

A Study of Maternal Outcome of Booked and Unbooked Cases

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ABSTRACT

Background: The provision of antenatal services is a matter of great importance because it not only enables women to receive appropriate healthcare, but it also ensures that any issues that may arise during childbirth are detected and managed effectively through timely consultations with specialists.

Aim: The aim is to ascertain how often booked cases appear during childbirth and to contrast the outcomes for mothers in the local population who have pre-booked appointments with those who have not.

Methods: A observational study was carried out for six months at Indus Medical Collage Tando Muhammad Khan, Pakistan. Non-probability consecutive sampling was used to select participants. Participants were asked to provide informed consent and were asked about their demographic information and obstetric history. The cases were classified as either "booked" or "un-booked" based on an operational definition, and their maternal outcomes were recorded in relation to delivery.

Results: Pre-eclampsia, out of a total of 180 participants, 42 (23.33%) were diagnosed with the condition. Of those 42 cases, 18 occurred in the booked group and 24 in the unbooked group. preeclampsia, 8.33% of unbooked women from low SES groups had preeclampsia, compared to only 5.0% of unbooked women from middle SES groups (p-value = 0.003). Similarly, for preterm birth, 10.55% of unbooked women from low SES groups had preterm births, compared to only 2.77% of unbooked women from middle SES groups (p-value < 0.0001).

Conclusion: The findings of our research indicated that most individuals who encountered unfavorable maternal consequences, such as surgical delivery, gestational hypertension, and premature delivery, belonged to the unregistered category. Conversely, the registered group demonstrated significantly lower occurrences of these complexities.

Keywords: booked and unbooked, pregnancy complications, Preeclampsia, maternal outcome

INTRODUCTION

Antenatal services are crucial for women's access to appropriate healthcare, especially since timely consultations with specialists can help identify and effectively manage any childbirth-related complications. These services have been present for a hundred years and are regarded as some of the most vital healthcare services offered by the healthcare system. As a result, their reception is consistently increasing in favor. Antenatal care denotes medical attention given from the beginning of pregnancy until the due date, excluding the time of childbirth.¹ Antenatal care has the objective of observing and enhancing the health of both the mother and the fetus.² Seeking antenatal care early on, receiving good antenatal care, and having trained personnel assist with delivery can enhance the outcomes for obstetrics and perinatal health.^{3,4}

The World Health Organization (WHO) has stated that taking appropriate measures during pregnancy and childbirth can prevent between 88% and 98% of all deaths of mothers.⁵ Maternal mortality rates are known to be considerably higher in cases where the mother has not received proper medical care, but the frequency of such cases varies widely. Specifically, the percentage of maternal deaths is much higher in un-booked cases, ranging from 92.2% to 6.9%,^{4,6,7} whereas in booked cases, it ranges from 6.9% to 0.9%.⁷

In 2011, a study found that the incidence of preterm labor was significantly higher in cases where women had not booked appointments with healthcare providers (22.5%) compared to those who had booked appointments (11%), with a p-value of less than 0.05.⁴ Another local study found that un-booked cases had a significantly higher rate of pre-eclampsia (16.6%) compared to booked cases (8.6%).⁸ In our progressing nation, issues linked to maternity and labor are the primary reason for fatality among women in their reproductive years, while the death rate in advanced nations is below 1%. However, these deaths could be avoided with better resources, services, and a more equitable distribution of these resources.⁹ In Asia, only around 65% of

women seek antenatal care at least once, indicating that these services are underutilized.¹⁰

The aim of this study was to identify how often scheduled appointments resulted in women going into labor at a specialized medical center, and to examine how the health outcomes of mothers differed between those who had booked appointments and those who had not at Indus Medical Collage Tando Muhammad Khan, Pakistan.

