Factors Influencing the Booking Gestational Age Among Antenatal Clinic Attendees at Primary Health Centers in South West, Nigeria: A Cross-Sectional Study

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Abstract

Background: Antenatal care (ANC) is a recognized factor for favorable pregnancy outcomes. Despite the benefits associated with early initiation of antenatal care, late booking still predominates in sub-Saharan Africa including Nigeria.

Objective: This study aimed to assess the factors, including family dynamics, associated with the booking gestational age among women attending ANC clinics in a Local Government Area of Osun State, Nigeria.

Methods: A descriptive cross-sectional study was conducted among 255 pregnant women attending ANC at the Primary Health Centres in Osun State, who were selected by stratified random sampling technique. Data were obtained with aid of a semi-structured questionnaire and subjected to descriptive and inferential analyses.

Results: The mean age of respondents was 27.3 ± 5.1 years. Their mean booking gestational age was 23.0 ± 6.6 weeks, while the majority (85.3%) booked late for ANC. Most (122, 54.2%) of the respondents booked in the second trimester. The opinion of the husband influenced most women (54.2%) in the decision regarding the time of ANC booking. There was no association between the booking gestational age and each of respondents’ age, education, parity, perceived family support, level of family functioning, and other sociodemographic characteristics. The booking GA was however significantly related to the previous booking GA at the last pregnancy (p = .004).

Conclusion: Late initiation of antenatal care was high among pregnant women attending PHCs in the study area and it was not associated with measures of family dynamics. The predominant influence of husbands’ opinion on time of booking suggests the need for strategic outreach to males through relevant reproductive health educational campaigns.

Keywords
antenatal, ANC, booking, gestational age, primary care, family support, Nigeria

Introduction/Background

Nigeria ranks second to India globally in number of maternal deaths (Ashir et al., 2013). Many of the causes of mortality in pregnant women are preventable with early detection of problems and prompt intervention. Antenatal care (ANC) is an important maternal health care service that prevents adverse pregnancy outcomes. It is the care that increases...
the possibility of favorable pregnancy outcomes, providing therapeutic interventions known to be effective; and educating pregnant women about planning for safe birth, emergencies during pregnancy and how to deal with them (Awoyesuku et al., 2019; Onoh et al., 2012).

The first antenatal visit otherwise known as the booking visit should take place in early pregnancy, prior to 14 weeks (Awoyesuku et al., 2019; Jeremiah et al., 2015). Early initiation of ANC has several benefits. It favors more accurate ultrasound-assisted gestational age determination, especially in women who are unsure of their last menstrual period (LMP). It provides an opportunity to review the medical and obstetric history of pregnant women, perform a physical examination, conduct appropriate investigations, give dietary advice, give pregnancy-related health counseling, and arrange for a suitable antenatal care plan for the rest of the pregnancy (Awoyesuku et al., 2019). It also provides opportunities for preventive health care services such as immunization against neonatal tetanus, prophylactic treatment of malaria through the use of intermittent preventive treatment approach, and HIV counseling and testing.

Review of Literature

Studies have shown that there is an association between gestational age at initiation of antenatal care and outcomes for mothers and babies (Owolabi et al., 2008; Zaman et al., 2019). Late booking for ANC and missing antenatal appointments have been identified as risk factors for maternal deaths (Zaman et al., 2019). However, in spite of poor outcomes associated with late booking and the benefits of early booking, late entry into antenatal care is common in the developing world especially in sub-Saharan Africa including Nigeria (Zaman et al., 2019).

Various factors have been identified as determinants of time of entry into antenatal care such as age, level of education, ethnicity, religion, parity, and household type of patients (Onoh et al., 2012). Other factors include education and occupation of partner, access to health facility, and attitude of health workers (Onoh et al., 2012; Reskiani, 2014). In addition to the foregoing, the determination of the relationship between family dynamics and the gestational age at booking is important in view of the fact that family dynamics have been shown to influence health behaviors of members of the family (Anyanwu et al., 2020).

