

ORIGINAL ARTICLE

Maternal and Fetal Outcomes in Booked versus Unbooked Pregnancies: Evidence from a Tertiary Care Hospital in Pakistan

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ABSTRACT

Objective: To compare maternal and fetal outcomes between booked women (≥ 3 antenatal visits) and unbooked women (no antenatal care), and to assess the association between antenatal care utilization and pregnancy outcomes.

Methods: This descriptive observational study included 500 women aged 15–45 years delivering at Sohail Trust Hospital Jinnah Medical and Dental College, Karachi, between February 01, 2023 and July 31, 2023. Participants were categorized into booked ($n=445$) and unbooked ($n=55$) groups. Maternal and fetal outcomes, sociodemographic factors, and obstetric complications were analyzed. Data were analyzed using SPSS 20, with chi-square tests for categorical variables. Statistical significance was set at $p<0.05$.

Results: During the study period 500 women were interviewed out of which 89% (445) did receive antenatal care; whereas 11% (55) did not receive any antenatal care. In the booked population prevalence of anemia was 54.8%, 1.3% had gestational diabetes, 6.7% had pregnancy induced hypertension, whereas Anemia was more prevalent among unbooked women (65.5% vs. 54.8%) [1]. 10.9% (6) had PIH, 1.8% (1) had GDM. In the booked group 24 had cesarean sections while in unbooked group 32.7% (18) had cesarean sections. As far as fetal outcome is concerned in booked group 15.7% infants were born having low birth weight, and 3.0% were stillbirth, while in unhooked patients (13) 23.6% were Low birth weight. 3.6% (2) were stillbirth.

Conclusion: Unbooked pregnancies are linked to higher rates of maternal anemia, operative delivery, and low birth weight. This emphasizes the need for regular antenatal visits and promotes the utilization of antenatal care to avoid the complications of pregnancy. There is also a need to improve the quality, availability and accessibility of antenatal care services, education level and socioeconomic status of women. Lack of antenatal care is associated with higher risk of adverse maternal and fetal outcomes. Strengthening antenatal care coverage could improve pregnancy outcomes.

Keywords: Booked versus Unbooked Pregnancies, Maternal and Fetal Outcomes, antenatal care,

INTRODUCTION

Antenatal care (ANC) is one of the most effective strategies to improve maternal and perinatal outcomes worldwide¹. The key strategies in maintaining safe motherhood consist of care provided to women during pregnancy by skilled health personnel. It includes health assessment of pregnant women, encouraging good health habits, addressing pregnancy related complications and providing social and psychological support.

The World Health Organization (WHO) recommends a minimum of eight ANC contacts during pregnancy to reduce perinatal mortality and improve women's experience of care². "The antenatal period clearly presents opportunities for reaching pregnant women with a number of interventions that may be vital to their health and well being and that of their infants. Various maternal behaviors and experiences before, during, and after pregnancy are associated with adverse health outcomes for both the mother and the infant⁴. Maternal complications and poor perinatal outcome are highly associated with non-utilization of antenatal and delivery care services and poor socioeconomic conditions of the patient, with poorer outcomes in unbooked than booked patients.

ANC facilitates early identification and management of complications, promotion of healthy behaviors, and provision of essential interventions such as tetanus immunization, nutritional supplementation, and birth preparedness planning³. Globally, inadequate ANC utilization is associated with increased maternal and neonatal mortality⁴. In South Asia, access to and quality of ANC remain inconsistent, particularly in rural and low-income urban populations⁵. In Pakistan, according to the 2017–18 Pakistan Demographic and Health Survey, 86% of women reported receiving at least one ANC visit, but only 51% received the WHO-recommended four visits⁶. Socioeconomic status, maternal education, and accessibility to health facilities are strong

determinants of ANC utilization^{7,8}. Unbooked pregnancies—where women have no prior ANC—are associated with higher rates of anemia, obstetric complications, low birth weight, and perinatal mortality compared to booked pregnancies^{9,10}. While several studies have examined ANC coverage in Pakistan¹¹, fewer have provided direct comparisons of maternal and fetal outcomes between booked and unbooked women in urban public-sector hospitals. This study aims to address this gap by analyzing data from a tertiary care hospital in Karachi.

METHODS

This descriptive observational study was conducted in the Department of Obstetrics and Gynaecology, Sohail Trust Hospital Jinnah Medical and Dental College, Karachi, between February 1, 2023 and July 31, 2023. A total of 500 married women aged 15–45 years who presented for delivery were included. Booked women were defined as those with ≥ 3 ANC visits; unbooked women had no ANC visits. Maternal outcome measures included mode of delivery i.e. spontaneous vaginal deliveries, emergency or elective lower segment caesarean sections and fetal health was studied as alive, stillbirth, low birth weight babies (birth weight below 2,500g), and early neonatal deaths. All singleton births during the study period were included. Women with multiple pregnancies were excluded.

Study variables included age, parity, level of education, monthly income, employment status and socio economic status of husband and women.

