

Antenatal-care knowledge among women of reproductive age group in Ido Ekiti, Nigeria



Damilola A. Jesuyajolu, MBBS; Peace Ehizibue, MBBS; I. Nnamdi Ekele, MBBS; Jamike Ekennia-Ebeh, MBBS; Abdulqudus Ibrahim, MBBS; Obinna Ikegwuonu, MBBS

BACKGROUND: Maternal mortality plagues much of the low- and low-middle-income countries. There were 303,000 maternal deaths in 2015, representing an overall global maternal mortality ratio of 216 maternal deaths per 100,000 live births. 99% of all maternal deaths occur in developing countries. The knowledge of antenatal care is an important factor affecting maternal mortality rates.

OBJECTIVE: This study aimed to assess the extent of knowledge of antenatal-care services among women of reproductive age in Ido Ekiti, a rural town in South West Nigeria.

STUDY DESIGN: This cross-sectional study was conducted among 299 women in the reproductive age group, ie, from the ages of 18 to 49 years. Data were collected with a set of self-administered questionnaires and analyzed using SPSS version 25. This study was conducted in Ido Ekiti, a town in the Ido-Osi local government area.

RESULTS: Most respondents were between 31 and 40 years of age. Most respondents (96%) were educated. 95.6% of the participants in this study were aware of antenatal-care services. 98.7% of the respondents acknowledged that weight and height measurements, abdominal examination, blood tests, and administration of folic acids were carried out during antenatal-care visits. 97.3% had excellent knowledge of the service.

CONCLUSION: Most respondents were aware of antenatal care and had excellent knowledge of its components. This is indeed a positive finding and is likely because of the high literacy levels, access to electronic media, and the location of 3 public health facilities in the town. Continuous education of women by relevant stakeholders and policymakers on antenatal care should be ensured to maintain the current state and replicate similar findings in other rural areas across Africa.

Keywords: Ekiti, gynecology, Hausa, Igbo, obstetrics, primary healthcare center, public health, study, West Africa, Yoruba

Introduction

Maternal mortality has been a pervasive problem in developing countries; it occurs mostly owing to pregnancy-related complications because of lack of good care during pregnancy. Maternal mortality plagues much of the low- and low-middle-income countries. There were 303,000 maternal deaths in 2015, representing an overall global maternal mortality ratio of 216 maternal deaths per 100,000 live births.¹ A total of 99% of all maternal deaths occur in developing countries.² Between 1990 and 2015, however, the maternal mortality

worldwide declined by approximately 44%. One of the reasons for this was good maternity health services.³

The knowledge of antenatal care (ANC) among pregnant women has played a major role in the reduction of maternal and perinatal mortality in women of reproductive age. Recent analysis shows that the overall ANC coverage stood at 61%.⁴ A cornerstone of maternal and perinatal healthcare has been identified as ANC, and it will facilitate the achievement of the Millennium Development Goal 5 (MDG 5), which focuses on improving maternal

mortality.⁵ ANC is one of the means to reduce maternal mortality and morbidity with interventions and information that promote the health, wellbeing, and survival of mothers and their babies.⁶

Although steadily declining, the maternal mortality ratio in Nigeria remains high at 814 deaths per 100,000 live births.⁷ It is apparent—through the elevated mortality rates—that the lack of knowledge of ANC services is an issue of immense importance in Nigeria. Problems such as lack of knowledge, obtaining money for treatment, distance to the health facility, and

From the Afe Babalola University College of Medicine and Health Sciences, Ekiti, Nigeria

The authors report no conflict of interest.

No external funding was obtained for this work.

Patient consent is not required because no personal information or details are included.

Cite this article as: Jesuyajolu DA, Ehizibue P, Ekele IN, et al. Antenatal-care knowledge among women of reproductive age group in Ido Ekiti, Nigeria. *Am J Obstet Gynecol Glob Rep* 2022;2:100073.

