

A Comparative Study of Fetal and Maternal Outcomes in Booked and Unbooked Mothers Delivering at a Tertiary Health Care Institute in Lagos- Retrospective Cohort Study

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DOI: <https://doi.org/10.36348/sjm.2024.v09i11.005>

| Received: 14.10.2024 | Accepted: 20.11.2024 | Published: 23.11.2024

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Abstract

Background: Prenatal care has proven to play an invaluable role in the reduction of maternal and perinatal mortality. The care provided to the parturient includes risk assessment, health promotion and education, and therapeutic intervention if need arises. The cardinal point of antenatal care is mainly but not limited to ensuring the delivery of a healthy newborn with minimal or no risk to the mother. The importance of prenatal care cannot be overemphasized especially in developing countries with high fertility rate, increased tendency to large family size and increased maternal mortality. **Objectives:** To determine the sociodemographic characteristics of booked and unbooked pregnant women and to ascertain any differences in maternal and perinatal outcome. **Materials and Method:** A retrospective cohort study at 68 Nigerian Army reference hospital from January 2020 to December 2023. All the antenatal records of women booked in our facility within the period of study were retrieved. Maternity records that included all unbooked deliveries were all retrieved. The variables of interest were maternal age, parity, educational status, antenatal care (ANC) attendance, mode of delivery, obstetrics complications and pregnancy outcomes. Data was analysed using SPSS version 29. $P < 0.05$ was considered significant. **Results:** A total number of 5032 patients were seen during the four-year period of review. Booked cases were 3572 (70.99%) while unbooked was 1460 (29.01%). Fetomaternal adverse outcome and complication were more in the unbooked category with high operative delivery 87.05% in the unbooked patients. **Conclusion:** The study showed that more adverse pregnancy outcomes occurs when women are unbooked during pregnancy. Continued utilisation of quality antenatal and delivery care services in our environment will significantly improve pregnancy outcome while reducing maternal and perinatal mortality and morbidity.

Keywords: Antenatal care, booked, unbooked, maternal mortality, Nigeria.

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INTRODUCTION

Specialist led high-quality antenatal care plays a vital role in early identification of habitual, environmental, biomedical, and social factors that may impact the progress of pregnancy negatively [1, 2]. Prenatal care has proven to play an invaluable role in the reduction of maternal and perinatal mortality. The care provided to the parturient includes risk assessment, health promotion and education, and therapeutic

intervention if need arises. The cardinal point of antenatal care is mainly but not limited to ensuring the delivery of a healthy newborn with minimal or no risk to the mother. The importance of prenatal care cannot be overemphasized especially in developing countries with high fertility rate, increased tendency to large family size and increased maternal mortality [1, 3, 4].

The high maternal morbidity and mortality rates in Nigeria has continued to be a topic of concern as it is

an index of the poor state of health services. Considering current maternal mortality situation in Nigeria, it is pertinent to determine the relationship between the booking status of mother and maternal outcomes. Pregnancy outcome (perinatal and maternal mortality) are indices by which nations are assessed in terms of health care delivery and development in general. Antenatal Care (ANC) is a continued risk assessment of pregnant women aimed at identifying and treating the earliest signs of complication to achieve safe delivery of a healthy baby to a healthy mother [4]. Unbooked mothers do not have the opportunity of being so assessed and cared for [5].

In Nigeria, a woman dies every 10 minutes of childbirth related causes and for everyone that dies, about 15 or more are near miss. Despite having only 2% of the world's population, Nigeria contributes disproportionately 10% of the world's maternal deaths [7, 8]. By encouraging pregnant women to book for ante natal care, it will ensure not only a healthy pregnancy for mother and baby, but also an effective transition to positive labour and childbirth and ultimately to a positive experience of motherhood viz-a-viz reduction in maternal mortality.

