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Assessing Barriers to Healthcare Access in Anambra State: A Comprehensive Evaluation

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Abstract:- The study, Assessing Barriers to Healthcare Access in Anambra State: A Comprehensive Evaluation, evaluated the current healthcare system in Anambra State by examining infrastructure, geographical distribution, transportation challenges, and socio-economic factors. The objectives sought to evaluate the current healthcare system in Anambra State and identify any accessibility issues. The study employed a mixed-methods research approach, including surveys, interviews, and a comprehensive review of existing literature. The findings showed that the overall accessibility of healthcare services in Anambra state is suboptimal ($t_{statistic}$, 2.911 > $t_{critical}$, 2.365). The study concluded that the healthcare delivery system in Anambra state is not operating at the optimal level that guarantees equal access to quality healthcare to all the citizens and residents of the state. It therefore recommended that the state government should invest in infrastructure, train healthcare workforce and adopt innovative solutions, such as telemedicine, to improve healthcare delivery in the state.

I. INTRODUCTION

Access to quality healthcare is a fundamental right for every individual, yet disparities persist across regions and communities. In Anambra State, Nigeria, understanding the factors that hinder healthcare accessibility is crucial for informed policy decisions and targeted interventions. With a population of over 13 million, Anambra State is one of the most populous states in Nigeria. The healthcare system in the state still faces a number of difficulties despite the notable advancements in the field in recent years, including a lack of professionals, inadequate infrastructure, and restricted access to healthcare services, particularly in under-served and remote areas. These challenges have led to high rates of morbidity and mortality and poor healthcare results. This study aimed to evaluate the current healthcare system in Anambra State and identify any accessibility issues. By examining infrastructure, geographical distribution, transportation challenges, and socio-economic factors, critical insights that could inform evidence-based strategies for improving healthcare access were uncovered. The multifaceted dimensions of accessibility were delved into, emphasizing the need for tailored solutions that address the unique context of Anambra State. Our findings contribute to the ongoing discourse on equitable healthcare delivery and pave the way for actionable recommendations.

II. LITERATURE REVIEW

➢ *Efficiency in Healthcare Delivery*

Wikipedia (2023) defines healthcare efficiency as a comparison of delivery system outputs, such as physician visits, relative value units, or health outcomes, with inputs like cost, time, or material. It then describes efficiency as a ratio of outputs to inputs or a comparison to optimal productivity using stochastic frontier analysis or data envelopment analysis. The Blomberg index calculates an efficiency score based on a nation's life expectancy along with relative and absolute health expenditures.

Efficiency in health can be technical or allocative. Technical efficiency is using the least possible amounts of inputs (such as health workers, medical equipment, and supplies) to produce a given amount of output, e.g., health services or treatments (WHO, 2021). Allocative efficiency focuses on allocating health inputs in a way that produces the optimal mix of health outputs to maximize overall societal health. Palmer and Torgerson (1999) described the concept of efficiency in health care as Technical, Productive, and Allocative.

Guinness *et al.* (2011) posited that efficiency in healthcare delivery systems (HCDs) means providing the most cost-efficient healthcare to those in need. As equity is a pillar of the HCDS, efficiency and equity are opposing forces. Therefore, it is critical to have the broader determinants of health into consideration on HCDS. Thus, Metaspire Business Consulting (2010) identified three essential keys to improving efficiency and effectiveness in healthcare delivery as defining and examining core, supporting and driving processes, leveraging tools and technology, and understanding the appetite of the current culture for change. Given the number and diversity of participants as well as the complexity of healthcare delivery process, implementing these keys uncovers the need for an objective party to initiate, facilitate, and integrate a sustainable efficient and effective healthcare delivery process.

In healthcare delivery, efficiency is crucial for making sure that patients receive timely, effective, and cost-effective care. Healthcare efficiency entails doing things both the right way (technical efficiency) and the right thing (allocative efficiency). By optimizing resource use, streamlining processes, and minimizing errors, we can

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enhance healthcare delivery for the benefit of the patients and the communities.

- *Healthcare Landscape in Anambra State*

The healthcare system in Anambra State, Nigeria faces several challenges that are common to many other parts of the nation. These challenges include inadequate health infrastructure, shortage of healthcare professionals, limited access to quality healthcare services and insufficient funding for healthcare programmes.

The primary health care centres (PHCs) in Anambra State grapple with significant operational challenges due to the lack of essential amenities like water and electricity. According to PUNCH (2024), the PHCs in Achalla and Okpoko, had not had water to run those facilities for over 10 years, just as electricity had also been cut off in Achalla PHC due to gunmen activities in Ihiala Local Government Area. According to the report, the facilities had, over 10 years, depended on the local vendors (mai ruwa) for water supply daily and, in most cases, the cost is borne by the patients. It is quite difficult to prevent infection and maintain good hygiene without adequate water supply. Overall, the quality of care is impacted by the lack of well-equipped clinics, hospitals, and primary health centres. Accurate diagnosis becomes difficult in the absence of the necessary medical equipment, diagnostic instruments, and infrastructure.

According to Tribune (2021), the Executive Secretary of Anambra State Primary Health Care Development Agency (ASPHCDA), Dr Chioma Ezenyimulu, at a Media Roundtable on Family Planning organised by The Change Initiative (TCI) lamented the shortage of manpower in the Primary Health Care centres across the state. Dr Ezenyimulu regretted that many health care workers were retiring without being replaced, urging the state government to recruit more workers in the health system. Shortage of healthcare professionals impedes the efficiency of the PHCs in Anambra state.

