Institutional-Based Study on the Knowledge of Appropriate Timing, Time and Predictors of Initiation of Antenatal Care in Lagos, Nigeria

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Abstract

Background: Antenatal care (ANC) is a specialized preventive health-care model that averts, detects, and promptly manages pregnancy- and nonpregnancy-related complications. These benefits are best harnessed when women initiate ANC early. **Objectives:** The study aimed to assess the knowledge of pregnant women on the ideal time to initiate ANC, determine their gestational age at antenatal booking, and examine the factors that influence it. **Materials and Methods:** The present study was a cross-sectional descriptive questionnaire-based survey carried out at the Lagos University Teaching Hospital, Lagos, Southwestern Nigeria. A total of 400 pregnant women who attended antenatal booking clinic and who gave informed consent were recruited by consecutive sampling. Participants' knowledge on timing of ANC, their gestational age at booking, and factors influencing their timing of booking were assessed using structured questionnaire. Data was analyzed using SPSS version 20.0. **Results:** Majority (88.9%) of respondents had good knowledge of the ideal time to initiate ANC even though 60.3% still started ANC late, commonly in the 2nd trimester with a mean gestational age at booking of 17.0 ± 7.2 weeks. Among the several factors associated with early antenatal booking, belief that early initiation of ANC is beneficial was the only significant independent factor that predicted early initiation of ANC (odds ratio = 5.06, P = 0.03). **Conclusion:** The incidence of early initiation of ANC is low among pregnant Nigerian women despite apparently good knowledge of the ideal time to initiate ANC. Appropriate intervention strategy that will translate knowledge to practice is advocated.

Keywords: Antenatal booking, antenatal care, gestational age, initiation, Nigeria

Introduction

Antenatal care (ANC) according to the World Health Organization (WHO) is "the care provided by skilled health-care professionals to pregnant women and adolescent girls to ensure the best health conditions for both mother and baby during pregnancy."[1] This goal can only be achieved by the early and timely provision of appropriate evidence-based health interventions and care to the pregnant woman through early initiation of ANC.[2] While the early initiation of ANC has been proven to improve maternal and fetal health,[1,2] late initiation of ANC, on the other hand, has been shown to be associated with poor pregnancy outcome for both mother and baby.[3-5] This is probably because early onset of regular ANC provides the pregnant woman with the better opportunity to benefit from early evaluation, detection, and the management of preexisting medical conditions and pregnancy-related complications; and from useful health information and interventions that would significantly enhance maternal and fetal health.

Many developing countries, including Nigeria, do not have National guidelines on ANC unlike their counterparts in developed nations.[6] According to WHO, pregnant women are expected to initiate ANC ideally within the first trimester.[7] The WHO ANC model of 2016 recommends that ANC should be initiated in the first trimester within the first 12 weeks of

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gestation and that pregnant women should have at least 8 contacts with their health-care provider.[1] In the UK, ANC booking is expected between 8 and 12 weeks.[8] This is not the case in most countries in the sub-Saharan Africa where most women have been reported to initiate ANC late in pregnancy.[9-11] According to Demographic and Health Survey (DHS) reports, only 20.4% of pregnant women initiate ANC in the first trimester in Ethiopia,[12] 24.4% in Tanzania,[13] 20.8% in Uganda,[14] 19.8% in Kenya,[15] and 17.6% in Nigeria.[16] In Nigeria, the mean gestational age at booking ranges from 24 to 26 weeks in the Eastern region of the country,[17,18] 19–23 weeks in the Western region,[4,19-21] 23 weeks in Southern region,[22,23] and 19–24 weeks in Northern region.[24,25] Similar pattern of late gestational age at initiation of ANC was observed in Uganda (22–27 weeks),[26,27] South Africa (28 weeks),[11] Ethiopia (16–17 weeks),[28,29] Tanzania (21 weeks),[30,31] and Peru (17 weeks).[32] This is in contrast to the early initiation of ANC seen in Australian[33] and Saudi Arabian[34] women.

Different factors have been identified to be associated with the pattern of utilization of ANC services in the sub-Saharan African region, especially the gestational age at the initiation of ANC. Women's sociodemographic characteristics, especially the level of education, employment and occupational status, and parity have been shown to be associated with the timing of initiation of ANC.[4,18,20] Similarly, knowledge of the right timing of antenatal booking, the presence or absence of medical and pregnancy-related problems, multiple antenatal registration and financial constraint were also identified to influence the timing of antenatal booking.[4,17,20,24] However, these factors have been inconsistent in its association as they vary from region-to-region.[17]

The aim of this study was to assess the knowledge of pregnant women on the appropriate timing of initiation of ANC and to determine their gestational age at antenatal booking. The study also aims to determine the incidence of early and late antenatal booking and to examine the factors that are associated with the choice of booking time. These findings will provide scientific information about antenatal booking in the hospital and will also assist in making evidence-based recommendations on how to improve early initiation of ANC in the hospital and in Nigeria at large.