In 68 Nigerian army reference hospital, there have not been a study to evaluate the outcomes in both booked and unbooked pregnant women, in order to contribute towards reduction in adverse pregnancy outcomes and increase utilisation of ante natal care, it becomes imperative to research on the local causes of and factors influencing adverse outcomes during pregnancy. Hence this study was aimed to determine maternal outcomes in booked and unbooked mothers at 68 Nigerian Army Reference Hospital Yaba, Lagos, Nigeria.

MATERIALS AND METHOD

Study Design: A retrospective cohort study.

Study Setting: It was done at 68 Nigerian Army reference hospital Yaba (68 NARHY), from January 2020 to December 2023. 68 NARHY is a tertiary health care facility that takes all referrals from all the Nigerian Army clinics. It serves both military personnel and civilians within the sub-region.

Eligibility: All the antenatal records of women booked in our facility within the period of study were retrieved and those referred from other facilities for delivery or as emergencies with no documented antenatal record.

Data management: The data was initially retrieved using excel spread sheet. This was later imported into statistical package of the social sciences SPSS version 29 for analysis. These data were obtained from a combination of admission and discharge registers, labour and delivery records, obstetric theatre records and retrieved case files from the Medical Records

Department of the hospital. Data compared include parity, age, marital status, social status, booking status, gestational age at delivery, mode of delivery, maternal complications, Apgar score of the infants, birth weight of the infants, near- miss morbidities, maternal deaths and the cause of deaths. The total number of deliveries and live births conducted during the study-period were also documented. Since the patients' relatives rarely allowed autopsy for personal and religious reasons, the causes of maternal deaths were attributed to the consensus diagnoses at the monthly maternal mortality audit meetings in the obstetrics and gynaecology department which were documented in the patients' files. Categorical variables were compared using Chi-square and Fisher exact test as appropriate, while continuous variables were analysed using Student's t-test. $P < 0.05$ was considered significant.

Definition of Terms:

1. Booked mothers were defined as those who had at least two antenatal care visits at our centre, while the unbooked mothers referred to those who had no antenatal care at all prior to delivery, and patients referred as emergencies from other facilities or traditional birth attendants or faith-based clinics.
2. Maternal death was defined according to the tenth revision of International Classification of Diseases (ICD 10) by World Health Organisation (11) [9].

ETHICS

Ethical clearance for the study was obtained from the hospital's Ethics and Research Committee. **Admin/68NARHY/537B.**

RESULTS

A total number of 5047 case notes were retrieved, only 5032 clients had complete records (99.7%) and were included in final data analysis. (Booked patients were 3572, 70.9%, whereas unbooked were 1460, 29%).

There is a slight difference in the maternal characteristics of the women studied. Compared to booked mothers, unbooked mothers were younger in age (36.67 vs. 14.05), had a lower educational status (52.32% vs 0.36%).

Table 2 shows causes of maternal deaths in the booked and unbooked mothers. During this period, a total of 65 maternal deaths were recorded. Fifty-five of the deaths (84.61%) were recorded among the 1460 women who were not booked for antenatal care, while 10 (15.38%) of 3572 booked patients died. Therefore, unbooked patients are more likely to die with pregnancy related complications.

Table 3 shows the causes of maternal deaths in the women studied, in unbooked mothers, the causes

were ruptured uterus (8 cases), eclampsia (15 cases), primary postpartum haemorrhage (16 cases), sepsis (12 cases) and HIV (4 cases), while in the booked patients,

maternal deaths were from eclampsia (5 cases), primary postpartum haemorrhage (3 cases) and sepsis (2 cases).

Table 1: Distribution of cases according to socio-demographic profile

	Booked		Unbooked		X ²	P-value
	Number	Percent	Number	Percent		
Age (years)						
<25	502	14.05	550	37.67	363.88	< 0.001
25-30	1320	36.95	461	31.57		
>30	1750	48.99	449	30.75		
Total	3572	100	1460	100		
Educational status						
None	13	0.36	764	52.32	3.4 x 10 ³	< 0.001
Primary	35	0.98	378	25.89		
Secondary	1356	37.96	225	15.41		
Tertiary	2168	60.69	93	6.37		
Total	3472	100	1460	100		

