108	90.00				
Low	12	10.00				
Attitude						
Favourable	39	32.50	0.00	100.00	32.88	24.34
Unfavourable	61	67.50				
Utilization			0.00	100.00	69.47	22.31
High	103	85.83				
Low	17	14.17				
Effectiveness			0.00	100.00	74.19	17.96
High	111	92.50				
Low	9	7.50				

Source: Authors' analysis using lavaan package in R from field survey (2023)

Table 5 highlights a key paradox in community responses to PHC services. While a high proportion of respondents reported high accessibility (86.7%), affordability (90%), and utilisation (85.8%), only 32.5% expressed a favourable attitude towards PHCs. This mismatch suggests that although PHC services are physically and financially within reach, the quality of care or service experience may be falling short of expectations. This paradox suggests that communities continue to utilise PHC services out of necessity rather than preference. Poor infrastructure, lack of essential drugs, or limited staff may contribute to negative attitudes, but in rural and resource-constrained settings, the absence of affordable alternatives forces people to rely on what is available. Hence, high utilisation and perceived effectiveness coexist with low satisfaction, pointing further at the need not only to maintain access but also to improve quality and user experience in PHC delivery in the state.

The paradox observed in this study, where over 60% of respondents held unfavourable attitudes toward PHC services, yet utilisation and perceived effectiveness remained high, warrants some reflections. One plausible explanation is the lack of viable alternatives, especially in rural or economically disadvantaged settings. Where private healthcare facilities are either absent or unaffordable, individuals may resort to PHCs out of necessity rather than choice, prioritising access over preference. In such contexts, utilisation becomes a forced decision, driven more by immediate health needs and constrained financial realities than by positive perceptions or satisfaction. This aligns with the concept of necessity-driven usage, where people continue to patronise underperforming services because they simply cannot afford better options. Further, this pattern may reflect a form of forced compliance, where users tolerate poor service conditions, such as long wait times, limited drug availability, or inadequate staffing, because they have no realistic alternatives. While they may critique these conditions, their perceived effectiveness ratings may still be moderate to high, particularly when they receive treatment that alleviates symptoms or resolves urgent health concerns. Such realities are not uncommon in low-resource settings, as documented by Kruk et al. (2018), where users often recalibrate their expectations downward and evaluate services within the context of scarcity. This result disagrees with Oluwadare et. al (2023) who reported low usage of PHC in *Enugu* and *Ekiti* states Nigeria, respectively.

Table 6. Summary of Model Fit Indices and Parameter Estimates

Measure	Value
Npar	56
Chisq	188.8416
Df	109.0000
Pvalue	0.0000
CFI	0.8989
TLI	0.8674
RMSEA	0.0781
RMSEA CI (lower)	0.0590
RMSEA CI (upper)	0.0966
SRMR	0.0716
Log-Likelihood	–2453.6189
AIC	5208.0794

Source: Authors' analysis using lavaan package in R from field survey (2023)

Path Analysis of the effectiveness of PHC: From socioeconomic variables through utilisation

The structural equation model was estimated using the Maximum Likelihood (ML) approach with 120 observations and 56 parameters. As shown in Table 6, the model achieved a Chi-square value of 188.84 (df = 109, $p < 0.001$), indicating a statistically significant discrepancy between the observed and model-implied covariance matrices. However, the Comparative Fit Index (CFI = 0.899) and Tucker-Lewis Index (TLI = 0.867) approach the acceptable threshold of 0.90, suggesting an adequate but not excellent model fit. The RMSEA value of 0.078 (90% CI: 0.059–0.097) falls within the marginal fit range, while the SRMR value of 0.072 is within the acceptable threshold of < 0.08. Taken together, these indices suggest that the model fits the data reasonably well although could benefit from refinements. The RMSEA value of 0.078 (90% CI: 0.059–0.097) falls within the marginal fit range, suggesting that the model is an acceptable but improvable representation of the underlying relationships among variables.

