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Determinants and Outcomes of Pregnancies among Booked versus Unbooked Patients in a Tertiary Hospital South East, Nigeria

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Abstract

Background: Inadequate antenatal care, both in coverage and standard, has been linked with poor pregnancy outcomes. In a resource poor setting, home delivery is considered very cheap, but the possible outcome of such pregnancies has been a subject of interest. This study evaluated the association of booking status with pregnancy outcomes. **Objectives:** To examine the factors that influence booking and impact of the booking status on pregnancy outcomes. **Methods:** This was a hospital-based prospective cohort study of 240 (120 booked and 120 un-booked) pregnant mothers selected through systematic random sampling. The study was carried out at the Department of Obstetrics and Gynaecology, Alex Ekwueme Federal University Teaching Hospital Abakaliki, Nigeria. Chi-square test, t-test and logistic regression were used for analysis. **Results:** The mean age of the participants was 30.39 ± 5.05 years and 29.05 ± 6.36 years respectively for the booked and unbooked. Marital status (OR = 6.35, 95% CI = 1.24 - 32.59), educational status (OR = 36.40, 95% CI = 5.26-152.83), place of residence (OR = 0.15, 95% CI = 0.06 - 0.41), partner's support (OR = 0.05, 95% CI = 0.01 - 0.37), family support (OR = 0.03, 95% CI = 0.01 - 0.13), mode of delivery (OR = 0.23, 95% CI = 0.12 - 0.46), APGAR score in first minute (OR = 6.02, 95% CI = 2.45 - 14.83) and NBICU admission (OR = 3.75, 95% CI = 1.67 - 8.43) were associated with booked status. However, being unmarried, nulliparity/grandmultiparity, low level of education, blue colar jobs, low income, rural dwelling and poor partner and poor family support were associated with the unbooked. The booked parturients had a better perinatal outcome compared the unbooked. **Conclu-**

sion/Recommendation: There was high prevalence of operative deliveries, perinatal morbidity and mortality among the unbooked mothers. Girl child education, employment and poverty alleviation would improve antenatal care utilization.

Keywords

Socio-Demographic Characteristics, Booking Status, Antenatal, Delivery

1. Introduction

Childbirth is a natural and physiologic event which can be quite rewarding to families but may become eventful through unexpected complications [1]. Antenatal care (ANC) is a preventive routine care provided for women between conception and onset of labour [2]. The role is to equip pregnant mothers for delivery and parenthood as well as guarantee their safety and that of their babies through prompt identification, prevention and/or management of health related problems that may impact on mothers and fetuses during pregnancy and delivery [3]. To ensure the success of any antenatal care, its policy formulation as well as its implementation must be made effective [4]. It should also ensure workable and operational continuity of care which is cost-effective, readily available and of high standard during and after pregnancy and delivery [3] [4] [5] [6].

Inadequate antenatal care (both in coverage and standard) has been highly linked with poor pregnancy outcome [5]. In developing countries (including Nigeria), millions of mothers and newborns die each year while others may experience serious health problems related to pregnancy and child delivery [7]. Home delivery is considered very cheap even though it is associated with increased risk of sepsis and non-availability of equipment to address possible adverse outcome [8]. In sub-Saharan Africa, there is paucity of skilled birth attendants [9]. This is considered as one of the major factors contributing to maternal and peri-natal morbidity and mortality. Nigeria has continued to experience high maternal mortality ratio (MMR) with variations across regions [9]. Maternal mortality ratio in Nigeria is 560 per 100,000 compared to an average of 210 globally while the peri-natal mortality ratio (PMR) in Nigeria is about 130 per 1000 births [10]. Improvement of antenatal care coverage and quality of the service delivery could enhance the reduction of the high maternal and peri-natal mortality rates in Nigeria [11].