Corresponding author: Damilola A. Jesuyajolu, MBBS djesuyajolu@gmail.com

2666-5778/\$36.00

© 2022 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>) <http://dx.doi.org/10.1016/j.xagr.2022.100073>

AJOG Global Reports at a Glance

Why was this study conducted?

There is a pressing need to identify the level of knowledge of antenatal care among women of reproductive age group in rural areas all around Nigeria. This will help to draw attention to the areas where health workers should focus on when educating women.

Key findings

Most respondents (96%) were educated. 95.6% of the participants in this study were aware of antenatal-care services.

What does this add to what is known?

This study produces encouraging results, and it gives credence to the idea that if the knowledge of antenatal care among the rural populations is increased, utilization of these services will also increase, leading to an increment in safe deliveries and reduction in maternal mortality.

having to take transport are some of the many difficulties stated by women when describing the difficulties with accessing healthcare.⁸ Although ANC services are relatively cheap and accessible in most parts of Nigeria, most women initiate ANC late in pregnancy. Approximately 62% and 12% of these women initiate ANC in the second and third trimesters, respectively.⁹

Tandu-Umba et al¹⁰ showed that bad outcomes in pregnancy are influenced by risk factors (pathologic or nonpathologic) that can be detected at the first antenatal visit. In a study in Osun, Nigeria, Onasoga et al¹¹ identified the lack of knowledge about existing services in ANC, in addition to others, as one of the major factors influencing the utilization of ANC services. In another descriptive cross-sectional study, which was carried out in February 2012 in the Ilorin East Local Government Area, Adewoye et al¹² found that 87.7% of the respondents were aware of ANC, out of which most of them had good knowledge.

There is a pressing need to identify the level of knowledge of ANC among women in the reproductive age group in rural areas all around Nigeria. This will serve as baseline knowledge and will help to draw attention to the areas where health workers should focus when educating women about maternal health to improve the utilization of these services. This is why our objective is to assess the knowledge of the ANC services among women of reproductive

age group in Ido Ekiti, a rural area in South West Nigeria.

Materials and Methods**Data source**

This study was conducted in Ido Ekiti, a town located in the Ido-Osi local government area. The town consists of 2 wards and 22 settlements. There are 3 health facilities in Ido Ekiti; a basic health center, a comprehensive health center, and a federal teaching hospital. The population of people in Ido-Osi according to the 2016 projection is 218,100. According to the National Reproductive Health Policy and Strategy, 22.6% of this projection represents the population of women within the reproductive age group.

Ethical approval was obtained from the Ethics and Review Committee of the Federal Teaching Hospital, Ido Ekiti. We adhered to the principles embodied in the Declaration of Helsinki. Informed consent was obtained from the respondents. The study population included all women in the reproductive age group (18–49 years) with children <5 years in Ido Ekiti, Ekiti State, Nigeria.

A descriptive cross-sectional study design was used. Data were generated from the respondents through the administration of a semistructured, interviewer-administered questionnaire. A multistage sampling technique (4 stages) as follows was used to select the eligible participants:

Stage 1: One ward was selected by a simple random sampling technique using a table of random out of the 2 wards in Ido Ekiti. Ido ward 2 was selected.

Stage 2: Simple random sampling using a table of random was used to select 4 settlements for the study, including Oke-Isoko, Ijemu, Inisa, and Isolo. Equal allocation was used to determine the number of respondents to be obtained from each settlement. A number of 75 each was arrived at.

Stage 3: One street was selected in each of the settlements by simple random sampling using all the streets in the settlement as sampling frames.

Stage 4: The houses were numbered, and systematic random sampling was employed to select the houses to visit. After the first house was determined, every third house thereafter was selected, and all the women that satisfied the eligibility criteria in each of the houses were included for the study until the required number of respondents were obtained.

The Fisher formula for sample size determination was used, and 10% of (n) was added to cater for improperly filled questionnaires.

A sample size of 299 women of the reproductive age group who qualified for inclusion criteria was selected to participate in the study. The sample size of 299 was also based on a 95% confidence level and a 5% margin of error.

