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Timing and associated factors of antenatal booking among pregnant women at a tertiary health institution in Nigeria: A cross-sectional study

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Abstract

Background and aim: The timing of first antenatal booking is still a problem in Sub-Saharan Africa making the accomplishment of WHO recommendation of eight contacts before delivery a big problem. The factors associated with late antenatal booking are multifactorial and have not been studied in our environment. This study aimed to determine the prevalence of late first antenatal visits, and the associated factors in a tertiary health institution, South-East Nigeria.

Materials and methods: It was an analytical cross-sectional study of consecutively recruited consenting one hundred and twenty pregnant women who came for booking. A self-administered, semi-structured questionnaire was used to obtain information from the study participants. Data were analysed using Stata version 16.1 statistical software. A two-sided statistical analysis was used with a p-value of <0.05 set as significant.

Results: The prevalence of the late first antenatal visits was 65.00%, the mean gestational age at booking was 17.58 ± 7.91 weeks. The main reason identified as to why the study participants booked at the time, booked was that the pregnancy has been normal (64.17%), followed by complications (17.50%). Grand multipara [aOR=1.472;95% CI (0.503, 4.309)] and those with interpregnancy interval ≥5 years [aOR=3.519;95% CI (0.378, 32.724)] had a higher likelihood of late booking.

Conclusion: The prevalence of late first antenatal visits among pregnant women is high. Grand multiparity and interpregnancy interval >5 years were identified as having higher odds for late booking. We, therefore, recommend that the public should be educated on the importance of early booking into antenatal care.

Keywords: timing; antenatal booking; associated factors.

Introduction

The World Health Organization (WHO) visualizes a world where "every pregnant woman and new-born receive quality care throughout pregnancy, childbirth and postnatal period" [1]. Antenatal Care (ANC) reduces maternal and perinatal morbidity and mortality both directly and indirectly [2]. About 99% of maternal death and 98% of child death which occur in middle and low income countries can be prevented if pregnant women are able to access quality ANC [2]. Since the introduction of WHO ANC model known as focused ANC in 2002, the low and middle income countries increased ANC utilization [1]. In 2016, WHO developed a new ANC model to replace the previous four visits focused ANC model with a new recommendation of a minimum of eight ANC contacts [1]. This is in order to provide the pregnant women with respectful, individualized, person-centred care at every contact, with the implementation of effective clinical practices, provision of relevant timely information, also provide psychosocial and emotional support by the practitioners with good clinical and interpersonal skills within a well-functioning health system [1].

Booking visit serves as the entry point for ANC for an index pregnancy [3]. According to WHO, early ANC refers to initiation of ANC as soon as possible after confirmation of pregnancy or within 12 weeks of gestation while late ANC is starting ANC after 12 weeks of gestation [1,4]. Early booking helps pregnant women especially those unsure of their last menstrual period to have fairly accurate dating [5]. In addition, the women benefit from certain baseline measurements and investigations such as blood pressure, body mass index, urinalysis, retroviral screening, hepatitis screening, blood group and genotype etc, these give the clinician a fair idea of the pre-pregnancy state of the client [5]. It also plays a role in detecting and treating some complications of pregnancy [4,6].

Despite the aforementioned benefits of early antenatal booking, late antenatal booking is still a problem in Sub-Saharan Africa making the accomplishment of WHO recommendation of eight contacts before delivery a big problem. The prevalence of late antenatal booking beyond Africa are variable with 41% in Australia [7], 37.5% in United Kingdom [8], 56.2% in Myanmar [9] and 28.2% in Malaysia [6]. In the African sub-region the prevalence of late ANC booking is 44.0% in Cameroon [4], 52.5% in Ethiopia [10], 62.9% in Burkina Faso [11], 70.4% in Tanzania [12], 72.0% in Zambia [13] and 88.5% in Uganda [14]. Nigeria which is one of the developing countries in West African sub-region has a high prevalence rate of late ANC booking. This ranges from 77.3%-82.6% in South-West Nigeria, [3,5] 53.3% in North-Central Nigeria [15], 73.5%-80% in South-South Nigeria [16,17] and 83.1% in South-East Nigeria [18].