A pregnant woman is described as "booked" or to have adequate antenatal care if she had at least four antenatal visits and received besides other elements of care, tetanus immunization [12]. On the other hand, the un-booked mother is the one who did not register her pregnancy for antenatal care or the one who delivered within three visits or less [12] [13]. It has been proven that antenatal care offers an opportunity for risk evaluation and supervision of pregnancy which

will usually lead to better maternal and peri-natal outcome [13]. Factors that determine whether a parturient is booked or unbooked vary significantly. The un-booked mothers are usually young, unemployed and most likely from a lower socio-economic class [14]. In some other instances, more elderly multiparous women who think they are experts in childbirth are less likely to book for ante-natal care services [15]. Un-booked pregnancies have been found to be directly related to increased peri-natal morbidity and mortality [15] [16]. This is because these mothers are usually referred to the hospital at the time of complications [16]. This class of women also does not benefit from health promotion, identification and prompt management of complications and care by skilled birth attendants which are usually obtained during antenatal services.

In developing nations, the utilization of antenatal care services is influenced by a combination of factors among which are demographic, socio-economic, religious, cultural, obstetric and health system factors [4] [17] [18]. Antenatal care as a key pillar of safe motherhood initiative is expected to positively contribute towards the attainment of the third component of the sustainable development goals which centers on good health and well-being. Adequate antenatal care coverage will achieve the goal 3 target as it concerns reduction in child and maternal mortality. While increasing antenatal care coverage is ideal in Nigeria, its coverage should ensure the integration of skilled personnel and quality antenatal care services.

The aim of this study is to determine the factors that influence pregnant women to access antenatal care and to compare the outcome of pregnancy between booked and unbooked parturients in a tertiary facility. It is our believe that the outcome of our finding will enrich antenatal care advise given to women during the visit and help policy makers formulate ideas that will improve antenatal care coverage and quality of services.

2. Method

2.1. Study Design

This was prospective cohort study involving booked and unbooked parturients who presented at the labour ward of the Obstetrics and Gynaecology Department of Alex Ekwueme Federal University Teaching Hospital within July and December, 2018.

2.2. Setting

This study was carried out in the Department of Obstetrics and Gynecology of the Alex Ekwueme Federal University Teaching Hospital, Abakaliki, Ebonyi State, Nigeria. The hospital is the major referral centre in the state, receiving referrals from secondary and primary health care facilities within and outside the state. The Obstetrics and Gynecology Department of the hospital has five consulting units and its ante-natal care services run daily from Monday through Friday. Unpublished hospital record showed an average of 12,568 antenatal visits

and 2546 deliveries per annum.

2.3. Study Population

This included booked and unbooked pregnant women who presented at the labour ward of the Obstetrics and Gynaecology Department of Alex Ekwueme Federal University Teaching Hospital within July and December, 2018. For this study, booked parturients were those who made four or more antenatal visits before delivery and who did all the routine investigations. Those who had less number of visits were excluded. Unbooked parturients were those who were never presented for antenatal care in our facility or those who were referred to the centre without a record of antenatal care. The participants were selected at presentation in labour ward and were followed up until delivery and discharge from the hospital. All pregnancies were singleton pregnancies at term defined as gestational age of 37 completed weeks. Multiple gestations and gestational age less than 37 weeks were excluded.

2.4. Sampling Strategy

The minimum sample size was determined on sample size comparing two proportions with two-tail test by Goyal [19]. The proportion of booked women who had good outcome from previous study was 28% while proportion of unbooked women who had good outcome form previous study was 12% [20]. The calculated sample size was 120 in each arm of the study.

The Participants were selected by systematic random sampling. To select the booked participants, the sampling interval was 5. That is, for every five booked patients, one was selected as soon as they presented in the labour ward. The number of the first booked patient included in the sample was randomly chosen by picking one out of first five booked patients by balloting among them. If number three (3) was picked, then every other fifth patient was included starting with the number three (3) until 120 booked patients were selected (*i.e.* 3, 8, 13, 18, etc.). This selection was made on daily basis. Similarly, the selection was same for unbooked parturients but at the interval of 3 because there were fewer unbooked patients from hospital unpublished records. During the selection, any number selected and who did not meet the inclusion criteria or did not give consent was dropped and the next number picked and such a pick did not affect the next random selection.

