INTERNATIONAL JOURNAL OF MEDICAL SCIENCE AND DENTAL HEALTH
(ISSN: 2454-4191)
www.ijmsdh.org (2026)

Received: 16 January 2026
Revised: 26 February 2026
Accepted: 23 March 2026
Published: 28 April 2026

Page No - 131-153
DOI - 10.55640/ijmsdh-12-04-16

Article Citation: Okoli, U. J., & Chiejina , N. E. (2026). Suboptimal Antenatal Care in Resource – limited Settings and Quality Improvement Strategies as Perceived by midwives in Awka – South LGA in Anambra State Nigeria. International Journal of Medical Science and Dental Health, 12(04), 131-153. https://doi.org/10.55640/ijmsdh-12-04-16

Suboptimal Antenatal Care in Resource – limited Settings and Quality Improvement Strategies as Perceived by midwives in Awka – South LGA in Anambra State Nigeria.

Uchenna Joy Okoli
Department of Nursing Science, Faculty of Health Sciences and Technology, Nnamdi Azikiwe University, Awka (Nnewi Campus), Anambra State, Nigeria

Nkechi Edith Chiejina
Department of Nursing Science, Faculty of Health Sciences and Technology, Nnamdi Azikiwe University, Awka (Nnewi Campus), Anambra State, Nigeria.

Abstract

Identifying the opportunities for quality improvement is essential to maximize the impact of midwife – led antenatal care. The aim of this study was to determine suboptimal antenatal care and the quality improvement strategies as perceived by midwives in resource – limited settings in Awka – south Local Government Area (LGA), Anambra state, Nigeria. The objectives of the study were to; determine areas of suboptimal antenatal care in resource – limited settings, in Awka –south LGA, Anambra state, Nigeria, and the areas of quality improvement as perceived by midwives. The design for the study was cross – sectional research. It was a facility study which constituted 31Primary Health Centres, 1 Secondary Health Facility, 1 Tertiary Health Facility, plus 112 midwives and 165 pregnant women. Multistage sampling technique was used for the study. Two (2) Questionnaires and one (1) Checklist were adopted for data collection in the study. Data generated from the study were analyzed using descriptive and inferential statistics. The hypotheses were tested at significant level of 0.05. The result indicated resource adequacy in the secondary and tertiary health facilities (100% and 63.1% respectively) and inadequacy in primary health facilities (38.7%). Across all the health facility levels, 75% of service delivery practices among midwives during antenatal care of pregnant women were rated as poor while 25% were categorized as good.

Secondary health facility lacked presence of midwives officially on call at all times. The quality of antenatal care provided by midwives had significant association with ANC Screening training update, p – value 0.02. Antenatal care provided by midwives in resource – limited settings did not significantly differ from areas of sub –optimal antenatal care, overall p – value 0.40. Antenatal care provided by midwives had no significant association with the perceived quality improvement strategies, over all p – value 0.42. Conclusively, the study revealed a substantial disparity in resource availability across facility levels. Recommendations included that Primary health facilities need to be adequately equipped and there should be regular supervision of midwives' practices by quality improvement team in order to identify areas of deficiencies to be properly addressed.

Keywords: Perceived, Suboptimal Antenatal care, quality improvement strategies, Resource – Limited Settings, Midwives, Awka – South, LGA.

Introduction

Mgawadere, Smith, Asfawb, Lambert and van den Broek (2019) reported that perceptions of what constitutes good quality care differed substantially. For healthcare providers, the most important characteristics of good quality care included structural aspects of care such as availability of materials, and sufficient human resources. Shortage of staff, poor labour room design and a non-functional referral system are key barriers to quality care. Khosrav *et a*l., (2022) stated that to improve antenatal care, health policy makers should take into account both the quality and quantity of antenatal care education, and promote antenatal care human resources through employment. Furthermore, insurance support, encouragement, supporting and motivating midwives, enhancing and improving the facilities, providing hospitals and maternity wards with cutting-edge equipment, promoting and reinforcing the position of midwives in the family doctor program, using a referral system and finally, establishing efficient and powerful monitoring system to control the practice of midwives, are among other strategies to improve the antenatal services in Iran.

Omotosho, Sodeinde , Abolurin , Adekoya, and Abiodun (2022) in a rural district in Ghana, reported that the prevailing antenatal cares are ineffective in preparing mothers for newborn care. Place and frequency of antenatal care had positive associations with umbilical cord care, and that there was a need to implement quality antenatal care that will enhance maternal and neonatal outcomes and implement innovative interventions to enhance antenatal care attendance. Omotosho et al (2022) suggested that WHO positive pregnancy experience model should be implemented. Nuamah et al., (2019) stated that there is suboptimal access and utilization of maternal healthcare in a rural district in Ghana, which was associated with socio-economic characteristics such as household wealth index, educational background, and number of children, and also documents very low knowledge of pregnancy-related emergencies and danger signs of newborn among mothers, and pointed out that educational interventions that utilize both health facility and community-based educational approaches will be required to reach all mothers in rural settings. For women, patient-centred care including a positive relationship and experience was prioritized. Mgawadere *et al*., (2019) emphasized that there is a need to incorporate women as well as healthcare provider's views when designing, implementing, monitoring and evaluating maternal health programmes. For a positive birth experience, a healthcare facility needs to have an enabling environment and good communication between healthcare providers and women should be actively promoted. Equally, van Pelt *et al*., (2020) identified differences in the quality of antenatal care provision and the level of motivation between healthcare workers, and reported that midwives complained about poor working conditions (e.g. lack of electricity, equipment or medication), and indicated a need for more training and better supervision and included that electronic clinical decision and support system could improve the quality of antenatal care and their working conditions.

Kyei, Chansa and Gabrysch (2012) stated that few antenatal care facilities in Bangladesh fulfilled criteria for optimum antenatal care service**,** and noted a far below antenatal care coverage which indicates missed opportunities at antenatal care for delivering effective interventions. They added that evaluating the level of antenatal care provision at health facilities is an efficient way to detect where deficiencies are located in the system and could serve as a monitoring tool to evaluate country's progress. Still considering areas of quality improvement in antenatal care, Islam and Masud (2018) stated that an unsatisfactory level of coverage of and content of antenatal care visits have been observed in Bangladesh, noting that further investigation is needed to identify the causes of under-utilization of antenatal care services in Bangladesh. Masud (2018) suggested that greater understanding of the identified risk factors and incorporating them into short- and long-term strategies would help improve the coverage and contents and thus quality of antenatal care services.

Akter *et al*., (2023) noted that quality of antenatal care remains poor in Bangladesh and that there is need to develop targeted interventions for different socio-demographic groups to improve the overall quality of antenatal care. Future interventions should

address both the demand and supply-side perspectives in which an education programme for women with regular knowledge-enhancing sessions for pregnant mothers may play a vital role in increasing the awareness of the importance of completing antenatal care visits. Moreover, Akter, *et al.,* (2023) noted that documentaries about maternal and child healthcare could be regularly broadcast on television, YouTube, Facebook and radio stations. Simultaneously, the supply side should be strengthened by reaching out to the target groups regarding the provision of health services with the application of mobile health technology along with information and communication technology. Trained healthcare providers at the field level with sufficient logistical support should be effectively engaged to provide quality antenatal care to pregnant mothers via the organization of satellite and mobile clinics as appropriate based on the local context (Akter, *et al.,* 2023). Amponsah-Tabi . *et al.* (2022) wrote that providing high quality antenatal care would ensure that women are adequately evaluated and treated for anaemia in pregnancy and counselled on prevention of anaemia before delivery. Service should ensure that women receive high quality antenatal care while the women are encouraged to comply with health education and care provided during antenatal care. Training and retraining of health workers together with improving health facilities will enable the facility to carry out recommended interventions thus improving quality. Sen, Jamee and Bari (2023) also indicated that skilled antenatal care plays an important mediating role in improving good essential neonatal care practice among highly empowered mothers, education is an important indicator to become empowered, women should be highly educated so that they can contribute in breaking barriers to healthcare access. Hence, the researchers embarked on this study to determine the status of antenatal care by midwives, resource – limitation and the need for quality Improvement Strategies as perceived by midwives in Awka – South LGA, in Anambra State of Nigeria.

