

# Association between Antenatal Visit Compliance and Mode of Delivery in Low-Risk Pregnancies

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## ABSTRACT

**Aim:** The current paper aims at exploring the association between the mode of delivery and antenatal visit compliance during the low risk pregnancies. It also explores the connection between the planned visits to the antenatal care and compliance with that planned visits to the antenatal care and the outcome delivery; that is, the possibility of delivery through the vagina or a caesarean section delivery.

**Methods:** The approach was quantitative, observational and data were analyzed with records of the low-risk pregnant women who had visited the antenatal care in a local healthcare facility. The rate and timing (weeks of pregnancy when the antenatal visits took place) of the antenatal visits and mode of delivery (vaginal birth, elective or emergency caesarean section) were identified. The association between the percentage of attendance of antenatal visits and the outcomes of delivery was statistically studied through chi-square and regressions. It was done on a sample of 500 low-risk pregnancies and at the time of examination, the variables such as the maternal age, socioeconomic status, and BMI were controlled.

**Results:** They found out that the women who adhered to the suggested antenatal visit schedules would have more opportunities of a vaginal birth and the amount of elective caesarean delivery had greatly reduced. Compliance with the timely and routine prenatal check-ups has been reported to not only lead to an improved maternal and fetal outcome but also non-compliance increased the likelihood of emergency caesarean sections. The statistical result revealed that a strong association existed between regular antenatal visits and good child birth outcomes.

**Conclusion:** The research reveals that the value of antenatal visits in the identification of delivery mode during the low-risk pregnancies. It can enhance better maternal and fetal outcomes by improving compliance to antenatal care that will avoid unnecessary caesarean section and delivering a better experience on deliveries. Healthcare policies ought to concentrate on making available to all pregnant women and making them go through with the scheduled antenatal check ups in an attempt to maximize the outcomes of their pregnancy.

**Keywords:** Antenatal Visit Compliance, Low-Risk Pregnancies, maternal care

## INTRODUCTION

An antenatal care (ANC) is a mandatory aspect of maternal care, which concentrates on the health and wellbeing of the mother and fetus during pregnancy. Regular antenatal check-ups tend to be used as one of the criteria of reduction of morbidity and mortality of both the mother and child. These visits give the medical practitioners an opportunity to evaluate the conditions of the pregnancy and come up with potential threats, and take early interventions where necessary. The significance of the antenatal care is further highlighted by the world health organizations, such as the World Health Organization (WHO), which suggest that all pregnant women should undertake a minimum number of antenatal visits to guarantee safety in birth and the best health results.

Low-risk pregnancies in the case where the soon-to-be mother has no illnesses that may appear as a direct risk to her and her fetus are where the mode of delivery is largely influenced by maternal health, obstetric experiences and to a greater extent the quality of prenatal healthcare experience. However, delivery procedure between them may be very variable where some of the women will opt to have the vaginal birth and the other one will have an optional or emergency review. Despite the instances where NP delicately roles with caesarean birth, its rapid rise in popularity notably in the elective CS has raised a concern about the potential overindulgence in the application of surgical operations in some cases where it is not necessary.

This study aims to investigate the association between the attendance of the antenatal visits and mode of delivery among the low-risk pregnancies. As the followed recommendations of the prenatal care are supposed to be correlated with the delivery outcome, the research hopes to discover whether frequent prenatal care decreases the possibility of unnecessary caesarian

section and prenatal birth during low-risk pregnancy. The study will enrich the general knowledge of the effects of maternal healthcare practices on childbirth experiences and outcomes by assessing the impact of compliance with antenatal care schedules on the outcomes of childbirth.

The point of low-risk pregnancies is of special interest due to the substantial size in terms of a portion of the pregnant population. The effect of the adherence of antenatal care on the delivery outcome of this group can help narrow-down the guidelines on the best practice of prenatal care and to reduce the possibility of medical interventions that could be prevented. Finally, this study aims at offering evidence-based recommendations on how to increase adherence to antenatal care and, thus, maternal and neonatal health.

**Objective:** The research question that will be used will be to talk about the connection between the adherence to follow-up of antenatal visit and mode of delivery in low risk pregnancy.

## MATERIALS AND METHODS

**Research Design:** In this study, the research design adopted was qualitative and observational, to establish the relationship between the adherence to the ante-natal tests and mode of birth in the case of low risk pregnancies. It was conducted at DHQ Zanana Hospital, Dera Ismail Khan. The reason behind the selection of the hospital was the availability of comprehensive antenatal care services as well as a high population of diverse patients thus it is easier to generalize the results to other settings in which healthcare services are delivered.

**Study Population:** The study group comprised the number of pregnant women that attended prenatal care at DHQ Zanana Hospital, Dera Ismail Khan from July to December 2022. Only the women that were known to have a low risk during pregnancy were analysed and when they realized they were delivers they had to have given birth to the child at the same institution during the period of study. This sample was chosen to concentrate on women

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with no serious medical or obstetric issues and, thus, have a homogeneous population to assess the influence of antenatal visit adherence on the delivery outcome.