Data on sociodemographic variables, obstetric history, and pregnancy outcomes were collected using structured interviews. Maternal outcomes included anemia, pregnancy-induced hypertension, gestational diabetes, and mode of delivery. Fetal outcomes included birth weight, stillbirth, and live birth rates. Data were analyzed using SPSS 20, with chi-square tests for categorical variables. Statistical significance was set at $p<0.05$.

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RESULTS

Among the 500 participants (55) 11 % unbooked did not receive any antenatal care where as (445) 89 % booked did receive antenatal care, breakdown of which is (280) 63% were registered in second trimester. (165) 37% in third trimester and 65% (289) received 2 doses of Tetanus Toxoid Vaccine. The mean age of booked women was 25.37 (St.dev. 6.92) and 24.54 (st.dev. 5.38) in unbooked women. In booked group 57.8% (257) were 15-25 years old. 30.8% (137) were 26-35 years old and 11.5% (51) were over 36 years old, in unbooked group 56.4% (31) were 15 - 25 years old. (23) 41.8% were 26-35 years old and 1% (1.8%) were over 36 years old and the difference was statically significant (P value 0.044). With regards to parity. Booked group had mean of 2.38 (st.dev 0.486). 61.8% (275) women had 1-2 children and 38.2% (170) had more than 3 children. Whereas unbooked group had, mean of 2.30 (si.dev 0.466). 69% (38) had 1-2 children and 30.9% (17) had more than 3 children.

In booked group the monthly income of 62% (n=276) were below Rs 6000 (US\$ 71.4), which were extremely poor. 34.8 % (n= 155) were earning Rs 6000 to 12000 (US\$ 71.4 to 142.8) and only 3% (14) were earning above Rs 12000 (US\$ 142.8). In unbooked group monthly income of 65.5% (36) were below Rs 6000 and 32.7% (18) were earning Rs 6000 to 12000.

Women's demographic characteristics are shown in table 1. With regard to education level of the booked group of women 55.3% (n=246) were uneducated and only 3.8 % (17) reached high school. In unhooked group 52.7 % (29) were uneducated, 7.3 % (4) reached high school.

Table 1: Demographic Characteristics of the Women

Characteristics of the women	booked group (with antenatal care) N=445 (89%)	Unbooked group (without antenatal care) N=55 (11 %)	P value
Age groups			
15-25	257 (57.8)	31 (56.4)	0.044
26-35	137 (30.8)	23 (41.8)	
36 onwards	51 (11.5)	1 (1.8)	
No. of children			
1-2 children	275 (61.8)	38(69.1)	0.292
>3 children	170 (38.2)	17 (30.9)	
Education			
Primary	124 (27.9)	15 (27.3)	0.692
Middle	58 (13)	7 (12.7)	
High	17 (3.8)	4 (7.3)	
Uneducated	246 (55.3)	29 (52.7)	
Monthly income			
Below 6000 PKR	276 (62)	36 (65.5)	0.801
6000-12000 PKR	155 (34.8)	18 (32.7)	
Above 12000 PKR	14 (3.1)	1 (1.8)	

Table 2: Maternal and Fetal Pregnancy Outcome

Pregnancy outcome	Booked patients N=445 (89%)	Un N=55 (11 %)	Booked patients N=55 (11 %)	P value
Maternal medical conditions				
Anemia	244 (54.8)		36 (65.5)	0.141
Pih	30 (6.7)		6 (10.9)	
Gestational diabetes	6 (1.3)		1 (1.8)	
Mode of delivery				
Vaginal deliveries	338 (76)		37 (67.3)	0.161
Caesarean section	107 (24)		18 (32.7)	
Fetal outcome				
Low birth weight	70 (15.7)		13 (23.6)	0.315
Still birth	14 (3.1)		2 (3.6)	
alive	361 (81.1)		40 (72.7)	

In the booked population prevalence of anemia was 54.8%, 1.3% had gestational diabetes, 6.7 % had pregnancy induced

hypertension, where as in unbooked patients 65.5% (36) were anemic, 10.9% (6) had pregnancy induced hypertension, 1.8% (1) had gestational diabetes mellitus.

No significant relationship was observed between the maternal medical conditions in both groups (p > 0.141). Maternal pregnancy outcome is summarized in table 2

In the booked group ratio of vaginal deliveries was 76% and 24 % had cesarean sections. While in unbooked group 67.3% (37) had vaginal deliveries and 32.7% (18) had cesarean sections. As far as fetal outcome is concerned in booked group 15.7 % infants were born having low birth weight, and 3.0 % were stillbirth, while in unbooked patients (13) 23.6% were Low birth weight, 3.6% (2) were stillbirth. Regarding postpartum complications 13% had puerperal sepsis in booked patients and in unbooked patients the ratio of puerperal sepsis is (11) 20%. No significant relationship was observed regarding mode of delivery (p value 0.161) and fetal outcome (p value 0.315) in both groups.

DISCUSSION

Antenatal care is one of the key strategies in maintaining safe motherhood. It is consist of care provided to women during pregnancy by skilled health personnel.