2.5. Data Collection

Data was collected by interviewer administered structured questionnaires (a modified Canadian Maternity Experience Survey Questionnaire of 2006). The ensure validity and credibility of the modified survey questionnaire, the tool was pretested before commencement of the data collection. Information collected from the participants include socio-demographic characteristics such as age, occupation, parity, marital status, income level, booking status, level of education, religion and family

support as well as the mode of delivery, fetal birth weight and outcome.

2.6. Data Analysis

The data collected were analyzed using Statistical Package for Social Sciences version 26 (IBM SPSS Inc & Chicago, IL, USA). Mean and standard deviations were estimated for numerical variables while number and percentages were estimated for the categorical variables. Comparison between the numerical variables was done using student's t-test while chi-square test was used to compare the categorical variables. The association between the independent and dependent variables was assessed using odds ratio (OR) at 95% confidence interval. The associations was considered statistically significant at $p < 0.05$ level.

2.7. Ethical Consideration

Approval for this study was obtained from the Research and Ethics Committee (REC) of the Alex Ekwueme Federal University Teaching Hospital, Abakaliki with REC approval number 23/01/2018-19/02/2018. Informed and written consent was obtained from all the participants. To ensure confidentiality, the number each participants picked was used to identify her. The participants name and other personal characteristics were not collected and not included in the data analyzed.

3. Results

The number of respondents who participated in this study was 240. Table 1 shows the association between socio-demographic characteristics of the participants and the booking status. The mean age of the booked participants was 30.39 ± 5.05 years and that of the unbooked participants was 29.05 ± 6.36 years. There was significant association between the marital status, parity, level of education, occupation, level of income and place of residence and the booking status $p \leq 0.05$.

Table 2 shows the relationship between support during pregnancy and booking Status.

Booked participants had more partners' support than unbooked 56.9% versus 43.1%); had better family support 92.2% versus 7.8% and were more satisfied 89.2% versus 10.8%. These were statistically significant ($p = 0.0001$).

Table 3 shows the predictors of booking status. Being booked was 6 times higher among the married compared to the unmarried (OR = 6.35, 95% CI = 1.24 - 32.59). Having at least a secondary education was 36 times more likely to be booked compared to those without secondary education (OR = 36.40, 95% CI = 5.26 - 251.83). Those who reside in rural areas, had no partner and family support were also more likely to be unbooked compared to those who reside in urban areas, had partner and family support (OR = 0.15, 95% CI = 0.06 - 0.41), (OR = 0.05, 95% CI = 0.01 - 0.37) and (OR = 0.03, 95% CI = 0.01 - 0.13) respectively.

As shown in Table 4, 66.7% of the booked mothers had spontaneous vertex delivery compared to 21.0% among the unbooked mothers while majority 66.0% of the unbooked mothers had caesarean delivery compared to 26.7% among the

Table 1. Association between socio-demographic variables and booking status among the participants.