Research questions

1. What are the areas of Sub – optimal Antenatal care provided by Midwives in the resource – limited Settings in Awka – South LGA, Anambra State, Nigeria.
2. What are areas for quality improvement in the Antenatal care as perceived by Midwives in resource – limited Settings in Awka – South LGA in Anambra State, Nigeria.

Hypotheses

1. There is no significant difference between antenatal care provided by midwives in resource – limited settings in Awka South LGA, Anambra State, Nigeria and areas of suboptimal antenatal care.
2. There is no significant association between the antenatal care provided by midwives in resource – limited settings in Awka south LGA, Anambra state, Nigeria and the perceived quality improvement strategies.

Materials and Method

Design

The research design for this study was cross – sectional design. In cross – sectional research, researcher observe the variables without influencing them (Thomas,2020). Omotosho *et al*., (2022) used cross – sectional research design in their study on 'How effective is Antenatal care in preparing mothers for newborn care? An exploratory survey of lactating women in a rural Nigerian district.

Sample size

Being a facility survey, (Turner et al., 2001), the entire population of the study constituted the sample size for the study, that is, 31Primary Health Care (PHCs), 1 Secondary Health Facility, 1 Tertiary Health Facility, (total = 33 Healthcare Facilities) plus 112 midwives. According to Turner et al., (2001) in Facility Survey, the sample size of clients per facility should be in the range of 3 – 6 Clients. So for this study, the sample size of clients per facility was 5. So total sample size of the Clients for all the facilities were 5 * 33 = 165.

Sampling technique

Multistage sampling technique was used for the study.

Stage 1: All the Government – owned Healthcare Facilities in Awka - South LGAs in Anambra State that provide Antenatal services were purposively selected. Reason was to avoid skipping facilities that were either resource – limited or otherwise. Hence all the 33 Government – owned Healthcare Facilities (31 Primary Health Care facilities (PHCs), 1 Secondary Healthcare facility and 1 Tertiary Healthcare Facility) were selected for the study.

Stage 2: Purposive sampling was adopted to select all the 112 midwives working across all the Healthcare Facilities. This was because they all counted in the resources that were assessed during data collection.

Stage 3: Purposive sampling was used to select Clients (expectant women who visited the selected Healthcare Facilities for

Antenatal services. 5 Clients were selected from each of the selected Government – owned Health Facilities (Turner et al., (2001). The total Clients selected from all the 33 Government – owned Health Facilities were 165.

Instrument for data collection

Two (2) Questionnaires and one (1) Checklist were used for data collection in this study. They are Questionnaire on Client exit for determining pregnant women's assessment of antenatal care they received from the midwives, Checklist for assessing the facilities and midwives training, supervisory and organizational support to determine areas of suboptimal care and areas that need quality improvement and Questionnaire on Perceived Quality Improvement Strategies.

Questionnaire on Client Exit Interview was used to assess the views of pregnant women who receive antenatal care in order to determine areas of suboptimal antenatal care and areas that need quality improvement was adapted from Demographic Health survey (2022) Service Provision Assessment Survey Inventory. Client exit Interview has twenty-four (24) items. The instrument has codes for the various options / observations; YES / NO, NUMBER OF WEEKS, NUMBER OF VISITS, YES ENOUGH/YES, BUT NOT ENOUGH, AT THIS FACILITY, OTHER FACILITY, AT HOME, AT TBA's HOME, INCONVENIENT OPERATING SYSTEM, BAD PREVIOUS EXPERIENCE, MORE EXPENSIVE, WAS REFERRED, ALL THE TIME, MOST OF THE TIME, A FEW TIME, A PROBLEM, NOT A PROBLEM. Information elicited from the items of the instrument include how many weeks pregnant the client is, if the client card indicate that she has received tetanus toxoid injection, if the client visit to the facility was the first time, if client has decided where to deliver her baby, if client felt she was treated with respect and others. The response options are Yes / No, All the time / Few / Most of the time; Problem / Not problem. Scoring is 1 point for any response.

Checklist on Facility Inventory and for assessing midwives training, supervisory and organizational support was adapted from Demographic Health survey (2022) Service Provision Assessment Survey Inventory developed by United Nations development fund, was used to determine areas of suboptimal antenatal care. The instrument has eight (8) items. The instrument has codes for the various options / observations; YES / NO, YES SEEN /NOT SEEN, TIME OFF, UNIFORM/BACK PACK, NONE, VERY SATISFIED, NOT SATISFIED, VERY DISSATISFIED. The information elicited from the items of the instrument include in – service or refresher training received by midwives with date, topics included in – service or refresher training like antenatal screening, counselling during antenatal care, micronutrient supplementation, prevention of mother – to – child transmission of HIV and others. This instrument was also used to determine areas that need quality improvement. For the Yes / No options each response = 1point.

Questionnaire on perceived quality improvement strategies was adapted from Service Provision Assessment Survey Inventory developed by United Nations development fund (Demographic Health survey, 2022). It has ten (10) items. The instrument has codes for the various options / observations; YES / NO, NUMBER OF CLIENTS, MORE SUPPORT FROM SUPERVISOR, MORE KNOLEDGE, MORE SUPPLIES, BETTER QUALITY EQUIPMENT, LESS WORKLOAD, BETTER FACILITY, INCREASED SECURITY. The information elicited from the items of the instrument include: if the facility have teams for quality assurance, if the facility routinely carryout quality assurance activities, if the facility receive any external supervision, the number of antenatal care visits made to the facility in the last completed month etc. among others. The instrument determined midwives perceived quality improvement strategies. The response options are Yes / No. The scoring is 1 point for any response.

Reliability of the instrument

Reliability tests for the instruments were done. It involved a study of 10% of the health care facility where antenatal care services were provided in another LGA outside the area of the study, which included the health facility, 19 midwives and 14 pregnant women that received care from the midwives. The data collected were coded for statistical analysis, split – half test was done, and the data were subjected to Cronbach Alpha test. A coefficient of 0.893 was obtained for Checklist on Facility Inventory and for assessing midwives training, supervisory and organizational support, 0.795 was obtained for quality improvement strategies for midwives and 0.923 was obtained for Client exit Interview Questionnaire. The reliability indices were high and were therefore considered adequate for the study. The overall reliability result was 0.870.

Ethical Consideration

The research was approved by the ethics and research committee of the Health facilities where the study was conducted. Written consents were obtained from the respondents before administering the instruments. Letters of introduction were addressed to the Heads of Departments of the Health facilities. The researchers visited the selected health facilities and obtained permission to gain access to the respondents.