PUNCH (2022), in their report, revealed that Anambra state did not have up to 21 doctors to man its healthcare centres at the local government level. There were many local governments without any doctor at all. In terms of infrastructure, some of the facilities were dilapidated beyond renovation. Some of the officers-in- charge (OICs,) were the only government-employed staff in their facilities, though the 2006 Minimum Ward Health Care Package for primary health care prescribes that every PHC must be staffed by one Public Health Nurse, one Community Health Officer, four midwives, two senior Community and Health Extension Workers, six Junior Community and Health Extension Workers, one laboratory technician, one medical record officer, one pharmacy technician, two security men and two caretakers. The deficit is made worse by the fact that many skilled workers leave Anambra State in search of better prospects abroad.

PUNCH also reported that due to geographic disparities, people in rural areas had limited access to quality healthcare services. Timely access to care is hampered by distant healthcare facilities and lack of transportation options. Even where healthcare facilities exist, patients are discouraged by out-of-pocket costs. Besides, insufficient knowledge about available services and preventive measures influences the conduct of those seeking health care.

Notwithstanding these challenges, initiatives have been taken to guarantee that every Anambra resident has access to high-quality healthcare. Some of these initiatives are Government Intervention and Basic Health Care Provision Fund (BHCPF), Anambra State Health Insurance Agency (ASHIA), Digitization Efforts, Screening and Treatment of cervical cancer, Alternative Transportation Options and Awkuzu Telemedicine HUB**.**

Radio Nigeria (2022) reported that the BHCPF was one of the initiatives in the country targeted at achieving the Universal Health Coverage (UHC) and was sourced from one percent of the Consolidated Revenue Fund (CRF) from the federal government, grants by international donor partners and funds from any other source, including the private sector. According to the report, having demonstrated its commitment to the initiative through the payment of its N100 million counterpart contribution, Anambra State joined the benefiting states in 2020 and currently has 332 primary health centres benefiting from the initiative being implemented through three gateways – the National Primary Health Care Development Agency (NPHCDA), which provides operational cost (Decentralized Facility Financing – DFF), Human Resource for Health (HRH) for PHCs through the State Primary Health Care Board (SPHCB), and the National Health Insurance Scheme (NHIS), which insures the most vulnerable Nigerians to access the BMPHS through the State Social Health Insurance Agencies (SSHIA).

For instance, Radio Nigeria reported that the Mgbakwu PHC, had accessed a total of N1,203,000 from the Basic Health Care Provision Fund (BNCPF) since 2021. Infrastructure upgrades include mended floors, staircases, and gates. Such intervention was found replicated in several other communities of Awka North Local Government Area, including Isuaniocha, Urum and Amansea.

To promote healthcare delivery, Anambra state has put in place health insurance scheme to provide affordable healthcare services to the residents. As obtained from the website of the Anambra State Health Insurance Agency (ASHIA), the ASHIA was established by the Anambra State Health Insurance Scheme Law 2016. According to ASHIA (2024), the aim is to provide quality healthcare that is efficient, equitable, affordable, and accessible to all the insured persons.

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In the area of telemedicine, Anambra State officially, launched its first-ever Telemedicine Hub in September 2022 in order to improve healthcare services throughout the state and alleviate the shortage of healthcare professionals. VON (2022) reported that the governor said that the hub was a starting point which would be used as a case study in 10 community healthcare centres within Oyi local government area of the state to experiment its effectiveness before linking it to other healthcare centres across the 175 communities in the state. The hub was reported to be strategically located at the Comprehensive Medical Centre in Awkuzu, Oyi Local Government Area. However, there is no information on the level of the implementation of the hub. Since the launch, nothing has been heard about the telemedicine hub.

III. METHODOLOGY

➢ *Research Design*

This study adopted a combination of descriptive and quantitative research design. The descriptive research design involved exploring the theoretical constructs, feasibility, and potential benefits of introducing AI-based telemedicine system. On the other hand, the quantitative research design was adopted for the collection and the analysis of the numerical data that related to healthcare outcomes, proposed system performance, and patient satisfaction. Quantitative research design is a research method used in various disciplines, including social sciences, psychology, economics, and market research. It aims to collect and analyze numerical data to answer research questions and test hypotheses (Nick, 2023).

➢ *Area of study*

The study focused on Anambra State, Nigeria, as a context for developing and implementing AI-based telemedicine solutions. Study outcome will also be adoptable to other areas of similar characteristics. The area today, known as Anambra State was created on August 27, 1991, along with eight other states of Nigeria by the then Military President, Ibrahim Badamasi Babangida GCFR. The state derives its name from Anambra River, which is a colonial convenient pronunciation of Omambala River. The River Anambra is a tributary of the majestic River Niger (Anambra state Government, 2024). With Awka, as the state capital, Anambra is bounded by Delta State to the west, Imo State and Rivers State to the south, Enugu State to the east, and Kogi State to the north.