Materials and Methods

Design and site of study

This was a cross-sectional study carried out at the antenatal clinic of Lagos University Teaching Hospital (LUTH), Lagos State, Nigeria, between August 1, 2015, and December 31, 2015. LUTH is a large federal tertiary hospital, and it is located in the southwestern part of Nigeria. It serves as the main referral hospital for all government and private hospitals in the state and its environs. The antenatal clinic holds every day from Monday to Friday except on Wednesdays between the hours of 7.30 a.m. to 1.00 p.m. The booking antenatal clinic runs concurrently with the regular antenatal clinic.

Study population and eligibility

The study was carried out after obtaining approval, and informed consent was obtained from all the study participants before the study. The study population comprised all pregnant women who were attending the antenatal clinic for the first time for the purpose of antenatal booking. About 30 pregnant women attended the booking antenatal clinic per week, with approximately 600 pregnant women booked for ANC during the study. Pregnant women with the regular menstrual cycle, who were sure of their last menstrual period (LMP) or who have had a first-trimester scan to date their pregnancy and who gave informed consent were recruited into the study by consecutive sampling. Pregnant women who were unsure of their LMP or who have irregular menstrual cycle and who have not had a first-trimester scan to date their pregnancy were excluded from the study.

Sample size determination

The minimum sample size was calculated using the formula $n = Z^2\ p\ (1 - p)/d^2$[35] with absolute error margin of 5% (d = 0.05), type 1 error of 5% (Z = 1.96) and proportion of women who initiated ANC late (p) of 83%.[17] The calculated sample size was 217 and after adjusting for a nonresponse rate of 20%, the final calculated minimum sample size was 261.

Data collection

The instrument of the survey was a structured questionnaire designed to elicit information about respondent sociodemographic characteristics, knowledge of the timing of antenatal booking, perception about benefits of early antenatal booking, the source of information and advice on ANC booking, sponsor of ANC, and whether the pregnancy was planned or unplanned. Gestational age at antenatal booking, reasons for booking at the particular gestational age, history of complaint in index pregnancy, past obstetric history including parity, previous pregnancy and delivery complications, mode of delivery, and medical history were also elicited.

Sociodemographic characteristics elicited were age, marital status, ethnicity, and religion. Others were the type of family setting, respondent's educational status, and husband's educational status. Knowledge of the timing of initiation of ANC was assessed by asking the respondents to choose the ideal time of commencement of ANC, i.e., within the first 3 months or 4–6 months or within 7–9 months of pregnancy. The gestational age at booking was assessed by using either the last normal menstrual period for women who had a regular menstrual cycle and were sure of their LMP or the earliest ultrasound scan estimated date for women who were uncertain about their LMP and/or who had irregular cycle. Early antenatal booking in this study was taken as booking within the first trimester (≤13 weeks gestation) while women who registered after the first trimester (≥14 weeks) were considered as having late antenatal booking. Respondents who indicated that ANC should be initiated within the first 3 months of pregnancy were categorized as having good knowledge of the timing of antenatal booking, whereas respondents who indicated that

ANC should commence within 4–6 months or 7–9 months of pregnancy were categorized as having poor knowledge of the timing of antenatal booking. Four hundred structured questionnaires were interviewer-administered by trained research assistants to all eligible study participants after an initial pilot study.

Data analysis

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 20.0, IBM Corp. Armonk, NY, USA. Categorical variables were compared using the Pearson's Chi-square test or Fisher's exact test as appropriate while continuous variables were compared using the Student's *t*-test. Multivariate analysis was performed using logistic regression. A value of $P < 0.05$ was considered to be statistically significant.

Results

A total of 400 questionnaires were administered to eligible pregnant women who attended the antenatal clinic within the study period. 380 questionnaires were correctly filled and analyzed, giving a response rate of 95%.

The mean age of the respondents was 31.6 ± 5.1 years (range = 15–49 years) and the median parity was 1 (range = 0–5). Majority of the respondents were of Yoruba ethnicity (50.5%), Christians (82.9%), and married (90.5%) in a monogamous family setting (98.4%). Most of the respondents and their husbands had a tertiary education (77.4% and 81.3%, respectively) [Table 1].

Majority of the respondents (88.9%) had good knowledge of the ideal time to initiate ANC, i.e., within the first 3 months of pregnancy, whereas 11.1% (42) of the women had poor knowledge of the ideal time to initiate ANC, i.e., believed that ANC should start from 4 months upward. 9.7% (37 of 380) of the respondents believed ANC should commence in the 2nd trimester, i.e., between 4 and 6 months of gestation whereas 1.4% (5) believed ANC should start in the 3rd trimester from 7 months of pregnancy upward [Table 2].

