Original Research Article

Material resource availability, clients' perception and satisfaction with quality of antenatal services delivery: a comparison of public and private secondary health facilities in Anambra, Nigeria.

Abstract

Background: The extent to which available antenatal care (ANC) services and its delivery is perceived to be of good quality among ANC attendees, remains key in achieving effective utilization, compliance and desirable outcomes with interventions.

Objective To assess and compare availability of material resources and supplies, perception and satisfaction with quality of services delivery among women accessing ANC at public and private secondary health facilities in Anambra, Nigeria

Materials and methods: The study was a comparative, cross-sectional analytical study involving pregnant women attending ANC clinic in public and private secondary health facilities in Anambra state. Multi-stage random sampling technique was used to select all eligible and consenting subjects. Data were collected using pretested, semi-structured, interviewer-administered, questionnaire and observation checklist. Data obtained were analyzed using IBM/SPSS version 22. Association between variables were tested using Chi-square and Binary logistic regression at 5% level of significance.

Results: The determinants of clients' overall perception on quality of ANC services include: time taken to see doctor, health information/education received, cost of registration, while registration at facility again and recommending facility to someone were the only predictors.

Only occupation of spouse (p = 0.042) and parity (p <0.001) were the socio-demographic determinants of overall perception of quality of ANC.

Conclusions: There was availability of functional material resources and supplies. The overall perception and satisfaction with quality of ANC services was good. Stakeholder are to sustain availability of material resources, quality of delivery and periodic feedback from clients.

Keywords/phrases; *Perceptions Nigeria, quality of care satisfaction*

Introduction

The ultimate goal of antenatal services delivery is to reduce poor maternal and perinatal unduce.[1] Attaining effective ANC, suffices that care is goal directed, client- oriented, evidence-based = focused antenatal care, and provision made by skilled health provider.[1,2] The activities and contents of focused ANC include educating the pregnant woman and her family on pregnancy and related issues appropriate for their individual needs, risk assessment to determine high risk pregnancy, provision of preventive services, monitoring the progress of pregnancy, birth preparedness and complication readiness and screening for early diagnosis.[1]

Maternal morbidity and mortality remains unacceptably high in sub-Saharan Africa, including Nigeria, despite efforts at its reduction, by various stakeholders and development partners.[1] The maternal mortality ratio for Nigeria ranges from 800-1500 per 100,000 live births, being higher in the rural than the urban areas and higher in the southern than northern parts of the Country.[1,2] One of the major public health concerns in this 21st century is the quality of ANC delivery.[2] There is also need to find out the level of ANC services utilization and the quality of ANC service.[2,3]

A method of evaluating the quality of healthcare services is by assessment of clients' perception of services.[3] Apart from using result of care as a basis for assessing the quality of care, clients' perception of care provides alternative opportunity of measuring quality of care based on their assessment.[3] Clients' perception of quality of care is one of the major elements of uptake of healthcare service. It also measures level of satisfaction with healthcare services received from health facility. [2,3]The reduction of maternal and child deaths can only be reduced if adequate measures are put in place, with optimal utilization of ANC services[2]

Understanding clients' perception of and satisfaction with healthcare services provides opportunity for identifying deficiencies in healthcare as well as motivators and barriers to uptake healthcare services. It can also be used for collating inputs of recipients of healthcare services for the purpose of establishing more patient-friendly services, and using the same to improve quality of care. It is also important in setting standards for maternal and child health services in the country.

The findings of this study will strengthen the information available so far and encourage government and policy makers on health matters to design effective strategies to reduce the incidence of maternal and child morbidity and mortality in the State. This study was set to assess and compare availability of material resources and supplies, perception and satisfaction with quality of antenatal services delivery among women accessing care at public and private secondary health facilities in Anambra, Nigeria

Methodology

Study area

This research was carried out from 1st August 2021 to 30th December 2022.in public and private secondary health facilities in Anambra State, southeastern Nigeria. Comprising of 21 local government areas (LGAs), the state covers a total area of 4844km^2 with a projected population of 5,482,177 in 2016 and population density of 1200 to 1500/km^2.[4] It has three senatorial zones (Anambra North, South and Central) with each zone comprising seven LGAs.[4] The major tribe (98%) of the inhabitants is Ibo, while the predominant language is Igbo.[4] The State is 60% urbanized.[4] Majority of the inhabitants are traders, civil servants, artisans, farmers, etc. The total fertility rate of Anambra sate is 4.3%.[5] The percentage distribution of pregnant women who had minimum of three ANC visit(s) stands at 2%, while those who had four or more visits stands at 90%.[6] Out of 1,607 registered health facilities in Anambra state, 1153 health facilities had provision for ANC services, including 70 Public General hospitals.[7]

Study design

This study was a comparative, cross-sectional analytical study involving pregnant women attending ANC in public and private secondary health facilities in Anambra State.

Study population

Pregnant women attending ANC clinics at public and private secondary health facilities in Anambra State.

Inclusion criteria

Pregnant women who have given at least one birth and lived for at least one year in the study area

Pregnant women who have attained a minimum number of two (2) ANC visits in the study settings.

Exclusion criteria

Pregnant women who decline full informed consent to participate in the study|. Pregnant women who were unstable / critically ill and unable to answer the questions.

Sample size determination

The sample size(n) was determined using the comparison proportion formula for descriptive studies.[8] = 62.2 Anticipating a response rate of 90%, an adjustment of the sample size estimate to cover for non- response rate was made by dividing the sample size calculated with a factor, f i.e. n/f, where f is the estimated response rate (0.90)..[9] Therefore, applying the formula for non-response rate,[8,9,10] n_s = n/1-non response, where n_s – Adjusted minimum sample size, n = calculated minimum size f = estimated response rate (0.90).n_s= 69.1 approximately 70 participants from each health facility. However a sample size of 120 participants per facility was used in this study in order to increase the power of the study.