➢ *Sources of Data*

This study employed questionnaire to obtain data from the respondents. The data collection also involved expert interviews, engaging healthcare professionals, policymakers, and technology experts to gather insights. The questionnaire and the interview were designed with the aim of obtaining sufficient data about the potential benefits and challenges, feasibility and acceptance, user satisfaction and likely features of AI-based telemedicine system that would be implemented in Anambra state. Also, documented facts, which have been in existence before the study were retrieved from textbook, journals, magazines, newspapers, and Internet.

➢ *Population of the Study*

The population of the study comprised the residents of Anambra state – patients who have utilized healthcare services, healthcare providers (doctors, nurses, and other staff), anyone who has who has utilized telemedicine services, etc. According to the National Bureau of Statistics, Anambra State has an estimated population of 5,527,809 (2016 population forecast). Thus, the total population is 5,527,809. Anambra state is made of 21 local governments - Aguata, Awka North, Awka South, Anambra East, Anambra West, Anaocha, Ayamelum,, Dunukofia, Ekwusigo, Idemili North, Idemili South, Ihiala, Njikoka, Nnewi North, Nnewi South, Ogbaru, Onitsha North, Onitsha South, Orumba North, Orumba South and Oyi. Therefore, the sample of the study was distributed across all the 21 local government areas, ensuring somewhat equal representation.

➢ *Determination of Sample size*

To determine the sample size, we employed the standard formula for sample size by Joseph Meyer:

$$Sample\ size = \frac{[z^2 \times p(1-p)]\ /z^2}{1 + [z^2 \times p(1-p)]\ /\ e^2 \times N]}$$

Where:

- N = population size
- z = z-score
- e = margin of error
- p = standard of deviation

To determine the sample survey size for a population size of 5,527,809 people, using a 95% confidence level, a 50% standard of deviation (population proportion), and a 5% margin of error, we have the following values:

- N = 5527809
- z = 1.96
- e = 0.05
- p = 0.5

Thus, sample size, n = 384 respondents

➢ *Sampling Technique*

The study considered only a section of the population that were available and willing to participate, while ensuring proper representation. Thus, convenience sampling and stratified random sampling were employed. For instance, participants available around specific locations like local health centres, medical schools, door-to-door, etc. were selected.

➢ *Instrument of Data Collection*

The questionnaire, which comprised eight items, evaluated the overall accessibility of healthcare services in Anambra state. Data was collected from all the 21 local government areas in Anambra state, Nigeria. The structured questionnaires were administered to 384 participants out of the estimated population of 5,527,809 in the state. The

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respondents included patients, healthcare providers, and anyone who had accessed healthcare in Anambra state. The questionnaire included the construct items adapted from previous studies. The respondents were required to complete the questionnaire voluntarily and the researcher aided in filling up the questionnaires where necessary. Out of the 384 questionnaires that were administered, 346 were returned for analysis. Thus, a response rate of 90.1% was ascertained.

The Likert-type scale was adopted, namely: The Likert scale was coded as follows, 5 = Strongly Agree, 4 = Agree, 3 = Undecided, 2 = Disagree and 1= strongly disagree.

➢ *Validation of Instrument*

To stablish the validity of the research instrument, the researcher presented the questionnaire to two examination and evaluation experts to ensure that the instrument measures what it was meant to measure. This was necessary to determine if the instrument contained misleading and ambiguous questions, which would make it impossible for every respondent to understand, or whether it will require further restructuring by the researcher.

➢ *Reliability of Instrument*

To ensure instrument reliability, we used Cronbach Alpha to assess the internal consistency and the stability of the data collection instruments. The calculated average alpha value was 0.95, indicating good internal consistency among the items. Thus, the scale demonstrates a satisfactory reliability.

➢ *Method of Data Analysis*

Data analysis was conducted using Microsoft Office Excel, version 2403 (Build 17425.20176 Click-to-Run), and IBM SPSS Statistics version 29.0.2.0 (20). For comprehensive data analysis both descriptive and inferential statistical tools were employed. Descriptive statistics focused on calculating the percentage, mean score and standard deviation.

➢ *Data Presentation*

Table 1 *Data from the Research Instrument*

S/N	ITEM	SA	A	UD	D	SD	TOTAL
1	Long travel distance is one of the major challenges faced by patients in accessing healthcare services in Anambra State.	122	70	1	147	6	346
2	High cost of health services hinders patients from accessing healthcare services in Anambra State.	296	13	0	37	0	346
3	There is limited access to healthcare services in rural areas in Anambra State.	211	80	1	42	12	346
4	The healthcare system in Anambra state is faced with inadequate healthcare infrastructure.	237	55	0	44	10	346
5	Inexperienced healthcare workers contribute to poor healthcare services in Anambra State.	77	65	0	196	8	346
6	Patients in Anambra state experience long waiting times before they can access health services.	201	41	0	102	2	346
7	The healthcare system in Anambra state is challenged with shortage of healthcare professionals.	202	86	1	57	0	346
8	There are incidences of preventable deaths in Anambra State due to lack of access to timely healthcare services.	221	91	2	32	0	346

Legend: SA =Strongly Agree, A = Agree, U = Undecided, D = Disagree, SD = Strongly Disagree

