



Comparison of Pregnant Ladies with and without Antenatal Care Booking and its Effect on Maternal and Fetal Outcome

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Abstract

Early Antenatal Care (ANC) introduction and frequent visits lead to favorable mother and fetal outcomes. Pregnant women who attend ANC experience much lower morbidity and mortality rates than those who do not. A cross-sectional study was conducted among women in an age group of 20-40 years who delivered at Jinnah International and Women and Children Hospital Abbottabad from March till August 2024. Women were selected through convenience sampling and interviewed through a self-structured questionnaire. 100 women were recruited with a mean age group of 20-40 years. Out of which 57% of the women received ANC while 43% did not. Antenatal care was significantly associated with better maternal and fetal outcome ($p=0.015$ and $p=0.000$) respectively. There was no statistical association between age ($p=0.239$) and mother's education ($p=0.128$) on maternal outcome while iron/folic acid intake ($p=0.000$) and pregnancy complications ($p=0.013$) showed a positive association with maternal outcome. In the case of fetal outcome, decreased fetal movements ($p=0.003$) showed an association with poor outcome while time of delivery ($p=0.015$) and availability of transport ($p=0.000$) showed an association with poor fetal outcome. It was concluded that un-booked pregnant females are at a greater risk of adverse fetal and maternal outcomes due to poor antenatal care and late coming of subjects with complications that can result in higher fetal and maternal mortality and morbidity than booked females.

Keywords Booking, Antenatal care, Pregnancy complications, Maternal mortality

1. Introduction

Antenatal care is vital for promoting the health and well-being of pregnant women and their unborn babies through regular check-ups, screenings, and interventions. The World Health Organization (WHO) has recognized the significance of antenatal care and has provided comprehensive recommendations to ensure a positive pregnancy experience for women worldwide (1).

Studies have shown that receiving proper antenatal care can lead to improved maternal and fetal outcomes. For instance, research conducted by Villar et al. demonstrated the benefits of vitamin supplementation in reducing the risk of pre-eclampsia, a potentially life-

threatening condition, particularly in populations with low nutritional status (2).

A study in Islamabad assessed the effectiveness of antenatal care coverage in squatter settlements. Out of 416 women, 399 availed services (with 92% of recommended visits). However, only 35% received effective care. Factors like maternal education, family income, first visit location, and health facility distance contributed to non-utilization (3).

A study was carried out to understand women and healthcare providers' perceptions and to investigate the cultural and behavioral factors influencing the use of antenatal IFA supplements in rural and urban settings of Pakistan. The study was conducted in two districts of Pakistan--districts Swabi and Islamabad for rural and urban samples, respectively. Four in-depth interviews

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with physicians who provide antenatal care services and ten in-depth interviews with women who were currently pregnant were carried out. Most mothers knew about the alleged advantages of prenatal IFA supplements. Nonetheless, compared to urban women, rural women knew less about the advantages of IFA supplements (4). A study undertaken in Thatta district, Pakistan in 2020 yielded significant findings regarding the determinants of antenatal care (ANC) utilization among pregnant women. Notably, the analysis revealed that the distance to the road network did not have a discernible impact on ANC usage. Conversely, the study found that women residing within a 5-kilometer radius of healthcare facilities were 1.21 times more likely to utilize ANC services. Furthermore, the results indicated that women with prior knowledge of ANC were 6.60 times more likely to access these services. Additionally, women residing in sturdy homes demonstrated a 2.58-fold increased likelihood of seeking ANC services. The study also revealed that nulliparous women who possessed knowledge of ANC and resided in sturdy homes with access to electricity were more inclined to utilize ANC services. (5).

A study in Punjab, Pakistan, found that women who received information and guidance during antenatal care (ANC) had higher chances of receiving postnatal care. Education played a crucial role in PNC utilization, with a 1% increase in adult literacy rate increasing PNC utilization by 0.254%. Addressing post-natal care ignorance is recommended to prevent maternal deaths (6).

2. Methodology

2.1. Study design, setting, duration and exclusion criteria

The study conducted was a quantitative cross-sectional study design, lasting from March 2023 to September 2023 at Jinnah International Hospital and Women & Children Hospital Abbottabad. The study focused on pregnant females aged 20 to 40 years, renal impairment, chronic liver disease, and those who declined to participate.