Sampling technique

Multi-stage random sampling technique was used. **Stage 1:** The list of secondary health facilities was obtained from the State Ministry of Health. Using this list, the facilities were classified by stratified sampling technique into public and private health facilities. **Stage 2** Simple random sampling technique by balloting was used to select one facility each from the Public and Private sectors **Stage 3:** In each health facility systematic random sampling was used to select all eligible pregnant and consenting women attending antenatal from the antenatal clinic attendance register, which served as the sampling frame i.e. the monthly attendance of clients who have attained the minimum of two (2). The sampling interval "K" was calculated by dividing the sampling frame with the minimum sample size. In each clinic day, the first client to be administered the questionnaire from the list of clients in the clinic attendance register was

selected by simple random sampling technique (balloting), afterwards every n^{th} client was selected until the calculated minimum sample size was obtained.

Data collection

Study Instruments: Two main tools were used for data collection namely; semi structured questionnaire and observation checklist. Responses were elicited from the respondents consecutively using a pretested, semi-structured, interviewer-administered, questionnaire adapted from Multiple Indicator Cluster Survey 2016-2017 [6] and 2013 Nigerian Demographic and Health Survey.[11] The questionnaire was divided into sections. Section A: Respondent's bio-data, Section B perception of quality of antenatal care services and Section C; Clients; satisfaction with quality of antenatal care services

Structural attributes of quality were assessed using a checklist based on various characteristics. The process dimension was measured through observation of the patient-provider interaction, considering interpersonal and technical aspects separately. Measurement of interpersonal quality was based on the accommodation provided for the women, privacy during the consultation, and the interaction between the client and provider. Technical aspects of process attributes were assessed by observing history taking, physical examination, diagnostic approach, prescription of prophylactic treatments, and provision of health education. The assessment of availability of structural attributes, indices for each of variables were generated. An index was generated, each variable used to assess the five different components of physical infrastructure were scored and then the sum of the scores were obtained. For example the structural attributes/ physical infrastructure index had five variables in which each was given a score of 1 if present and 0 if absent. These variables were scored, such that a variable was given a score of one if undertaken and zero if not undertaken, and then the scores were summed under each of the broad categories

described above to generate an index. Interpersonal aspects (0-5), History taking had index values ranging from (0-11), examination of clients (0-14), tests performed (0-12) and health education given (0-11).

Observation checklist was also used to determine the perception of quality of the ANC services and to assess the presence of structural elements such as; physical infrastructure, diagnostic equipment and essential drugs. The checklist has two sections namely; Section one: Availability of materials resources for antenatal care services; to determine the available material for antenatal care services. It composed of the five items namely; physical infrastructure, equipment, essential drugs, supply of consumables and health education. For physical infrastructure availability, data was collected on the existence of a waiting area, an examination table, and counseling rooms for auditory and visual privacy, source of water and toilets. The diagnostic equipment assessed included; microscope, sphygmomanometer, gloves, stethoscope, uristix, adult weighing scale, vaginal speculum, etc. The essential drugs in stock at the time of study included; paracetamol, vitamin A capsules, tetanus toxoid, fansidar, folic acid, mebendazole, etc. Maintenance of the facility was also pictured. Section two: Capacity of human resources for focused antennal care; it consists of five items namely; adequacy of the staff, qualification of the staff, supervision of the staff, skills of the staff, and in-service training for the staff. Scoring for health personnel per facility was calculated by using number of Health personnel in each facility divided by the total number of studied facilities as stipulated by World Health Organization.[11]

Recruiting / Training of Research Assistants

This study was carried out with the help of five research assistants who were mainly medical practitioners'. The Research Assistants were instructed and train on how to interpret, administer

the questionnaires and fill the checklist to ensure the objectiveness of the data. They were also enlightened on the nature of this study.

Pretesting of Questionnaire

The questionnaire was pretested at a private and public health facility outside the study area to ascertain the reliability and validity of the instrument and time duration of completing the questionnaire.

Validity of the instrument

A draft questionnaire along with abridge copy of the work were reviewed and certified by the lecturers of Faculty of Medicine, Nnewi campus before the commencement of this study. Comments, corrections and suggestions made were duly effected to give the face and content validity for the instruments.

Data analysis and management

Data collected were analyzed using 2013, International Business Machine (IBM),Statistical Package for Social Science(SPSS), statistics for windows version 22.[12] It was presented using tables and charts. The outcome variables included perception of quality of ANC. Relevant Means was calculated and tests of association between socio-demographic variables, perception of quality of ANC and factors affecting the utilization ANC services was assessed using the chi-square $(X)^2$ test and binary logistic regression. The level of statistical significance was set at $p \leq 0.05$.

Results

A total of 270 questionnaires were distributed among the respondents and 254 were retrieved, giving a response rate of 94.1%. However, out of the 254 retrieved questionnaires, 14 were

rejected due to incomplete filling. Consequently, 240 (94.5%) questionnaires were valid and thus were analyzed. Table 1 shows the socio- demographic characteristics of respondents. Majority of respondents [public: 82 (68.3%) and private: 77 (64.2%)] were aged between 19 to 30 years. The mean age of the respondents in the public healthcare facilities was 26.3±6.4 years while that of those in the private healthcare facilities was 27.3±6.4 years. One hundred and seven (89.2%) respondents from the public health facilities were married compared to 115 (95.8%) respondents from the private health facilities.

Table 2 highlights the availability of material resources and supplies in the studied public and private health care facilities. The findings revealed that the percentage of available and functioning waiting area with seats for patients in the public health care facilities was 75 while that of the private was 87.5%. Counseling room with table and two chairs was not available in 5 (62.5%) of the public health care facilities and 3 (37.5%) of the private health care facilities studied. Patients' toilets were available and functioning in almost all the health facilities [public: 5 (62.5%) vs private: 8 (100%)]. There was non-availability of source of potable water in twenty five percent of the public health care facilities unlike the private health care facilities that recorded 100%. Examination equipment were available and functioning in all the facilities studied. Essential drugs were not available in only one of the public health facilities visited.