Method of Data Collection

The researchers presented copies of ethical clearance to the heads of the selected Healthcare Facilities to obtain their permission and allow them access to the Health facilities. Two (2) research assistants who were midwives were engaged for each Health facility for the study by the researchers. They were briefed about the purpose of the study in order to gain understanding about their role concerning the study. Collection of data was done on the days of antenatal clinics for each facility and from the respondents: 33 copies of the Facility inventory checklist for the facilities, 112 copies of the antenatal care observation checklist for the midwives and 165 copies of questionnaire on client exit for the pregnant women. The researchers used the Facility Inventory checklist to observe material and human resources that were available in each facility, Antenatal care observation checklist was used to observe what the midwives do as they render care to pregnant women, and health facility factors, questionnaire for assessing midwives training, supervisory and organizational and questionnaire for perceived quality improvement strategies were given to midwives to get their responses, while copies of client exit interview were used to record the information obtained from the interview of the pregnant women. The return rate was 100% for all the copies of the instruments.

Method of Data Analysis

Data generated from the study were coded and analyzed using descriptive and inferential statistics. Descriptive statistics of frequency distribution and percentages was used in analyzing the demographic data of the respondents and answering the research questions. Hypotheses were tested using Chi - square analysis to determine association between the antenatal care provided by midwives in resource – limited settings in Awka South LGA and the perceived quality improvement strategies to be adopted by the midwives, the difference between antenatal care provided by midwives in resource – limited settings in Awka South LGA, Anambra state, Nigeria and areas of suboptimal antenatal care. Statistical Package for Social Science (SPSS) software version 25 was used in the analysis. The significance was at 0.05 level.

RESULTS

Table 1: Demographic variables of the respondents.

Section A: Sociodemographic Distribution of the midwives in the study. (n =112)

Variables	Categories	Primary *n*=93 n(%)	Secondary *n*=5 n(%)	Tertiary *n*=14 n(%)	Total n(%)	Mean Age/SD
Age in years	25-34	18(19.4)	0(0)	6(42.9)	24(21.4)	
	35-44	34(36.6)	4(80)	4(28.6)	42(37.5)	
	45-54	23(24.7)	1(20)	1(7.1)	25(22.3)	
	More than 55	18(19.4)	0(0)	3(21.4)	21(18.8)	41.88±9.38
Years of experience	Less than 1	27(29)	1(20)	7(50)	35(31.3)	
	5-Jan	52(55.9)	3(60)	5(35.7)	60(53.6)	

	10-Jun	4(4.3)	1(20)	0(0)	5(4.5)	
	15-Nov	2(2.2)	0(0)	1(7.1)	3(2.6)	
	More than 15	8(8.6)	0(0)	1(7.1)	9(8)	
Marital status	Married	86(92.5)	5(100)	12(85.7)	103(92)	
	Divorced	2(2.2)	0(0)	0(0)	2(1.8)	
	Single	3(3.2)	0(0)	1(7.1)	4(3.6)	
	Widowed	2(2.2)	0(0)	1(7.1)	3(2.6)	
Are you in-charge of antenatal care services?	Yes, antenatal	31(33.3)	1(20)	1(7.1)	33(29.5)	
	No	62(66.4)	4(80)	13(92.9)	79(70.5)	
Total					**112(100%)**	
Section B: Respondents pregnant women attending antenatal care					**(n=165)**	
Age (years)	18-25	29(18.7)	1(20)	3(60)	33(20)	
	26-35	91(58.7)	3(60)	1(20)	95(57.6)	
	36-45	35(22.6)	1(20)	1(20)	37(22.4)	30.35± 5.95
What is the highest level of school you attended	Primary	11(7.1)	0(0)	0(0)	11(6.7)	
	Secondary	123(79.4)	4(80)	5(100)	132(80)	
	Tertiary	21(13.5)	1(20)	0(0)	22(13.3)	
	No formal education	0(0)	0(0)	0(0)	0(0)	
Marital status	Yes, currently married	148(95.5)	4(80)	4(80)	156(95.5)	
	Not married but living with a man	4(2.6)	1(20)	0(0)	5(3)	
	No, not in union	3(1.9)	0(0)	1(20)	4(2.4)	

Information About Visit – Antenatal Care						
How many weeks pregnant is the client	First trimester	5(3.2)	0(0)	0(0)	5(3)	
	Second trimester	54(34.8)	1(20)	0(0)	55(33.3)	
	Third trimester	96(61.9)	4(80)	5(100)	105(63.6)	25.87± 7.28
Is this your first pregnancy	First pregnancy	61(39.9)	3(60)	0(0)	64(38.8)	
	Have been pregnant before	94(56.97)	2(1.2)	5(3.3)	101(61.4)	
	Total	155(93.1)	5(3.03)	5(3.03)	**165(100%)**	

Table 1 presented the sociodemographic characteristics of midwives and pregnant women across primary, secondary, and tertiary health care facilities in terms of age, years of experience, marital status, and educational level. etc. Most midwives in primary facilities were aged 35–44 and had 1–5 years of experience. Tertiary facilities had younger midwives with 50% having less than 1 year of experience. Secondary facilities had more midwives aged 35–44. Most midwives were married across all levels. 33.3% of midwives in primary health facilities held managerial roles and were in charge of antenatal care, while this was less common in secondary and tertiary facilities.

As shown in Section B, in primary facilities, most of the respondents' pregnant women were aged 26–35, had secondary education, and were in their third trimester. Tertiary Facility had more young pregnant women (18–25) and all were in their third trimester. Education levels were 13.3% in tertiary health care facility and 80% in secondary Facility. 95.5% of the pregnant women in primary facility were married, and multiparity was 56.97% in primary health facilities.

Research question 1; WHAT ARE THE AREAS OF SUBOPTIMAL ANTENATAL CARE PROVIDED BY MIDWIVES IN RESOURCE – LIMITED SETTINGS IN AWKA SOUTH LGA, ANAMBRA STATE, NIGERIA.

Table 2: Perceived Midwives' training and updates.

(n=112)

Variables	**Categories**	**Primary n(%)**	**Secondary n(%)**	**Tertiary n(%)**	**Total n(%)**
Relevant Training Opportunity for midwives					
ANC Screening training update	Yes, in 24 months	71(76.3)	0(0)	9(64.3)	80(71.4)

	No training or update	22(23.7)	5(100)	5(35.7)	32(28.6)
Counseling for ANC training update	Yes, in 24 months	72(77.4)	0(0)	9(64.3)	81(72.3)
	No training or update	21(22.6)	5(100)	5(35.7)	31(27.7)
Micronutrient supplementation training update	Yes, in 24 months	68(73.1)	0(0)	9(64.3)	77(68.8)
	No training or update	25(26.9)	5(100)	5(35.7)	35(31.3)
Post-abortion family planning counseling	Yes, in 24 months	67(72)	0(0)	8(57.1)	75(67)
	No training or update	26(28)	5(100)	6(42.9)	37(33)
Do you provide services for PMTCT of HIV/AIDS?	Yes	87(93.5)	0(0)	14(100)	101(90.2)
	No	6(6.5)	5(100)	0(0)	11(9.8)
Supervisory support					
The last time you were personally supervised, did your supervisor do any of the following					
Check records or reports?	Yes	77(82.8)	0(0)	12(85.7)	89(79.5)
	No	16(17.2)	5(100)	2(14.3)	23(20.5)
Observe your work?	Yes	77(82.8)	0(0)	10(71.4)	87(77.7)
	No	16(17.2)	5(100)	4(28.6)	25(22.3)
Provide feedback on performance?	Yes	77(82.8)	0(0)	11(78.6)	88(78.6)
	No	16(17.2)	5(100)	3(21.4)	24(21.4)
Give verbal/written feedback?	Yes	73(78.5)	0(0)	11(78.6)	84(75)
	No	20(21.5)	5(100)	3(21.4)	28(25)
Provide updates on administrative issues?	Yes	58(62.4)	0(0)	11(78.6)	69(61.6)
	No	35(37.6)	5(100)	3(21.4)	43(38.4)
Discuss problems?	Yes	68(73.1)	0(0)	11(78.6)	79(70.5)