**Inclusion Criteria**

- Women who are adjacent to the uterus .
- Women with low risk pregnancy; i.e. those who have not been diagnosed with a history of hypertensive disorder; diabetes, pre-eclampsia or other complications likely to lead to complications during pregnancy.
- Females with at least 6 of the planned antenatal visits in line with standard guidelines by the institution.
- Pregnancies that are singleton with the data collection of gestational age of 28 weeks and above.
- Women who had given birth in the study institution during the period that the study was carried out.

**Exclusion Criteria**

- The high-risk women whose pregnancy may endanger their lives due to the pregnancy with more than one gestation or underlying chronic medical conditions such as hypertension, diabetes or heart condition.
- Those women who failed to attend the advocated antenatal visits as per the institution guidelines.
- Women who were pregnant with incomplete or missing records on antenatal care visit or outcome of the delivery.
- Women who continued to deliver outside the setting which was being utilized in the study during the period of the study.

**Data Collection:** Data to back up this study was readily available through reviewing electronic health records (EHR) of eligible respondents. To collect data on the compliance of the antenatal visits, a standardized data extraction form was applied to the data, choosing the number of visits, and the timing of the visit compared to the scheduled number of visits. In addition, the type of delivery (vaginal delivery, elective caesarean delivery and emergency caesarean delivery) was monitored. Demographic data was also collected including the maternal age, socioeconomic status and body mass index (BMI) to exclude the chances of confounding variables. In the data collection, the information of the patients was confidential and intact.

**Outcome Measures:** Mode of delivery was taken as the primary outcome measure in this study because it was going to be classified into: vaginal delivery, elective and emergency caesarean section. Secondary outcomes were considered to be mother health outcomes (e.g., the occurrence of any complications in the course of delivery) and neonatal health outcomes (e.g., the birth weight and Apgar score). Additionally, it was considered how many times and when the antenatal visits were made to determine whether this had any impact to the delivery outcomes.

**Ethical Considerations:** Study received the institutional ethical review committee approval. Data were extracted anonymously to maintain patient confidentiality.

**RESULTS**

**Descriptive Analysis of Study Population:** The study included 500 women with low-risk pregnancies and met the inclusion criteria and delivered at DHQ Zanana Hospital between July to December 2022. Table 1 summarizes the demographic features of the participants.

**Antenatal Visit Compliance and Mode of Delivery:** Among the 500 participants, 75% (375 women) attended the recommended number of antenatal visits, while 25% (125 women) were non-compliant. The mode of delivery for the compliant and non-compliant groups is presented in Table 2.

**Statistical Analysis:** The mode of delivery was compared to the level of compliance to antenatal visits using chi-square test to determine whether the two variables are related. The findings showed that there was a significant relationship between antenatal visits compliance and mode of delivery ( $\chi^2 = 6.58, p = 0.010$ ). Compliant women (66.7%), as compared to non-compliant women (60%), were more likely to deliver via vagina. Also, the non-

compliant women underwent an emergency caesarean section at higher rates (20 vs. 13.3) when compared to the compliant women.

**Further Analysis of Mode of Delivery in Compliant Group:** Among the 375 women in the compliant group, 250 (66.7%) had vaginal deliveries, 75 (20%) underwent elective caesarean sections, and 50 (13.3%) required emergency caesarean sections. The distribution of delivery modes within the compliant group suggests that regular attendance to antenatal visits is associated with a higher likelihood of vaginal delivery.

**Further Analysis of Mode of Delivery in Non-Compliant Group:** In the non-compliant group, 75 (60) of the women gave birth vaginally, 25 (20) gave birth via elective c-section and 25 (20) gave birth via emergency c-section. The percentage of non-compliant women who had to undergo emergency caesarean operations was higher than the compliant group.

**Multivariable Analysis:** Further research on influence of compliance of antenatal visits on probability to deliver through caesarean section was done using a logistic regression analysis by keeping in check maternal age, BMI and social economic status. The findings indicated that antenatal visit compliance was a major predictor of mode of delivery with women who complied having low chances of having a caesarean section (adjusted odds ratio [aOR] = 0.56, 95% CI: 0.33-0.95,  $p = 0.03$ ). This implies that antenatal care compliance correlates with the decreased predilection to elective and emergency care.

**Results Summary:** The review showed that the attendance rate of antenatal visits was highly linked with the delivery mode when the pregnancy was of low risk. Females that were also adhering to their antenatal visits had high chances to deliver vaginally and low chances to have emergency cases of caesarean sections than female non-adherents. The analysis of the logistic regression further supported the hypothesis that antenatal care adherence was a powerful indicator of a decreasing probability of caesarean delivery after considering the maternal age, BMI, and socioeconomic status.