Table 3 summarizes the perception of quality of care among the respondents in the two health facilities. The physical infrastructure of all first tier public and private facilities was reasonably good. In terms of structural attribute; there was a statistically significant difference on the perception of the respondents on water supply ($p<0.001$) and ventilation ($p=0.001$). Sitting arrangement & spacing ($p=0.029$) and general environmental sanitation ($p=0.047$) were clearly better in the private healthcare facilities. In terms of process of care; even though more than 50%

of the respondents in the two health care facilities opined that the health workers were polite (p=0.330) and empathetic (p=0.245), the difference was not significant. The respondents also mentioned that they were asked personal information on their HIV status [public 21(17.5%); private 43 (35.8%), obstetrics and gynecological history; [public 21(17.5%); private 15 (12.5%). Significantly slightly more pregnant women in private than the public healthcare facility had their blood pressure measured, underwent packed cell volume, urine, blood grouping, Rhesus factor and malaria test were given sulfadoxine--pyrimethamine. In respect to health education received significantly more respondents from the private healthcare facilities received health education on diet and nutrition, malaria prevention, family planning and child spacing, breast self-examination, HIV/AIDS information & counseling and birth plan counseling & emergency preparedness.

Table 4 summarizes the quality of care rendered, assessed using observational checklist shows that the structural attributes and basic diagnostic equipment observed were not statistically significant in the two healthcare facilities. Maintenance of the facility was clearly better in the private compared to public healthcare facilities. The essential drugs in stock were more in the private healthcare facilities; as metronidazole was significantly higher in all private healthcare facilities visited (p=0.005).

Table 5 shows the assessment of influence of structural and technical quality on the perception of quality of ANC services. From the findings as presented, here was a statistically significant difference on the clients' perception of some structural attributes between the two healthcare facilities; [facility is spacious ($\chi2$=7.6, p=0.006), Availability of diagnostic equipment ($\chi2$=15.3, p<0.001), provision of essential drug ($\chi2$=7.8, p= 0.005)]. In terms of technical quality; diagnostic approach ($\chi2$=6.4, p=0.012), good registration process ($\chi2$=21.0, p<0.001), waiting

time ($\chi 2$=4.8, p=0.028), cost of registration ($\chi 2$=29.9, p<0.001), health education received ($\chi 2$=9.4, p=0.002), examination room privacy ($\chi 2$=9.7, p=0.002) were found to be statistically associated with the clients' perception of quality of ANC services.

Table 6 shows the overall satisfaction on the quality of ANC received; clients from the private healthcare facilities were significantly more likely to use the centre for ANC again 93 (77.5%) compared to public healthcare facilities studied 79 (65.8%). Also, clients from the private healthcare facilities were significantly more likely to recommend the centre to someone 80 (66.7%) compared to public healthcare facilities studied 64 (53.3%).

Table 7 shows the influence of clients' socio-demographic characteristics on the overall perception of quality of ANC services in the two healthcare facilities. Only occupation of spouse (X^2 = 8.2, p = 0.042) and parity (X^2 = 16.2, p <0.001) were significant determinants of overall perception of quality of ANC.

Table 8 highlights the logistic regression of all the significant determinants of clients' over all perception on quality of ANC services shows that time taken to see doctor, health information/education received, cost of registration, registration at facility again and recommending facility to someone were the only predictors (factors) statistically significant).

Discussion

The index study was a comparative, cross-sectional analytical type. It assesses assess and compare availability of material resources and supplies, perception and satisfaction with quality of antenatal services delivery among women accessing care at public and private secondary health facilities in Anambra.

This study highlights the availability of material resources and supplies in the studied public and private health care facilities. The findings reveal that the percentage of available and functioning waiting area with seats for patients in the public and private health care facilities was roughly seven to nine in every ten of them. Examination equipment were available and functioning in all the facilities studied. This finding is corroborated by findings of high levels of availability and functionality of such services other similar studies.[13,14,15,16] However, essential drugs were not available in only one of the public health facilities visited. Contrasting finding was reported by other authors, who observed shortage of supplies, stocking out of essential drugs, lack of ANC waiting area, absent water supply, and electricity shortage in the facilities [17,18,19] This is an area for concern and measures should be put in place to sustain the functionality of the facilities studied.

The present study summarizes the perception of quality of care among the participants in the two health facilities. The physical infrastructure of private facilities was better perceived thus: water supply and ventilation sitting arrangement and spacing and environmental sanitation. This finding remains consistent with the findings of other studies which found that women's perceptions of antenatal visits significantly influence their assessment of quality of services that are provided.[20] As a result of this paradigm shift in measurement, clients' perception and satisfaction has become a veritable tool in assessing system performance.

The findings of the present study on the quality of care rendered, assessed using observation checklist shows that the structural attributes and basic diagnostic equipment observe an association in the two healthcare facilities, with better maintenance of the facility as well as

availability of essential drugs in the private healthcare facilities. Therefore, improvement in the areas of input, process, and output is recommended for the public facilities

This study shows the statistical relationship between structural and technical quality on the perception of quality of ANC services. From the findings, the clients' perception of some structural attributes between the two healthcare facilities; [facility is spacious, availability of diagnostic equipment, provision of essential drug. This study compared relationships with technical quality; reports thus: diagnostic approach, good registration process, waiting time, cost of registration, health education received, examination room privacy with the clients' perception of quality of ANC services. This is similar to findings from other studies[20,21] Consequently, one of the issues in queue management is not only the actual amount of time the customer has to wait but also the customer's perceptions of that wait [21]