	No	25(26.9)	5(100)	3(21.4)	33(29.5)
Discuss clinical skills?	Yes	60(64.5)	0(0)	8(57.1)	68(60.7)
	No	33(35.5)	5(100)	6(42.9)	44(39.3)
Written job description in this facility?	Yes, observed	42(45.2)	0(0)	2(14.3)	44(39.3)
	Yes, reported	46(49.5)	5(100)	12(85.7)	63(56.3)
	No, not seen	5(5.4)	0(0)	0(0)	5(4.5)
Opportunities for promotion in this job?	Yes	80(86)	3(60)	11(78.6)	94(83.9)
	No	13(14)	2(40)	3(21.4)	18(16.1)
Does this facility have team(s) responsible for quality assurance in this facility?	Yes	65(69.9)	3(60)	11(78.6)	79(70.5)
	No	28(30.1)	2(40)	3(21.4)	33(29.5)
Does this facility routinely carry out quality assurance activities?	Yes	66(71)	1(20)	11(78.6)	78(69.6)
	No	27(29)	4(80)	3(21.4)	34(30.4)
Is there an official record of any quality management activities carried out during the past year?	Yes	87(93.5)	4(80)	12(85.7)	103(92)
	No	6(6.5)	1(20)	2(14.3)	9(8)
Does this facility receive any external supervision, e.g., from the district, regional, zonal or national office?	Yes	89(95.7)	5(100)	13(92.9)	107(95.5)
	No	4(4.3)	0(0)	1(7.1)	5(4.5)
When was the last time a supervisor from outside this facility came here on a supervisory visit? Was it within the past 6 months or more than 6 months ago	Yes	66(71)	3(60)	7(50)	76(67.9)
	No	27(29)	2(40)	7(50)	36(32.1)
The last time during the past 6 months that a supervisor from outside the facility visited, did he or she do any of the following -					
Use a checklist to assess the quality of available health services data	Yes	23(24.7)	0(0)	7(50)	30(26.8)
	No	70(75.3)	5(100)	7(50)	82(73.2)

Discuss health workers' clinical skills based on available health services data	Yes	43(46.2)	4(80)	6(42.9)	53(47.3)
	No	50(53.8)	1(20)	8(57.1)	59(52.7)
Help the facility make any decisions based on available health services data	Yes	38(40.9)	2(40)	6(42.9)	46(41.1)
Does this facility have a functional ambulance or other vehicle for emergency transportation for clients that is stationed at this facility and that operates from this facility?	Yes	0(0)	0(0)	0(0)	0(0)
	No	93(100)	5(100)	14(100)	112(100)
Does this facility have a written plan for natural disaster emergency?	No	93(100)	5(100)	14(100)	112(100)
Organizational Support					
Are you paid a salary for this work?	Paid	91(97.8)	5(100)	14(100)	110(98.2)
	Not paid	2(2.2)	0(0)	0(0)	2(1.8)
If paid, was it recent?	Yes, >12 months	72(77.4)	4(80)	3(21.4)	79(70.5)
	No	21(22.6)	1(20)	11(78.6)	33(29.5)
Non-monetary incentives received	Time off/ vacation	1(1.1)	0(0)	1(7.1)	2(1.8)
	Uniform/ back pack	9(9.7)	0(0)	1(7.1)	10(8.9)
	Discount medicine	3(3.2)	0(0)	0(0)	3(2.7)
	Training	0(0)	0(0)	0(0)	0(0)
	None	80(86)	5(100)	12(85.7)	97(86.6)
Satisfaction with time at facility?	Very satisfied	10(10.8)	0(0)	3(21.4)	13(11.6)
	Satisfied	61(65.6)	5(100)	8(57.1)	74(66.1)
	Not satisfied	22(23.7)	0(0)	3(21.4)	25(22.3)

	Very dissatisfied	0(0)	0(0)	0(0)	0(0)
Overall level of ANC	**Suboptimal**	**11(11.8)**	**5(100)**	**3(21.4)**	**19(17.0)**
	Optimal	**82(88.2)**	**0(0.0)**	**11(78.6)**	**93(83.0)**

NB; Result 0 – 49%, Suboptimal antenatal care while result 50% and above, Optimal antenatal care

Table 2. presented the extent of professional training and supervisory support received by midwives so as to determine areas of suboptimal antenatal care. 71.4% had received ANC screening training within the last 24 months, 72.3% had been trained in ANC counseling, and 68.8% in micronutrient supplementation. Training in post-abortion family planning was 67%. Notably, secondary facility midwives had not received any recent training in these areas. Regarding PMTCT services, 90.2% provided such services, although none in secondary facilities did. Supervision varied—79.5% had their records checked, 77.7% had their work observed, and 78.6% received feedback. Administrative communication and team-based quality assurance efforts were 61.6% receiving updates and 70.5% participating in quality teams. All facilities lacked functional ambulances and disaster preparedness plans. Salaries were received by 98.2% of respondents, though only 70.5% had been paid for the past six months. 8.9% received non-monetary incentives like uniforms or discounts. Lastly, satisfaction with work time showed that 66.1% were satisfied, while 22.3% were not.

Research question 2: WHAT ARE AREAS OF QUALITY IMPROVEMENT IN ANTENATAL CARE AS PERCEIVED BY MIDWIVES IN THE RESOURCE-LIMITED SETTING IN AWKA SOUTH, LGA, ANAMBRA STATE, NIGERIA

Table 3.1 Perceived Areas of suboptimal facility resources requiring quality improvement

(n=33)

Variables	**Categories**	**Primary n(%)**	**Secondary n(%)**	**Tertiary n(%)**	**Total n(%)**
Presence of midwife at the facility at all times or officially on call	No	13(41.9)	0(0)	0(0)	13(39.4)
Cellular telephone or a private cellular phone at the facility	No	19(61.3)	1(100)	0(0)	20(60.6)
Access to email or internet via computer, mobile phones	No	24(77.4)	1(100)	0(0)	25(75.8)
Most commonly used water source for the facility	No water source	9(29)	1(100)	0(0)	10(30.3)
Water outlet from the water supply availability	Beyond 500m of facility	5(16.1)	1(100)	0(0)	6(18.2)
Water was available from that source of water at the time of the survey	No	6(19.4)	0(0)	0(0)	6(18.2)
Facility connected to the national electricity grid	No	3(9.7)	1(100)	0(0)	4(12.1)
During the past 7 days, was electricity (excluding any back-up generator) available during the times	Sometimes interrupted	31(100)	1(100)	1(100)	33(100)