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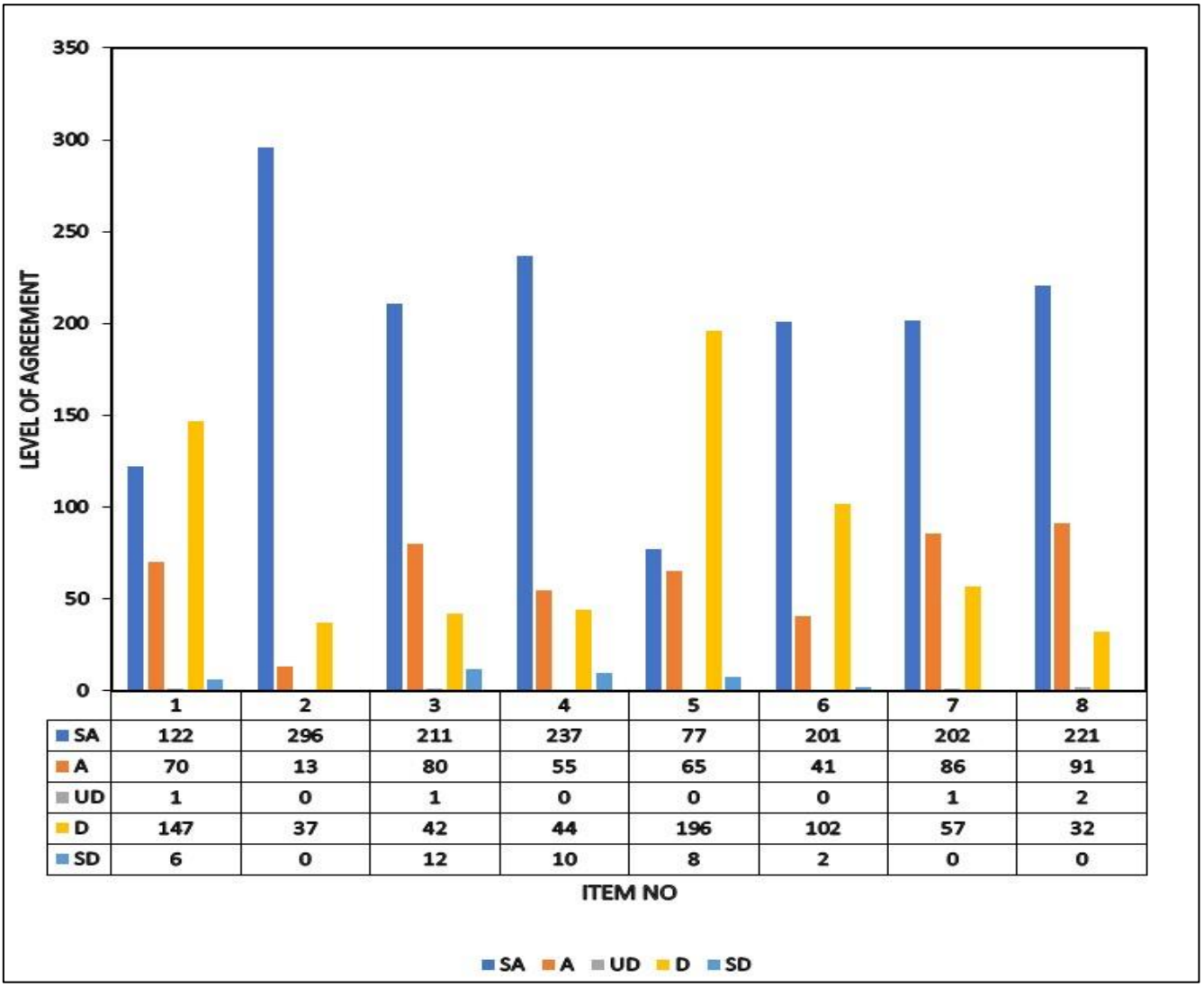

	1	2	3	4	5	6	7	8
SA	122	296	211	237	77	201	202	221
A	70	13	80	55	65	41	86	91
UD	1	0	1	0	0	0	1	2
D	147	37	42	44	196	102	57	32
SD	6	0	12	10	8	2	0	0

Fig. 1 Plots of Level of Agreement of Respondents on Accessibility and Efficiency of Anambra State Healthcare System.

The data obtained from the survey is presented in Table 1 and Fig 1. The research question sought to appraise the status of healthcare system in Anambra state in terms of accessibility and efficiency. The research instrument, which comprised eight (8) items, outlined how the healthcare system in Anambra state is affected by different factors. While the last column represents the total number of respondents, other rows represent the number of responses to each of the liker-scale options.

➢ *Data Analysis*

In this section, the data presented in the previous section (section 4.1) were analysed quantitatively. The analysis was conducted using Microsoft Office Excel, version 2404 (Build 17531.20152 Click-to-Run), and IBM SPSS Statistics version 29.0.2.0 (20).

For each research question, there is a table containing the percentage, mean score, and standard deviation of responses. This is immediately followed by a figure, showing the graphical representation of the responses. After the table and the figure, a detailed explanation of the analysis is presented.

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➢ *Data Analysis*

Table 2 Percentage, Mean Score, and Standard Deviation of Responses on Accessibility and Efficiency of the Healthcare System of Anambra State.