This study summarizes the overall satisfaction on the quality of ANC received; by clients. It reports that those accessing ANC at the private healthcare facilities were significantly more likely to use the centre for ANC again as well as recommend the centre to someone, when compared to those accessing care at the public healthcare facilities Comparable findings were reported by previous research that revealed positive correlation between clients' satisfaction and health care functionality[15,22] In tandem with the findings of the index study, the reference studies reported that majority of the clients were satisfied with the quality of antenatal care they received and would recommend the facility to friends. The participants were also willing to use the same facility in subsequent pregnancies. However, contrasting findings were reported by other researchers, where the low quality reported, might be due to the focus on increasing coverage of the service rather than quality of the service[24,25,26]

This study also highlights the logistic regression of all the significant determinants of clients' over all perception on quality of ANC services posits that time taken to see doctor, health information/education received, cost of registration, registration at facility again and recommending facility to someone were the only predictors. Findings from the logistic regression in a reference study concurs that continued utilization of antenatal services is directly linked to the satisfaction of the clients.[27]This reemphasizes the need for continued audit and evaluation of services at the antenatal clinic by health providers and policy makers. This thus concurs that satisfied clients are likely to come back for the services and recommend services to others[6]. Cost of care, time spent at the hospital and doctor communication have been found to influence clients; satisfaction in previous studies[27,28]

Finally, Oladapo and Osiberu found that socio-demographic and obstetric characteristics were not associated with the overall satisfaction with antenatal care quality.[29] There was a similar finding in the index study, only for occupation of spouse and parity.

Limitations: In the design of study questionnaire, some of the questions were dependent on the respondents' ability to recall information, which may have led to recall bias. In addition, due to the sensitive nature of some of the questions, the study may have been faced with socially desirable responses from the participants leading to over-responding or under-responding, however they were assured of confidentiality and that this research was strictly academic. Concerning study design and data collection, prospective studies and focus group interviews may provide more information on what clients perceive of antenatal care services and changes that they would expect in the health service delivery systems. This study did not address clients' self-

audit on quality of services for which the authors like to recommend further study addressing this. Moreover, facility-based studies may overestimate client satisfaction and be better conducted in the community in the future.

Conclusions

This study reports the availability of material resources and supplies in the studied public and private health care facilities as well as functioning waiting area, examination equipment and essential drug The study subjects centered perception of quality of care on the physical infrastructure of private facilities and was positively associated with water supply and ventilation sitting arrangement and spacing and environmental sanitation. The structural attributes and basic diagnostic equipment were better maintained in the private healthcare facility. The overall perception of quality of ANC services in the two healthcare facilities was based on time taken to see doctor, health information/education received, cost of registration, registration at facility again and recommending facility to someone clients' parity and occupation of spouse.

Recommendations: Based on the study findings, the stakeholder should work on sustaining the availability of material resources and supply in the studied public and private health care facilities as well as functioning waiting area, examination equipment and essential drug and giving in-services training for health professionals. The study subjects centered perception of quality of care on the physical infrastructure. Consequently, this result should motivate policy makers to design interventions that could improve the quality of ANC service. The structural attributes and basic diagnostic equipment were better maintained in the private healthcare facility. Policy makers and health providers should however address improvement of amenities, reduction of waiting time and ensure that health interventions are available for all clients.

Periodic feedback from clients by policy makers and hospital managers should be instituted as part of antenatal care evaluation.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study has been examined and approved by the Nnamdi Azikiwe University Teaching Hospital Ethics Committee. Permission to conduct the study was obtained from the State Ministry of Health Verbal informed consent was obtained from each participant for the conduct and publication of this research study and assurance of confidentiality given. Study participants were free to refuse or withdraw from the study at any time without any penalty. The study's purpose and objectives were explained to each participant prior to interview. All authors hereby declare that the study has therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

References

1 Obionu CN. Primary Health Care for Developing Countries. 2nd ed. Enugu: Institute for Development Studies UNEC, 2007; 249 – 260.

2 Nnebue CC, Ebenebe UE, Adinma ED, Iyoke CA, Obionu CN, Ilika AL. Clients' knowledge, perception and satisfaction with quality of maternal health care services at the primary health care level in Nnewi, Nigeria. Nigerian Journal of Clinical Practice, 2014; 17:594-601.

3 Emelumadu OF, Onyeonoro UU, Ukegbu AU, Ezeama NN, Ifeadike CO, Okezie OK. Perception of quality of maternal healthcare services among women utilising antenatal services in selected primary health facilities in Anambra State, Southeast Nigeria. Nigerian Medical Journal, 2014; 55:148-155.

4 Government of Anambra State, Nigeria. History of Anambra. Available at: http://www.anambrastate.gov.ng (Accessed on 27 April 2020).

5 National Bureau of Statistics. Demographic statistics bulletin, 2017. Available at: http://www.nigerianstat.gov.ng (Accessed on 27 April 2020)

6 National Bureau of Statistics – United Nations Children's Fund. Multiple Indicator Cluster Survey 2016-2017. National survey finding report. Available at: http://www.unicef.org/nigeria/resources_11701.html (Accessed on 27 April 2020).

7 Anambra State Ministry of Health, Nigeria. Report of Anambra State- wide rapid health facility assessment. Available at: https://www.fhi360.org/sites/default/files/media/.../Anambra%20RHFA%20report.pdf (Accessed on 27 April 2020).