when the facility was open for services, or was it ever interrupted for more than 2 hours at a time?					
Tertiary Institution; Large buildings well-designed in terms of space, layout and privacy	No	N/A	N/A	1(100)	N/A
Secondary health facilities: Mid-sized, one-storey building with adequate space	No	N/A	1(100)	N/A	N/A
Primary health facility: One storey building, well-ventilated	No	27(87.1)	N/A	N/A	N/A
Tertiary Institution; Ultrasound and other diagnostic tools	No	N/A	N/A	0(0)	N/A
Secondary facility; Ultrasound, syringes, infusion and infusion set and other basic vital tools	No	N/A	0(0)	N/A	N/A
Primary facility; BP apparatus, thermometer, patient cots, syringes, infusion and infusion set, guidelines for pregnancy and child management	No	7(22.6)	N/A	N/A	N/A
Tertiary Institution; Human resources depend on the specific context and the number of pregnant women seeking care	No	N/A	N/A	0(0)	N/A
Secondary Institution; One or more midwives	No	N/A	1(100)	N/A	N/A
Primary health facility; At least one midwife	No	2(6.5)	N/A	N/A	N/A
Overall suboptimal facility score requiring improvement		31(93.9)	1(3.03)	1(3.03)	33(99.93)

Table 3.1. identified specific facility resource gaps across primary, secondary, and tertiary facilities. Among the 33 facilities, 39.4% lacked midwives at all times or on call. Telecommunication was poor, with 60.6% lacking cellular phones and 75.8% lacking internet access. (30.3%) of the health facilities had no water source, and 18.2% accessed water from beyond 500 meters. Grid electricity was unavailable in 12.1% of cases, and all facilities experienced power interruptions during service hours. Only 12.1% of primary facilities met ideal ventilation and structural standards. Additionally, 27.3% of primary facilities lacked essential tools like BP apparatus and guidelines. The secondary facility notably lacked midwives who were officially on duty at all times or on call. The overall score of facility resources that require improvement were 93.9% for primary health facilities and 3.03% for secondary and tertiary health facilities respectively.

Table 3.2 Areas of suboptimal antenatal care delivery requiring quality improvement.

(n=33)

Variables	Categories	Primary n(%)	Secondary n(%)	Tertiary n(%)	Total n(%)
Did the midwife worker greet the client (and others present) in a friendly and respectful manner?	No	60(64.5)	4(80)	10(71.4)	74(66.1)
Did the midwife worker introduce her/himself and title (midwife, nurse, etc.)	No	58(62.4)	4(80)	12(85.7)	74(66.1)
Did the midwife call the client by her appropriate name or appropriate title?	No	18(19.4)	0(0)	9(64.3)	27(24.1)
Did the midwife ask about or the client mention any of the following facts?					
Client's age	No	55(59.1)	2(40)	8(57.1)	65(58)
Medication the client is taking	No	19(20.4)	0(0)	8(57.1)	27(24.1)
Date that client's last menstrual period began	No	22(23.7)	0(0)	8(57.1)	30(26.8)
Prior pregnancies	No	62(66.7)	4(80)	10(71.4)	76(67.9)
Number of prior pregnancies	No	44(47.3)	2(40)	10(71.4)	56(50)
Did the midwife or client discuss any of the following complications for prior pregnancies?					
Heavy bleeding during or after delivery	No	70(75.3)	4(80)	11(78.6)	85(75.9)
Anemia	No	41(44.1)	5(100)	10(71.4)	56(50)
High blood pressure	No	74(79.6)	5(100)	14(100)	93(83)
Convulsions	No	93(100)	5(100)	14(100)	112(100)
Multiple pregnancies (twins or above)	No	75(80.6)	4(80)	13(92.9)	92(82.1)
Prolonged labour	No	78(83.9)	4(80)	13(92.9)	95(84.8)
Caesarean section	No	87(93.5)	4(80)	14(100)	105(93.8)
Assisted delivery (forceps, ventouse)	No	80(86)	4(80)	13(92.9)	97(86.6)
Prior neonatal death (death of baby less than 1 month old)	No	77(82.8)	5(100)	11(78.6)	93(83)

Prior stillbirth (baby born dead that does not breathe or cry)	No	74(79.6)	5(100)	12(85.7)	91(81.3)
Prior abortion/miscarriage (loss of pregnancy)	No	72(77.4)	2(40)	14(100)	88(78.6)
Did the midwife ask about or the client mention any of the following for current pregnancy?					
Vaginal bleeding	No	80(86)	2(40)	11(78.6)	93(83)
Fever	No	31(33.3)	1(20)	9(64.3)	41(36.6)
Headaches or blurred vision	No	55(59.1)	1(20)	10(71.4)	66(58.9)
Swollen face or hands	No	46(49.5)	1(20)	11(78.6)	58(51.8)
Convulsions or loss of consciousness	No	93(100)	5(100)	14(100)	112(100)
Severe difficulty breathing	No	77(82.8)	3(60)	11(78.6)	91(81.3)
Persistent cough for 2 weeks or longer	No	78(83.9)	3(60)	14(100)	95(84.8)
Severe abdominal pain	No	78(83.9)	5(100)	12(85.7)	95(84.8)
Foul smelling discharge	No	71(76.3)	5(100)	10(71.4)	86(76.8)
Frequent or painful urination	No	53(57)	3(60)	9(64.3)	65(58)
Whether the client has felt a decrease or stop in fetal movement.	No	93(100)	5(100)	14(100)	112(100)
If there are any other problems the client is concerned about	No	6(6.5)	0(0)	8(57.1)	14(12.5)
Did the midwife wash his/her hands with soap or use alcohol hand rub prior to examination?	No	72(77.4)	4(80)	11(78.6)	87(77.7)
Vaginal bleeding					
Fever	No	3(3.2)	0(0)	7(50)	10(8.9)
Headaches or blurred vision	No	73(78.5)	2(40)	12(85.7)	87(77.7)
Swollen face or hands	No	19(20.4)	0(0)	2(14.3)	16(14.3)
Convulsions or loss of consciousness	No	9(9.7)	0(0)	9(64.3)	18(16.1)
Severe difficulty breathing	No	4(4.3)	0(0)	7(50)	11(9.8)
Persistent cough for 2 weeks or longer	No	4(4.3)	0(0)	7(50)	11(9.8)
Severe abdominal pain	No	22(23.7)	1(20)	7(50)	30(26.8)

Foul smelling discharge	No	46(49.5)	3(60)	9(64.3)	58(51.8)
Counseling and outcome					
Counseling on recommended minimum of 8 ANC visits for each pregnancy	No	91(97.8)	5(100)	13(92.9)	109(97.3)
Did the midwife use any visual aids for health education or counseling during the consultation?.	No	91(97.8)	5(100)	14(100)	110(98.2)
Did the midwife speak using easy-to-understand language for the client?	No	3(3.2)	0(0)	8(57.1)	11(9.8)
Did the midwife look at the client's health card/booklet, either before beginning the consultation or while collecting information or examining the client	No	3(3.2)	0(0)	7(50)	10(8.9)
Did the midwife write on the client's health card?	No	38(40.9)	2(40)	9(64.3)	49(43.8)
Do you have the national antenatal care guidelines available	No, not observed	91(97.8)	5(100)	14(100)	110(98.2)
Overall level of Antenatal care that require improvement based on score	Poor	70.5(83.3)	4(4.8)	10(11.9)	84(100)

Table 3.2 highlighted key service delivery deficiencies in antenatal care across facilities. Most midwives (66.1%) did not greet clients respectfully or introduce themselves. More than half (58%) failed to ask the client's age, and 67.9% did not inquire about previous pregnancies. High proportions also failed to ask about complications such as anemia (50%), high blood pressure (83%), and stillbirths (81.3%). No midwife asked about convulsions or decreased fetal movement. For current pregnancies, 83% did not inquire about vaginal bleeding, 58.9% did not ask about headaches, and 51.8% skipped questions about swelling. Only 22.3% washed hands before conducting exams. Counseling was poor—97.3% did not counsel on 8 ANC visits, and 98.2% did not use visual aids. Documentation was also weak; 43.8% did not write on health cards. Lastly, 98.2% of facilities lacked the national ANC guidelines. The overall antenatal care that require improvement were 83.3% for the primary health facilities,4.8% in the Secondary health Facility and 11.9% in the tertiary health facilities.