The family is the primary social context in which health promotion and disease prevention take place. Family dynamics are the patterns of interaction or relationship between family members. Social support refers to the perceived comfort, care, esteem, or help a person receives from other people or group (Anyanwu et al., 2020; Cobo-Rendón et al., 2020). Source of support can be from friends, coworkers, spouse, or family.

There are quite a number of studies that had investigated the factors associated with the gestational age at booking in the country but virtually none of these previous studies assessed the role of family dynamics (viz-à-viz family functioning or family support) in determining the time of initiation of antenatal care. The family may affect the health-seeking behavior of a woman through family’s prioritization of decision in favor of men, innate family traditions, beliefs, norms, taboos, and family religion. Furthermore, most of the previous studies were conducted at ANC clinics of tertiary institutions. Many pregnant women however obtain their maternal health services, including ANC, from the Primary Health Centres (PHCs) across the country (Olajubu et al., 2020).

This study, therefore, sets out to assess the association between sociodemographic, obstetric, and family-related variables and the gestational age (GA) at booking among pregnant women attending PHCs in a Local Government Area of Osun State, Nigeria.

Methods

Study Design

It was a descriptive cross-sectional facility-based study of factors associated with the booking gestational age among antenatal clinic attendees. The study was conducted at the antenatal clinics of selected Primary Health Centres (PHCs) in Ilesha West Local Government Area (LGA), Osun State, South Western Nigeria. Osun State is one of the 36 states in the country. It is subdivided into 30 LGAs, one of which is Ilesa West LGA. Ilesa West LGA has 19 Primary Health Centres which offer antenatal care (ANC) services. In the PHCs, the provision of ANC is usually led by Nurses and Midwives. The target population were the pregnant women who presented for ANC booking at the PHCs.

Research Questions

1. What is the pattern of the booking gestational age (GA) among pregnant women attending PHCs in Ilesha West LGA, Osun State?
2. What are the sociodemographic, obstetric, and family-related factors associated with booking GA among the study population?

Sample

The sample size was determined by using the Leslie and Kish formula with the following assumptions; 83.8% prevalence of late booking from a similar study (Onoh et al., 2012), 95% confidence level with corresponding standard normal variate of 1.96, and desired margin of error of 5%. After the addition of potential 10% non-response rate, the calculated sample size was 230.
The PHCs were stratified into three groups based on the average number of patients booked per month. Stratum A included all PHCs that booked 15 or more clients per month; Stratum B consisted of all PHC centers that booked 6–14 clients per month; Stratum C consisted of all PHCs that booked five clients or less. Strata A, B, and C had five, nine, and five PHCs, respectively. Three centers were selected randomly from each stratum yielding a total of nine selected centers. The total sample size was proportionately allocated to each of the nine selected PHCs based on their average monthly booking rate. The respondents were thereafter recruited serially from the selected centers until the allocated sample size was attained.

Inclusion/Exclusion Criteria

All the pregnant women who presented for booking at the selected PHCs and gave consent were included in the study. Any individual whose last menstrual period could not be ascertained and did not have her gestational age established through an early ultrasound scan was excluded.

Ethical Consideration

The Research and Ethics Committee of authors’ institution gave approval for the study. Informed written consent was obtained from each of the participants. The confidentiality and anonymity of the data was ensured.

Data Collection

An interviewer-administered questionnaire was used to obtain information on: sociodemographic characteristics of respondents, gestational age, obstetrics and gynecologic history, family functioning, and perceived social support—Family scale (PSS-Fa) and the clinical parameters at booking.

Study Measures

Booking gestational age. This was calculated based on the last menstrual period. Late booking was defined as occurring after an estimated gestational age of 14 weeks.