The factors associated with late ANC booking are multifactorial and include pregnancy being too early, avoidance of frequent visit, poor knowledge about the right time to commence ANC, financial constraint, educational level, parity, age of the pregnant women, marital status, unplanned pregnancy, history of obstetrics complications [5,11,12,17-19].

Very few studies have been carried out in the South Eastern part of Nigeria and none in our institution hence necessitating the need for this study. The results from this study will provide information on the factors responsible for late ANC booking in this environment and the factors identified will help policy makers update existing policies. The findings will also help in public health education so as to promote a better pregnancy outcome. The aim of this study is therefore, to determine the prevalence of late first ANC visit, and the associated factors in a tertiary health institution, South- East Nigeria.

Materials and methods

Study design: It was an analytical cross-sectional study.

Study site: Nnamdi Azikiwe University Teaching Hospital, Nnewi was used.

Study population and sampling: This consisted of all consecutive, consenting pregnant women at their first antenatal visit in the institution till the calculated sample size is achieved. Convenience sampling method was adopted.

Sample size: For sample size calculation, the following assumptions was made based on previous studies: prevalence of late booking of 50%, 5% margin of error, and 95% confidence level, non-response rate of about 20%. Using Fisher's formula, $N = \frac{Z^2 pq}{d^2}$ where N equals to sample size, Z is the standard normal deviate and for 95% confidence level and the value is 1.96, p is the proportion booking late, q is equal to 1-p which is 50%, d is the degree of precision or margin of error, $=N = \frac{1.96^2 . 5 \times .5}{.05^2}$ approximately 96, assuming 20% non-respondent, the final sample size = $\frac{96}{1 - .20}$ = 120.

Inclusion and exclusion criteria: All pregnant women who came for antenatal booking at the study site and gave consent were recruited while those who refused to give consent were excluded from the study.

Study instrument and data collection: A self-administered semi structured questionnaire was developed and used to extract information from all consecutive consenting pregnant women coming for the first booking visit. A sample of about 15 questionnaires was pre-tested for the validity and reliability amongst the participants, also the people who understood the study topic read through the questionnaire to evaluate whether the questions effectively captured the study topic. Internal consistency of the questionnaire was assessed using Cronbach's alpha; values between 0.8 to 0.9 was accepted as normal. The questionnaire included data on demography: age, gestational age, parity, level of education and occupation; the occupation and the level of education of the spouse will be included where possible. Other information included was reason for booking at the particular gestation, history of present and past pregnancies, medical and drug history. The questionnaire was self-administered for the literate client. The non-literate client was assisted by the research assistants assigned to the booking clinic to translate the questions in the questionnaire in the local language (Igbo) which was predominantly in the study location.

Ethical consideration: Approval was sought and obtained from the research and ethics committee of the Nnamdi Azikiwe University Teaching Hospital before commencement of the study. Informed consent was also be sought and obtained from all participants. Confidentiality was maintained throughout and beyond the study.

Table 1: Socio-demographic distribution among the study participants.

Variable	Frequency	Percentage (%)
Age range (years)		
≤19 years	1	0.83
20-24 years	22	18.33
25-29 years	49	40.83
30-34 years	25	20.83
35-39 years	21	17.50
40 and above	2	1.67
Mean Age	29.06 ± 5.15 years	
Marital Status		
Married	118	98.33
Single	2	1.67
Religion		
Anglican	28	23.33
Jehovah witness	1	0.83
Catholic	60	50.00
Pentecostal	31	25.83
Distance from Hospital		
5 to 10 km	41	34.17
<5 km	51	42.50
>10 km	28	23.33
Educational status of mother		
Primary	1	0.83
Secondary	72	60.00
Tertiary	47	39.17
Occupation of mother		
Apprentice	1	0.83
Artisan	15	12.50
Civil servant	14	11.67
House wife	13	10.83
Professional	7	5.83
Student	16	13.33
Trader	54	45.00
Husband Occupation		
Artisan	15	12.71
Businessman	1	0.85
Civil servant	18	15.25
Farmer	1	0.85
Pastor	1	0.85
Professional	11	9.32
Trader	70	59.32
Unemployed	1	0.85
Parity		
Primiparous	31	25.83
Grand multiparous	3	2.50
Multiparous	47	39.17
Nulliparous	39	32.50
Total	**120**	**100**

Table 2: History of present pregnancy.