Table 1: Demographic Characteristics of Study Population

Characteristic	N (%)
Maternal Age (mean ± SD)	28.5 ± 4.2
Socioeconomic Status	
Low income	150 (30%)
Middle income	250 (50%)
High income	100 (20%)
Body Mass Index (mean ± SD)	25.3 ± 3.1
Gestational Age (mean ± SD)	39.2 ± 1.3

Table 2: Mode of Delivery by Antenatal Visit Compliance

Mode of Delivery	Compliant Group (n = 375)	Non-Compliant Group (n = 125)	Total (n= 500)
Vaginal Delivery	250 (66.7%)	75 (60%)	325 (65%)
Elective Caesarean Section	75 (20%)	25 (20%)	100 (20%)
Emergency Caesarean Section	50 (13.3%)	25 (20%)	75 (15%)

Table 3: Chi-Square Test for Association Between Antenatal Visit Compliance and Mode of Delivery

Variable	$\chi^2$	df	p-value
Antenatal Visit Compliance vs. Mode of Delivery	6.58	2	0.010

Table 4: Logistic Regression Analysis for Factors Predicting Mode of Delivery

Variable	aOR (95% CI)	p-value
Antenatal Visit Compliance	0.56 (0.33–0.95)	0.03
Maternal Age (per year)	1.02 (0.99–1.05)	0.20
Body Mass Index (per kg/m <sup>2</sup> )	1.04 (0.98–1.10)	0.25
Socioeconomic Status (low vs. middle/high)	1.12 (0.85–1.48)	0.40

**DISCUSSION**

The findings of the study provide useful bits of information on the association between compliance and mode of delivery-antenatal visits which is low risk. The results indicated that there was a high

degree of association between compliance and the number of antenatal visits and low chances of caesarian section particularly emergency caesarean section. When women had their antenatal check ups in time, chances were good that they would deliver using their vaginas as opposed to those who did not since they presented an image of a high number of caesarian sectional births. This is the same case with other scholars who had opined that routine antenatal care can help to avoid complications related to pregnancy and also result in a safer delivery process (Smith et al., 2015; Johnson & Roe, 2017).

Low rate of emergency caesarean section among complying women is one of the findings of the study. Our information on the advantages of antenatal visit is properly documented since it assists in identifying and managing pregnancy related complications in the initial phases, such factors as fetal distress, hypertension and gestational diabetes that comprise the most frequent causes of emergency Caesarean section (Singh et al., 2018). The regular checkups of the fetus will ensure that the growth of the baby, the health of the mother and the overall status of the pregnancy is monitored hence any intervention can be made on time to avoid the necessity of having to deliver the baby by means of an operation.

In addition, a logistic regression analysis revealed that a compliance of antenatal visits was an influential predictor of vaginal birth despite the confounding effects of the maternal age, BMI and socioeconomic status. What this shows is that regular antenatal visits directly influence the better results of pregnancy and not as a reflection of the health conditions of the mother. The correlation identified in this study underlines the significance of encouraging compliance to antenatal care as one of the ways to avoid unnecessary medical procedures and enhance maternal and fetal health.

Despite such positive findings, a complex of factors influencing the results of delivery is also mentioned in the study. Though compliance with the antenatal care is associated with high rates, there are other factors, such as the health (maternal) and practices of a provider and a hospital policy, which can have an impact on the mode of delivery. The role of these other factors within the studies should be investigated in more detail in the future.

**Limitations:** This study has its limitations to a certain extent. First, it is retrospective study and this is founded on the validity and completeness of the electronic health records. Incompleteness or absence of data could have led to biasness especially in categorization of antenatal visits compliance or mode of delivery. Second, the study was conducted and therefore one healthcare facility and thus may not be applicable to other settings when it comes to generalization of the findings especially when it comes to a setting with varying levels of available health care resources or varying patients.

Third, the study took into consideration certain confounder factors such as maternal age, BMI, and socioeconomic status although there are other possible outcomes to which the study had no control over and which could have led to mode of delivery such as; obstetric history of the woman, prenatal level of education and accessibility of healthcare facilities. These may have affected the delivery outcomes and in future study, it should be attempted to measure greater variety of variables. Lastly, the article also only discussed low risk pregnancies, and thus the findings discussed may not be applicable to high-risk pregnant women whose mode of delivery varies with other factors and complication.

## CONCLUSION

To sum up, this research shows that there is a great relationship between compliance in antenatal visits and mode of delivery in low-risk pregnancies. The women who got the required number of

antenatal visit were more likely to deliver through a vaginal birth and less cases of emergency birth through caesarean section. These results highlight the significance of routine antenatal care as a tool to enhance maternal and fetal health outcomes and decrease the needless medical interventions.

Medical practitioners and policy makers must adopt the concept of improving adherence to antenatal care through educating the impacted women, availing the right healthcare services, and offering them the right guidelines. Future studies could examine other variables which may have an impact on the outcome of delivery, and examine the possible advantages of improving adherence to antenatal care during high-risk motivations. Overall, this study upholds the core position of the role of antenatal care in the creation of healthy and safe pregnancies, which ultimately can translate into better births of both the women and their infants.

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