The mean gestational age at booking in this study was 17.0 ± 7.2 weeks (range = 6–39 weeks). About 39.7% (151 of 380) of the women initiated ANC early (within the 1st trimester), 47.7% (181 of 380) of the respondents booked in the 2nd trimester (within 4–6 months gestation), whereas 12.6% (48 of 380) started ANC in the 3rd trimester (within 7–9 months gestation). Approximately 40% (151 of 380 respondents) initiated ANC early, whereas 60.3% (229 of 380 respondents) booked late [Table 3].

The practice of early antenatal booking was most commonly observed among respondents who were between the age group of 35–39 years (41.0%), primigravidae (46.4%) and who had a tertiary level of education (86.1%). However, there was no statistically significant association observed between respondents' sociodemographic characteristics and timing of initiation of ANC ($P > 0.05$) [Table 4]. The presence of complications in previous pregnancy was significantly associated with early antenatal booking in index pregnancy ($P < 0.001$). On the contrary, there was no statistically significant relationship observed between previous history of labor/delivery complications, previous mode of

Table 1: Sociodemographic characteristics of the respondents

Variable	Frequency ($n=380$), *n* (%)
Age (years) (as at last birthday)	
<20	3 (0.8)
20-24	18 (4.7)
25-29	84 (22.1)
30-34	128 (33.7)
35-39	126 (33.2)
>40	21 (5.5)
Total	380 (100.0)
Marital status	
Single	33 (8.7)
Married	344 (90.5)
Divorced	3 (0.8)
Total	380 (100.0)
Ethnic group	
Yoruba	192 (50.5)
Igbo	138 (36.3)
Hausa	5 (1.3)
Others[¥]	45 (11.8)
Total	380 (100.0)
Religion	
Islam	65 (17.1)
Christianity	315 (82.9)
Total	380 (100.0)
Respondent's education	
No formal education	2 (0.5)
Primary	22 (5.8)
Secondary	62 (16.3)
Tertiary	294 (77.4)
Total	380 (100.0)
Partner's education	
No formal education	4 (1.1)
Primary	12 (3.2)
Secondary	55 (14.5)
Tertiary	309 (81.3)
Total	380 (100.0)
Family setting	
Monogamy	374 (98.4)
Polygamy	6 (1.6)
Total	380 (100.0)
Parity	
0	181 (47.6)
1	94 (24.7)
2	65 (17.1)
3	31 (8.2)
4	8 (2.1)
≥5	1 (0.3)
Total	380 (100.0)

[¥]Others include Urhobo, Ogoni, Tiv, Efik, Ijaw, Ibibio and Nupe

Table 2: Respondents' choice of time to initiate antenatal care and knowledge of appropriate timing of antenatal care initiation

Variable	Frequency (n=380), n (%)
Time to initiate ANC	
Within 1st 3 months (1st trimester)	338 (88.9)
From 4 to 6 months (2nd trimester)	37 (9.7)
From 7 to 9 months (3rd trimester)	5 (1.4)
Total	380 (100.0)
Knowledge of appropriate timing of ANC	
Good	338 (88.9)
Poor	42 (11.1)
Total	380 (100.0)

ANC: Antenatal care

Table 3: Gestational age at booking and time of initiation of antenatal care

Variable	Frequency (n=380), n (%)
GA at initiation of ANC	
≤13 weeks (1st trimester)	151 (39.7)
14-26 weeks (2nd trimester)	181 (47.7)
27-40 weeks (3rd trimester)	48 (12.6)
Total	380 (100.0)
Mean GA at booking (weeks)	17.0±7.2
Time of initiation of ANC	
Early	151 (39.7)
Late	229 (60.3)
Total	380 (100.0)

ANC: Antenatal care, GA: Gestational age

delivery, and timing of antenatal booking in the current pregnancy (P = 0.856 and 0.971, respectively) [Table 5].

Several reasons were given by the respondents for initiating ANC at the time they did in the study. Among the reasons suggested, belief that it was the right time to start ANC, complications in previous pregnancy and being advised to book early were observed to be significantly associated with early initiation of ANC among the respondents (P < 0.001, 0.029, and <0.001, respectively). On the other hand, prior antenatal booking in another hospital was significantly associated with late initiation of ANC among the women in this study (P < 0.001) [Table 6].

The electronic and print media (20.6%), doctors and nurses (17.9%), parents, siblings and relatives (12.6%), and respondents' partners (10.5%) were the main sources of information and advice on timing of initiation of ANC in this study. About 36.2% of the respondents had never received any form of information or advice on the timing of antenatal booking. There was no statistically significant relationship observed between the source of information on ANC and the timing of antenatal booking in the study (P > 0.05). The major sponsors of respondents' ANC were respondents' husbands (68.7%), both couples (23.2%) and the respondents themselves in 5.3% of cases. These did not significantly influence the pattern of initiation of ANC (P > 0.05).