MATERIAL AND METHODS

The Indus Medical College in Tando Muhammad Khan, Pakistan conducted a six-month observational study involving 180 participants. The study utilized a non-probability, sequential sampling technique. The research involved all first-time pregnant instances aged 17-41 years who arrived at the department for their childbirths in labor, which entails agonizing uterine contractions that result in the widening and thinning of the cervix during a vaginal examination. Expectant mothers with verified low blood count (Hb<11g/dl) and Gestational diabetes mellitus, as well as Renal & cardiac disease mentioned in their medical history, were not considered for the study. From the Gynaecology and Obstetrics OPD and Emergency department at Indus Medical Hospital in Tando Muhammad Khan, 180 cases were selected. The pregnant female or her attendant was asked for informed consent before collecting their demographic information (name, age, contact no) and gestational age. Patients who had booked appointments were taken from 20 weeks of pregnancy and were monitored monthly in the outpatient department until 34 weeks, after which they were monitored fortnightly until delivery. Both booked and un-booked cases were categorized based on an operational definition, and their maternal outcomes were compared with their delivery outcomes, including pre-eclampsia, maternal mortality, normal vaginal delivery (NVD), and preterm birth. All data was recorded on a proforma attached by the researcher herself.

Statistical Analysis: The data was inputted and analyzed using SPSS 22.0, a software designed for social science statistics. Quantitative variables, including age and gestational age, were

represented using the mean value and standard deviation (S.D.). In contrast, qualitative variables such as pre-eclampsia, maternal mortality, mode of delivery, and preterm birth, which were associated with maternal outcomes during delivery, were presented as frequencies and percentages in both study groups. The study groups were compared with regards to maternal outcomes such as pre-eclampsia, maternal mortality, mode of delivery, and preterm birth. A p-value of ≤ 0.05 was considered significant.

RESULTS

It appears to be a table with data on four different variables - Pre-eclampsia, Maternal mortality, NVD (normal vaginal delivery), and Preterm birth - and how they are distributed between two different groups: booked and unbooked. Additionally, there is data on the socioeconomic status (SES) of the participants, divided into two categories: low and middle.

Pre-eclampsia, out of a total of 180 participants, 42 (23.33%) were diagnosed with the condition. Of those 42 cases, 18 occurred in the booked group and 24 in the unbooked group. Maternal mortality, there were a total of 16 cases, with 3 occurring in the booked group and 13 in the unbooked group. In terms of NVD, out of a total of 180 participants, 93 (51.66%) had a normal vaginal delivery, with 77 occurring in the booked group and 16 in the unbooked group.

Preterm birth, out of a total of 180 participants, 51 (28.33%) were born preterm, with 19 cases occurring in the booked group and 32 cases in the unbooked group.

Finally, the table also includes information on the SES of the participants, with 93 (51.66%) falling into the low SES category and 87 (48.33%) falling into the middle SES category. **Table 1**

The table 2 provides the study groups and corresponding p-values for various pregnancy-related conditions and maternal age groups.

Preeclampsia: The occurrence of preeclampsia varied significantly among women under and above the age of 30 who participated in a research group. Women under the age of 30 who were part of the research group experienced a notably greater occurrence of preeclampsia compared to those who were not involved in the study. However, this distinction was not observed in women who were 30 years of age or older.

Maternal mortality: The occurrence of maternal mortality showed no notable variation among females under and above 30 years old, regardless of their participation in a research cohort or not.

NVD: The occurrence of NVD varied significantly among women in a study group depending on their age. Younger women in the study group, specifically those below 30 years old, experienced a considerably greater occurrence of NVD when compared to women who were not part of the study group. This contrast was also evident among older women, specifically those above 30 years old.

Preterm birth: The prevalence of premature delivery exhibited notable disparities between females below and above 30 years' old who participated in a research cohort. Females below the age of 30 who were part of the research cohort experienced a considerably greater occurrence of premature birth in contrast to those who were not part of the cohort. Nonetheless, this contrast was not evident among females aged 30 and above. **Table 2**

Table 3 reveals that, apart from maternal mortality, there exists a statistically notable correlation between the study group and the results. In general, women belonging to study groups with lower socioeconomic status experienced more unfavorable outcomes compared to women from study groups with moderate socioeconomic status. To illustrate, the incidence of preeclampsia among unbooked women from low socioeconomic status groups was 8.33%, whereas it was only 5.0% among unbooked women from middle socioeconomic status groups (p-value = 0.003). Similarly, for preterm birth, 10.55% of unbooked women from low SES groups had preterm births, compared to only 2.77% of unbooked women from middle SES groups (p-value < 0.0001).