2.2. Sampling and procedure for data collection

A sample size of 100 was determined using a WHO calculator with a 5% error and 95% confidence interval, utilizing non-probability convenience sampling. Data was collected through a self-structured questionnaire

administered by interviewers and entered into SPSS version 20 for analysis.

Ethical considerations were taken into account, and approval was taken by the ethical committee of Women Medical College, Abbottabad

2.3. Analysis

Descriptive analysis was conducted using IBM SPSS Statistics Version 20, with associations examined through chi-square for categorical variables.

3. Results

3.1. Sociodemographic Parameters

With a sample of 100 females, the most common age group was 20 to 40 years. There was significant variation among booked and unbooked women as far as some variables are concerned. The table 1a below outlines the socio-demographic characteristics of the participants, including age, weight, education level, and socioeconomic status. Regarding age the maximum number of participants $n=35(35\%)$ were in the age group 26 to 30 as shown in table 1a. A significant portion of females $n=22(22\%)$ weighed between 66-70 kgs. Education-wise, 84% were educated, and a majority $n=57(57\%)$ had a satisfactory socioeconomic status, earning 25,000-50,000 monthly.

The results indicated that socioeconomic status is significantly associated with the booking status of mothers, ($p=0.030$) this suggests that mothers with higher socioeconomic backgrounds are more likely to receive regular antenatal care. In contrast, age group does not show a significant difference between booked and unbooked mothers ($p = 0.239$), indicating that whatever the age group does not have an effect on the likelihood of receiving antenatal care (Table 1c). While the Table 1b and figure 2 shows the number of study participants based on their booking and antenatal care status.

Table 1a: Sociodemographic and other characteristics of study population

Characteristics	(N)	%age
Age (in years)		
20-25	28	28.0
26-30	35	35.0
31-35	18	18.0
36-40	19	19.0

Weight (in kgs)		
50-55	13	13.0
56-60	16	16.0
61-65	21	21.0
66-70	22	22.0
71-75	15	15.0
76-80	12	12.0
81-85	1	1.0

Mothers Education		
Uneducated	16	16.0
Primary	36	36.0
Secondary	32	32.0
Higher	16	16.0

Socioeconomic status			
Less than 25,000 (Below Average)	43	43.0	
Between 25,000-50,000 (Satisfactory)	57	57.0	

Table 1b: Comparison of Maternal Characteristics based on their booking status and antenatal care status

	N	%age
Booked/unbooked	Yes	45 45
	No	55 55
Received ANC	Yes	57 57
	No	43 43
Availability of transport facilities	Yes	32 32
	No	68 68

Table 1c: Sociodemographic characteristics of booked and unbooked mothers

Variable	Unbooked (%)	Booked (%)	P value
Age group			
20-25	12 (42.9%)	16 (57.1%)	0.239
26-30	18 (51.4%)	17 (48.6%)	
31-35	12 (66.7%)	6 (31.6%)	
36-40	13 (68.4%)	6 (31.6%)	
Educational level			

Uneducated	13 (81.3%)	3 (18.8%)	0.128
Primary	18 (50%)	15 (46.9%)	
Secondary	17 (53.1%)	9 (56.3%)	
Higher	7 (43.8%)		

Socioeconomic Status			
<25000(Below average)	29 (67.4%)	14 (32.6%)	0.030
25000-50000(Satisfactory)	26 (45.6%)	31 (54.4%)	

Table 2: Maternal and fetal complications and outcomes in booked and unbooked mothers.

Variable	Unbooked N (%)	Booked N (%)	P value
Diseases due to pregnancy			
DM	6 (10.9)	0 (0)	0.013
HTN	17(13.9)	7 (15.6)	
others	12 (21.8)	10 (22.2)	
Mode of delivery			
C-section	31 (48.4)	34 (75.6)	0.030
Spontaneous– vaginal delivery	24 (43.6)	11 (20)	
Status of the baby			
alive:	36 (65.5)	44 (97.7)	0.000
dead:	19 (34.5)	1 (2.2)	
Time of delivery			
At term	30 (54.5)	33 (73.3)	0.015
preterm	22 (40)	6 (13.3)	
late term	3 (5.5)	6 (13.3)	

The maternal and fetal complications and outcomes indicate significant differences between booked and unbooked mothers as shown above in Table 2.& Fig 2 Diseases due to pregnancy, such as diabetes mellitus (DM) and hypertension (HTN), are more prevalent in unbooked mothers (p= 0.013), suggesting that unbooked mothers are at higher risk of pregnancy-related diseases. Mode of delivery also shows a significant difference (p = 0.030). The status of the baby, with a p-value of 0.00, highlights that babies born to booked mothers have a higher survival rate, as indicated by fewer instances of fetal death in this group. Additionally, there is a significant association between booking status and timing of delivery (p = 0.00), showing that booked mothers have a higher rate of term deliveries, whereas

unbooked mothers experience more preterm deliveries (Table 2).