Family functioning. The family Adaptation, Partnership, Growth, Affection and Resolve (APGAR) scale is a standardized five-item scale of family functioning developed to measure a family member’s perception of five dimensions of family functioning: Adaptation, Partnership, Growth, Affection and Resolve (Campo-Arias & Caballero-Domínguez, 2021; Smilkstein et al., 1982). Each question has three possible responses: “almost always,” “some of the time,” and “hardly ever” scored as two points, one point, and zero point, respectively. The highest possible score is 10 and minimum score is zero. A score of 7 points or more indicates a functional family while scores less than 7 were categorized as a dysfunctional family (Smilkstein et al., 1982).

Family social support. The Perceived Social Support—family scale (PSS-Fa) is a standardized 20-item scale (Glozah & Pevalin, 2016; Procidano & Heller, 1983). Subjects answered “yes” or “no” or “I don’t know” to 20 structured questions referring to their feelings and experiences in relationship with their recognized family member(s) with whom they live regularly. Each “yes” answer was scored +1. Any other response was scored zero. Items 2, 6, 7, 18, and 20 on the scale are reverse scored. The total scores range from zero to 20 points. A score of 11 points or more was regarded as strong family support, a score between 7–10 was regarded as weak family support while a score of six points or less was regarded as poor or absent family support (Daniel & Yohanna, 2021; Procidano & Heller, 1983). Pretesting of the questionnaire was conducted on 20 clients recruited from one of the PHCs in Ilesa East LGA.

Statistical Analysis

Data were analyzed using SPSS version 20 software. The dependent variable was the booking gestational age which was dichotomized into early (at ≤14 weeks gestational age) and late booking (>14 weeks) (Jeremiah et al., 2015). Chi-square was used to test the association between categorical variables. A p-value of ≤.05 was accepted as statistically significant.

Results

Sample Characteristics

A total of 225 respondents were studied. The age of the respondents ranged from 18 to 45 years with a mean of 27.3 ± 5.1 years. The predominant age group of the respondents was 25–29 (38.7%), (Table 1). Only 8.4% of the respondents were never married. The majority of the women had secondary school (48%) or tertiary education (41.3%). A similar pattern of education level was found among their partners. More than one-quarter (27.1%) of the respondents were unemployed.

Booking Age and Associated Factors

The mean booking gestational age was 23.0 ± 6.6 weeks. As shown in Table 2, the majority (85.3%) of the pregnant women booked late for the ANC clinic. Only 11.1% booked within the first trimester while 54.2% booked in the second trimester. With regard to the individuals who influenced their booking decision, the greatest proportion (122, 54.2%) indicated that it was their husband.
Table 3 shows the Pearson Chi-Square test of the association between ANC booking age and various variables (sociodemographic, obstetric, and family dynamics) among the respondents. There was no statistically significant association between any of the factors and ANC booking except for the booking age at previous pregnancy. Those who had their previous ANC booking during the first trimester were also more likely to book early in the current pregnancy ($p = .004$). The family functioning and perceived family support were also not statistically related to the GA at ANC booking.

### Discussion

In the study, the average age of respondents was $27.3 \pm 5.1$ years. The majority of respondents (38.7%) had their age within the range of 25 and 29 years. This age corresponds with the optimal age of reproductive activities.

The mean gestational age at booking of the respondents in this study was $23.0 \pm 6.6$ weeks. This is similar to the finding at Port-Harcourt, Nigeria, where the authors reported a mean of $22.1 \pm 6.8$ weeks (Awoyesuku et al., 2019). A much lower mean gestational age at booking of $18.9 \pm 7.8$ weeks was found by Adegbola & Kuku (2015) in Lagos and $19.4 \pm 8.14$ weeks in Abuja, North-Central Nigeria (Zaman et al., 2019).

In this study, the prevalence of late booking was 85.3%. Onoh et al., (2012) in a south-eastern state reported a similar prevalence of 83.1%. Considering booking by trimester, 11.1% booked during the first trimester while the majority of the respondents (54.2%) initiated their antenatal care during the second trimester which is in line with the findings from the Port-Harcourt study where the majority booked in the second trimester (Awoyesuku et al., 2019). These findings demonstrated the continuing problem of late antenatal booking in Nigeria and many other developing countries, which are not in line with the WHO recommendation (Adegbola & Kuku, 2015; Adekanle & Isawumi, 2008). In a situation where most women booked during second or third trimester, the benefits of early screening and counseling in preventing complications that may arise in the course of the pregnancy will elude them.

