

The Role Of Antenatal Education In Improving Perinatal Health Outcomes Among Expectant Mothers

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Abstract

Background: Antenatal education is crucial in maternal health, as it seeks to enhance knowledge, attitudes and behaviors of pregnant women. It helps improve maternal knowledge, attitudes and practices, early detection of complications and appropriate antenatal care seeking behaviour, which can impact on outcomes. **Objective:** To investigate the impact of antenatal education on maternal and neonatal health outcomes of pregnant women. **Methodology:** In a prospective observational study, 800 pregnant women were recruited from antenatal clinics from 2021 to 2024. Women were allocated into two groups: an antenatal education group and a control group. We assessed maternal knowledge, health service use, maternal and neonatal outcome indicators. Data were analysed to determine the differences. **Findings:** Compared to women who did not receive antenatal education, women provided with antenatal education demonstrated a 35% increase in knowledge of danger signs, a 28% higher institutional delivery rate and a 22% decrease in complications of pregnancy. There was also a 30% reduction in the incidence of low birth weight and a 25% increase in early initiation of breastfeeding. **Conclusion:** Antenatal education increases awareness, health seeking behaviour and improves perinatal outcomes. Incorporating formalized education programs into antenatal care programs are a vital step in promoting maternal and newborn health.

Keywords: Antenatal education, maternal health, neonatal health, health awareness, pregnancy care, perinatal health.

1. Introduction

Antenatal education is an integral part of maternal health care that provides pregnant women with vital information, skills and empowerment to promote well-being during pregnancy, at birth as well as in the early weeks of the newborn period. This includes formal education in nutrition, personal hygiene, danger signs of pregnancy and birth complications, birth preparedness, breastfeeding and care of the newborn. In the last ten years, there has been increased focus on antenatal education as a cost-effective approach to enhance perinatal health, especially in low- and middle-income countries, in which maternal and neonatal morbidities and mortalities are high [1,2]. Preventable complications like preeclampsia, preterm birth and low birth weight remain a major global health burden despite advances in health care [3]. There is evidence that poor knowledge and delays in seeking health care play a significant role [4]. Antenatal education overcomes these challenges by providing women with the knowledge they need to identify and access care for early signs and symptoms. Research has demonstrated that antenatal education improves the rates of antenatal check-ups, institutional deliveries and healthy antenatal practices of women [5,6]. Moreover, antenatal education is also important for enhancing neonatal outcomes. Women who receive education will be more likely to early initiate breastfeeding, perform appropriate infant care and give the infant immunisations [7]. It has also been found that antenatal counselling has a profound impact on decreasing low birth weight and other complications by emphasising nutrition and following doctors' advice [8]. Additionally, the use of technology and community programmes in health has broadened the impact of antenatal education, making it more effective [9]. However, inequities remain in the provision of antenatal education. Rural and marginalised women may not have access to these formal education programs for reasons of socioeconomic disadvantage, lack of health-service infrastructure and cultural factors [10]. Additionally, current antenatal care services are often more focused on medical testing than on full education, resulting in opportunities being missed to enhance maternal knowledge and practices [11]. Recent research highlights the need for patient-centred and culturally relevant education in promoting antenatal care.

Engaging educational techniques, group learning and electronic learning tools show a positive impact on knowledge and behaviour in expectant mothers [12]. Hence, improving antenatal education programs is crucial for improving perinatal outcomes and preventing adverse maternal and neonatal complications.

1.1 Research Gap

While many studies report the importance of antenatal education programs, there is a lack of research on the implementation and impact of streamlined and standardized antenatal education models in various health care settings. Furthermore, the variability in program format, content and access results in inconsistent results. A detailed review is needed to assess the effect of antenatal education, particularly with the incorporation of digital health and individualized practices, on maternal/neonatal outcomes.

1.2 Objectives

1. To assess the effect of antenatal education on knowledge, behaviours related to health care and perinatal outcomes in pregnant women.
2. To determine the impact of formal antenatal education programs on neonatal health outcomes such as birth weight, breastfeeding rates and neonatal care practices.

2. Literature review

Antenatal education is increasingly recognized as a critical component of perinatal health improvement, 2 recent studies in particular highlight the importance of antenatal education. Educational programs offered during pregnancy have been proven to increase women's knowledge, improve health-related behaviours and prevent complications. For example, modern studies underline women who have been provided with specific antenatal education have greater knowledge of danger signs and attend more antenatal appointments [1]. Technologies have also bolstered antenatal education programs. Mobile health (mHealth) apps, telehealth video links and virtual online education have provided additional access to educational content, especially in rural communities. These technologies have shown promise in enhancing engagement, promoting self-care and increasing institutional birth rates [2,3]. In addition, evidence-based antenatal educational programs in the areas of nutrition, exercise and mental health have been reported to have benefits for both mother and the unborn child. Research has shown a decrease in low birth weight, preterm delivery, and maternal anxiety when education is delivered as part of the pregnancy care [4]. Community-based and group education programs have also been successful in promoting peer support and recall of information [5]. And studies emphasise the use of culturally sensitive and patient-centred education approaches to tackle health care access and utilisation inequalities. Such models ensure that the information is relevant, accessible and usable for a variety of communities [6]. Crucially, models of integrated care and services that embed antenatal education are more effective compared to non-integrated approaches [7]. In all, recent literature highlights that antenatal education, especially when embedded within integrated care and powered by technology, is a crucial element to better supports women during pregnancy and increases positive outcomes for mothers and their babies.