8 Kirkwood BR, Sterne JA. Essential Medical Statistics 2nd edition. Massachusetts: Blackwell Science; 2003.

9 Araoye MO. Research methodology with statistics for health and social sciences. 2nd ed. Ilorin: Nathadex Publications, 2004; 115-122.
10 Isatou K, Yiing-Jenq J, Tsai-Ling C, Nicole Huang L. Women's perception of antenatal care services in public and private clinics in the Gambia. International Journal for Quality in Health Care, 2012; 4(6):595–600.
11 World Bank. Nigeria Demographic and Health Survey (NDHS) 2013. http://microdata.worldbank.org/index.php/catalog/2014 (Accessed on 20 August 2020).
12 International Business Machines Corporation- Statistical Package for Social SciencesI (BM-SPSS) Statistics for windows, version 22.0. Armonk, NY: IBM Corporation, 2013.
13 Balogun OR. Patients' perception of quality of antenatal services in four selected private facilities in Ilorin, Kwara State of Nigeria. Nigerian Medical Practitione.r2007;51(4):80–84..
14 Nwaeze II, Enabor OO Oluwasola TAO, Aimakhu CO Perception and satisfaction with quality of antenatal care services among pregnant women at the university college hospital, Ibadan, Nigeria. Ann Ib Postgrad Med. 2013 Jun; 11(1): 22–28.
15 Deccacche A. Evaluating quality and effectiveness in the promotion of health: approaches and methods of public health and social sciences. Promot Educ.1997;;4(2):10-5.
16 Osungbade K, Oginni S, Olumide A. Content of antenatal care services in secondary health care facilities in Nigeria: implication for quality of maternal health care. Int J Qual Health care. 2008;20(5):346–351.
17 Mekonnen N, Berheto TM, Ololo S, Tafese F. Quality of antenatal care services in demba gofa woreda, gamo gofa zone. *Rural Ethiopia. Health Science Journal*. 2017; 11(3).
18 Mansur AM, Rezaul KM, Mahmudul HM. Quality of antenatal care in primary health care centers of Bangladesh. *J Family Reprod Health.* 2014;8(4):175.
19 Chemir F, Alemseged F, Workneh D. Satisfaction with focused antenatal care service and associated factors among pregnant women attending focused antenatal care at health centers in jimma town, jimma zone, south west Ethiopia; A facility based cross-sectional study triangulated with qualit. *BMC Res Notes.* 2014;7:164.
20 Kamil A, Khorshid E. Maternal perceptions of antenatal care provision at a tertiary level hospital, Riyadh. Oman Med J. 2013;28(1):33–35.
21 Taylor S. Waiting for Service: The Relationship between Delays and Evaluation of Service. Journal of Marketing. 1994;58(2):56–69.
22 Oladapo OT, Iyaniwura CA, Sule-Odu AO. Quality of antenatal services at the primary care level in Southwest Nigeria. Afr J Reprod Health. 2008;12(3):71–92.
23 Miltenburg A S, van der Eem L, Nyanza EC, van Pelt S, Ndaki P, Basinda N, et al. Antenatal care and opportunities for quality improvement of service provision in resource limited settings: a mixed methods study. *PLoS One*. 2017;12(12):e0188279.
24 Phommachanh S, Essink DR, Jansen M, Broerse JE, Wright P, Mayxay M. Improvement of quality of antenatal care (ANC) service provision at the public health facilities in Lao PDR: perspective and experiences of supply and demand sides. *BMC Pregnancy Childbirth.* 2019;19(1):255.
25 Abebe S, Alemayehu A, Gebremariam A, Dirar A. Quality of antenatal care service in public health facilities of chencha district, gamo gofa zone, southern Ethiopia. *MOJ Womens Health*. 2017;4(3):00086.

26 David M, Hillary M, Violet N. Quality of antenatal care offered at nambale Sub county. *Busia County. SOJ Gynecol Obstet Womens Health*. 2017;3(3):1-7.
27 Donabedian A. The definition of quality and approaches to its assessment. Ann Arbor, Michigan: Health administration press; 1980.79–128.
28 Ofovwe CE, Ofili AN. Indices of patient satisfaction in an African population. Public Health. 2005;119(7):582–586.
29 Oladapo OT, Osiberu MO Do socio-demographic characteristics of pregnant women determine their perception of antenatal care quality. Matern Child Health J. 2009;13(4):505–511.

Tables

Table 1: Socio-demographic characteristics of the respondents

Variables	Public n(%)	Private n(%)	Inferential test (χ^2)	*p* value
Age group				
≤ 18	10 (8.3)	6 (5.0)		
19 – 30	82 (68.3)	77 (64.2)	2.4	0.301
≥ 31	28 (23.3)	37 (30.8)		
Mean age	26.3±6.4	27.3±6.4	t=1.8	0.073
Marital status		(3.3)		
Never married	7 (5.8)	115 (95.8)		
Currently Married	107 (89.2)	1 (8.3)	5.1	0.164
Divorced/Separated	3 (2.5)	0 (0.0)		
Widowed	3(2.5)			
Educational status				
No formal Education	3 (2.5)	0 (0.0)		
Primary	20 (16.7)	5 (4.2)		
Secondary	76 (63.3)	85 (70.8)	14.1	0.003
Tertiary	21 (17.5)	30 (25.0)		
Religion				
Christian	113 (94.2)	118 (98.3)		
Moslem	0 (0.0)	0 (0.0)	2.9	0.089
Traditional	7 (5.8)	2 (1.7)		
Tribe				
Ibo	115 (95.8)	118 (98.3)		
Hausa	0 (0.0)	2 (1.7)		
Yoruba	3 (2.5)	0 (0.0)	7.0	0.071
Others (Tiv, Igala)	2 (1.7)	0 (0.0)		
Occupation of spouseIf married				
Farmer				