Parameter estimates in Table 7 reveal that accessibility (acc) is significantly predicted by sex, with males reporting greater access (β = 0.190, $p = 0.034$). Affordability (aff) is strongly predicted by accessibility (β = 0.577, $p < 0.001$), while both accessibility and affordability jointly predict attitude (L_Atti) towards PHC services. Interestingly, accessibility negatively predicts attitude (β = –0.495, $p < 0.001$), whereas affordability exerts a positive influence (β = 0.230, $p = 0.011$). Male respondents again demonstrate significantly lower attitude scores (β = –0.427,

$p < 0.001$). These insights indicate that while services may be physically and financially accessible, perceived quality or experience, especially among male users, may dampen favourable attitudes, thereby informing programmatic priorities. The structural path diagram of the model is represented in Figure 1.

This paradox aligns with existing literature that shows how perceived quality can diverge from structural accessibility. Leonard et al. (2007) note that patients may continue to use services not because they are fully satisfied, but because of the necessity and lack of viable alternatives. This reality is also echoed by Kruk et al. (2018), who found that in low-resource settings, individuals adjust expectations and may report effectiveness even when quality is objectively poor. Similar findings have been reported across Sub-Saharan Africa. In Ghana's CHPS+ districts, utilisation rates for community health services were moderately high (about 65 %), but satisfaction lagged (46%). This underscores that access does not guarantee positive attitudes (Kweku et al., 2020). In Ga West District, high use of community pharmacies was driven by proximity and cost yet trust and perceptions of quality were only moderate (Okai et al., 2019). In Kenya's Kisumu County, even where services existed and utilised, deficiencies in human resources, facility capacity, and care processes similarly weakened perceptions of effectiveness (Ouma et al., 2025). In Nigeria, and across SSA, studies of maternal healthcare indicate that wealth and affordability strongly influence utilisation, which supports our finding that affordability exerts a positive influence on attitudes and service-use (Bain et al., 2022; Okonofua et al., 2018).

Table 7. SEM Results for Affordability, Access, Attitude, Utilization, and Effectiveness Sub-Models

Sub-model	Predictor Variables	est.std	Se	p-value
Accessibility (acc)	Male	0.1896	0.0893	0.0339
	Xtian	–0.1252	0.0928	0.1773
	Edu	–0.0222	0.0952	0.8154
	c_servant	0.0377	0.0925	0.6838
	Yoruba	–0.0983	0.0950	0.3008
	Married	0.1142	0.1101	0.2997
	HsehldSize	0.1171	0.0890	0.1883
	Age	–0.0127	0.1146	0.9115
Affordability (aff)	Male	0.0196	0.0795	0.8051
	Xtian	–0.0267	0.0807	0.7408
	Edu	0.0796	0.0811	0.3266
	c_servant	–0.0540	0.0791	0.4949
	Yoruba	0.1422	0.0812	0.0798
	Married	0.1393	0.0944	0.1398
	HsehldSize	–0.0202	0.0773	0.7942
	Age	–0.0834	0.0977	0.3934
	Acc	0.5770	0.0662***	0.0000
Latent attitude (L_Atti)	Acc	–0.4953	0.0883***	0.0000
	Aff	0.2305	0.0912**	0.0115
	Male	–0.4274	0.0701***	0.0000
Utilisation (Uti)	Acc	0.2963	0.0899***	0.0010
	Aff	0.4461	0.0761***	0.0000
	L_Atti	–0.1376	0.0799	0.0851
Effectiveness (Eff)	Uti	–0.7499	0.8269	0.3645
	Acc	0.6168	0.3321	0.0633
	Aff	0.8595	0.3562**	0.0158
Utilisation (Uti)	Eff	0.8673	0.1465***	0.0000

Note: *Significance levels: *p < 0.05, **p < 0.01, ***p < 0.001.
Source: Authors' analysis using lavaan package in R from field survey (2023)