Table 2: Causes of maternal deaths

Cause	Unbooked	Booked	Fischer's exact, P-value
Rupture uterus	8	0	0.596
Eclampsia	15	5	
Primary PPH	16	3	
Sepsis	12	2	
HIV	4	0	
TOTAL	55	10	

Table 3: Maternal and perinatal outcomes and complications in booked and unbooked mothers

Variable	Unbooked	%	Booked	%	OR	CI	P-value
Pregnancy Outcomes Mode of Delivery							
SVD	752	51.5	3140	87.90			
Vacuum assisted	26	1.78	11	0.03			
Vaginal Breech	3	0.20	0	0			
Caesarean section	675	46.23	421	11.78			
Laparotomy	4	0.27	0	0			
Maternal mortality	23	1.57	3	0.08			
FOETAL OUTCOME							
5 min APGAR score < 5	233	15.95	12	0.33			
Birthweight <2.5kg	126	8.63	16	0.44			
Perinatal mortality							
Intra uterine death	102	6.98	2	0.05			
Early neonatal death	79	5.41	3	0.08			
Maternal outcomes							
PPH	44	3.01	6	0.16			
PE/Eclampsia	45	3.08	30	0.83			
Obstructed labour	35	2.39	1	0.02			
APH	31	2.12	5	0.13			
Puerperal sepsis	27	1.84	2	0.05			
ICU Admission	78	5.34	5	0.13			
PROM	120	8.2	46	1.28			

DISCUSSION

Healthcare seeking behaviour has long been a problem in most developing countries. This attitude of poor utilization of modern healthcare is also not uncommon among pregnant women especially the multiparous among them. Therefore, the promotion of efficient prenatal care-seeking behaviour has been a re-

occurring topics in most maternity units across the country as this has shown to reduce maternal and perinatal mortality and morbidity.

Our study showed that there are more adverse pregnancy outcomes with more obstetrics complications in unbooked mothers. It also revealed that unbooked mothers were younger and had lower education

attainment when compared to their booked counterparts. These findings are similar to that of Owolabi and colleagues who also reported that unbooked mothers in their study were younger, more likely to be unmarried, and a sizeable proportion also had lower education status and belong to a lower socioeconomic class.¹⁰ However, In another study where 195 unbooked mothers were compared with 196 booked mothers, it also showed that in as much as the unbooked mothers were younger, belonged to low socioeconomic class, more likely to live in rural areas and had less education, it also showed that they had lower parity. The greater percentage of the booked women having higher education may be explained by the fact that the more educated a woman is, the more empowered she may become. Such women are likely to be financial independent and have a better understanding of the risks associated with pregnancy and childbirth [11, 12].

This study also showed that unbooked mothers are more likely to die, have higher risk of operative intervention, more likely to have postpartum haemorrhage, have higher risk of puerperal sepsis and had more perinatal mortality. Similarly, Owolabi *et al.*, also reported higher maternal mortality from preventable causes such as postpartum haemorrhage and uterine rupture which were more in the unbooked mothers [10].

Anyigor-Ogah and co-workers also revealed that unbooked pregnant women are also at increased risk of maternal death and had more birth-related perineal injuries. Their study further revealed more perinatal mortality and higher intensive care admission for both newborns and their mothers.

In conclusion, this study showed that more adverse pregnancy outcomes occurs when women are unbooked during pregnancy. Continued utilization of quality antenatal and delivery care services in our environment will significantly improve pregnancy outcome while reducing maternal and perinatal mortality and morbidity.

The strength of our study is on the relatively large sample size and high proportion of data available for analysis. However, we are limited by the study being only a single center study in a state with so many tertiary health care facilities.

Guarantor: The corresponding author will act as the guarantor for this manuscript.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)- We hereby declare that no generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during writing or editing of manuscripts.

ACKNOWLEDGMENTS

We are also grateful to all our nurses, midwives, theatre and medical record staff who played a vital role in the management of these patients.

Financial Support and Sponsorship: None

Conflicts of Interest: None

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