Table 3.3: Areas of suboptimal midwife training and update requiring improvement.

(n=112)

Variables	**Categories**	**Primary n(%)**	**Secondary n(%)**	**Tertiary n(%)**	**Total n(%)**
Relevant Training Opportunity for midwives					
ANC Screening training update	No training or update	22(23.7)	5(100)	5(35.7)	32(28.6)

Counseling for ANC training update	No training or update	21(22.6)	5(100)	5(35.7)	31(27.7)
Micronutrient supplementation training update	No training or update	25(26.9)	5(100)	5(35.7)	35(31.3)
Post-abortion family planning counseling	No training or update	26(28)	5(100)	6(42.9)	37(33)
Do you provide services for PMTCT of HIV/AIDS?	No	6(6.5)	5(100)	0(0)	11(9.8)
Supervisory support					
The last time you were personally supervised, did your supervisor do any of the following					
Check records or reports?	No	16(17.2)	5(100)	2(14.3)	23(20.5)
Observe your work?	No	16(17.2)	5(100)	4(28.6)	25(22.3)
Provide feedback on performance?	No	16(17.2)	5(100)	3(21.4)	24(21.4)
Give verbal/written feedback?	No	20(21.5)	5(100)	3(21.4)	28(25)
Provide updates on administrative issues?	No	35(37.6)	5(100)	3(21.4)	43(38.4)
Discuss problems?	No	25(26.9)	5(100)	3(21.4)	33(29.5)
Discuss clinical skills?	No	33(35.5)	5(100)	6(42.9)	44(39.3)
Written job description in this facility?	No, not seen	5(5.4)	0(0)	0(0)	5(4.5)
Opportunities for promotion in this job?	No	13(14)	2(40)	3(21.4)	18(16.1)
Does this facility have team(s) responsible for quality assurance in this facility?	No	28(30.1)	2(40)	3(21.4)	33(29.5)
Does this facility routinely carry out quality assurance activities?	No	27(29)	4(80)	3(21.4)	34(30.4)
Is there an official record of any quality management activities carried out during the past year?	No	6(6.5)	1(20)	2(14.3)	9(8)
Does this facility receive any external supervision, e.g., from the district, regional, zonal or national office?	No	4(4.3)	0(0)	1(7.1)	5(4.5)
Was it within the past 6 months	No	27(29)	2(40)	7(50)	36(32.1)
Does this facility have a functional ambulance or other vehicle for emergency transportation	No	93(100)	5(100)	14(100)	112(100)

for clients that is stationed at this facility and that operates from this facility?					
Does this facility have a written plan for natural disaster emergency?	No	93(100)	5(100)	14(100)	112(100)
Organizational support					
Are you paid a salary for this work?	Not paid	2(2.2)	0(0)	0(0)	2(1.8)
Satisfaction with time at facility?	Not satisfied	22(23.7)	0(0)	3(21.4)	25(22.3)
Overall suboptimal midwife Training and update that require improvement	Suboptimal	11(57.89)	5(26.32)	3(15.7)	19(100)

Table 3.3 showed areas of suboptimal midwife training and updates, 28.6% had no recent ANC screening training, with secondary Facility recording a 100% training gap. Similar deficits were noted for counseling (27.7%), micronutrient updates (31.3%), and post-abortion family planning (33%). PMTCT services were not offered in 9.8% of cases. Supervisory practices showed 20.5% did not have records checked, 22.3% were not observed, and 21.4% did not receive performance feedback. Clinical skill discussions were absent for 39.3%. Furthermore, 38.4% did not receive administrative updates. 4.5% lacked job descriptions, and 16.1% saw no promotion opportunities. While 70.5% had quality assurance teams, 30.4% did not engage in quality assurance activities. There was no plan for disaster and emergency response systems. Two midwives (1.8%) were not paid at all, and only 11.6% were very satisfied with their time at the facility.

The overall suboptimal midwife training and update that require improvement was 57.89% in primary health facilities, 26.32% in secondary health Facility and 15.79% in tertiary Facility.

Hypothesis 1: There is no significant difference between the antenatal care provided by midwives in resource – limited settings in Awka south LGA, Anambra state, Nigeria and areas of suboptimal antenatal care.

Table 4: Chi – Square test of Difference between antenatal care provided by midwives' and areas of suboptimal antenatal care.

Variables	Categories	Poor	Good	X^2	p-value
ANC Screening training update	Yes, in 24 months	55(68.8)	25(31.3)	5.83	0.02
	No training or update	29(90.6)	3(9.4)		
Counseling for ANC training update	Yes, in 24 months	57(70.4)	24(29.6)	3.35	0.07
	No training or update	27(87.1)	4(12.9)		
	Yes, in 24 months	53(68.8)	24(31.2)	5.00	0.03

Micronutrient supplementation training update	No training or update	31(88.6)	4(11.4)		
Post-abortion family planning counseling	Yes, in 24 months	55(73.3)	20(26.7)	0.34	0.56
	No training or update	29(78.4)	8(21.6)		
Do you provide services for PMTCT of HIV/AIDS?	Yes	75(74.3)	26(25.7)	0.30	0.58
	No	9(81.8)	2(18.2)		
Check records or reports?	Yes	68(76.4)	21(23.6)	0.46	0.50
	No	16(69.6)	7(30.4)		
Observe your work?	Yes	65(74.7)	22(25.3)	0.02	0.90
	No	19(76)	6(24)		
Provide feedback on performance?	Yes	66(75)	22(25)	0.00	1.00
	No	18(75)	6(25)		
Give verbal/written feedback?	Yes	64(76.2)	20(23.8)	0.25	0.61
	No	20(71.4)	8(28.6)		
Provide updates on administrative issues?	Yes	52(75.4)	17(24.6)	0.01	0.91
	No	32(74.4)	11(25.6)		
Discuss problems?	Yes	60(75.9)	19(24.1)	0.13	0.72
	No	24(72.7)	9(27.3)		
Discuss clinical skills?	Yes	52(76.5)	16(23.5)	0.20	0.66
	No	32(72.7)	12(27.3)		
Written job description in this facility?	Yes, observed	35(79.5)	9(20.5)	0.98	0.61
	Yes, reported	45(71.4)	18(28.6)		
	No, not seen	4(80)	1(20)		
Opportunities for promotion?	Yes	71(75.5)	23(24.5)	0.09	0.77
	No	13(72.2)	5(27.8)		
Are you paid a salary for this work?	Paid	83(75.5)	27(24.5)	0.68	0.41
	Not paid	1(50)	1(50)		

If paid, was it recent?	Yes, >12 months	61(77.2)	18(22.8)	0.70	0.40
	No	23(69.7)	10(30.3)		
Non-monetary incentives received	Time off/ vacation	2(100)	0(0)	2.87	0.41
	Uniform/ back pack	6(60)	4(40)		
	Discount medicine	3(100)	0(0)		
	Training	0(0)	0(0)		
	None	73(75.3)	24(24.7)		
Satisfaction with time at facility?	Very satisfied	12(92.3)	1(7.7)	2.54	0.28
	Satisfied	53(71.6)	21(28.4)		
	Not satisfied	19(76)	6(24)		
	Very dissatisfied	0(0)	0(0)		
Overall p-value					**0.40**

*** = significant at p<0.05**

Table 4 above shows that there was no significant difference between antenatal care provided by midwives and areas of suboptimal care. Overall p-value = 0.40. Therefore, we accepted the null hypothesis.