Civil servant	28 (23.3)	20 (16.7)		
Artisan	24 (20.0)	22 (18.3)		
Others	40 (33.3)	45 (37.5)	2.1	0.547
	28 (23.3)	33 (27.5)		
Parity				
Para 1 – 4	88 (73.3)	103 (85.8)		
Para ≥ 5	32 (26.7)	17 (14.2)	5.8	0.016
Gestational Age (wks)				
< 12	3 (2.5)	9 (7.5)		
13 – 27	87 (72.5)	68 (56.7)	7.6	0.022
> 28	30 (25)	43 (35.8)		
Socio-economic class				
Lower	51 (42.5)	46 (38.3)		
Upper	69 (57.5)	74 (61.7)	0.4	0.511
Place of residence				
Urban	63 (52.5)	79 (65.8)		
Rural	57 (47.5)	41 (34.2)	4.4	0.036
Distance from ANC				
Close (≤ 10 minutes)	10 (8.3)	28 (23.3)		
Moderate (20 – 45 minutes)	87 (72.5)	76 (63.3)	10.5	0.005
Far (> 1 hour)	23 (19.2)	16 (13.3)		

Table 2: Availability of material resources and supplies in the Health facilities

Variables	Public n=8	Private n=8
Waiting area with seat for patients		
Available and Functioning	6 (75.0)	7 (87.5)
Available not functioning	2 (25.0)	1 (12.5)
Not available	0 (0.0)	0 (0.0)
Counseling room with table and two chairs		
Available and Functioning	2 (25.0)	4 (50.0)
Available not functioning	1 (12.5)	1 (12.5)
Not available	5 (62.5)	3 (37.5)
A locked storage cupboard for drugs		
Available and Functioning	4 (50.0)	7 (87.5)
Available not functioning	3 (37.5)	1 (12.5)
Not available	1 (12.5)	0 (0.0)
Patient's toilet		
Available and Functioning	5 (62.5)	8 (100.0)
Available not functioning	3 (37.5)	0 (0.0)
Not available	0 (0.0)	0 (0.0)
Staff toilet		
Available and Functioning	5 (62.5)	5 (62.5)
Available not functioning	1 (12.5)	2 (25.0)
Not available	2 (25.0)	1 (12.5)
Source of water (portable)		

Available and Functioning	6 (75.0)	8 (100)
Available not functioning	0 (0.0)	0 (0.0)
Not available	2 (25.0)	0 (0.0)
Reliable source of light		
Available and Functioning	5 (37.5)	7 (87.5)
Available not functioning	1 (12.5)	1 (12.5)
Not available	2 (25.0)	0 (0.0)
Examination Equipment		
Available and Functioning	8 (100.0)	8 (100.0)
Available not functioning	0 (0.0)	0 (0.0)
Not available	0 (0.0)	0 (0.0)
Essential Drugs		
Available and Functioning	7 (87.5)	8 (100.0)
Available not functioning	0 (0.0)	0 (0.0)
Not available	1 (12.5)	0 (0.0)
Sustainable Supply of Consumables		
Available and Functioning	4 (50.0)	6 (75.0)
Available not functioning	4 (50.0)	2 (25.0)
Not available	0 (0.0)	0 (0.0)

Table 3a: Perception of quality of care among the respondents in the health facilities

Attributes of quality	**Public n=120**	**Private n=120**	**(X^2) Test**	***p*-value**
STRUCTURAL ATTRIBUTE				
Physical infrastructure[a]				
• Water supply	69 (57.5)	101 (84.2)	20.6	<0.001*
• Hygiene (toilet and bathroom)	84 (70.0)	89 (74.2)	0.5	0.472
• Ventilation	104 (86.7)	83 (69.2)	10.7	0.001*
• Sitting arrangement & spacing	71 (59.2)	87 (72.5)	4.7	0.029*
• General environmental sanitation	78 (65.0)	92 (76.7)	4.0	0.047*
PROCESS OF CARE				
Interpersonal aspects[b]				
• **Making women comfortable**		101 (84.2)		
Seat offered	74 (61.7)			
• **Health worker–woman interaction**		88 (73.3)	15.3	<0.001*
Interest	67 (55.8)	114 (95.0)		
Non-interruption of woman's speech	82 (68.3)	86 (71.7)	8.0	0.005*
Politeness	79 (65.8)	63 (52.5)	28.5	<0.001*
Asking about woman's concerns	54 (45.0)		1.0	0.330
• **Privacy**		109 (90.8)	1.4	0.245
Door closed during consultation	91 (75.8)			
		103 (85.8)	9.7	0.002*
• **Explaining procedures to the women**	94 (78.3)	53 (44.2)		
Explaining before examination	31 (25.8)	120 (100.0)		
Explaining the findings after examination	96 (80.0)		2.3	0.130
Explaining use of prophylactic drugs			8.9	0.003*
			26.7	<0.001*
Technical aspects[c]				

• **Assessing the history of women**				
*Personal information				
Medical history	120 (100.0)	120 (100.0)	-	-
• Medication	71 (59.2)	59 (49.2)	2.4	0.120
• Allergies	44 (36.7)	63 (52.5)	6.1	0.014*
• HIV status	21 (17.5)	43 (35.8)	25.4	<0.001*
• Malaria	62 (51.7)	33 (27.5)	14.7	<0.001*
• High blood pressure	19 (15.8)	28 (23.3)	2.1	0.143
• Diabetes	4 (3.3)	1 (0.8)	1.8	0.175
• Urinary tract infection	35 (29.2)	27 (22.5)	1.4	0.238
Surgical history				
Obstetrics and gynecological history	21 (17.5)	15 (12.5)	1.2	0.278
Family and social history	34 (28.3)	19 (15.8)	5.4	0.020*
Immunization	120 (100.0)	120 (100.0)	-	-

*Significant

Table 3b: Assessment of quality of care among the respondents at the health facilities