Variables	Unbooked (%) (n = 120)	Booked (%) (n = 120)	Total (%)	χ^2	P-value
Age Group (years)				3.563	0.313
≤19	9 (69.2)	4 (30.8)	13 (5.4)		
20 - 29	53 (51.0)	51 (49.0)	104 (43.3)		
30 - 39	50 (45.5)	60 (54.5)	110 (45.8)		
≥40	8 (61.5)	5 (38.5)	13 (5.4)		
Marital Status				23.612	0.0001
Married	83 (43.0)	110(57.0)	193 (80.4)		
Single	25 (86.0)	4 (14.0)	29 (12.1)		
Divorced	1 (33.3)	2 (66.7)	3 (1.3)		
Widowed	11 (73.3)	4 (26.7)	15 (16.2)		
Parity				8.953	0.011
Nulliparous	42 (52.5)	38 (47.5)	80 (33.3)		
Multiparous	51 (42.0)	70 (58.0)	121 (50.4)		
Grand multiparous	27 (69.0)	12 (31.0)	39 (6.2)		
Educational Status				145.375	0.0001
None	8 (89.0)	1 (11.0)	9 (3.8)		
Primary	52 (98.0)	1 (2.0)	53 (22.0)		
Secondary	58 (54.0)	49 (46.0)	107 (44.6)		
Tertiary	2 (2.8)	69 (97.2)	71 (29.6)		
Occupation				95.710	0.0001
Housewife	17 (39.5)	26 (60.5)	43 (17.9)		
Artisan	33 (78.6)	9 (21.4)	42 (17.5)		
Farming	39 (95.0)	2 (5.0)	41 (17.1)		
Civil Service	5 (7.7)	60 (92.3)	65 (27.1)		
Trading	26 (53.1)	23 (46.9)	49 (20.4)		
Monthly Income (₦)				89.189	0.0001
Less than 2000	38 (86.4)	6 (13.6)	44 (18.3)		
2000 - 5000	68 (66.0)	35 (34.0)	103(42.9)		
6000 - 10,000	12 (36.4)	21 (66.6)	33 (13.8)		
11,000 - 20,000	2 (11.1)	16 (88.9)	18 (7.5)		
Greater than 20,000	0 (0.0)	42 (100.0)	42 (17.5		
Religion				1.769	0.559
Christianity	116 (49.6)	118 (50.4)	234 (97.5)		
Islam	2 (50.0)	2 (50.0)	4 (1.7)		
ATR	2 (100.0)	0 (0.0)	2 (17.5)		
Place of Residence				99.581	0.0001
Urban	17 (17.3)	81 (82.7)	98 (40.8)		
Semi-Urban	27 (45.8)	32 (54.2)	59 (24.6)		
Rural	76 (91.6)	7 (8.4)	83 (34.6)		

Table 2. Relationship between support during pregnancy and booking status.

Variable	Unbooked (%) (n = 120)	Booked (%) (n = 120)	Total (N)	χ^2	P-value
Partner's Support				25.621	0.0001
Yes	88 (43.1)	116(56.9)	204 (100.)		
No	32 (88.9)	04 (11.1)	36 (100)		
Support Satisfaction				99.834	0.0001
Very Satisfied	11 (10.7)	91 (89.2)	102 (100%)		
Somewhat Satisfied	19 (52.7)	17 (47.2)	36 (100%)		
Somewhat Dissatisfied	34 (82.9)	07 (17.1)	41 (100%)		
Very Dissatisfied	24 (96.0)	01 (04.0)	25 (100%)		
Family Support				86.937	0.0001
None of the Time	38(60.3)	25 (39.7)	63 (100%)		
Some of the Time	78(75.0)	26 (25.0)	104 (100%)		
Most of the Time	4 (7.8)	47 (92.2)	51 (100%)		
All of the Time	0 (0.0)	22(100.0)	22 (100%)		

Table 3. Predictors of booking status among the participants.

Socio-demographic Variable	Odds Ratio (OR)	P-value	95% CI for OR
Age Group (years):	0.759	0.599	0.271 - 2.123
<30			
≥30			
Marital Status	6.350	0.027	1.238 - 32.586
With spouse			
Without Spouse			
Parity	2.822	0.198	0.505 - 28.905
0 - 4			
≥5			
Educational Status	36.399	0.0001	5.261 - 251.825
Without Secondary Education			
Secondary Education & Above			
Occupation:	0.287	0.157	0.051 - 1.619
Civil Servant			
Not Civil Servant			
Monthly Income (₦)	7.817	0.067	0.869 - 70.289
≤10,000			
>10,000			
Religion	0.518	0.731	0.012 - 22.008
Christianity			
Non-Christianity			
Place of Residence	0.149	0.0001	0.055 - 0.407
Urban			
Rural			

Continued

Partner's Support	0.054	0.003	0.008 - 0.368
Yes			
No			
Family Support	0.025	0.0001	0.005 - 0.134
With Family Support			
Without Family Support			

CI: confidence interval.