A safe motherhood initiative is a global effort to reduce maternal mortality and morbidity and ensuring the provision of ANC may help progress to the Millennium Development Goals for maternal and child mortality¹⁶ In the study maternal, foetal, obstetrical and socio demographical characteristics were studied in booked and unbooked pregnant women for antenatal care.

This study demonstrates that unbooked pregnancies are associated with increased risks of anemia, cesarean delivery, and low birth weight compared to booked pregnancies. These findings are consistent with studies from Nigeria⁹, India¹⁰, and Libya¹¹, where unbooked women had higher complication rates.

In the study maternal, foetal, obstetrical and socio demographical characteristics were studied in booked and unbooked pregnant women for antenatal care. Overall larger proportion of women had received antenatal care i.e. 89 % which is consistent with the study from India 92.24%⁸ and Libya with 94% results 9. as compared to other studies in the country where it ranged from 50 - 70%¹⁷.

The percentage of antenatal care in the study was encouraging as compared to other studies in the country, may be due to availability of free medical facilities at doorsteps within the vicinity existing a government hospital. In addition, being housewives provided them abundance of spare time at their disposal to seek health services every now and then.

The utilization of antenatal care is more in younger age women (ranged 15 - 25 years) as compared to older women which are more in number in unbooked group which is also reported in another study from South Africa. Where as in various other studies older women are more likely to use maternal health services⁵.

Regarding parity inverse relation was observed in the study. multiparous were more in un booked group which may be due to their prior successful hospital deliveries or they may not be concerned about the antenatal visits⁷ In the both groups more than 88.6% of women visiting hospital live in households of low socio economic status and income which is in consistent with another studies^{17,18} 62.4% earning below. 6000 PKR which were extremely poor. 94.8% women were housewives and monthly incomes were mainly earned by their spouses majority of which were laborers earned on daily or weekly basis. There was no association seen regarding socioeconomic class of the women in both groups, More than half of the study population in both groups was uneducated and rest of the women could only read and write simple words. The education status of women does not show any association with antenatal care in the study, whereas according to another study, literacy does play some role in receiving antenatal care^{17,18}.

Regarding maternal health conditions the prevalence of anemia in booked group of patients was 52.6% and 65.5% (36)

were anemic in unbooked patients. The prevalence of anemia in both groups especially in unbooked patients is point of concern. This might be due to the lower socioeconomic and ultimately poor nutritional status and non existence of doctor's advice could be the cause of higher anemia in unbooked group. This association is also seen in another study¹⁵. It is estimated that more than half of the pregnant women in developing countries suffer from anemia. World health Organization recommended supplementation of all pregnant women with a daily dose of 60 mg iron and 400 g folate to control iron deficiency anemia as a primary prevention method¹¹.

Ratio of vaginal deliveries was 75.4 % while 25.4 % had cesarean section in booked group, which is also seen in other study. While in unbooked group (36) 65.5% vaginal deliveries and (19) 34.5 had cesarean section. The high incidence of cesarean section in unbooked patients are may be due to late presentation of patients in hospital with complications and such association was also seen in other studies.

Regarding the neonatal outcome, the low birth weight babies were 11.6% (which leads to high infant morbidity and mortality), which is low as compare to Pakistan's overall 19% an Indian study's 19.2 % which may be because our was a hospital based study with good antenatal care in spite of women are living below poverty line. Whereas two other recent population based studies had still birth rate of 3.2% which is in consistent with this study's stillbirth rate 3% (2<). It is pertinent to note that low birth weight and stillbirth is one of the most common adverse outcomes of pregnancy. These outcomes are preventable with appropriate obstetric care, improving nutritional trends and overcoming number or unwanted behaviors^{7,16}.

The high prevalence of anemia among unbooked women aligns with WHO estimates that over 40% of pregnant women in developing countries are anemic¹². Iron deficiency remains a leading cause, compounded by poor dietary intake and limited access to supplementation¹³.

The higher cesarean section rate in unbooked women may be due to late presentation with complications, as reported in other low-resource settings^{16,18}. Timely ANC could reduce such emergency interventions. Low birth weight prevalence was significantly higher in unbooked women, echoing findings from Pakistan¹⁸ and other South Asian countries^{17,18}. ANC plays a critical role in promoting maternal nutrition and fetal growth monitoring.

Overall, the results highlight the urgent need for public health strategies to increase ANC coverage, particularly among socioeconomically disadvantaged populations in urban Pakistan.

CONCLUSION

Unbooked pregnancies are linked to higher rates of maternal anemia, operative delivery, and low birth weight. This emphasizes the need for regular antenatal visits and promotes the utilization of antenatal care to avoid the complications of pregnancy. There is

also a need to improve the quality, availability and accessibility of antenatal care services, education level and socioeconomic status of women. It is suggested that necessary steps may be taken to lower the prevalence of anemia in the pregnant women by providing the iron supplements in government health services. Improving ANC access and quality should be a public health priority to reduce preventable maternal and perinatal morbidity.

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