Hypothesis 2: There will be no significant association between the antenatal care provided by midwives in resource – limited settings in Awka south LGA, Anambra state, Nigeria and the perceived quality improvement strategies.

Table 5: Chi – Square test of Association between the perceived areas of quality improvements strategies and the antenatal care provided by the midwife.

Quality improvement Strategies	Categories	Poor antenatal care	Good antenatal care	X^2	p-value
Does this facility have team(s) responsible for quality assurance in this facility?	Yes	64(81)	15(19)	5.17	0.02*
	No	20(60.6)	13(39.4)		
Does this facility routinely carry out quality assurance activities?	Yes	59(75.6)	19(24.4)	0.06	0.81
	No	25(73.5)	9(26.5)		
Is there an official record of any quality management activities carried out during the past year?	Yes	81(78.6)	22(21.4)	9.06	<0.01*
	No	3(33.3)	6(66.7)		

Does this facility receive any external supervision, e.g., from the district, regional, zonal or national office?	Yes	81(75.7)	26(24.3)	0.63	0.43
	No	3(60)	2(40)		
Was it within the past 6 months or more than 6 months ago	Yes	55(72.4)	21(27.6)	0.87	0.35
	No	29(80.6)	7(19.4)		
Extern supervisor used a checklist to assess the quality of available health services data	Yes	19(63.3)	11(36.7)	2.98	0.09
	No	65(79.3)	17(20.7)		
Discuss health workers' clinical skills based on available health services data	Yes	40(75.5)	13(24.5)	0.01	0.91
	No	44(74.6)	15(25.4)		
External supervisor helped the facility make any decisions based on available health services data	Yes	35(76.1)	11(23.9)	0.05	0.82
	No	49(74.2)	17(25.8)		
Does this facility have a functional ambulance or other vehicle for emergency transportation	No	84(75)	28(25)	-	-
Does this facility have a written plan for natural disaster emergency?	No	84(75)	28(25)	-	-
More support from supervisor	No	22(26.2)	11(39.3)	1.73	0.19
More knowledge / updates	No	57(67.9)	19(67.9)	0	1
More supplies /stock	No	26(31)	5(17.9)	1.8	0.18
Better quality equipment / supplies	No	43(51.2)	19(67.9)	2.36	0.12
Less workload (i.e more staff)	No	23(27.4)	7(25)	0.06	0.81
Better working hours flexible time	No	9(10.7)	1(3.6)	1.32	0.25
More incentives (salary promotion holidays)	No	44(52.4)	14(50)	0.05	0.83
Transportation for referral patient	No	17(20.2)	3(10.7)	1.3	0.25
Increased security	No	6(7.1)	4(14.3)	1.32	0.25
Better facility	No	0(0)	0(0)	-	1
Infrastructure	No	0(0)	1(3.6)	3.03	0.08
Overall p-value					**0.42**

*** = significant at p<0.05**

Table 5 above shows that there was no significant association between antenatal care provided by midwives and perceived areas for quality improvement strategies. (overall p-value = 0.42). Therefore, we accepted the null hypothesis.

Discussion

Research question 1: what are areas of suboptimal antenatal care provision by midwives in resource – limited settings in Awka- South, LGA, Anambra State, Nigeria.

The findings from the study showed the extent of professional training and supervisory support received by midwives. All the facilities lacked functional ambulances and disaster preparedness and all the midwives in the secondary facility reported a suboptimal care Table (2.0). This conforms with the study conducted by Mweemba *et al*., (2021) on access barriers to maternal health services in Kaputa and Ngabwe, Zambia. They concluded that the women spent more time travelling to the facilities, had long queues and the cost of service was a problem. The findings is also in line with the study conducted by Akter *et al*., (2023) on levels and determinants of quality antenatal care in Bangladesh. They concluded that the quality of antenatal care remains poor in Bangladesh, that there is need to develop targeted interventions for different socio- demographic groups to improve the overall quality of antenatal care. Also, the study conducted by Amponah –Tabi *et al*., (2022) on quality of antenatal care and pregnancy outcomes in a tertiary hospital in Ghana, they observed that most women did not receive good quality antenatal care.

Research question 2: what are areas of quality improvement in antenatal care as perceived by midwives in the resource – limited setting in Awka South LGA, Anambra State, Nigeria.

Findings from the study showed areas of resource gaps across primary, secondary, and tertiary facilities that require quality improvement. The overall antenatal care that require improvement were 83.3% for the primary health facilities, 4.8% in the secondary health facility and 11.9% in the tertiary health facility, highlighting key service delivery deficiencies of antenatal care across facilities (Table 3.2). The overall suboptimal midwife training and update that require improvement was 57.89% in primary health facilities, 26.32% in secondary health facilities and 15.79% in tertiary facilities. Overall facility resources that require improvement were 93.9% for primary health facilities, 3.03% for secondary and tertiary health facilities respectively (Table 3.1). The study was in line with the study conducted by Khosrav *et al.,* (2022) on strategies to improve the quality of midwifery care in Iran. They concluded that policy makers should take into account both the quality and quantity of midwifery education, and promote midwifery human resources through employment. The findings also conforms to the study conducted by Limatol *et al.,* (2019) on what factors do make quality improvement work in primary health care? The factors that contributed to the process of quality improvement include awareness and attitude of leaders toward quality improvement, staff enthusiasm and multidisciplinary collaboration and a culture where quality improvement is integrated in existing responsibilities. The study was in line also with the study conducted by Manzi *et al*., (2018) on beyond coverage: improving the quality of antenatal care delivery through integrated mentorship and quality improvement at health centres in rural Rwanda. They concluded that assessment of critical danger signs improved under mentorship, enhanced supervision for healthcare and quality improvement.

Hypothesis 1: There would be no significant difference between the antenatal care provided by midwives in resource – limited settings in Awka south LGA, Anambra state, Nigeria and areas of suboptimal antenatal care.

The result showed that there was no significant difference between antenatal care provided by midwives and areas of suboptimal care. Overall p – value = 0.40 (Table 4). This is not in line with study conducted by van Pelt *et al*., (2020), who identified differences in the quality of antenatal care provision and the level of motivation between healthcare workers, and reported that midwives complained about the poor working conditions. Also, the study by Nuamah *et al.,* (2019) on access and utilization of maternal healthcare in Ghana concurs with the study, they noted suboptimal access and utilization of maternal healthcare in rural districts of Ghana, and suggested the need for tailored intervention to improve maternal healthcare utilization for mothers in this and other settings.