All women between the ages of 18 and 49 years, women without children or whose last child is <5 years, women who gave consent for the study, and women willing to participate were included in the study. Women outside of the reproductive age group, women whose last child is more than 5 years old, women who were visitors, and women who had not spent up to a year in Ido Ekiti were excluded.

Data collection was subject to strict controls, and procedures were followed precisely. The participants were met in their different workplaces and homes. The involved settlements were covered in a day. Many women spoke their native language, including Yoruba, Igbo, or Hausa. We had interviewers

fluent in these languages who collected data from the respondents. Patients or the public were not involved in the design, conduct, reporting, or dissemination plans of our research.

Data analysis

The questionnaires were checked to ensure that all the sections were filled. The data were extracted from the questionnaires and analyzed using SPSS version 25 (IBM Corp, Armonk, NY). The data were represented in percentages and frequency tables. 299 respondents were sampled, and 297 questionnaires were filled and returned, which represented a 99% response rate. None of the women declined our request to participate. However, 2 women stopped during the interview, leading to inadequately filled questionnaires.

The respondents were first asked whether they were aware of ANC. Those who were aware were asked further questions to assess the extent of their knowledge. A scoring system was used for assessing the knowledge of the respondents by awarding marks on the basis of their response to a question that gave them 10 options to choose from (each of the 10 options was an activity carried out during an antenatal visit). They picked from the 10 options, and the grading of scores was based on the total scores obtained from the marks awarded to the questions. Every correct response was awarded a maximum of 1 mark, whereas an incorrect response attracted 0 marks. The total obtainable marks were 10. The total scores obtained were graded into 3 levels, namely poor, fair, and good knowledge. If the respondents were able to answer 1 to 4 questions correctly of 10, it meant they had poor knowledge, 5 to 7 correct answers represented fair knowledge, and 8 to 10 correct answers meant good knowledge. Data on the demographics, the time they believe ANC should be assessed, and the importance of ANC were also collected, analyzed, and tabulated.

Results Demographics

A demographic description of the participants, including the age, occupation, level

TABLE 1
Demographic description of respondents

Variable	Frequency N=297	Percentage
Age group		
<20 y	3	1.0
21–30	93	31.3
31–40	143	48.1
>40	58	19.5
Occupation		
Unemployed	25	8.4
Farming	19	6.4
Business	145	48.8
Civil service	78	26.3
Others	30	10.1
Variable	Frequency N=297	Percentage
Education		
None	12	4.0
Primary	22	7.4
Secondary	114	38.4
Tertiary	149	50.2
Religion		
Islam	32	10.8
Christianity	263	88.6
Others	2	0.7
Marital status		
Single	10	3.4
Married	278	93.6
Divorced	4	1.3
Separated	4	1.3
Widowed	1	0.3
Ethnic group		
Hausa	22	7.4
Igbo	32	10.8
Yoruba	230	77.4
Others	13	4.4
Number of children		
1	38	12.8
2	97	32.7
3	75	25.3
4	43	14.5
≥5	44	14.8
Husband education		
None	11	3.8
Primary	19	6.6
Secondary	86	30.0
Tertiary	181	63.2
Husband occupation		
Unemployed	12	4.2
Farming	28	9.8
Business	126	44.1
Civil service	100	35.0
Others	20	7.0

Jesuayajolu. Antenatal-care knowledge among women of reproductive age group in Ido Ekiti, Nigeria. Am J Obstet Gynecol Glob Rep 2022.

of education, religion, marital status, ethnic group, number of children, level of education of the husband, and the husband's occupation, is described in Table 1.

48.1% of the correspondents were between the ages of 31 and 40 years, and 48.8% of them were businesswomen. Most of the respondents sampled

TABLE 2
Awareness of antenatal care

Awareness	Frequency	Percent
Yes	284	95.6
No	13	4.4
Total	297	100

Jesuyajolu. Antenatal-care knowledge among women of reproductive age group in Ido Ekiti, Nigeria. *Am J Obstet Gynecol Glob Rep* 2022.