Table 7 shows the relationship between planned pregnancy, respondent's perception of the benefit of early ANC, knowledge of the right time to initiate ANC and timing of antenatal booking. Respondent's perception that early antenatal booking was beneficial was significantly associated with early initiation of ANC among the respondents (P < 0.001). A significant proportion of the respondents (86.8%) indicated that early initiation of ANC was beneficial. Having a planned conception and good knowledge of the ideal time to initiate ANC did not significantly influence early antenatal booking (P = 0.062 and 0.661, respectively), even though majority of the respondents had a planned pregnancy and good knowledge the right time to initiate ANC.

After adjusting for all the significant variables associated with early antenatal booking using multiple logistic regression analysis, respondent's belief that the early initiation of ANC is beneficial was the only significant predictor of early initiation of ANC among the respondents (odds ratio = 5.06, P = 0.03, respectively) [Table 8].

Discussion

ANC is an effective health care preventive strategy designed to ensure best health outcomes for mother and baby; however, its benefits are best harnessed when women initiate ANC early in pregnancy. This will allow for early evaluation, detection, and management of underlying pathology; and prompt commencement of appropriate health interventions. Unfortunately, most women in this study initiated ANC late, with only 39.7% of the women initiating ANC early. This is similar to the pattern of ANC booking seen in most developing countries, especially in sub-Saharan Africa where late initiation of ANC is almost a norm. The incidence of late antenatal booking has been shown to range between 52.8% and 78.3% in Ethiopia,[29,36,37] 53.3%–90.3% in Nigeria,[6,17,21,22,24] 71%–82.5% in Tanzania,[30,31] 88.5% in Uganda,[26] and 94% in South Africa.[11] Reports from recent DHS of several African countries also corroborated these findings.[12-16]

The mean gestational age at initiation of ANC in our study (17 weeks) was earlier compared to the figures observed in other studies across Nigeria, where gestational age at booking ranged between 24 and 26 weeks in the Eastern region,[17,18] 19 and 23 weeks in the Western region,[6,19-21] 23 weeks in Southern region,[22,23] and 19–24 weeks in Northern region.[24,25] Similar trend of late gestational age at booking is seen in other developing countries such as South Africa (28 weeks),[11] Uganda (22–27 weeks),[26,27] and Tanzania (21 weeks).[30,31] The relatively early gestational age at antenatal booking observed in this study is probably due to the fact that most women in our study had high level of education and the study was conducted in an urban city with a relatively higher level of development compared to other areas with low socioeconomic development. As a result, women in our study probably had better access to health information and education, leading to better health awareness. These partly explain why the respondents had multiple sources of information

Table 4: Association between sociodemographic characteristics and timing of antenatal booking

Variable	Early booking ($n=151$), n (%)	Late booking ($n=229$), n (%)	Total ($n=380$), n (%)	χ^2	P
Age (years) (as at last birthday)					
<20	1 (0.7)	2 (0.9)	3 (0.8)	0.001#	0.055
20-24	2 (1.3)	16 (7.0)	18 (4.7)		
25-29	26 (17.2)	58 (25.3)	84 (22.1)		
30-34	54 (35.8)	74 (32.3)	128 (33.7)		
35-39	62 (41.0)	64 (27.9)	126 (33.2)		
>40	6 (4.0)	15 (6.6)	21 (5.5)		
Total	151 (100.0)	229 (100.0)	380 (100.0)		
Marital status					
Single	10 (6.6)	23 (10.0)	33 (8.7)	0.023#	0.323
Married	139 (92.1)	205 (89.5)	344 (90.5)		
Divorced	2 (1.3)	1 (0.4)	3 (0.8)		
Total	151 (100.0)	229 (100.0)	380 (100.0)		
Ethnic group					
Yoruba	79 (52.3)	113 (49.3)	192 (50.5)	0.001#	0.360
Igbo	58 (38.4)	80 (34.9)	138 (36.3)		
Hausa	1 (0.7)	4 (1.7)	5 (1.3)		
Others¥	13 (8.6)	32 (14.1)	45 (11.8)		
Total	151 (100.0)	229 (100.0)	380 (100.0)		
Religion					
Islam	29 (19.2)	36 (15.7)	65 (17.1)	0.78	0.378
Christianity	122 (80.0)	193 (84.3)	315 (82.9)		
Total	151 (100.0)	229 (100.0)	380 (100.0)		
Respondent's education					
No formal education	1 (0.7)	1 (0.4)	2 (0.5)	0.001#	0.055
Primary	8 (5.3)	14 (6.1)	22 (5.8)		
Secondary	16 (10.6)	46 (20.1)	62 (16.3)		
Tertiary	126 (83.4)	168 (73.4)	294 (77.4)		
Total	151 (100.0)	229 (100.0)	380 (100.0)		
Partner's education					
No formal education	1 (0.7)	3 (1.3)	4 (1.1)	0.001#	0.179
Primary	2 (1.3)	10 (4.4)	12 (3.2)		
Secondary	18 (11.9)	37 (16.2)	55 (14.5)		
Tertiary	130 (86.1)	179 (78.1)	309 (81.3)		
Total	151 (100.0)	229 (100.0)	380 (100.0)		
Family setting					
Monogamy	150 (99.4)	224 (97.8)	374 (98.4)	0.189#	0.409
Polygamy	1 (0.6)	5 (2.2)	6 (1.6)		
Total	151 (100.0)	229 (100.0)	380 (100.0)		
Parity					
0	70 (46.4)	111 (48.5)	181 (47.6)	0.003#	0.903
1	38 (25.1)	56 (24.5)	94 (24.7)		
2	29 (19.2)	36 (15.7)	65 (17.1)		
3	11 (7.3)	20 (8.7)	31 (8.2)		
4	3 (2.0)	5 (2.2)	8 (2.1)		
≥5	0 (0.0)	1 (0.4)	1 (0.3)		
Total	151 (100.0)	229 (100.0)	380 (100.0)		