Hypothesis 2: There would be no significant association between the antenatal care provided by midwives in resource – limited settings in Awka south LGA, Anambra state, Nigeria and the perceived quality improvement strategies.

The result showed that there was no significant association between antenatal care provided by midwives and perceived areas for quality improvement strategies, (overall p – value = 0.42) (Table 5). In the researchers' opinion, this result implies

that there is need for external supervisors to be visiting the facilities in order that the midwives services be monitored, and support given where necessary. Limatol *et a*l., (2019) opined that making quality improvement a success requires action at four levels. At individual level, leadership attributes can create an internal quality environment, at team level staff enthusiasm and collaboration can be triggered through engaging and tasking everyone in the quality improvement process and a shared vision of what quality should look like; at organizational level, quality improvement should be integrated in planned activities, ensuring financial and human resources; and quality improvement can be encouraged when it is implemented by the wider health system as part of national accreditation programs.

Conclusion

The findings from the study revealed a substantial disparity in resource facility levels, some midwives at primary health facilities lacked resources like water, electricity and telephone. There were no functional ambulances or vehicles for emergency transportation stationed across all health facilities, which means at the face of emergency situation, movement will be very difficult. Also, there was no significant association between the antenatal care provided by the midwives in resource – limited settings and their perceived quality improvement strategies.

Recommendations

1. Antenatal care service delivery should be planned to reduce waiting time for the clients and cost of service should be affordable for the pregnant women.
2. Training and retraining of midwives should be on going in order for them to be up to date with current best practices.
3. Primary health care facilities to be adequately equipped
4. Regular supervision of midwives practices by quality improvement team.
5. Written plan for natural disaster emergency should be made available across all health care facilities.
6. Antenatal care guideline to be made available across all health care facilities.

References

1. Akter,E., Hossain, A.T., Rahman, A.E., Tanwi, T.S., Nusrai, N., Nahsr, Q., Arifeen S.E., and Chowdhury, M.E.,(2023).Levels and determinants of quality Antenatal care in Bangladesh: Evidence from the Bangladesh Demographic and Health Survey. Retrieved from https://doi.org.10,1371/journal .pone,0269767 on 19th june,2023.

2. Amponsah–Tabi, S., Dassa, E.T., Asubouteng, G.O., Ankobea, F., Annan, J.K., Senu, E., Opoku, S., Opoku, E., Opare – Addo, H.S., (2023). An assessment of the quality of Antenatal care and pregnancy outcomes in a tertiary hospital in Ghana. Plos ONE 17(10) :e0275933. Retrieved from https://doi.eng/10.1371/journal.pone.0275933 on 18th June,2023.

3. Demographic Health Survey (2022). Service provision assessment survey, inventory Questionnaire. United State Agency for International development. Retrieved from https://www.SPA_Combined_QRE_EN on 23rd October,2023.

4. Islam, M. M,. and Masud, M.,S.,(2018).Determinants of frequency and contents of Antenatal care visits in Bangladesh:Assessing the extent of compliance with the WHO recommendations. PLos ONE journal 13(9): eo204752. Retrieved from https://doi.org/10.1371/journal.pone.0204752 on 19th June,2023.

5. Khossravy,S.,Babaey,F.,Abedi,P.,Kalahroodi,Z.M., and Hajimirzale,S.S.,(2022).Strategies to Improve the quality of midwifery care and developing midwife- centred care in Iran: analyzing the attitudes of midwifery experts.Journal of BMC Pregnancy and childbirth 22 (40).

6. Kyei,N.N.A.,Chansa,C., and Gabbrysch,S.,(2022).Quality of Antenatal care in Zambia : a National assessment. Journal of BMC pregnancy and childbirth. 12 (151). Retrieved from http://www.biomedcentral.com/147-2393/12/151 on 19th June,2023.

7. Limato,R.,Tumbelaka,P.,Ahmed,R.,Nasir,S.,Syafruddin,D., Ormel,H.,Kumar,M.B.,Taegtmeyer,M., and Kok,M.,(2019). What factors do make quality improvement work.PLos ONE 14 (12):e0226804. Retrieved from https://doi.org/10.371/journal.pone.0226804 on 17th July,2023.

8. Manzi,A.,Nyirazinyoye,L.,Ntaganira,J.,Magge,H.,Bigirimana,E.,Mukanzabikeshimana,L., Hirchhorn, L.R., and HedtGauther, B.,(2018).Beyound coverage: improving the quality of Antenatal care delivery through integrated mentorship and quality improvement at health centres in rural Rwanda. Journal of BMC health services Research 18 (136). Retrieved from https://doi.org/10.1186/s 12913-018-2939-7 on 17th July,2023

9. Mgawadere,F.,Smith,H.,Asfaw.,A., van den Broek., N., & Lambert.J., (2019). There is no time for knowing each other: Quality of care during child birth in a low – resource settings. Journal of

Midwifery:https://doi.org/10.1016/J.midw.2019.04.00. /www.elsevier.com/locate/midw.

10. Mweemba, C., Mapulanga, M., Jacobs, C., Katowa–Mukwato, P., and Maimbolwa, M.,(2021). Access barriers to maternal healthcare services in selected hard –to-reach areas of Zambia :a mixed method design. PanAfrican medical journal, 40 (4). Retrieved from www.panafrican-med-journal.com//content/article/40/4/fill.
11. Nuamah,G,B.,Agyei –mBaffour,P.,Mensah,K,A.,Boateng,D.,Quansah.D.D., and Addai – Donkor,K.,(2019).Access and utilization of maternal healthcare in rural district in the forest belt of Ghana. Journal of BMC pregnancy and childbirth 19 (6). Retrieved from https://doi.org/10.118/s/2884-018-2/59-5 on 19th june,2023.
12. Omotosho,A.,Sodeinde,K.,Abolurin,O.,Adekoya,A., and Abiodum,O.,(2022).How effective is Antenatal care in preparing mothers for newborn care? An exploratory survey of Lactating women in a rural Nigerian district. Journal of heliyon 8 (2022). Retrieved from https://doi.org/10.1016/j.heliyon.2022.e11650 on 18th june,2023.
13. Sen,K,K.,James,A.R., and Bari,W.,(2023).Women's multidimensional empowerment index and essential newborn care practice in Bangladesh :The mediating role of skilled Antenatal care follow –ups.PLos ONE 18 (2) :eo281369.Retrieved from http://doi.org/10.1371/journal. Pone.0281369 on 19th June,2023.
14. Thomas,L.,(2020).Cross – Sectional study/Definition,Uses & Examples. Retrieved from www.scribbr,com on 23rd January,2024.
15. Turner,A.G.,Angeles,G.,Tsui,A.O.,Wilkinson, M., and Magnani, R.,(2001).Sampling manual for facility surveys for population, maternal; health, Child health and STD programs series, NO: 3 Measure evaluation, Carolina population centre, University of North Carolina at Chapel Hill.
16. Van Pelt, S., Massar, K.,van der Een, Shields–Zeeman, L., de Wit, J.,F., and Ruiter, R., A.,C.,(2020)."If you don't have enough equipment, you are not going to Provide quality services": Healthcare workers' perceptions on improving the quality of Antenatal care in rural Tanzania. International journal of Africa Nursing Sciences 13 (100232). Retrieved from https://doi.org/10.1016/j.ijans.2020.100232 On 18th june,2023.