3.2. Maternal Outcome

There was no statistical correlation between the age of the pregnant woman and complications experienced during pregnancy ($p=0.209$). Complications were found to be evenly distributed among all age groups. The mother's educational status did not show a significant correlation with maternal outcomes ($p=0.128$). However, a significant relationship was observed between receiving antenatal care (ANC) and the occurrence of pregnancy complications ($p=0.013$). Women who received proper ANC were less likely to face complications compared to those who did not. On the other hand, there was a statistical correlation between the intake of iron/folic acid supplements and maternal outcomes ($P=.000$). Women who took these supplements during pregnancy had fewer complications and delivered healthier babies. (Figure 1)

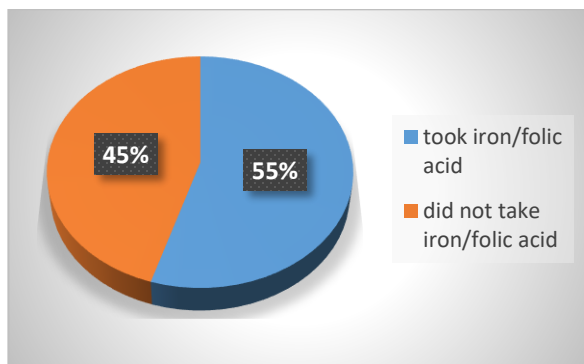


Figure 1: Iron and Folic acid intake by participants

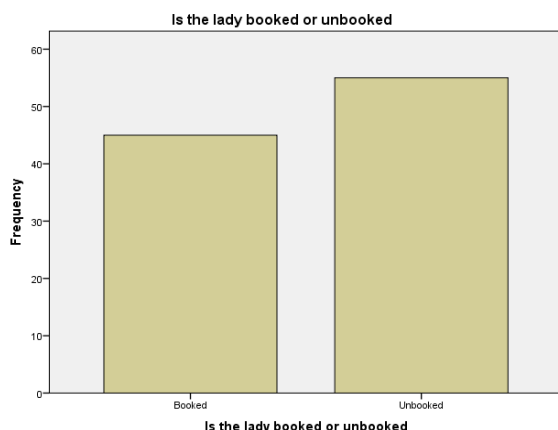


Figure 2: ANC booking status of females

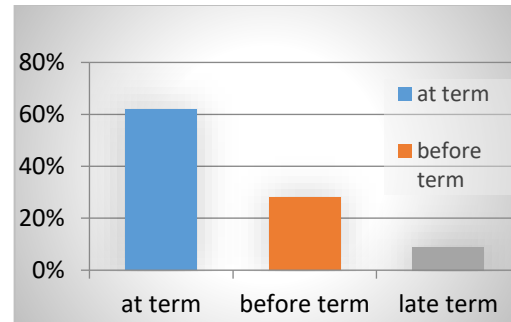


Figure 3: Time of Delivery of participants

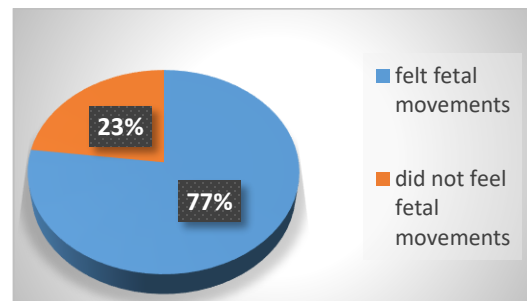


Figure 4: Feeling of Fetal movements by study participants

3.3. Fetal Outcome

Our study revealed a strong association between booking for antenatal care and positive fetal outcomes, with women who had scheduled appointments, delivering healthier babies compared to those who were unbooked ($p=0.000$). Interestingly, the availability of transport for pregnant women did not show a significant impact on fetal outcomes ($P=0.236$), indicating that access to transportation does not play a major role in the health of the baby. Furthermore, the level of awareness among women regarding antenatal care did not have a statistical correlation with fetal health ($p=0.152$), suggesting that knowledge of ANC does not significantly affect the well-being of the baby. On the other hand, there was a significant correlation between fetal movements and the birth outcome, with active movements indicating a healthy baby ($p=0.026$). Monitoring fetal movements can help detect any potential issues and ensure the baby's well-being (Figure 4). Additionally, the timing of delivery did not impact fetal outcomes ($p=0.070$) that whether the baby was born at term or late term (Figure 3). Complications that the women suffered during pregnancy had no effect on fetal outcome ($p=.108$) whereas complications suffered

during delivery showed a significant correlation with the baby's health ($p=0.000$). (Fig.5)