#Fisher's exact χ^2, ¥Others include Urhobo, Ogoni, Tiv, Efik, Ijaw, Ibibio, and Nupe

and advice on ANC with the most common source being the electronic and print media. It was, therefore, not surprising that approximately 90% of the respondents had good knowledge of the ideal time to initiate ANC and also believed that early initiation of ANC was beneficial. The pattern of knowledge of the ideal time for ANC initiation was similar in some other Nigerian studies where majority of the respondents indicated that the first trimester was the most ideal time to register for ANC, followed by the second trimester.[6,37] This was however at variance to findings in other studies, where majority of the respondents indicated that the ideal time to initiate ANC was after 12 weeks[38] and in the second trimester.[17]

Table 5: Events in previous pregnancy/delivery and its influence on timing of antenatal care

Variable	Early booking (*n*=81), *n* (%)	Late booking (*n*=118), *n* (%)	Total (*n*=199), *n* (%)	χ^2	*P*
Problems in previous pregnancy					
Yes	38 (46.9)	25 (21.2)	63 (31.7)	14.693	<0.001*
No	43 (53.1)	93.0 (78.8)	136 (68.3)		
Total	81 (100.0)	118 (100.0)	199 (100.0)		
Problems in previous delivery					
Yes	19 (23.5)	29 (24.6)	48 (24.1)	0.033	0.856
No	62 (76.5)	89 (75.4)	151 (75.9)		
Total	81 (100.0)	118 (100.0)	199 (100.0)		
Mode of delivery					
Normal delivery	51 (63.0)	74 (62.7)	125 (62.8)	0.001	0.971
Caesarean section	30 (37.0)	44 (37.3)	74 (37.2)		
Total	81 (100.0)	118 (100.0)	199 (100.0)		

*Significant P

Table 6: Association between reasons for initiating antenatal care and time of initiation of antenatal care

Reasons for starting ANC now	Early booking (*n*=151), *n* (%)	Late booking (*n*=229), *n* (%)	Total (*n*=380), *n* (%)	χ^2	*P*
I believe it is the right time to start	112 (74.2)	65 (28.4)	177 (46.6)	76.505	<0.001*
It is a convenient time for me	15 (9.9)	56 (24.5)	71 (18.7)	12.726	0.054
I have complaints in this pregnancy	12 (7.9)	20 (8.7)	32 (8.4)	0.076	0.783
I had problem in my previous pregnancy	17 (11.3)	12 (5.2)	29 (7.6)	4.795	0.029*
I had problem in my previous delivery	9 (6.0)	13 (5.7)	22 (5.8)	0.015	0.903
Due to financial problem	2 (1.3)	2 (0.9)	4 (1.1)	0.139#	0.710
I was advised to book early	26 (17.2)	13 (5.7)	39 (10.3)	13.025	<0.001*
I have already started ANC in another hospital	3 (2.0)	41 (17.9)	44 (11.6)	22.406	<0.001*

Multiple responses observed. *Significant *P*, #Fisher's exact χ^2. ANC: Antenatal care

Table 7: Influence of planned pregnancy, perception of the benefits of early antenatal care and knowledge of timing of antenatal booking on time of initiation of antenatal care

Variables	Early booking (*n*=151), *n* (%)	Late booking (*n*=229), *n* (%)	Total (*n*=380), *n* (%)	χ^2	*P*
Planned pregnancy					
Yes	129 (85.4)	178 (77.7)	307 (80.8)	3.477	0.062
No	22 (14.6)	51 (22.3)	73 (19.2)		
Total	151 (100.0)	229 (100.0)	380 (100.0)		
Perception of the benefits of early ANC booking					
Beneficial	149 (98.7)	181 (79.0)	330 (86.8)	0.001#	<0.001*
Not beneficial	2 (1.3)	48 (21.0)	50 (13.2)		
Total	151 (100.0)	229 (100.0)	380 (100.0)		
Knowledge of timing of ANC					
Good knowledge	133 (88.1)	205 (89.5)	338 (88.9)	0.192	0.661
Poor knowledge	18 (11.9)	24 (10.5)	42 (11.1)		
Total	151 (100.0)	229 (100.0)	380 (100.0)		