Variable	Frequency	Percentage (%)
GA at booking		
Mean GA	17.58 ± 7.91 weeks	
Reasons for booking		
RVD status	1	0.83
TT immunization	1	0.83
Complications	21	17.50
Financial	6	5.00
Pregnancy has been normal	77	64.17
Relocation	11	9.17
Time of quickening	3	2.50
Mode of Conception		
Assisted	1	0.83
Spontaneous	119	99.17
Have you done USS?		
No	71	59.17
Yes	49	40.83
If yes, at what GA? (n=49)		
4-13 weeks	28	57.14
14-23 weeks	13	26.53
24-33 weeks	7	14.29
above 33 weeks	1	2.04
How many foetuses? (n=49)		
One	47	95.92
Two	2	4.08
Any problem since pregnant?		
No	99	82.50
Yes	21	17.50
If yes, what? (n=21)		
Bleeding	3	14.29
Cramps	10	47.62
Dyspepsia	1	4.76
Excessive vomiting	4	19.05
Fever	1	4.76
Headache	1	4.76
Low back pain	1	4.76
Medical history in present pregnancy		
Asthma	3	2.50
PUD	3	2.50
RVD	3	2.50
Hypertension	4	3.33
None	107	89.17

Statistical analysis

Stataversion 16.1 statistical softwarewas used for data entry and analysis. The data analysis was both descriptive and inferential. For normally distributed, categorical variables were presented as frequencies, percentages with confidence intervals. Continuous variables as mean and standard deviations. Inferential statistics using Chi-square, Fisher's exact test was used where applicable for relating gestational age at booking to some demographic and obstetric variables. The associations were further explored using multivariate logistic regression to obtain adjusted odds ratio. A two-sided statistical analysis was used with p-value of <0.05 set as significant.

Results

Table 1 shows the socio-demographic distribution among the study participants. The mean age among the pregnant women was 29.06 ± 5.15 years with 25-29 years having the highest category (40.83%). Majority (98.33%) of the women were married and were mostly from the Catholic, Pentecostal and Anglican church denominations (50.00%, 25.83% and 23.33%) respectively, a higher proportion (42.50%) of the participants had to cover <5 km distance from their homes to the hospital facility.

Table 2 shows the history of present pregnancy, the mean gestational age at booking was 17.58 ± 7.91 weeks. Majority (64.17%) of the participants booked at the gestational age they booked because their pregnancy had been normal, 17.50% has had a problem since they were pregnant, 47.62% had cramps.

Table 3 shows that a higher proportion (37.80%) had 2 years as the pregnancy interval from their last delivery, 89.02% did not have any complication in their last pregnancy, 81.48% had normal baby as their previous delivery outcomes, 4.17% of the participants has history of infertility, 20.83% had miscarriage and 96.00% had the miscarriage at first three months of their pregnancy.

Table 3: Previous Obstetrics and Gynaecological history.

Variable	Frequency	Percentage (%)
Interval from last delivery (n=82)		
<1 year	2	2.44
1 year	30	36.59
2 years	31	37.80
3 years	9	10.98
4 years	3	3.66
>4 years	7	8.54
Any complications in last pregnancy? (n=82)		
No	73	89.02
Yes	9	10.98
If yes, what type? (n=9)		
Ectopic pregnancy	1	11.11
Miscarriage	2	22.22
Pre-eclampsia	4	44.44
Stillbirth	1	11.11
Uterine rupture	1	11.11
Mode of delivery (n=81)		
CS	14	17.28
SVD	65	80.25
Instrumental Delivery	2	2.47
Delivery outcome (n=81)		
Baby was admitted into SCBU	1	1.23
Big baby	2	2.47
Died within one month of delivery	3	3.70
Died within one week of delivery	5	6.17
Injury to baby	2	2.47
Intrapartum death	2	2.47
Normal baby	66	81.48
Any history of Infertility?		
No	115	95.83
Yes	5	4.17
If yes, how many years? (n=5)		
1 year	1	20.00
3 years	1	20.00
6 years	1	20.00
8 years	2	40.00
What age did you marry? (n=34)		
20-34 years	34	100
Mean Age (±SD)	25.76 ± 3.33	
Any miscarriage?		
No	95	79.17
Yes	25	20.83
If yes, how many times? (n=25)		
Once	17	68.00
Thrice	3	12.00
Twice	5	20.00
Was it in the first three months or later?		
After 3 months	1	4.00
1st 3 months	24	96.00
Any past gynaecological surgery?		
No	117	97.50
Yes	3	2.50
History of infrequent/scanty menstruation?		
No	112	93.33
Yes	8	6.67