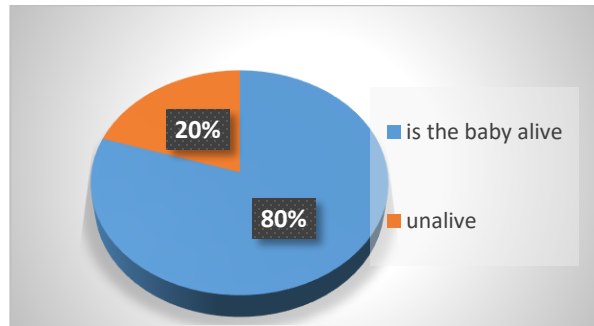


Figure 5: Present status of the baby

4. Discussion

According to our research, 57% of the total women received antenatal care while those who did not receive had more complications than those who received it. Our study results were quite similar to research done in Lady Willingdon hospital Lahore, Pakistan. where it was stated that maternal complications occurred more commonly in women without ANC. It was stated that women with more than 3 ANC visits were more likely to have a good outcome (7).

As far as age was concerned in our study it had no significant relation with antenatal care and maternal or fetal outcome. However, Teenage pregnancy is a worldwide problem that leads to serious maternal and fetal complications and advanced age is a major risk factor for miscarriage associated with chromosomal abnormalities. Our study has no significant associations between maternal age and pregnancy complications. In Contrast, young maternal age was associated with prematurity in studies conducted in Singapore (8).

A study in Finland suggested that adverse pregnancy outcomes in teenage pregnancies can most probably be overcome if the pregnant lady receives good antenatal care (9).

According to our study, 57% of the women took iron and folic acid supplementation. Our finding is in agreement with research done in South Ethiopia where many pregnant females were compliant with iron and folic acid (10). Whereas adherence to iron and folic acid supplementation was low in Bangladesh (11).

According to our research, only 16% of the women were educated and maternal education did not have a significant impact on booking attitude of mother. Our

research findings were in contrast with an article in the International Journal of Reproduction, Contraception, Obstetrics and Gynecology where of all illiterate mothers; 90.9% had low birth weight babies and 13.6% had stillbirth (12).

ANC is one of the fundamental strategies recommended to reduce the risk of neonatal mortality in any community our study results show a close association with the study conducted in a tertiary hospital in Ghana where not receiving ANC led to the development of anemia, preeclampsia, and delivery of low birth weight babies (13).

Fetal movement counting is a means of screening fetal status. Our study results were quite similar to a study conducted in Norway where women experiencing DFM are at risk for adverse outcomes such as pre-term birth and fetal growth restriction (14).

The result of our research shows a close association with the study conducted at Harare Maternity Hospital, Zimbabwe where booked ladies with good fetal outcomes and unbooked ones with preterm and low birth weight babies (15).

Our research had no significant association with the knowledge about the importance of ANC and fetal outcome. Our research findings were not supported by research done in Bangladesh that revealed that women who were told about pregnancy complications during ANC were more likely to deliver at the health facility compared to those who were not told (16).

5. Conclusion

Study emphasizes the vital importance of antenatal care (ANC) in optimizing maternal and fetal health outcomes. Women who received ANC exhibited reduced pregnancy complications, higher neonatal survival rates, and improved overall outcomes compared to those who did not access care. Crucial interventions, including iron and folic acid supplementation and regular fetal monitoring, significantly contributed to these benefits. Notably, socioeconomic disparities emerged as a primary determinant of ANC access, whereas maternal age and education did not demonstrate a substantial impact. These findings underscore the urgent need for equitable access to ANC and the strengthening of healthcare systems to mitigate preventable maternal and neonatal morbidity and mortality.

Conflict of Interest: The authors declare no conflict of interest.

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