Table 4. Effect of booking status on delivery outcome.

Variable	Unbooked (n = 120)	Booked (n = 120)	χ^2	P-value
Mode of Delivery			51.377	0.0001
SVD	25 (21.0)	80 (66.7)		
Instrumental	16 (13.0)	08 (06.6)		
Caesarean Delivery	79 (66.0)	32 (26.70)		
APGAR Score at 1st Minute			78.806	0.0001
<7	80 (66.7)	13 (10.8)		
≥7	40 (33.3)	107 (89.2)		
APGAR Score at 5th Minute			33.326	0.0001
<7	38 (31.7)	04 (3.3)		
≥7	82 (68.3)	116 (96.7)		
Perinatal Outcome			29.427	0.0001
Live Birth	87 (72.5)	117 (97.5)		
Early Neonatal Death	09 (07.5)	01 (00.8)		
Intrauterine Fetal Death	24 (20.0)	02 (01.7)		
Birth Trauma:			0.517	0.722
Yes	05 (04.2)	03 (02.5)		
No	115 (95.8)	117 (97.5)		
NBICU Admission:			24.631	0.0001
Yes	49 (40.8)	15 (12.5)		
No	71 (59.2)	105 (87.5)		

booked mothers. These were statistically significant (p = 0.0001).

In the first and fifth minutes APGAR Scores 66.7% and 31.7% respectively of babies born to unbooked mothers had APGAR scores less than 7. Similarly for babies of booked mothers 10.8% had APGAR score of <7 in the first minute and 3.3% had APGAR score of < in the 5th minute. These were statistically significant (p = 0.0001).

Live births, early neonatal deaths and intra-uterine fetal deaths were the outcomes recorded in 98.5%, 0.8% and 1.7% of booked mothers respectively while for the unbooked mothers, these were recorded as 72.5%, 7.5% and 20.0% respectively.

Only 2.5 percent and 4.2 percent of babies of booked and un-booked mothers respectively, had birth trauma. There was no significant difference in birth trauma for booked mothers when compared with the unbooked (p = 0.722).

Newborn intensive care unit admission for babies of booked mothers was 12.5% while that for unbooked mothers was 40.8% There was significant difference in NBICU admission of babies of booked mothers when compared with the unbooked (p = 0.0001).

Mode of delivery, APGAR score and newborn intensive care unit admission significantly associated with booking status as shown in Table 5.

4. Discussion

Antenatal care is aimed at equipping mothers for delivery and parenthood in order to guarantee their safety and that of their babies through timely identification, prevention and management of health-related problems and its success is dependent on the effective formulation and implementation of its policies. Some pregnant women remain unbooked and therefore fail to benefit from the antenatal care services, sometimes with some consequences.

Antenatal care booking rate was reduced among teenagers (30.8% versus 69.2%), young women between 20 - 29 years (49% versus 51%) and in those older than 40 years (38.5% versus 61.5%). This slight difference observed among the teenagers, young adult women and those ≥ 40 years in this study could be due to

Table 5. Mode of delivery and newborn outcome among the booked and unbooked parturients.