#Fisher's exact χ^2, *Significant *P*. ANC: Antenatal care

Several factors have been shown to affect timing of antenatal booking including sociodemographic factors such as age,[6,29] educational status,[20,24,29,34] and parity;[6,18,21,29,36] however, this was not the case in our study. Similar to findings in another Nigerian study,[17] respondents' sociodemographic characteristics did not significantly affect the time of initiation of ANC in our study; although the majority of the women that registered early for ANC were within the age group of 35–39 years with the tertiary level of education and were primigravidae. This is also comparable to findings in other studies where the level of education,[6,21] age[11,20,21,24] and parity,[11,24] did not significantly influence the timing of initiation of ANC.

The belief that early antenatal booking is beneficial and the presence of complications in previous pregnancy; significantly

Table 8: Predictors of early initiation of antenatal care

Variables	OR	95% CI	*P*
Problem in previous pregnancy	1.45	0.79-10.16	0.11
Belief that it is the right time to start ANC	3.32	0.85-8.63	0.09
Advised to start early	2.82	0.92-6.79	0.05
Belief that early booking is beneficial	5.06	1.23-9.57	0.03*

*Significant *P*. CI: Confidence interval, OR: Odds ratio, ANC: Antenatal care

influenced early initiation of ANC among pregnant women in our study. This is congruent with findings in studies that showed that women who initiated ANC late reported that there are no benefits in starting ANC early and that ANC should be initiated in the 2nd trimester.[17,37] This relatively high level of perception that early antenatal booking is beneficial could have significantly contributed to the relatively earlier gestational age at booking observed in the study compared to the other studies. Likewise, the perception that it is the right time to start ANC, occurrence of complications in previous pregnancy and being advice to start ANC early; were the reasons given by the respondents, that were significantly associated with early initiation of ANC in our study. This is comparable to findings in others studies where previous counseling and advice on early antenatal booking,[6,29,36] perception of the ideal time for antenatal booking[29,36] and previous pregnancy complication[11] were significantly associated with early gestational age at booking.

It was observed that a large proportion of the women who had good knowledge of the ideal timing of ANC and who believed that early antenatal booking was beneficial did not initiate ANC early. This discordance is similar to findings in other studies.[6,17,37] This may be as a result of the fact that majority of these women had inadequate knowledge and information regarding ANC which could have affected their attitude toward early antenatal booking. In addition, awareness, knowledge, and perception alone may not be the only determining factors that would bring about health-related behavioral changes and modification which are usually multifactorial in nature.[39]

Factors such as previous complications during labor and delivery and previous mode of delivery did not significantly influence the pattern of antenatal booking. This is similar to findings in a South African study where previous cesarean section and previous obstetric complications did not influence the early initiation of ANC.[11] Similarly, planned conception, the source of information on ANC and sponsor of ANC did not significantly influence the timing of initiation of ANC as observed in another study.[40]

History of prior antenatal booking in another hospital was significantly associated with late antenatal booking in our study. This is also a common reason for late antenatal booking in some studies.[24,37] Most of these women who had registered previously in other facilities, usually present late for antenatal booking in the new facility.

After adjusting for all the significant variables associated with early initiation of ANC using multiple logistic regression analysis, belief that early initiation of ANC is beneficial was the only independent variables that predicted early booking for ANC. This is congruent to findings in another study.[29] Efforts should be made to promote and improve the knowledge of women on the benefits associated with early antenatal booking, as this may go a long way in promoting early initiation of ANC among women.

A major strength of this study is that the study evaluated the level and impact of women's knowledge of the ideal time to initiate ANC and their perception on the benefits of early initiation of ANC on the actual timing of initiation of ANC; in addition to other sociodemographic and obstetric factors that were examined. However, the study did not examine the various factors that influence their knowledge and perception. Further studies would be required to assess these factors to suggest appropriate areas of intervention that would positively enhance their knowledge and bring about positive behavioral changes.

Conclusion

The study found that most Nigerian women initiate ANC late in pregnancy despite their relatively good knowledge of the ideal time to initiate ANC. It also found that "belief that early initiation of ANC is beneficial" was a significant factor that predicted early initiation of ANC among pregnant women in our study. Further scientific studies are recommended to evaluate the factors that influence these findings in order to suggest appropriate evidence-based health intervention and strategy. These interventions will significantly reduce the high incidence of late initiation of ANC in our environment and help our women harness the full benefits of ANC.

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Conflicts of interest

There are no conflicts of interest.