TABLE 3
Time of accessing antenatal care service

First antenatal	Frequency	Percent
1–3 mo	138	46.5
4–6 mo	114	38.4
7–9 mo	33	11.1
Never	12	4.0
Total	297	100.0

Jesuyajolu. Antenatal-care knowledge among women of reproductive age group in Ido Ekiti, Nigeria. *Am J Obstet Gynecol Glob Rep* 2022.

attended tertiary institutions, and 88.6% of them practiced Christianity, making it the dominant religion. 3.4% of the respondents were single, 93.6% were married, 1.3% were divorced, and 0.3% were widows. The predominant ethnic group was Yoruba (77.4%).

Awareness of antenatal-care

The data on the awareness of ANC among participants are presented in

Table 2. The data indicated that 4.4% of the women were not aware of ANC, whereas most of them, with a figure of 95.6%, were aware.

Timing of antenatal-care service

As demonstrated in Table 3, 46.5% of the respondents thought that pregnant women should access ANC services between the first and third months, 38.4% believed that they should access

these services between 4 and 6 months, 11.1% of them suggested between 7 and 9 months, and 4.0% of the respondents believed that pregnant women did not need ANC.

Activities carried out during antenatal care

The participants were given 10 options of activities that were carried out during ANC to choose from. The resulting data are presented in Table 4. 98.7% of the respondents acknowledged that weight and height measurements, abdominal examination, blood tests, and administration of folic acids were carried out during ANC. A similarly large percentage (97.6) agreed that urine tests and administration of antimalarial medications were essential parts of antenatal visits. 97.3% and 96% of respondents were aware that tetanus toxoid administration and human immunodeficiency virus test counseling, respectively, were also services that could be offered during these visits. Although 8.4% of the respondents were not aware that education on signs of pregnancy complications was given during ANC visits, 98.0% of them were aware that blood pressure monitoring was done routinely.

Assessing the knowledge of antenatal care

The knowledge of ANC was scored on the basis of the responses given in

TABLE 4
Activities carried out during antenatal care service

Activities	Yes	Frequency (%)	No	Frequency (%)	Total	Total (%)
Weight and height measurement	293	98.7	4	1.3	297	100.0
Urine test	290	97.6	7	2.4	297	100.0
Abdominal examination	293	98.7	4	1.3	297	100.0
Antitetanus injection administration	289	97.3	8	2.7	297	100.0
Administration of iron/folic acid	293	98.7	4	1.3	297	100.0
Administration of Antimalaria	290	97.6	7	2.4	297	100.0
HIV test counseling	285	96.0	12	4.0	297	100.0
Signs of pregnancy complication	272	91.6	25	8.4	297	100.0
Blood pressure monitoring	291	98.0	6	2.0	297	100.0
Blood test	293	98.7	4	1.3	297	100.0

Jesuyajolu. Antenatal-care knowledge among women of reproductive age group in Ido Ekiti, Nigeria. *Am J Obstet Gynecol Glob Rep* 2022.

TABLE 5
Knowledge scoring of the activities carried out during antenatal care

Activities carried out	Frequency	Percentage
0–4 (Poor knowledge)	08	2.8
5–7 (Fair knowledge)	00	0.0
8–10 (Good knowledge)	276	97.2
Total	284	100.0

Jesuyajolu. Antenatal-care knowledge among women of reproductive age group in Ido Ekiti, Nigeria. *Am J Obstet Gynecol Glob Rep* 2022.

Table 4. Those who chose 4 options or below had poor knowledge, those who scored between 5 and 7 had fair knowledge, and those who had above 8 selected options had good knowledge. The findings of the knowledge assessment are presented in **Table 5**. On the basis of the 10-mark scoring of their knowledge of ANC, it was shown that among the respondents that were aware of ANC, 2.7% of them had poor knowledge about the activities carried out during the service, whereas 97.3% had good knowledge.

Discussion

Principal findings

In our study, most of the women that were surveyed (95.6%) were aware of ANC; close to half of the women sampled believe that women should access ANC services in the first trimester of pregnancy, whereas a slightly lesser percentage chose the second trimester. We had positive findings with regard to knowledge, as over 90% of the women sampled knew each activity carried out during ANC, and over 97% had excellent knowledge of ANC.