	Odds Ratio (OR)	P-value	95% CI for OR
Mode of Delivery	0.231	0.0001	0.116 - 0.458
SVD			
Non-SVD			
APGAR Score 1st Minute	6.022	0.0001	2.446 - 14.826
<7			
≥7			
APGAR Score 5th Minute	1.306	0.742	0.265 - 6.437
<7			
≥7			
Perinatal Outcome	0.275	0.157	0.046 - 1.645
Live Birth			
Non-Live Birth			
Birth Trauma	2.316	0.401	0.260 - 16.460
Yes			
No			
NBICU Admission:	3.747	0.001	1.665 - 8.434
Yes			
No			

the possibility of hiding the pregnancy till the time of delivery, less satisfaction with service delivery, lack of pregnancy experience and previous unpleasant experiences respectively. Other researches had similar opinion as teenage and young pregnant women were said to be more likely unbooked than older adults while women aged 25 - 39 years were more likely to be booked [14] [21] [22]. These were attributed to the rejection usually faced by teenage pregnant women by their consorts and family, poor social support and less satisfaction younger women derive from healthcare services. A clinical review in Jos, Nigeria showed that women aged 35 years or over had increased odds of utilizing antenatal care [23]. Another cross-sectional study also demonstrated that older women do not book compared to younger age group [7]. These were attributed to the unfriendly attitude of healthcare workers, low educational status and low income level.

This study showed that antenatal care booking was significantly associated with being married unlike the unmarried pregnant women who were largely unbooked (OR = 6.35, 95% CI = 1.24 - 32.59, p = 0.027). This may be attributed to better psychosocial support, financial empowerment and motivation to utilize antenatal care services enjoyed by the married unlike the unmarried who might have had unwanted or unplanned pregnancies and attempt to conceal them. This finding is similar to the findings of other studies in Nigeria [5] [22] and Tanzania [24] where statistically significant numbers of single/unmarried pregnant women were unbooked. These findings were attributed to better social support among the married, more moral and economic support of married women by their husbands which positively influence their decision making. Contrary to the above, the finding from this study did not agree with a community-based study in North-West Ethiopia which documented a significant difference between the married and single pregnant mothers, with single/divorced women said to be about 3 times more likely to utilize antenatal care more than the married [25].

Parity was also a determinant factor for antenatal care utilization. Nulliparous and grand multiparous women were more likely to be unbooked and this was statistically significant (p = 0.011). This finding is similar to the findings of Sodje and his colleague [22], and Marsland and colleagues in India [26] Grandmultiparous and nulliparous women were more likely to be unbooked with reliance on their experience on the part of the grandmultiparous women, thus do not seek skilled/expert care while the nulliparous women lack experience and may not know the value of antenatal care. However, Fabamwo and colleagues [21] showed that more grand multiparous women were booked while Shittu and Ekwempu [23] showed that parity had no significant association with booking status. This difference may be attributed to the sociocultural values and orientation within the place of the study.

Unbooked mothers were more likely not to have received any formal education compared to booked mothers and this difference in educational attainment

between the booked and un-booked women was statistically significant (p = 0.0001). A population-based study by Fagbamigbe and colleague also reported that pregnant mothers with higher educational qualification had statistically significant higher chances of being booked [27]. These findings were also similar to the findings in Ilorin, Benin, Uganda and Nepal [2] [22] [23] [28] [29]. The odds of not being booked in those with poor educational attainment were not different from other recent studies [30] [31] [32]. Education may increase the likelihood of gainful employment, appreciation of the risks associated with pregnancy and benefits of utilizing skilled health care as well as increased chances of meeting up with the financial costs of healthcare services.

Antenatal care booking was increasingly associated with being a housewife (60.5% versus 39.5%) and a civil servant (92.3% versus 7.7%) unlike being an artisan, a farmer or trader which was more associated with not being booked. These differences were statistically significant (p = 0.0001). Antenatal care booking among civil servants and housewives as reported above could be due to increased financial capacity on the part of the civil servants and enough time to seek antenatal care on the part of the housewives. This finding is similar to a cross-sectional survey in South Africa which reported that pregnant women who were employed significantly utilized antenatal care services more than the unemployed ones, as employment improved socioeconomic empowerment of women, hence improve the affordability of health care cost [33]. This finding is contrary to the finding of a Southern Ethiopia study which demonstrated that being a housewife and self-employed were significantly associated with late or non-utilization of antenatal care [34]. This was said to be due to increased workload by housewives and busy schedules by the self-employed. This difference may be explained by the sociocultural milieu existing in different environments and this helps in prioritizing antenatal care services by the women.