References

1. World Health Organization. WHO Recommendations on Antenatal care for a Positive Pregnancy Experience. Geneva: World Health Organization; 2016. Available from: http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/anc-positive-pregnancy-experience/en/. [Last accessed on 2018 Jul 10].
2. Tunçalp Ö, Pena-Rosas JP, Lawrie T, Bucagu M, Oladapo OT, Portela A, *et al.* WHO recommendations on antenatal care for a positive pregnancy experience-going beyond survival. BJOG 2017;124:860-2.
3. Centers for Disease Control and Prevention (CDC). Entry into prenatal care: United States 1989-1997. MMWR Mord Mortal Wkly Rep 2000;49:393.
4. Cresswell JA, Yu G, Hatherall B, Morris J, Jamal F, Harden A, *et al.* Predictors of the timing of initiation of antenatal care in an ethnically diverse urban cohort in the UK. BMC Pregnancy Childbirth 2013;13:103.
5. Tesfaye G, Loxton D, Chojenta C, Semahegn A, Smith R. Delayed initiation of antenatal care and associated factors in Ethiopia: A systematic review and meta-analysis. Reprod Health 2017;14:150.
6. Aduloju OP, Akintayo AA, Ade-Ojo IP, Awoleke JO, Aduloju T,

Ogundare OR, *et al.* Gestational age at initiation of antenatal care in a tertiary hospital, Southwestern Nigeria. Niger J Clin Pract 2016;19:772-7.
7. Villar J, Bergsjo P. WHO Antenatal Care Randomized Trial: Manual for the Implementation of the New Model Geneva: World Health Organization; 2002. Available from: http://www.who.int/iris/handle/10665/42513. [Last accessed on 2018 Aug 11].
8. National Institute for Health and Care Excellence. Antenatal Care for Uncomplicated Pregnancies (Clinical Guideline 62). National Institute for Health and Care Excellence; 2008. Available from: https://www.nice.org.uk/guidance/cg62. [Last accessed on 2018 Jul 10].
9. Wang W, Alva S, Wang S, Fort A. Levels and Trends in the use of Maternal Health Services in Developing Countries, DHS Comparative Reports. Calverton, MD, USA: ICF Macro; 2011. Available from: https://www.dhsprogram.com/pubs/pdf/CR26/CR26.pdf. [Last accessed on 2018 Feb 24].
10. Abou-Zahr CL, Wardlaw TM. Antenatal care in Developing Countries: Promises, Achievements and Missed Opportunities. An Analysis of Trends, Levels and Differentials, 1990-2001. Geneva: World Health Organization; 2003. Available from: http://www.who.int/iris/handle/10665/42784. [Last accessed on 2018 Feb 24].
11. Basu JK, Basu D, Jeketera CM. Demographic and clinical variables influencing gestational age at booking among South African pregnant women. J Obstet Gynaecol 2011;31:718-20.
12. Central Statistical Agency (CSA) and ICF 2016. Ethiopia Demographic and Health Survey 2016. Addis Ababa, Ethiopia, and Rockville, Maryland, USA: Central Statistical Agency and ICF; 2016. Available from: https://www.edhsprogram.com/pubs/pdf/FR328/FR328.pdf. [Last accessed on 2018 Feb 24].
13. Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC), Ministry of Health (MoH), National Bureau of Statistics (NBS), Office of the Chief Government Statistician (OCGS), and ICF 2016. Tanzania Demographic and Health Survey and Malaria Indicator Survey (TDHS-MIS) 2015-16. Dar es Salaam, Tanzania, and Rockville, Maryland, USA: MoHCDGEC, MoH, NBS, OCGS, and ICF; 2016. Available from: https://www.dhsprogram.com/pubs/pdf/fr321/fr321.pdf. [Last accessed on 2018 Feb 24].
14. Uganda Bureau of Statistics (UBOS) and ICF International Inc. Uganda Demographic and Health Survey 2011. Kampala, Uganda: UBOS and Calverton, Maryland: ICF International Inc.; 2012. Available from: https://www.dhsprogram.com/pubs/pdf/fr264/fr264.pdf. [Last accessed on 2018 Feb 24].
15. Kenya National Bureau of Statistics, Ministry of Health/Kenya, National AIDS Control Council/Kenya, Kenya Medical Research Institute, and National Council for Population and Development/Kenya 2015. Kenya Demographic and Health Survey. Rockville, MD, USA: Kenya National Bureau of Statistics; 2014. Available from: http://www.dhsprogram.com/pubs/pdf/FR308/FR308.pdf. [Last accessed on 2018 Feb 24].
16. National Population Commission (NPC) and ICF International 2014. Nigeria Demographic and Health Survey 2013. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF International. Available from: https://www.dhsprogram.com/pubs/pdf/fr293/fr293.pdf. [Last accessed on 2018 Feb 24].