ITEM ID	ITEM	SA	A	UD	D	SD	TOTAL	$\bar{x}$	σ
A	Long travel distance is one of the major challenges faced by patients in accessing healthcare services in Anambra State.	122 *35.3%*	70 *20.2%*	1 *0.3%*	147 *42.5%*	6 *1.7%*	346 *100%*	3.45	0.98
B	High cost of health services hinders patients from accessing healthcare services in Anambra State.	296 *85.5%*	13 *3.8%*	0 *0.0%*	37 *10.7%*	0 *0.0%*	346 *100%*	4.64	0.97
C	There is limited access to healthcare services in rural areas in Anambra State.	211 *61.0%*	80 *23.1%*	1 *0.3%*	42 *12.1%*	12 *3.5%*	346 *100%*	4.26	0.97
D	The healthcare system in Anambra state is faced with inadequate healthcare infrastructure.	237 *68.5%*	55 *15.9%*	0 *0.0%*	44 *12.7%*	10 *2.9%*	346 *100%*	4.34	0.97
E	Inexperienced healthcare workers contribute to poor healthcare services in Anambra State.	77 *22.3%*	65 *18.8%*	0 *0.0%*	196 *56.6%*	8 *2.3%*	346 *100%*	3.02	0.99
F	Patients in Anambra state experience long waiting times before they can access health services.	201 *58.1%*	41 *11.8%*	0 *0.0%*	102 *29.5%*	2 *0.6%*	346 *100%*	3.97	0.98
G	The healthcare system in Anambra state is challenged with shortage of healthcare professionals.	202 *58.4%*	86 *24.9%*	1 *0.3%*	57 *16.5%*	0 *0.0%*	346 *100%*	4.25	0.97
H	There are incidences of preventable deaths in Anambra State due to lack of access to timely healthcare services.	221 *63.9%*	91 *26.3%*	2 *0.6%*	32 *9.2%*	0 *0.0%*	346 *100%*	4.45	0.97
AVERAGE MEAN/ STANDARD DEVIATION								4.05	0.98

Legend: $\bar{x}$ = Mean Score, σ = Standard deviation

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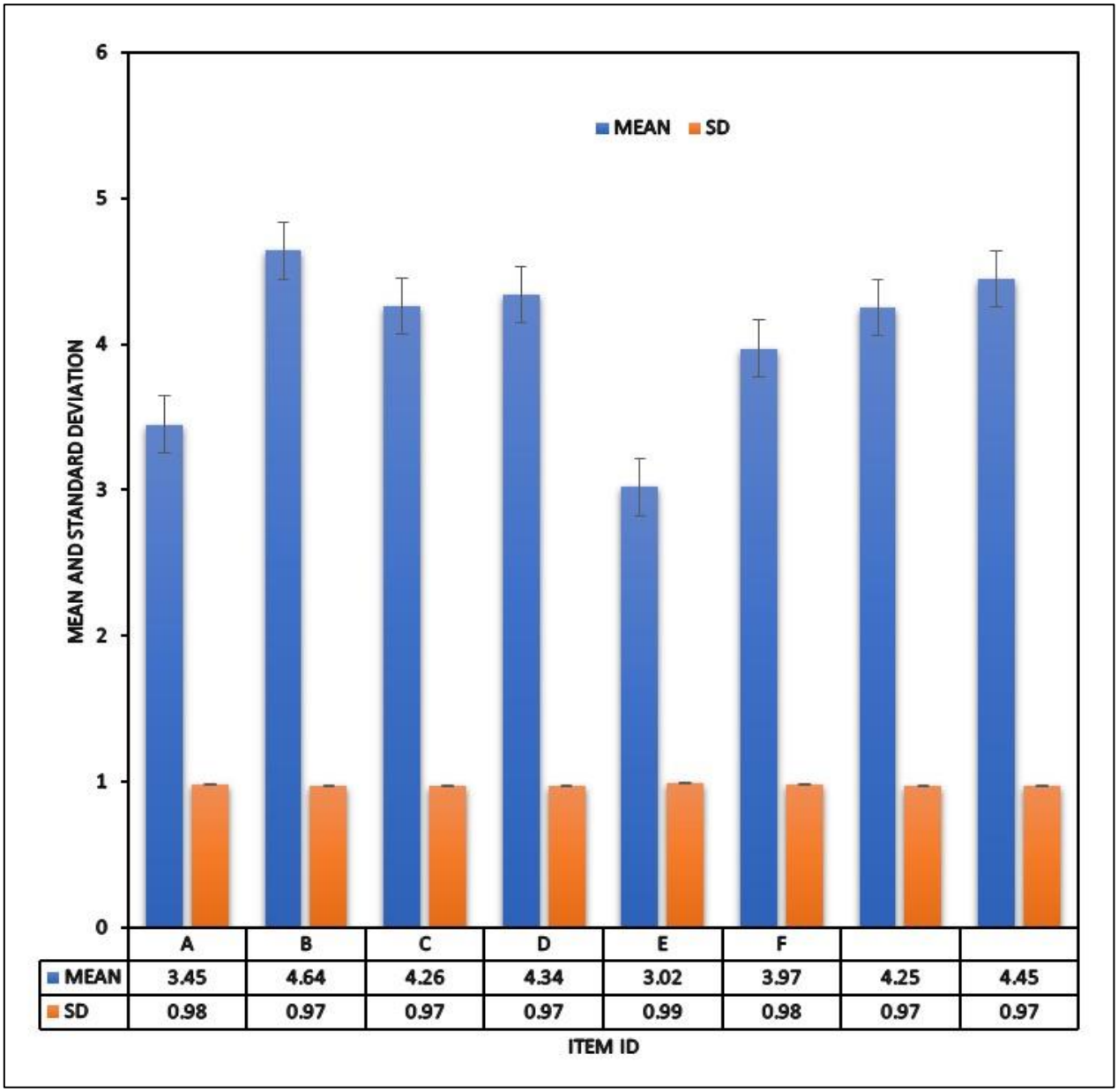