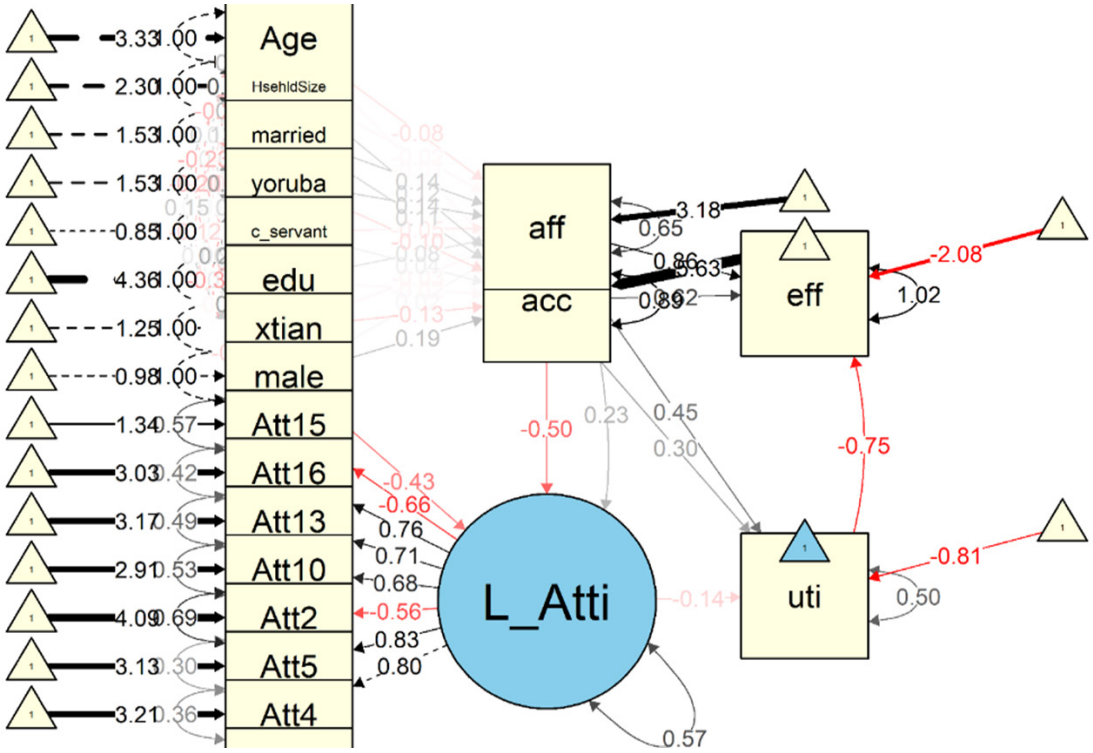

Figure 1. Path Diagram of Structural Equation Model for Affordability, Access, Attitude, Utilization, and Effectiveness of PHCs

Note: Latent attitude (L_Atti), affordability (aff), accessibility (acc), effectiveness (eff), and utilisation (uti) of PHC services. Standardized path coefficients shown. Rectangles = observed variables; ovals = latent variables. Red arrows = negative relationships; black arrows = positive relationships. Circular arrows = residual variances. Primary health care (PHC)
Source: Authors' analysis using semPlot package in R from field survey (2023)

Male respondents' significantly lower attitude scores ($\beta = -0.427$, $p < 0.001$) further point to a need for improving service delivery experiences, not just access. This finding agrees with existing literature which reported lower access and use of PHC among women (Ntoimo et al., 2019; Otieno et al., 2020). These insights have clear policy implications: PHC interventions must go beyond expanding access and affordability to improving perceived and actual service quality, especially for groups like men who may have greater access but lower satisfaction.

Finally, we found a strong link between utilisation and perceived effectiveness, and this underscores the strong interconnect between these two variables. As users engage more with services, their perceptions of effectiveness improve, which may further encourage utilisation. This feedback loop highlights the necessity for continuous evaluation of service delivery strategies to ensure that they effectively meet user needs and foster positive experiences.