Booking time of the study participants

The proportion of the study participants who booked late was 65.00% as shown in Table 4.

Table 4: Booking time of the study participants.

GA at booking	Frequency	Percentage (%)	95% Confidence Interval	
			Lower	Upper
Early booking	42	35.00	26.90	44.06
Late booking	78	65.00	55.93	73.09

*Early booking <12 weeks Gestational age, Late booking >12 weeks gestational age.

Table 5: Cross-tabulation analysis showing relationship between Socio-demographic characteristics and booking time.

Socio-demographic characteristics	Total (%)	Booking time (%)		χ^2-value	p-value
		Early booking (n=42)	Late booking (n=78)		
Age range (years)					
≤19 years	1 (0.83)	0	1 (1.3)		
20-24 years	22 (18.33)	8 (36.3)	14 (18.0)		
25-29 years	49 (40.83)	19 (45.2)	30 (38.45)	2.23	0.817
30-34 years	25 (20.83)	9 (21.4)	16 (20.5)		
35-39 years	21 (17.50)	5 (11.9)	16 (20.5)		
40 and above	2 (1.67)	1 (2.4)	1 (1.3)		
Distance from Hospital					
5 to 10km	41 (34.17)	15 (35.7)	36 (46.2)		
<5km	51 (42.50)	16 (38.1)	25 (32.1)	1.22	0.544
>10km	28 (23.33)	11 (26.2)	17 (21.18)		
Educational status					
Primary	1 (0.83)	1 (2.4)	0		
Secondary	72 (60.0)	22 (52.4)	50 (64.1)	3.09	0.213
Tertiary	47 (39.17)	19 (45.2)	28 (35.9)		
Parity					
Primiparous	31 (25.83)	12 (28.6)	19 (24.4)		
Grand multiparous	3 (2.50)	0	3 (3.9)	2.99	0.394
Multiparous	47 (39.17)	14 (33.3)	33 (42.3)		
Nulliparous	39 (32.50)	16 (38.1)	23 (29.5)		

Relationship between obstetric history and booking time

There is a statistical difference in the relationship between medical history in present pregnancy and booking time. P- value; 0.055 as shown in Table 6.

Table 6: Cross-tabulation analysis showing relationship between obstetric history and booking time.

Obstetric history	Total (%)	Booking time (%)		χ^2-value	p-value
		Early booking (n=42)	Late booking (n=78)		
Have you done USS?					
No	71 (59.17)	22 (52.4)	49 (62.8)	1.23	0.331
Yes	49 (40.83)	20 (47.6)	29 (37.2)		
Any problem since pregnant?					
No	99 (82.50)	32 (76.2)	67 (85.9)	1.78	0.212
Yes	21 (17.50)	10 (23.8)	11 (14.1)		
Medical history in present pregnancy					
Asthma	3 (2.50)	1 (2.4)	2 (2.6)		
PUD	3 (2.50)	2 (4.8)	1 (1.3)		
RVD	3 (2.50)	1 (2.4)	2 (2.6)	9.24	0.055
Hypertension	4 (3.33)	4 (9.5)	0		
None	107 (89.17)	34 (81.0)	73 (93.6)		
Interval from last delivery (n=82)					
<1 year	2 (2.44)	0	2 (3.6)		
1 year	30 (36.59)	14 (51.9)	16 (29.1)		
2 years	31 (37.80)	8 (29.6)	23 (41.8)	7.37	0.194
3 years	9 (10.98)	2 (7.4)	7 (12.7)		