	A	B	C	D	E	F		
MEAN	3.45	4.64	4.26	4.34	3.02	3.97	4.25	4.45
SD	0.98	0.97	0.97	0.97	0.99	0.98	0.97	0.97

Fig 2 Plots of Mean/Standard Deviation of Responses on Accessibility and Efficiency of the Healthcare System of Anambra State

Table 2 and Fig 2 summarize the findings from the statistical analysis of the responses from research question one, which appraised the healthcare system of Anambra state in terms of accessibility and efficiency. Valuable insights were provided by the result, leading to deeper understanding of the overall healthcare system of the state, highlighting how the critical aspects of the sector, such as cost, infrastructure, geographical disparity, etc., affect the healthcare services.

The first item sought to know whether travel distance affects the patients' ability in accessing healthcare services in Anambra State. The aim was to find out whether healthcare services are closer to the people, or they need to travel long distance to access healthcare. Out of the 346 responses, 122 respondents (35.3%) strongly agreed that long travel distance is one of the major challenges faced by patients in accessing healthcare services in Anambra State. 70 respondents (20.25) agreed, 1 respondent (0.3%) was undecided, 147 respondents (42.5%) disagreed while 6 respondents (1,7%) strongly disagreed with the assertion. In all, 192 respondents, representing 55.5% of the respondents agreed that long travel distance is one of the major challenges faced by patients in accessing healthcare services in Anambra State, while 153 respondents, representing 44.2%, disagreed.

Looking at the mean score of 3.45 for this item, it indicates a moderate agreement, and the participants lean towards agreeing that long travel distance poses a challenge to healthcare accessibility in Anambra state. with a standard deviation of 0.98, the coefficient variation (CV) in our dataset is 0.284. This means that the standard deviation of 0.98 accounts for 28.4% of the mean value of 3.45. This reflects moderate variability around the mean. It shows that though the majority (55.5%) believe that long travel distance

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is a challenge in accessing healthcare services, there is still variability in the responses.

The second item evaluated how high cost of health services hinders patients from accessing healthcare services in Anambra State. 296 respondents (85.5%), out of the total 346 responses, strongly agreed that high cost of health services hinders patients from accessing healthcare services in Anambra State. Similarly, 13 respondents (3.8%) agreed, while 37 respondents (10.7%) disagreed with the assertion. What this means is that 303 respondents, representing 89.3% of the respondents are in agreement that high cost of health services hinders patients from accessing healthcare services in Anambra State., while 37 respondents, representing 10.7%, are in disagreement with is statement.

The mean score of 4.64 for this item shows a strong agreement. This indicates that the participants expressed a high level of agreement with the assertion that high cost of health services hinders patients from accessing healthcare services in Anambra State. The standard deviation of 0.97 and the coefficient variation (CV) of 0.209 reflect moderate variability around the mean. This means that although there is a high level of agreement (89.3%) that high cost of health services hinders patients from accessing healthcare services in Anambra State, there is a diverse view on it.

Limited access to healthcare services in rural areas in Anambra State was accessed by the third item. Out of the total 346 responses, 211 respondents (61.0%) strongly agreed that there is limited access to healthcare services in rural areas in Anambra State. In the same vein, 80 respondents (23.1%) agreed, while 1 respondent (0.3%) was undecided. Conversely, 42 respondents (12.1%) disagreed while 12 respondents (3.5%) strongly disagreed with the perspective. This shows that while 291 respondents, representing 84.1%, agreed that there was limited access to healthcare services in rural areas in Anambra State, 54 respondents, representing 15.6%, disagreed.

With the mean score of 4.26 item three shows that the participants expressed a high level of agreement with the assertion that there is limited access to healthcare services in rural areas in Anambra State. The standard deviation of 0.97 and the coefficient variation (CV) of 0.209 reflect moderate variability around the mean. This means that although there is a high level of agreement (84.1%) with this assertion, there is still some sort of a divergent view around it.

The fourth item centred on the adequacy of healthcare infrastructure. The statistical analysis revealed that out of the 346 respondents, 237 (68,55) strongly agreed that the healthcare system in Anambra state is faced with inadequate healthcare infrastructure. Relatedly, 55 respondents (15.9%) agreed with the same view. However, 44 respondents (12.7%) disagreed while 10 respondents, which represents 2.9%, strongly disagreed that inadequate healthcare infrastructure is a challenge to the healthcare system in Anambra state. What this entails is that 292 respondents, representing 84.4% of the respondents agreed that the healthcare system in Anambra state is faced with inadequate healthcare infrastructure, while 54 respondents, representing 15.6%, disagreed.