Booking was significantly associated with monthly income greater than 5000 naira unlike monthly income levels of less than 5000 naira which was seen among the unbooked. This finding is similar to a cross-sectional study in Ilorin which showed that booking was significantly associated with higher household monthly income [35]. Higher income is associated with higher the socioeconomic status and affordability of antenatal care services. This study was similar to a population based survey by Fagbamigbe and colleague who demonstrated that higher household income were associated with increased likelihood of booking, and higher income motivates improved health-seeking behavior [26]. Other recent studies also made similar findings [23] [36].

Christians were more likely to be booked than any of the other religions. This association was not statistically significant (p = 0.559). No independent association existed between religion and booking status. Similar finding was made by Olarinoye and colleagues in a descriptive cross-sectional survey of referred and booked parturients in a Nigerian teaching hospital which reported no statistically significant difference between religion and booking status [35]. It is also similar with the finding by Shittu and colleague in Jos Nigeria where being a Chris-

tian or a Muslim was associated with increased likelihood of attending antenatal care but such association was not statistically significant [23].

Booked status was significantly associated with residing in an urban area (82.7%) while being a rural dweller was significantly associated with unbooked status (91.6%). The significant difference between booking and place of residence could be due to good access roads in the urban area and antenatal care services provision on daily basis in the study institution. Adedokun and colleague [30], Shittu and colleagues [23], Fagbamigbe and colleague [27] and Dahiru and colleagues [37] in their studies reported that being a rural dweller and semi-urban dwelling are significantly associated with not being booked. Poor access road and poor transport network which are characteristic of rural environment in Nigeria and the lopsided distribution and location of healthcare facilities in urban areas at the expense of rural areas to account for these observations.

There was significant association between antenatal care booking and the availability of partner's support in pregnancy (56.9% versus 43.1%) while the absence of partner's support increased the likelihood of not being booked (88.9% versus 11.1%) (OR = 0.05, 95% CI = 0.01 - 0.37, p = 0.03). Booked women were also more likely to be very satisfied with the level of support received from partners whereas various levels of dissatisfaction were more associated with not being unbooked. Partner's and family supports, and the satisfaction observed in this study could be due to moral support derivable from such social intimacy. This finding is similar to a qualitative study by Kaswa and colleagues in South Africa which showed that women with good partner and family support had improved antenatal care booking because of the feeling of sense of belonging and good moral support such support provides [38]. Studies in Ethiopia and DR-Congo also documented that adequate partner's and family support were significantly associated with adequate use of antenatal care services [32] [34]. In Nigeria, Fagbamigbe and colleague noted that women who got their partners' support always book more than those who had no support because of financial support attached to such a support [17].

Booked women had higher rates of spontaneous vertex delivery compared to unbooked women (66.7% versus 21.0%) whereas unbooked pregnancies were more associated with instrumental and caesarean deliveries(OR = 0.23, 95% CI = 0.12-0.46, p = 0.0001). This could be due to poor pregnancy and labour management by traditional birth attendants and places of primary presentation for deliveries. This finding is supported by Nigerian studies in Calabar [14], Port-Hacourt [39], Owerri [16], Umuahia [40] and a population based study in Nepal [41] documented a statistically significant increased rate of caesarean delivery and instrumental deliveries among unbooked women. The findings were attributed to teenage pregnancy, uterine rupture and pregnancy-related complications which were higher among the unbooked parturients.