Results

This high level of knowledge and awareness is consistent with other studies from rural areas in Western Africa.^{12,13} This study produced higher scores than a similar study conducted in Ilorin, which observed that over two-thirds of the respondents (87.7%) were aware of ANC services¹²; it also showed higher scores than a study conducted in Ghana that recorded 79.2% of women sampled as having good knowledge.¹³

Clinical implications

We believe that the reason behind the high level of awareness is the proximity of the health institutions to the residential areas of the women studied. There are 3 health facilities as follows in different areas in Ido Ekiti: a basic health center, a comprehensive health center, and a federal teaching hospital. The presence of these health centers in different parts of the town likely contributed to how they heard about ANC. Also, the high literacy levels and access to electronic media such as television and radio might be contributory factors to the high level of awareness among the respondents.

Knowledge of the activities of ANC is important¹⁴ it enables women to see the benefits of ANC and be aware of the care they receive. It also allows them to ensure that they are getting adequate service, no matter the level of the hospitals that they go to. It is important to note, however, that sometimes, good knowledge does not always imply that there would be good utilization of ANC.¹⁵

Lack of proper knowledge on when to go for an antenatal could lead to women starting care in the later stages of pregnancy, further putting them at risk of easily preventable complications. The World Health Organization (WHO), through its 2002 ANC model known as “focused ANC,” recommends that the first visit should be in the first trimester,¹⁴ and it has also been recommended nationally by the Nigerian Ministry of Health. Despite this, however, many women start ANC late in pregnancy for various reasons, with 62% and 12% starting in the second and third trimesters, respectively.⁹

The observation that most women in our study acknowledged that pregnant women should access ANC services for the first time during pregnancy within the first 3 months points toward a promising future for attaining the best reproductive health practices, as set out by the WHO.¹⁶ However, some of our respondents did not have the correct knowledge; this can serve as a major reason for providing education at the local, state, and national levels. We educated the women who did not have correct knowledge on the right time to access ANC after data collection.

Research implications

These are encouraging results and give credence to the idea that if knowledge of ANC among rural populations of developing countries is increased, the rate of utilization of these services will also increase, consequently leading to an increment in safe deliveries and reduction in maternal mortality. More qualitative studies with a more representative sample size across the country and/or continent regarding the utilization of ANC and factors affecting utilization will be needed; these will help establish if knowledge truly affects ANC and if the problems lie with the utilization of ANC and not merely the extent of knowledge.

Strengths and limitations

This study’s weakness is that it mainly focuses on assessing the knowledge of ANC; it leaves out the questions of the utilization rates of ANC and the factors affecting them. The small sample size and size of the community also make it hard to generalize our findings across the different regions of the country and/or continent. We had some limitations with this study. Many of the women spoke their native languages, ie, either Yoruba, Igbo, or Hausa. We had interviewers fluent in these languages who collected data from the respondents. Because the questionnaires were interviewer-administered, there was no way to confirm the responses of the women sampled; a few of them may have given false answers hoping to receive incentives. Response bias may have led to the

overestimation of the knowledge of ANC services. The patients or public were not involved in the design, conduct, reporting, or dissemination plans of our research. In the next phase of our study, however, we intend to involve them.

Conclusion

The study was educative and challenging, and it serves as a basis for further studies in other geographic areas in sub-Saharan Africa. Women of reproductive age in Ido Ekiti have very good knowledge of ANC services—a finding which will help the relevant stakeholders identify the factors that have resulted in this positive development and will enable them to replicate that among other rural areas across the continent. Most maternal and neonatal deaths can be prevented if adequate knowledge of the benefits of ANC is made available to all women of the reproductive age group. ■