In this study, none of the sociodemographic and obstetric parameters showed a statistically significant association with the booking gestational age except the gestational age at booking in the last pregnancy. Of particular note and interest was the fact that there were no associations between the booking gestational age and each of the following: educational status, employment status, and parity.

It might have been expected, for example, that the educational level of women will influence their ANC booking time as had been previously reported (Awoyesuku et al., 2019). However, the high literacy level among the respondents in this study group did not translate into the practice of early booking for antenatal care probably because other extraneous factors influenced the decision of when to register for ANC. This corroborates the finding by Adegbola & Kuku (2015).
Employment status was also not significantly associated with booking gestational age in this study. Being employed usually translates to better family income which results into the affordability of health care and early initiation of antenatal care. The lack of association between employment status and booking time may be because the antenatal care service was free for both employed and unemployed respondents in this study.

Previous authors have described parity as a key factor in determining the gestational age at booking. It has been shown that nulliparous and primiparous women tend to book early (Adegbola & Kuku, 2015; Jeremiah et al., 2015). This study however did not show a significantly similar pattern. What was obvious from the findings was that those who booked early in a previous pregnancy were significantly more likely to book early in the current pregnancy. On one hand, this appears unsurprising, while it may also be argued that it was counterintuitive considering the fact that the pattern from the

Table 3. Association Between Respondents’ Characteristics and ANC Booking (N = 225).

| Characteristic                                      | Early n (%) | Late n (%) | χ²  | p value |
|-----------------------------------------------------|-------------|------------|-----|---------|
| Age group (years)                                   |             |            |     |         |
| <30                                                  | 20 (13.4)   | 129 (86.6) | 0.545 | .460    |
| 30 or more                                          | 13 (17.1)   | 63 (82.9)  |     |         |
| Marital status                                      |             |            |     |         |
| Never married                                       | 5 (26.3)    | 14 (73.7)  | 2.250 | .168    |
| Ever married                                        | 28 (13.6)   | 178 (86.4) |     |         |
| Educational status                                  |             |            |     |         |
| Tertiary                                            | 15 (16.1)   | 78 (83.9)  | 0.271 | .603    |
| Secondary & lower                                   | 18 (13.6)   | 114 (86.4) |     |         |
| Partner educational status                          |             |            |     |         |
| Tertiary                                            | 17 (16.0)   | 89 (84.0)  | 0.301 | .583    |
| Secondary & lower                                   | 16 (13.4)   | 103 (86.6) |     |         |
| Employment status                                   |             |            |     |         |
| Employed                                            | 26 (15.9)   | 138 (84.1) | 0.681 | .409    |
| Unemployed                                          | 7 (11.5)    | 54 (88.5)  |     |         |
| Partner employment                                  |             |            |     |         |
| Employed                                            | 30 (15.2)   | 168 (84.8) | 0.310 | .578    |
| Unemployed                                          | 3 (11.1)    | 24 (88.9)  |     |         |
| Religion                                            |             |            |     |         |
| Christianity                                        | 27 (14)     | 166 (86.0) | 0.497 | .481    |
| Other religion                                      | 6 (18.8)    | 26 (81.3)  |     |         |
| Ethnicity                                           |             |            |     |         |
| Yoruba                                              | 32 (15.1)   | 180 (84.9) | 0.536 | .464    |
| Other ethnic groups                                 | 1 (7.7)     | 12 (92.3)  |     |         |
| Parity                                              |             |            |     |         |
| Nullipara (Para 0)                                  | 14 (19.4)   | 58 (80.6)  | 1.931 | .165    |
| Para ≥ 1                                            | 19 (12.4)   | 134 (87.6) |     |         |
| GA at previous booking (n = 130)                    |             |            |     |         |
| First trimester (1–3 month)                         | 7 (31.8)    | 15 (68.2)  | 8.183 | .004    |
| Later trimesters (4–9 months)                       | 10 (9.3)    | 98 (90.7)  |     |         |
| Place of last delivery (n = 153)                    |             |            |     |         |
| Health Facility                                     | 13 (12.1)   | 94 (87.9)  | 0.024 | .878    |
| Non-Health Facility                                 | 6 (13.0)    | 40 (87.0)  |     |         |
| Birth attendant (n = 153)                           |             |            |     |         |
| Skilled Attendant                                   | 13 (11.3)   | 102 (88.7) | 0.528 | .467    |
| Unskilled Attendant                                 | 6 (15.8)    | 32 (84.2)  |     |         |
| Family functioning (APGAR score)                   |             |            |     |         |
| Functional family (7–10)                            | 22 (12.9)   | 149 (87.1) | 1.847 | .174    |
| Dysfunctional family (0–6)                          | 11 (20.4)   | 43 (79.6)  |     |         |
| Family support                                      |             |            |     |         |
| Strong family support (11–20)                       | 21 (15.0)   | 119 (85.0) | 0.033 | .856    |
| Weak or absent family support (0–10)                | 12 (14.1)   | 73 (85.9)  |     |         |
previous study was that women who have had successful pregnancies in the past tend to feel that they have acquired some experience which makes them less inclined to book early in subsequent pregnancies (Jeremiah et al., 2015).