4 years	3 (3.66)	2 (7.4)	1 (1.8)		
>4 years	7 (8.54)	1 (3.7)	6 (10.9)		
Mode of delivery (n=81)					
CS	14 (17.28)	6 (23.1)	8 (14.6)		
SVD	65 (80.25)	20 (76.9)	45 (81.8)	1.74	0.419
Instrumental Delivery	2 (2.47)	0	2 (3.6)		

Multivariate logistic regression showing the effect of sociodemographic factors and obstetric history on late booking

The logistic regression model was not significant for the covariates. However, using the adjusted odds ratio, the odds of late booking is very low for age groups >40 year (aOR=.298) compared with the younger group of <24 years; those with tertiary education had lowest odds (aOR=0.634) of late booking compared with other lower levels of education. Also, the odds are lower for the nullipara (aOR=0.846), those with problem in the index pregnancy (aOR=0.991), existing medical challenges (aOR=0.260) and distance more than 10 km from the hospital. (aOR=0.884) Grand multipara (aOR=1.72) and those with inter-pregnancy interval ≥5 years (aOR=3.519) have higher likelihood of late booking as shown in Table 7.

Table 7: Multivariate logistic regression showing the effect of sociodemographic factors and obstetric history on late booking.

Socio-demographic factors	Crude OR	aOR	Std. Error	*P-value*	(95% CI)	
					Lower	Upper
Age range (years)						
≤24 years	-	-	-	-	-	-
25-29 years	0.902	0.795	0.456	0.690	0.258	2.450
30-34 years	1.015	0.687	0.476	0.589	0.177	2.672
35-39 years	1.828	1.179	0.903	0.829	0.262	5.291
40 and above	0.571	0.298	0.462	0.436	0.014	6.233
Distance from Hospital						
5 to 10 km	-	-	-	-	-	-
<5 km	1.536	1.450	0.680	0.428	0.578	3.637
>10 km	0.989	0.884	0.489	0.824	0.298	2.614
Educational status of mother						
Primary	-	-	-	-	-	-
Secondary	1.542	1.365	0.568	0.454	0.603	3.089
Tertiary	1.473	0.634	0.842	0.637	0.234	2.038
Parity						
Primiparous	-	-	-	-	-	-
Grand multiparous	1.583	1.472	0.806	0.480	0.503	4.309
Multiparous	1.488	0.950	0.489	0.921	0.346	2.607
Nulliparous	0.907	0.846	0.492	0.824	0.385	2.695
Clinical factors						
Any problem since pregnant?						
No	-	-	-	-	-	-
Yes	0.525	0.991	0.927	0.993	0.158	6.202
Medical history in present pregnancy						
No	-	-	-	-	-	-
Yes	0.291	0.260	0.185	0.058	0.064	1.048
Interval from last delivery						
Not prolonged (1-4 years)	-	-	-	-	-	-
Prolonged (≥5 years)	3.183	3.519	4.003	0.269	0.378	32.724

Any complications in last pregnancy?						
No	-	-	-	-	-	-
Yes	0.575	2.664	3.365	0.438	0.224	31.689
Any miscarriage?						
No	-	-	-	-	-	-
Yes	0.761	1.748	1.356	0.471	0.382	7.995
Mode of delivery						
Normal	-	-	-	-	-	-
Abnormal	1.350	1.094	0.907	0.913	0.215	5.559
Delivery outcome						
Normal	-	-	-	-	-	-
Abnormal	1.071	1.401	1.049	0.652	0.323	6.082