REFERENCES

- Ozimek JA, Kilpatrick SJ. Maternal mortality in the twenty-first century. *Obstet Gynecol Clin North Am* 2018;45:175–86.
- Buddeberg BS, Girard T. Geburtshilfe: hypertensive Erkrankungen in der Schwangerschaft. *Anesthesiol Intensivmed Notfallmed Schmerzther* 2017;52:184–95.
- Maine D, Wardlaw TM, Ward M, et al. Guidelines for Monitoring the Availability and Use of Obstetric Services. 1997. Available at: <https://www.publichealth.columbia.edu/sites/default/files/pdf/unguidelinesen.pdf>.
- World Health Organization. Trends in maternal mortality: 1990 to 2015. 2017. Available at: <https://www.afro.who.int/sites/default/files/2017-05/trends-in-maternal-mortality-1990-to-2015.pdf>. Accessed January 22, 2022.
- World Health Organization. Millennium Development Goals (MDGs). 2018. Available at: [https://www.who.int/news-room/factsheets/detail/millennium-development-goals-\(MDGs\)](https://www.who.int/news-room/factsheets/detail/millennium-development-goals-(MDGs)). Accessed January 22, 2022.
- Onasoga OA, Afolayan J, Oladimeji B. Factors influencing utilization of antenatal care services among pregnant women in Ife Central Lga Osun State Nigeria. *Advances in Applied Science Research* 2012; 3 :1309–1315.
- United Nations Children's Fund Nigeria. Situation of women and children in Nigeria. 2022. Available at: <https://www.unicef.org/nigeria/situation-women-and-children-nigeria>. Accessed January 22, 2022.
- Partnership for Maternal, Newborn and Child Health. About PMNCH. 2021. Available at: <https://pmnch.who.int/>. Accessed January 22, 2022.
- Aliyu AA, Dahiru T. Predictors of delayed antenatal care (ANC) visits in Nigeria: secondary analysis of 2013 Nigeria Demographic and Health Survey (NDHS). *Pan Afr Med J* 2017;26:124.
- Tandu-Umba B, Mbangama MA, Kamongola KMB, et al. Pre-pregnancy high-risk factors at first antenatal visit: how predictive are these of pregnancy outcomes? *Int J Womens Health* 2014;6:1011–8.
- Onasoga OA, Afolayan J, Oladimeji B. Factors influencing utilization of antenatal care services among pregnant women in Ife Central Lga Osun State Nigeria; 2012. Available at: https://www.researchgate.net/publication/308698442_Factors_influencing_utilization_of_antenatal_care_services_among_pregnant_women_in_Ife_Central_Lga_Osun_State_Nigeria. Accessed January 22, 2022.
- Adewoye KR, Musa IO, Atoyebi OA, Babatunde OA. Knowledge and Utilization of Antenatal Care Services by Women of Child-Bearing Age in Ilorin-East Local Government Area, North Central Federal Republic of Nigeria. *International Journal of Science and Technology* 2013; 3: 188–193.
- Afaya A, Azongo TB, Dzomeku VM, et al. Women's knowledge and its associated factors regarding optimum utilisation of antenatal care in rural Ghana: a cross-sectional study. *PLoS One* 2020;15:e0234575.
- Couillet M, Serhier Z, Tachfouti N, Elrhazi K, Nejari C, Perez F. The use of antenatal services in health centres of Fès, Morocco. *J Obstet Gynaecol* 2007;27:688–94.
- Rosliza AM, Muhamad MJ. Knowledge, attitude, and practice on antenatal care among Orang Asli women in Jempol, Negeri Sembilan. *Malays J Public Heal Med* 2011;11:13–21. Accessed May 6, 2022. Available at: https://www.researchgate.net/publication/311428117_KNOWLEDGE_ATTITUDE_AND_PRACTICE_ON_ANTENATAL_CARE_AMONG_ORANG_ASLI_WOMEN_IN_JEMPOL_NEGERI_SEMBILAN.
- World Antenatal Care Trial Research Group. WHO antenatal care randomized trial: manual for implementation of the new model. 2002. Available at: http://apps.who.int/iris/bitstream/handle/10665/42513/WHO_RHR_01.30.pdf?sequence=1. Accessed May 6, 2022.