Attributes of quality	Public n=120	Private n=120	X^2 Test	*p*-value
• **Diagnostic approach /Lab. Investigations**				
Blood pressure measurement	102 (85.0)	113 (94.2)	5.4	0.020*
Packed cell volume	47 (37.5)	66 (55.0)	6.0	0.014*
Urine for albumin, sugar and protein	7 (5.8)	20 (16.7)	7.1	0.008*
Urine for infection	14 (11.7)	25 (20.8)	3.7	0.054
Blood grouping and rhesus factor	104 (86.7)	120 (100.0)	17.1	<0.001*
VDRL/RPR for syphilis screening	120 (100.0)	120 (100.0)	-	-
HIV testing	120 (100.0)	120 (100.0)	-	-
CD4 count if indicated	14 (11.7)	5 (4.2)	4.6	0.031*
Blood examination for malaria	116 (96.7)	120 (100.0)	4.1	0.044*
Ultrasound scan	120 (100.0)	120 (100.0)	-	-
TB screening and detection	42 (35.0)	48 (40.0)	0.6	0.424
Tetanus toxoid vaccination	120 (100.0)	120 (100.0)	-	-
• **Provision of prophylactic drugs**	29 (24.2)	40 (33.3)	2.5	0.117
Iron(II) sulfate and folic acid	116 (96.7)	120 (100.0)	4.1	0.044*
Sulfadoxine-pyrimethamine (fansidar)				
Physical examination				
General examination				
• Blood pressure	120 (100.0)	120 (100.0)	-	-
• Weight	120 (100.0)	120 (100.0)	-	-
• Height	120 (100.0)	120 (100.0)	-	-
• Pulse	120 (100.0)	120 (100.0)	-	-
• Temperature (if indicated)	67 (55.8)	40 (33.3)	12.3	<0.001*
Checking for anemia, pallor (conjunctiva, palm)	82 (68.3)	96 (80.0)	4.3	0.039*
Fetal heart beat auscultation	91 (75.8)	78 (65.0)	3.4	0.066
Lymph nodes	76 (63.3)	84 (70.0)	1.2	0.273
Female Genital inspection	45 (37.5)	19 (15.8)	14.4	<0.001*
Checking of legs for swelling	120 (100.0)	120 (100.0)	-	-
Checking for sores, discharge	65 (54.2)	43 (35.8)	8.1	0.004*
PV bleeding	14 (11.7)	0 (0.0)	14.9	<0.001*
Abdominal examination				
• Inspection (scars, movement with respiration and shape of the abdomen)	120 (100.0)	120 (100.0)	-	-
• Palpation				

Providing health education	120 (100.0)	120 (100.0)	-	-
• General health education	111 (92.5)	120 (100.0)	9.4	0.002*
• Health education on diet & nutrition	107 (89.2)	120 (100.0)	13.7	<0.001*
• Health education on prevention of malaria	92 (76.7)	113 (94.2)	14.8	<0.001*
• Family planning and child spacing	79 (65.8)		4.0	0.045*
• Danger signs of pregnancy	120 (100.0)	93 (77.5)	-	-
• Child care and breast feeding	120 (100.0)	120 (100.0)	-	-
• Prevention of STIs / PMTCT	88 (73.3)	120 (100.0)	3.5	0.060
• Breast self-examination	115 (95.8)	100 (83.3)	5.1	0.024
• Prevention of cervical cancer	74 (61.7)	120 (100.0)	2.9	0.091
• HIV/ AIDS information and counseling	103 (85.8)	61 (50.8)	18.3	<0.001*
• Counseling on birth plan and emergency preparedness	111 (92.5)	120 (100.0)	4.7	0.031*
Good registration process		118 (98.3)		
Appointment for the next visit	115 (95.8)		0.4	0.554
	120 (100.0)	113 (94.2)	-	-
		120 (100.0)		

*Significant

Table 4: Assessment of quality of care using observation checklist

Attributes of quality	Public n=8	Private n=8	Inferential Test (X^2)	*p*-value
Structural attributes[a]				
General infrastructure	5 (62.5)	8 (100.0)	3.7	0.055
Toilets with water to flush & wash hands	8 (100.0)	8 (100.0)	-	-
Waiting area	4 (50.0)	6 (75.0)	1.1	0.302
Privacy of examination room	4 (50.0)	5(62.5)	0.3	0.614
Basic diagnostic equipment				
Sphygmomanometer				
Microscope	8 (100.0)	8 (100.0)	-	-
Gloves	5 (62.5)	7 (87.5)	1.3	0.248
Stethoscope	6 (75.0)	6 (75.0)	-	-
Laboratory	8 (100.0)	8 (100.0)	-	-
Haemoglobin measurement	5 (62.5)	7 (87.5)	1.3	0.248
Uristix for the detection of glucose and	5 (62.5)	7 (87.5)	1.3	0.248
protein in the urine	2 (25.0)	5 (62.5)	2.3	0.131
Patellar hammer	4 (50.0)	3 (37.5)	0.3	0.614
Maintenance of facility				
Cleanliness of toilets				
Cleanliness of facility	5 (62.5)	8 (100.0)	3.5	0.055
Maintenance of floors	7 (87.5)	8 (100.0)	1.1	0.302
Maintenance of walls	5 (62.5)	5 (62.5)	-	-
	5(62.5)	8 (100.0)	3.5	0.055
Essential Drugs				
Iron(II) sulfate/folic acid				
Chloroquine	8(100.0)	8 (100.0)	-	-
Methyldopa	5 (62.5)	8 (100.0)	3.5	0.055
Furosemide	0 (0.0)	0 (0.0)	-	-
Metronidazole	2 (25.0)	8 (100.0)	9.6	0.002*
Mebendazole	7 (87.5)	7 (87.5)	-	-

Paracetamol	8 (100.0)	7 (87.5)	1.1	0.302
Acetylsalicylic acid	8 (100.0)	8 (100.0)	-	-
Cotrimoxazole	7 (87.5)	8 (100.0)	1.1	0.302
Penicillin vials	7 (87.5)	8 (100.0)	1.1	0.302
Tetanus toxoid vaccination	6 (75.0)	8 (100.0)	2.3	0.131
Vitamin A capsules	5 (62.5)	6 (75.0)	0.3	0.590
	6 (75.0)	8 (100.0)	2.3	0.131

*__Significant__

Table 5: Assessment of influence of structural and technical attributes on perception of quality ANC in the health facilities.