-: Reference Category Variables; aOR: Adjusted Odds Ratio

Discussion

World Health Organization recommends that pregnant women should start ANC within 12 weeks Gestational Age (GA) [1]. In the present study, 65% of the participants booked late (ie. after 12 weeks GA while 35% booked before 12 weeks GA. This finding is similar to studies carried out in Burkina-Faso and Rwanda which reported the prevalence rates of late first booking visit to be 62.93% and 61.1% respectively [11,20]. The prevalence found in this study was higher than studies conducted in Malaysia (28.2%) [6], Wales (41%) [7], Cameroon (44%) [4], Ethiopia (52.5%), [10] and Myanmar (56.2%) [9]. The reasons for the difference could be attributed to better awareness by the study participants in these studies and also some of the studies classified late booking after 16 weeks GA unlike in the present study where 12 weeks GA was used as the cut off point for late booking [9]. However, the finding from this study was lower than rates obtained from other studies [14,19,21]. This difference could be attributed to the sociocultural factors of the study population. Also the time difference between the studies because presently there is an improvement of the awareness of antenatal care [10].

The mean gestational age at booking in the present study was 17.58 ± 7.91. Studies conducted in Ethiopia (17.7 weeks) [22] and Myanmar (18.23 weeks) [9] reported a similar result. However, a lower mean GA at booking was noted in a study conducted by Kyaw et al [23] while other studies [3,15,18,14] found a higher mean GA at booking. These variations maybe due to the differences the socioeconomic status of the study population and timing of these studies [9].

The main reason identified as to why the study participants booked at the time, they booked in the present study was that the pregnancy has been normal (64.17%), followed by complications (17.50%). This finding could be explained by the fact that most pregnant women especially those who had been pregnant in the past may not be enthusiastic to visit the hospital early to book, probably because of past experience as long as there was nothing unusual with their current pregnancy. In resource poor settings like Nigeria, one would expect that financial constraint would be the major reason why the women booked late but the findings from this study has shown the women's understanding of the purpose of antenatal care play a major role. This finding is similar to a study conducted by Ndidi et al who in their study observed that majority (73%) of the women booked late because they did not have any serious problem [17]. Antenatal care seems viewed by most women as curative rather than preventive which is in contrast with the purpose of antenatal care which is mainly preventive [17]. Similarly, Kisuule et al in their study reported that 53.3% of the participants did not have any problem with their current pregnancy and so saw no reason to come early for antenatal care [24]. However, other studies [4,18,19] observed varied reasons such as financial constraints, long distance to the hospital, busy schedule, unaware they were pregnant, personal wishes as the reasons for late booking.

In the current study a multivariate logistic regression was performed to ascertain the effects of the various sociodemographic, obstetrics/gynaecological, and medical factors on the likelihood that participants booked late. The logistic regression model was not significant for the covariates a. However, it is noteworthy that using the adjusted odds ratio, that the odds of late booking was very low for age groups >40 year (aOR=.298) compared with the younger group of <24 years; those with tertiary education had lowest odds (aOR=0.634) of late booking compared with other lower levels of education. In the same vein, the odds were lower for the nullipara (aOR=0.846), those with problem in the index pregnancy (aOR=0.991), existing medical challenges (aOR=0.260) and distance more than 10 km from the hospital (aOR=0.884). Grand multipara (aOR=1.472) and those with interpregnancy interval ≥5 years (aOR=3.519) had higher likelihood of late booking. Similarly, Jice et al in their study reported that pregnant mothers with no past medical history of medical illness (95% CI=1.26, 6.59) were 2.88 times more likely to book their pregnancy late than those with a history of medical illness. Pregnant mothers without a history of pregnancy complications (95% CI = 1.09, 4.99) were 2.34 times more likely to delay their antenatal booking, compared to those with a history of complications during pregnancy [6]. However, Tolefac et al in their study observed that the odds of starting ANC late were about 2 times higher if the participant live greater than 10 km from the hospital [4]. This variation may probably be attributed to the fact that the study was conducted in a rural community where assess to the hospital may be cumbersome due to bad road and poor transportation system, in the rural community. Limitation of the study is that the study is a hospital-based cross-sectional study whose findings are not generalized to the general population.

Conclusion

From the present study, the prevalence of late antenatal booking among pregnant women is high. Grand multiparity and interpregnancy interval >5 years were identified as having higher odds for late booking. We therefore recommend that the public should be educated on the importance of early booking into antenatal care. Also, women should be counselled during their routine postnatal visit on the need to book early in their subsequent pregnancy, if they wish to conceive again.

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