The mean score of 4.34 for this item indicates positive agreement, showing that the participants agree that inadequate healthcare infrastructure is a challenge to the healthcare system in Anambra state. With a standard deviation of 0.97, the coefficient variation (CV) in our dataset is 0.224. This means that the standard deviation of 0.97 accounts for 22.4% of the mean value of 3.45. This reflects moderate variability around the mean. While not highly dispersed, there is some diversity in the responses. It shows that though the majority (84.4%) believe inadequate healthcare infrastructure is a challenge to the healthcare system in Anambra state, there is still variability in the responses.

Furthermore, the contribution of inexperienced healthcare workers in the Anambra state's health sector was also assessed by item five. Out of the 346 respondents, 77 (22.3%) strongly agreed that inexperienced healthcare workers contribute to poor healthcare services in Anambra State. Similarly, 65 respondents (18.8%) agreed with the same view. Conversely, 196 respondents (56.6%) disagreed while 8 respondents, which represents 2.3%, strongly disagreed that inexperienced healthcare workers contribute to poor healthcare services in Anambra State. The implication of this result is that 142 respondents, representing 41.1% of the respondents agreed that the inexperienced healthcare workers contribute to poor healthcare services in Anambra State, while 204 respondents, representing 58.9%, disagreed.

The mean score of 3.02 for this item indicates moderate agreement, and the participants lean towards agreeing that inexperienced healthcare workers contribute to poor healthcare services in Anambra State. This is because of variability in the responses. With a standard deviation of 0.99 and the CV of 0.328, moderate variability around the mean is reflected. This shows some level of diversity in the responses. It shows that though the majority (58.9%) disagreed that inexperienced healthcare workers contribute to poor healthcare services in Anambra State, variability on the responses exists.

The analysis of the waiting time spent by the patients to access health services in Anambra state was highlighted by item six. 201 respondents (58.1%), out of the total 346 responses, strongly agreed that patients in Anambra state experience long waiting times before they can access health services. Relatedly, 41 respondents (11.8%) agreed. On the contrary, 102 respondents (29.5%) disagreed with the assertion while 2 respondents (0.6%) strongly disagreed. In all, 242 respondents, representing 69.9% of the respondents agreed that patients in Anambra state experience long waiting times before they can access health services, while 104 respondents, representing 30.1%, disagreed with the statement.

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The mean score of 3.97 for this item shows a positive agreement, indicating that the participants expressed agreement with the assertion patients in Anambra state experience long waiting times before they can access health services. The standard deviation of 0.98 and the coefficient variation (CV) of 0.247 reflects moderate variability around the mean. This means that although there is majority agreement (69.9) that patients in Anambra state experience long waiting times before they can access health services, diverse view still exists.

Also, statistical analysis of how the healthcare system in Anambra state is challenged with shortage of healthcare professionals provided varying insights. Out of the 346 responses, 202 respondents (58.4%) strongly agreed that the healthcare system in Anambra state is challenged with shortage of healthcare professionals. Similarly, 86 respondents (24.9%) agreed with this, while 1 respondent (0.3%) remained undecided. Conversely, 57 respondents (16.5%) disagreed with the assertion. In all, 288 respondents, representing 83.3% of the respondents agreed that the healthcare system in Anambra state is challenged with shortage of healthcare professionals, while 57 respondents, representing 16.5%, disagreed.

A look at the mean score of 4.25 indicates positive agreement with the view that healthcare system in Anambra state is challenged with shortage of healthcare professionals. With a standard deviation of 0.97, the coefficient variation (CV) in our dataset is 0.228. This means that the standard deviation of 0.97 accounts for 22.8% of the mean value of 4.25. This reflects moderate dispersion around the mean. It shows that though the majority (83.3%) are of the view that healthcare system in Anambra state is challenged with shortage of healthcare professionals, there is still variability in the responses.

Finally, the last item x-rayed the incidences of preventable death in Anambra State. This analysis provided interesting insights on the matter. Out of the 346 responses, 221 respondents (63.9%) strongly agreed that there are incidences of preventable deaths in Anambra State due to lack of access to timely healthcare services. Relatedly, 91 respondents (26.3%) agreed with this, while a small fraction of the respondents, 2 respondents (0.6%), was neutral. On the contrary, 32 respondents (9.2%) disagreed. In all, 312 respondents, representing 90.2% of the respondents agreed there were incidences of preventable death in Anambra State due to lack of access to timely healthcare services, while 32 respondents, representing 9.2%, disagreed with the assertion.

The mean score of 4.45 for this item shows a strong agreement, indicating that the participants expressed high level of agreement with the assertion there are incidences of preventable death in Anambra State due to lack of access to timely healthcare services. The standard deviation of 0.97 and the coefficient variation (CV) of 0.218 reflects moderate variability around the mean. This means that although there is majority agreement (90.2%) that there are incidences of preventable death in Anambra State due to lack of access to timely healthcare services, diverse view still exists.

In conclusion, the average mean score of 4.05 with the average standard deviation of 0.98 offers a statistical summary of respondents' views on accessibility and efficiency of the healthcare system of Anambra State. Overall, the standard deviation accounts for 24.2% of the average mean value of 4.05. It underlines the varying views of the respondents on the status of healthcare system in the state, expressing high level of agreement with the highlighted variables.