	Number Satisfied			
Variables	**Public n(%)**	**Private n(%)**	**Inferential test (X^2)**	***p* value**
Structural quality				
Facility is spacious				
Yes	81 (67.5)	60 (50.0)	7.6	0.006*
Maintenance of the facility				
Yes	51 (42.5)	62 (51.7)	2.0	0.155
General infrastructure				
Yes	64 (53.3)	93 (77.5)	15.4	<0.001*
Available Diagnostic equipment				
Yes	69 (57.5)	97 (80.8)	15.3	<0.001*
Provision of essential drugs				
Yes	73 (60.8)	93 (77.7)	7.8	0.005*
Technical quality				
Diagnostic approach				
Yes	64 (53.3)	83 (69.2)	6.4	0.012*
Good registration process				
Yes	70 (58.3)	102 (85.0)	21.0	<0.001*
Waiting / Time taken to see doctor				
Yes	48 (40.0)	65 (54.2)	4.8	0.028*
Total time spent at ANC				
Yes	43 (35.8)	70 (58.3)	12.2	<0.001*
Cost of registration				
Expensive	89 (74.2)	47 (39.2)	29.9	<0.001*
Cost of other ANC services				
Expensive	74 (61.7)	51 (42.5)	8.8	0.003*
Health information / Education				
Yes	111 (92.5)	120 (100.0)	9.4	0.002*
Comfortability of the Examination room				
Yes	74 (61.6)	101 (84.2)	15.4	<.0.001*
Interpersonal quality Examination room				

privacy				
Yes	91 (75.8)	109 (90.8)	9.7	0.002*
Health workers' attitude				
Poor	79 (65.8)	86 (71.7)		
Good	41 (34.2)	34 (28.3)	1.0	0.330
Communication				
Poor	54 (45.0)	63 (52.5)	1.4	0.245
Good	66 (55.0)	57 (47.5)		
Explanation of procedures				
Yes	94 (78.3)	103 (85.8)	2.3	0.130
No	26 (21.7)	17 (14.2)		

Table 6: Overall satisfaction on quality of antenatal care services received by the respondents

Measures of satisfaction	Public	Private	X^2 Test	*p* value
Clients would use the centre for ANC again	79 (65.8)	93 (77.5)	4.0	0.045*
Client would recommend the centre to someone	64 (53.3)	80 (66.7)	4.4	0.035*
Client said she was satisfied or very satisfied (truly satisfied)	59 (49.2)	73 (60.8)	3.3	0.069
Satisfaction index				
Satisfied	25 (42.4)	31 (42.5)		
Very satisfied	34 (57.6)	42 (57.5)		-
			-	

Table 7: Socio-demographic factors influencing the perception of quality ANC

	Number Satisfied			
Variables	**Public (59)**	**Private (73)**	**Inferential test**	***p* value**
Age group			***(X^2)***	
≤ 18	8 (13.6)	5 (6.8)		
19 – 30	34 (57.6)	39 (53.4)	2.7	0.258
≥ 31	17 (28.8)	29 (39.7)		
Marital status				
Never married	5 (8.5)	4 (5.5)		
Married	49 (83.1)	68 (93.2)	4.8	0.190
Divorced/Separated	3 (5.1)	1 (1.4)		
Widow	2 (3.4)	0 (0.0)		
Educational status				
No formal Education	0 (0.0)	0 (0.0)		
Primary	6 (10.2)	2 (2.7)	3.8	0.148
Secondary	38 (64.4)	46 (63.0)		
Tertiary	15 (25.4)	25 (34.2)		
Religion				
Christian	57 (96.6)	73 (100.0)		
Moslem	0 (0.0)	0 (0.0)	2.5	0.113
Traditional	2 (3.4)	0 (0.0)		
Tribe				
Igbo	56 (94.9)	73 (100.0)		
Hausa	0 (0.0)	0 (0.0)		
Yoruba	2 (3.4)	0 (0.0)	3.8	0.150
Others (Igala, Tiv)	1 (1.7)	0 (0.0)		
Occupation of spouse If married				
Farmer	3 (5.1)	1 (1.4)		
Civil servant	29 (49.2)	22 (30.1)		
Artisan	20 (33.9)	32 (43.8)	8.2	0.042*
Others	7 (11.9)	18 (24.7)		
Parity				
Para 1 – 4	27 (45.8)	58 (79.5)	16.2	<0.001*
Para ≥ 5	32 (54.2)	15 (20.5)		
Gestational Age (wks)				
< 12	2 (3.4)	5 (6.8)		
13 – 27	42 (71.2)	48 (65.8)	0.9	0.630
> 28	15 (25.4)	20 (27.4)		
Socio-economic				

class				
Lower	13 (22.0)	21 (28.8)	0.8	0.379
Upper	46 (88.0)	52 (71.2)		
Place of residence				
Urban	32 (54.2)	45 (61.6)	0.7	0.391
Rural	27 (45.8)	28 (38.4)		
Distance from ANC				
Close	7 (11.9)	19 (26.0)		
Moderate	49 (83.1)	47 (64.4)	5.7	0.056
Far	3 (5.1)	7 (9.6)		

Table 8: Logistic regression analysis – predictor variables on client perception of quality of ANC

Variable	AOR	CI	*p*-value
Time taken to see doctor			
No	0.6	0.338 – 0.941	0.028*
Yes	-	-	-
Health information			
Poor	0.9	0.879 – 0.973	0.002*
Good	-	-	-
Cost of registration			
Expensive	-	-	-
Not expensive	4.5	2.575 – 7.721	<0.001*
Register at facility again			
Yes	-	-	-
No	0.6	0.316 – 0.990	0.046*
Recommend facility to somebody else			
Yes	-	-	-
No	0.6	0.339 – 0.963	0.036*s