Booking status was also found to have a significant effect on outcomes. For example, for NVD, 18.3% of women from low SES groups who booked had NVD, compared to only 6.11% of unbooked women from the same group (p-value = 0.004).

Maternal mortality did not show a statistically significant association with study group or booking status. **Table 3**

Table 1: Maternal outcome in booked and unbooked patients (n=180)

		Booked	Unbooked	Total
Pre-eclampsia	Yes	18	24	42 (23.33%)
	No	108	30	138 (76.66%)
Maternal mortality	Yes	3	13	16 (8.88%)
	No	114	50	164 (91.11%)
NVD		77	16	93 (51.66%)
Preterm birth	Yes	19	32	51 (28.33%)
	No	107	22	129 (71.66%)
SES	Low			93 (51.66%)
	Middle			87 (48.33%)

Table 2: Normal Vaginal Delivery (NVD), Socioeconomic status Comparison of maternal outcome with study groups stratifying by age

	Age (years)	Study Groups		P-Value	
		Booked	Un booked		
Preeclampsia	Below 30	Yes	15 (8.33%)	14 (7.77%)	0.006
		No	62 (34.4%)	22 (12.22%)	
	Above 30	Yes	3 (1.66%)	10 (5.55%)	<0.0001
		No	45 (25%)	9 (5.0%)	
Maternal mortality	Below 30	Yes	1 (0.55%)	3 (1.66%)	0.702
		No	70 (38.88%)	33 (18.33%)	
	Above 30	Yes	3 (1.66%)	8 (4.44%)	0.173
		No	44 (24.44%)	18 (10.0%)	
NVD	Below 30	Yes	48 (26.66%)	12 (6.66%)	0.002
		No	29 (16.11%)	24 (13.33%)	
	Above 30	Yes	29 (16.11%)	4 (2.22%)	0.001
		No	20 (11.11%)	14 (7.77%)	
Preterm birth	Below 30	Yes	12 (6.66%)	25 (13.88%)	<0.0001
		No	64 (35.55%)	11 (6.11%)	
	Above 30	Yes	8 (4.44%)	6 (3.33%)	0.013
		No	42 (23.3%)	12 (6.66%)	

Table 3: Comparison of maternal outcome with study groups stratifying by SES

	SES	Study Groups		P-Value	
		Booked	Un booked		
Preeclampsia	Low	Yes	10 (5.55%)	15 (8.33%)	0.003
		No	48 (26.6%)	20 (11.1%)	
	Middle	Yes	8 (4.44%)	9 (5.0%)	<0.0001
		No	60 (33.3%)	10 (5.55%)	
Maternal mortality	Low	Yes	2 (1.11%)	8 (4.44%)	0.655
		No	52 (28.8%)	32 (17.7%)	
	Middle	Yes	1 (0.55%)	4 (2.22%)	0.571
		No	62 (34.4%)	19 (10.5%)	
NVD	Low	Yes	33 (18.3%)	11 (6.11%)	0.004
		No	25 (13.8%)	24 (13.3%)	
	Middle	Yes	44 (24.4%)	5 (2.77%)	0.001
		No	24 (13.3%)	14 (7.77%)	
Preterm birth	Low	Yes	8 (4.44%)	19 (10.55%)	<0.0001
	No	50 (27.7%)	15 (8.33%)		

DISCUSSION

The Indus Medical Hospital conducted an observational study consisting of a series of cases to establish how often women who had pre-arranged appointments with the hospital ended up giving birth naturally without medical intervention. The study also aimed to compare the outcomes for mothers who had pre-arranged appointments with those who did not.

The provided information pertains to the incidence of pre-eclampsia, maternal mortality, normal vaginal delivery (NVD), preterm birth, and socioeconomic status (SES) among 180 participants. The results showed that 23.33% of the participants were diagnosed with pre-eclampsia, 16 cases of maternal mortality occurred, 51.66% of participants had NVD, and 28.33% of participants were born preterm. In terms of SES, 51.66% of participants fell into the low SES category, while 48.33% were in the middle SES category.