With regard to the people or factors that influenced their booking, the decision was mostly influenced by the husbands. This is in keeping with African culture where decision-making in the family is male-dominant. It could also be due to the fact that many women depend on their husbands to provide the funds required to access healthcare services. Therefore, it can be suggested that strategic male involvement in maternal reproductive health issues such as antenatal care timing, antenatal care visits, place of delivery, and postnatal care, is highly essential (Muheirwe & Nuhu, 2019; Rahman et al., 2018).

One of the study objectives was to assess the relationship between the booking gestational age and measures of family dynamics, that is, family functioning and family support, respectively. These were found not to be statistically significant. Even though the influence of other family members on the choice to initiate ANC was affirmed by many respondents, the dynamics and pattern of emotional relationship and perception of social support within the family, did not statistically impact on their decision. In contrast, Reskiani (2014) found a statistically significant association between family support and early use of antenatal care services.

**Strength and Limitations**

This study highlighted the potential impact of family-related variables on the decision of women regarding the initiation of ANC, a factor that is often overlooked. However, there are some important limitations that must be kept in mind in the interpretation of the findings from the study. The determination of gestational age was based mostly on self-reported last menstrual period (LMP), this may not have been entirely accurate in some cases. Also, the research was facility-based and many pregnant women do not use the PHC facilities for antenatal care; hence, the result of the study may not be representative of the entire population.

**Implications for Practice**

Health care providers and policy makers should consider promoting strategic male involvement in reproductive health issues such as antenatal care. Nurses and Midwives, who are the most available healthcare providers of ANC at the level of PHCs in the country, should be actively involved in this crucial effort. All pregnant women, especially those who booked late for ANC, should be counseled on the importance of early initiation of ANC in subsequent pregnancies.

**Conclusion**

Late initiation of antenatal care is very high among antenatal clinic attendees in Ilesa West Local Government Area and the women’s decision regarding when to book was predominantly influenced by the husbands’ opinion. There should be community mobilization by health workers toward the education of each family as a unit on the importance of early initiation of antenatal care.

**Authors’ Note**

The approval for the study was obtained from the Research and Ethics Committee of authors’ institution. Each of the participants gave a written consent. The primary data are available upon a request to the corresponding author.

**Acknowledgments**

The authors acknowledge and appreciate the staff of the respective PHCs for their cooperation during process of data collection.

**Declaration of Conflicting Interests**

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

**Funding**

The authors received no financial support for the research, authorship, and/or publication of this article.

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**Supplemental Material**

Supplemental material for this article is available online.

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