Neonatal asphyxia (APGAR score < 7 at 1st and 5th minutes) was significantly higher among the unbooked pregnancies while booked women had statistically significant higher non-asphyxiated babies (p = 0.0001). However, when con-

founders were eliminated, only APGAR score at 1 minute had statistically significant independent association with booking status as the probability of not being booked was 6 times higher in mothers who had babies with APGAR score below 7 in the 1st minute (OR = 6.02, 95% CI = 2.45 - 14.83, p = 0.0001). Higher rate of asphyxia recorded among the unbooked from this study might be related to fetal distress which resulted from obstructed labour. This finding agreed with a study in India and Nepal which showed that unbooked status had statistically significant association with birth asphyxia [1] [41]. Their findings were attributed to complications from attempted home deliveries. This finding is also similar to findings by other Nigerian studies [15] [40] [42] which documented that unbooked mothers are at increased risk of giving birth to asphyxiated babies [40]. These findings may be attributed to poor clinical state of mothers at presentation and poor quality of care they received prior to presentation in health facilities.

Antenatal care booking was significantly associated with live births while unbooked status was more associated with perinatal deaths (p = 0.0001). This finding could be due to extreme poverty, poor utilization of healthcare services, low birth weight, primary delays in seeking delivery care and asphyxia. Similar increase in perinatal deaths among unbooked mothers was reported from studies in India [1] and Nepal [41] as well as in Nigeria [16] [21] [43]. These observations were linked to low socioeconomic status, pregnancy complications and weak healthcare systems [41] [44].

Birth trauma was more associated with unbooked pregnancies. However, this association was not statistically significant (p = 0.722). Unbooked status had statistically significant association with newborn intensive care unit admission than the booked pregnancies (p = 0.0001). Higher association of newborn intensive care unit admission with unbooked status from this study could be explained from the point of view of very low birth weight, neonatal asphyxia and neonatal infection which are usually prominent in unbooked pregnancies.

Admission into the newborn intensive care unit had statistically significant association with booking status with the probability of not being booked about 4 times higher in mothers whose babies were admitted (OR = 3.75, 95% CI = 1.67 - 8.43, p = 0.0001). This is similar to the finding by a study in India [1] and Ilorin, Nigeria in which newborn intensive care unit admission had statistically significant association with unbooked pregnancies than in the booked mothers [35]. These findings were attributed to birth asphyxia and neonatal infections.

Unbooked participants had more perinatal mortality 275 per 1000 births, stillbirth rate of 200 per 1000 births and early neonatal death rate of 75 per 1000 births compared to that of the booked parturients which was 25 per 1000 births, stillbirth rate of 16.7 per 1000 births and early neonatal death rate of about 8.3 per 1000 births. This finding is different from community based survey in Ethiopia which reported a lower PMR of 110 per 1000 births among the unboooked [45]. It also differed from a demographic and health survey in Nepal which re-

ported a PMR of 42 per 1000 births [46]. The perinatal mortality figures may be attributed to predictors such as low level of education, extremes of maternal age, unemployment, less than 4 antenatal care visits and spontaneous vertex delivery [7] [45]. However, the disparities in these findings emphasized the wide gap between developed and developing nations (Nigeria inclusive) in terms of maternal and child health care coverage.

Strength and limitation: This study was prospective cohort study and the patients were followed up to the time of discharge. The data collected were not retrospective which are prone to recall bias. However, the study was hospital based which is its major limitation. A prospective population based study may give a better generalized outcome and retest this study's conclusion.

Recommendation: Girl child education, employment and poverty alleviation would improve antenatal care utilization.

5. Conclusion

Unbooked status and unsupervised pregnancy and child birth which could be explained by ignorance, poverty and sociocultural factors may result in poor pregnancy outcomes. There is high untoward outcome of unbooked pregnancies with increased risk of operative deliveries, perinatal morbidity and mortality. Efforts should be made by the government to improve access to antenatal care by pregnant women especially in the rural areas. This can be achieved by equipping the primary health centres, subsiding the cost of antenatal care services and delivery and encouraging appropriate healthcare workforce including family physicians to stay work in those facilities. It can also be made compulsory for every woman to access antenatal care during pregnancy.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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