Maternal health is a crucial aspect of public health, and maternal mortality rates are an important indicator of a country's healthcare system's efficiency. The concept of booked and unbooked cases is widely used in maternal health research to describe the antenatal care status of pregnant women. The term "booked" signifies a woman who has undergone prenatal care and

has officially recorded her pregnancy with a medical practitioner. Conversely, an "unbooked" situation refers to a woman who has not received prenatal care or has registered her pregnancy belatedly.

The educational attainment of women influences their perspective on prenatal care, as expectant mothers with higher levels of education willingly opt for such care. Scientifically supported healthcare practices indicate that having consistent access to skilled and urgent obstetric care during pregnancy, delivery, and the postpartum phase can effectively avert the majority of maternal deaths associated with pregnancy.¹¹

Ayub Medical College conducted a study that included 322 participants, out of which 52 were reserved and 270 were not reserved. A study conducted at Harare maternity hospital in Zimbabwe found that the majority of un-booked patients were from rural areas and had lower socioeconomic status.¹² The research conducted a comparison between 195 recently delivered mothers who had not made prior bookings and 196 mothers who had made prior bookings. The results revealed that the unbooked mothers were considerably younger, had lower levels of parity, possessed lower educational qualifications, and had a higher likelihood of residing in or moving from rural regions. Furthermore, their babies had a greater tendency to be born prematurely and have a lower birth weight, resulting in elevated rates of perinatal mortality.^{13,14}

A research investigation was conducted in Nepal to examine the perinatal outcomes of pregnancies that were either scheduled or unscheduled. The study findings demonstrated that nearly eighty percent (81.4%) of unreserved mothers lacked knowledge about the duration of their pregnancy.¹⁵

Various studies have reported that maternal mortality is commonly caused by postpartum hemorrhage, anemia, puerperal pyrexia, and wound infections, particularly among unregistered cases.^{16,17} Osungbade et al.,¹⁸ discovered that unplanned deliveries can result in elevated levels of morbidity and disability and play a substantial role in the increased rates of child mortality in developing nations. Aftab et al.,⁸ likewise established that there exists a clear correlation between the likelihood of complications for both the mother and fetus and instances of unregistered births.

Latif and colleagues found that out of 1212 patients who had normal vaginal delivery, 640 were pre-booked cases and 572 were unplanned cases. In comparison, their study identified 111 normal deliveries in the pre-booked group and 24 in the unplanned group.²⁰

In another research conducted by Bright Chigbu and colleagues,⁹ it was found that inadequate antenatal care is positively associated with negative pregnancy outcomes. The study revealed that unbooked patients had worse outcomes compared to those who had booked for antenatal care. Unbooked mothers had a significantly higher incidence of pre-eclampsia/eclampsia, with an odds ratio of 3.88, a 95% confidence interval of 2.61-5.77, and a p-value <0.001. Furthermore, mothers who had not made prior appointments were thirteen times more prone to fatality during their hospital stay in comparison to patients who had made appointments. Additionally, unbooked mothers had a reduced probability of giving birth through natural vaginal delivery in contrast to booked patients, with a chance that was roughly half as significant.²¹⁻²³

The study revealed that there was no substantial dissimilarity in the occurrence of pre-eclampsia between cases where patients were registered and cases where they were not (2.2% in registered cases and 12.5% in unregistered cases, with a p-value of 0.093).²² Nevertheless, a nearby study demonstrated a noteworthy distinction in the frequency of pre-eclampsia between the two categories, with a higher percentage in unregistered cases (16.6%) compared to registered cases (8.6%). This dissimilarity was also observed in the present study.¹⁵

CONCLUSION

Based on our research findings, the majority of patients belonged to the group that had made prior appointments. We observed that

patients who had not made prior appointments, on the other hand, had a significantly higher occurrence of adverse maternal outcomes such as Cesarean section, Preeclampsia, and preterm birth, in comparison to those who had made appointments.

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