➢ *Test of Hypothesis*

The hypothesis formulated in this study was tested using two-tailed, one sample t-test at 5% significance level, α. A two-tailed one-sample t-test is a statistical test used to compare the mean of a sample to a hypothesized value. The t-test always uses the following null hypothesis:

H_0: $\mu = \mu_0$ (population mean is equal to a hypothesized value, denoted as μ_0)
H_1: $\mu \neq \mu_0$ (population mean is not equal to a hypothesized value, μ_0)
The t-statistic, t is calculated using the following formula:

$$t = \frac{\bar{x} - \mu_0}{s/\sqrt{n}} - William\ Sealy\ Gosset$$

Where:
$\bar{x}$ = sample mean
μ_0 = hypothesized population mean
s = sample standard deviation
n = sample size
The decision rule is as that if $|t| > t_{critical}$, reject the null hypothesis (H_0).
H_{01}: The overall accessibility of healthcare services in Anambra state is not suboptimal (μ=3.00).
H_{11}: The overall accessibility of healthcare services in Anambra state is suboptimal (μ≠3.00).

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Table 3: One Sample T-Test for First Hypothesis

Parameters	Description
Hypotheses	H_{01}: The overall accessibility of healthcare services in Anambra state is not suboptimal (μ=3.00)
	H_{11}: The overall accessibility of healthcare services in Anambra state is suboptimal (μ≠3.00)
Sample mean ($\bar{x}$)	4.05
Test value (μ_0)	3.00
Standard deviation (s)	0.98
Sample size (n)	8
t-statistic	$\frac{\bar{x}-\mu_0}{s/\sqrt{n}} = 2.911$
Critical t-value (Two-tailed), $\alpha = 0.05$, df = 7	±2.365
Comparison	Calculated t-statistic (2.911) > critical t-value (2.365)
Conclusion	Reject H_{01}: There is enough evidence to conclude that the overall accessibility of healthcare services in Anambra state is suboptimal

H_1 evaluates whether the overall accessibility of healthcare services in Anambra state is suboptimal. Table 3 clearly shows that the calculated t-statistic, 2.911 is greater than the critical t-value, 2.365 at 0.05 significance level and 7 degrees of freedom. Therefore, the null hypothesis (H_{01}), which states that the overall accessibility of healthcare services in Anambra state is not suboptimal, is rejected. This means that the eight survey items, which has high value of mean score ($\bar{x}$ = 4.05), presented enough evidence to conclude that the overall accessibility of healthcare services in Anambra state is suboptimal.

IV. DISCUSSION OF FINDINGS

The importance of an efficient healthcare system can never be overemphasized because health is wealth. To have a robust economy, a nation must ensure an efficient and effective sector in the state. e health sector that will guarantee a healthy workforce. A healthy nation is a wealthy nation. Despite some efforts made by the Anambra state Government towards improving the health sector, the state still struggles with some challenges that hamper the health system. Healthcare services in the state is not yet easily accessible to all the residents of the state. Table 2 shows some major challenges faced by the Anambra health sector. 55.5% of the respondents believe that long travel distance poses a challenge in accessing healthcare services, just as 89.3% identified high cost of health services as one of the factors that hinders patients from accessing healthcare services in Anambra State. Limited access to healthcare services in rural areas was acknowledged by 84.1% of the respondents as another major challenge. Furthermore, 84.4% of the respondents acknowledged that the healthcare system in Anambra state was faced with inadequate healthcare infrastructure, while 41.1% of the respondents identified inexperienced healthcare workers as a contributory factor to poor healthcare services in Anambra State. Though less than 50% acknowledged this as a major problem facing the healthcare system in the state, it is important to note that 1% of error in administering health services could lead to death. A substantial body of evidence points to medical errors as a leading cause of death and injury (Kohn L.T. *et al.,* 2000). Long waiting time spent by the patients to access health services in Anambra state was highlighted by 69.9% of the respondents. Also 83.3% of the respondents agreed that the healthcare system in Anambra state was challenged with shortage of healthcare professionals. As high as 90.2% of the respondents agreed that there were incidences of preventable death in Anambra State due to lack of access to timely healthcare services.

The average mean score of 4.05 with the average standard deviation of 0.98 from Table 2 shows high level of agreement with the highlighted challenges that confront the healthcare system in Anambra state. This is collaborated by the result of Table 3 which shows that the calculated t-statistic, 2.911 is greater than the critical t-value, 2.365 at 0.05 significance level and 7 degrees of freedom. Therefore, with $t_{statistic}$, 2.911 > $t_{critical,}$ 2.365, it is evident that the overall accessibility of healthcare services in Anambra state is suboptimal.

Therefore, the findings demonstrate that the overall accessibility of healthcare services in Anambra state is suboptimal ($t_{statistic}$, 2.911 > $t_{critical,}$ 2.365). The average mean score of 4.05, as indicated in Table 2, shows high level of agreement with this position.

V. CONCLUSION

Having assessed the quality of the healthcare system in Anambra state, the study established that the healthcare delivery system in Anambra state is not operating at the optimal level that guarantees equal access to quality healthcare to all the citizens and residents of the state. This is due to several identified factors such as long travel distance in accessing healthcare services, high cost of health services, limited access to healthcare services in rural areas, inadequate healthcare infrastructure, inexperienced healthcare workers, long waiting times to access health services, shortage of healthcare professionals and incidences of preventable deaths.

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RECOMMENDATION

To improve healthcare delivery in the Anambra state, it is important that the state government invest in infrastructure, train healthcare workforce and adopt innovative solutions, such as telemedicine.

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