17. Onoh R, Umerora O, Agwu U, Ezegwui H, Ezeonu P, Onyebuchi A, *et al.* Pattern and determinants of antenatal booking at Abakaliki Southeast Nigeria. Ann Med Health Sci Res 2012;2:169-75.
18. Nwagha UI, Ugwu OV, Nwagha TU, Anyaehie US. The influence of parity on the gestational age at booking among pregnant women in Enugu, South East Nigeria. Niger J Physiol Sci 2008;23:67-70.
19. Adegbola O. Gestational age at antenatal booking in Lagos university teaching hospital (LUTH). Nig Q J Hosp Med 2009;19:162-4.
20. Oladokun A, Oladokun RE, Morhason-Bello I, Bello AF, Adedokun B. Proximate predictors of early antenatal registration among Nigerian pregnant women. Ann Afr Med 2010;9:222-5.
21. Okunlola MA, Owonikoko KM, Fawole AO, Adekunle AO. Gestational age at antenatal booking and delivery outcome. Afr J Med Med Sci 2008;37:165-9.
22. Umoh AV, Umoiyoho AJ, Abasiattai AM, Bassey EA, James SR. Gestational age at first antenatal visit in Uyo, Nigeria. Ibom Med J 2006;1:13-7.
23. Ebeigbe PN, Igberase GO. Antenatal care: A comparison of demographic and obstetric characteristics of early and late attenders in the Niger Delta, Nigeria. Med Sci Monit 2005;11:CR529-32.
24. Ifenne DI, Utoo BT. Gestational age at booking for antenatal care in a tertiary health facility in North-Central, Nigeria. Niger Med J 2012;53:236-9.
25. Ibrahim SA, Galadanci HS, Omale AE. Gestational age at first antenatal attendance in Kano, Northern Nigeria. Highland Med Res J 2007;5:75-8.
26. Turyasiima M, Tugume R, Openy A, Ahairwomugisha E, Opio R, Ntunguka M, *et al.* determinants of first antenatal care visit by pregnant women at community based education, research and service sites in Northern Uganda. East Afr Med J 2014;91:317-22.
27. Kisuule I, Kaye DK, Najjuka F, Ssematimba SK, Arinda A, Nakitende G, *et al.* Timing and reasons for coming late for the first antenatal care visit by pregnant women at Mulago hospital, Kampala Uganda. BMC Pregnancy Childbirth 2013;13:121.
28. Gulema H, Berhane Y. Timing of first antenatal care visit and its associated factors among pregnant women attending public health facilities in Addis Ababa, Ethiopia. Ethiop J Health Sci 2017;27:139-46.
29. Hussen SH, Melese ES, Dembelu MG. Timely initiation of first antenatal care visit of pregnant women attending antenatal care service. Womens Health Care 2016;5:346.
30. Exavery A, Kanté AM, Hingora A, Mbaruku G, Pemba S, Phillips JF. How mistimed and unwanted pregnancies affect timing of antenatal care initiation in three districts in Tanzania. BMC Pregnancy Childbirth 2013;13:35.
31. Gross K, Alba S, Glass TR, Schellenberg JA, Obrist B. Timing of antenatal care for adolescent and adult pregnant women in South-Eastern Tanzania. BMC Pregnancy Childbirth 2012;12:16.
32. Moore N, Blouin B, Razuri H, Casapia M, Gyorkos TW. Determinants of first trimester attendance at antenatal care clinics in the amazon region of Peru: A case-control study. PLoS One 2017;12:e0171136.
33. Trinh LT, Rubin G. Late entry to antenatal care in New South Wales, Australia. Reprod Health 2006;3:8.
34. Al-Shammari SA, Khoja T, Jarallah JS. The pattern of antenatal visits with emphasis on gestational age at booking in Riyadh health centres. J R Soc Health 1994;114:62-6.
35. Charan J, Biswas T. How to calculate sample size for different study designs in medical research? Indian J Psychol Med 2013;35:121-6.
36. Belayneh T, Adefris M, Andargie G. Previous early antenatal service utilization improves timely booking: cross-sectional study at university of Gondar hospital, Northwest, Ethiopia. Pregnancy 2014;2014:132494.
37. Ebeigbe PN, Igberase GO. Reasons given by pregnant women for late initiation of antenatal care in the Niger Delta, Nigeria. Ghana Med J 2010;44:47-51.
38. Geta MB, Yallew WW. Early initiation of antenatal care and factors associated with early antenatal care initiation at health facilities in Southern Ethiopia. Adv Public Health 2017;2017:1624245.
39. Okunowo AA, Daramola ES, Soibi-Harry AP, Ezenwankwo FC, Kuku JO, Okunade KS, *et al*. Women's knowledge of cervical cancer and uptake of pap smear testing and the factors influencing it in a Nigerian tertiary hospital. J Cancer Res Pract 2018;5:105-11.
40. Mkandawire P. Gestational age at first antenatal care visit in Malawi. Matern Child Health J 2015;19:2366-74.