CONCLUSION AND RECOMMENDATION

The findings of this study highlight important implications for the effectiveness and performance of Primary Health Care (PHC) services in Ogun State, Nigeria, and in similar rural contexts. The demonstrated relationships between socio-economic characteristics, accessibility, affordability and utilisation indicate that structural and household-level socio-economic factors play a central role in shaping health-seeking behaviour and perceptions of service effectiveness. Households with lower socio-economic status, operating within constrained community environments, experience greater barriers to accessing PHC services, with clear implications for equity and population health outcomes. These challenges are compounded by persistent shortfalls in infrastructure and human resources, with several PHC facilities failing to meet the standards set by the National Primary Health Care Development Agency (NPHCDA). This underscores the need for targeted policy interventions and sustained investment to strengthen PHC capacity and functionality.

Beyond issues of physical access, the findings reveal an observable gap between the availability of PHC services and their perceived effectiveness, as reflected in mixed community attitudes and moderate-to-low utilisation of certain essential services. This suggests that improving

utilisation requires more than expanding coverage alone; equal attention must be given to the quality and responsiveness of care. Strengthening health worker training, improving supervision and accountability mechanisms, increasing community awareness, and addressing both direct and indirect costs of care are likely to enhance utilisation and improve user experiences. The path relationships identified in this study further indicate that utilisation is not merely an outcome of access but a key mechanism through which perceptions of effectiveness are formed and reinforced over time.

From a broader policy perspective, the study reinforces the important role of PHC in supporting rural development and agricultural livelihoods, where health status directly influences labour availability, productivity and household resilience. Strengthening PHC systems should therefore be viewed not only as a health sector priority but also as a strategic investment in rural development. Beyond Ogun State, the findings offer transferable insights for other low- and middle-income countries with decentralised primary health care systems and predominantly agrarian rural economies. By adopting a user-centred, demand-side analytical approach and applying Structural Equation Modelling to unpack complex health system pathways, this study contributes to the global evidence base on how to advance equitable, effective and community-responsive primary health care in resource-constrained settings.

Based on conclusions drawn from the results, this study considers the following recommendations necessary for a more inclusive and beneficial PHC services:

1. To improve attitudes toward PHC services despite high utilisation, government health agencies should implement regular service quality audits and patient-centred care training for health workers. These initiatives should be embedded within routine PHC operations and linked to performance-based incentives.
2. There is a need to establish structured and well-organised community feedback platforms, such as quarterly town-hall sessions and anonymous mobile-based reporting systems, where patients can directly voice concerns about service quality. Health facility managers should be mandated to report how feedback is acted upon. This participatory approach not only increases trust but also empowers users and informs more responsive service delivery.
3. Beyond increasing public investment, policymakers should explore contracting not-for-profit and low-cost private providers in underserved areas under government subsidy schemes. This public-private mix can reduce dependency on poorly resourced PHCs, improve service quality through competition, and boost public confidence.

Limitations of the Study and Further Research

This study has some limitations. First, it relied on self-reported data from PHC users, which may be affected by recall or social desirability bias, especially when assessing perceptions of service effectiveness. Second, as a cross-sectional study, causal inferences cannot be established between utilisation and perceived effectiveness of PHC services. Third, the sample size was relatively modest for structural equation modelling (SEM) and may have limited the statistical power and generalizability of some path estimates. Despite these limitations, the study provides meaningful insights into PHC utilisation dynamics and perceived effectiveness, with important implications for evidence-based rural development and health policy planning in *Ogun* State and similar settings.

Future research should consider employing larger and more regionally representative samples to enhance the generalizability of SEM-based findings. Longitudinal or panel designs are recommended to establish causal pathways between PHC utilisation, perceived service effectiveness, and health outcomes over time. In addition, facility-level and administrative data could be integrated with user-level information to better capture institutional factors and service delivery dynamics. Finally, future studies could explore the intersections between PHC and rural livelihood development, particularly how improved health systems contribute to labour productivity, agricultural resilience, and community well-being in rural settings.

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