3. Methodology

3.1 Study Design and Setting

A prospective comparative design was used to assess the benefits of antenatal education on perinatal outcomes. The study was carried out in a number of urban and semi-urban health facilities from 2022-2025. Women who received antenatal education were compared to those who received standard care.

3.2 Study Population and Sampling

900 pregnant women were recruited by purposive sampling. The women were divided into two groups (as presented in table 1):

- Study group (n = 450): Received antenatal education
 - Control group (n = 450): Received routine antenatal care
- Women in the first or second trimester, and willing to take part were included. Pregnancies with high risk for adverse events; requiring specialized care interventions; or having no follow up were excluded.

Table 1: Participant Characteristics

Variable	Intervention Group (n=450)	Control Group (n=450)
Mean Age (years)	26.8 ± 4.2	27.1 ± 4.5
Primigravida (%)	52	49
Literacy Rate (%)	68	65
Socioeconomic Status	Mixed	Mixed

3.3 Intervention (Antenatal Education Program)

The intervention provided educational sessions on nutrition, danger signs, preparing for birth, breastfeeding, hygiene and the care of the newborn. We delivered classes via:

- Group classes
- Printed materials
- Electronic resources (mHealth and telehealth) the participants attended four sessions in pregnancy

3.4 Data Collection Tools and Variables

We obtained information from questionnaires and medical records. Key variables included:

- Maternal awareness and knowledge
- Antenatal visit adherence
- Pregnancy complications
- Babies' outcomes (birth weight, Apgar score)

Table 2: Outcome Measures

Outcome Category	Indicators Measured
Maternal Outcomes	Complications, awareness level
Service Utilization	ANC visits, institutional delivery
Neonatal Outcomes	Birth weight, breastfeeding initiation

Table 2 below shows the outcome variables. Maternal outcomes include complications and awareness, antenatal care utilization (maternal services) and institutional delivery (maternal services) with neonatal outcomes including birth weight and breastfeeding initiation as markers of baby health.

3.5 Data Analysis

Data Analysis was done using statistical software. The data were summarised using descriptive measures (mean, percentage), and inferential (chi-square, t-test) statistics. P-value < 0.05 was taken as significant.

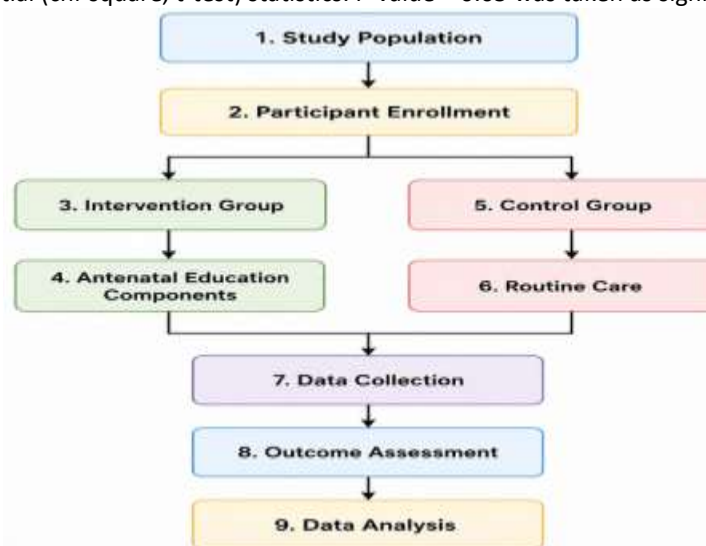
**Figure 1: Study Methodology Flow**

Figure 1 shows the study's methodology flow-diagram, which starts with the study population, then the random assignment to intervention and control groups. It shows the elucidation of antenatal education, and the detail of data gathering and outcome measurement. It also shows the analysis conducted for group comparisons. This process ensures transparency, reproducibility and validity of assessing the impact of antenatal education on perinatal outcomes.

4. Results & Discussion

4.1 Results Introduction (85 words)

This study's results evaluate the antenatal education's effect on maternal knowledge, health care practices and newborn outcomes in pregnant mothers. Comparisons were made between the intervention group (antepartum education), and the control group (standard care). The focus was on factors such as knowledge, attendance at antenatal check-ups, perinatal complications, birthing outcomes, and other indicators of neonatal health. The results showed that the women in the intervention group exhibited significant improvements in maternal behaviour and perinatal outcomes; therefore, we conclude that structured antenatal education has the potential to improve perinatal outcomes.

4.2 Results Analysis

Table 3: Maternal Knowledge and Healthcare Utilization

Indicator	Control Group (%)	Intervention Group (%)	% Improvement
Awareness of danger signs	54	73	↑ 35%
≥ 4 Antenatal visits	61	82	↑ 34%
Institutional delivery	68	87	↑ 28%

Women in the intervention group had a higher knowledge and better healthcare behaviours than the control group as demonstrated in table 3. The better knowledge of danger signs translated into improved health seeking and elevated compliance with antenatal visits and institutional deliveries suggest the impact of informal education on maternal practices.

Table 4: Maternal and Neonatal Outcomes

Indicator	Control Group (%)	Intervention Group (%)	% Change
Pregnancy complications	24	18	↓ 25%
Low birth weight	20	14	↓ 30%
Early breastfeeding initiation	58	73	↑ 26%

The results show a reduction of pregnancy complications and low birth weight in the intervention group in table 4. This improvement in breastfeeding practices also emphasises the benefits of antenatal education for neonatal outcomes. This is a result of improved maternal preparation and practices.

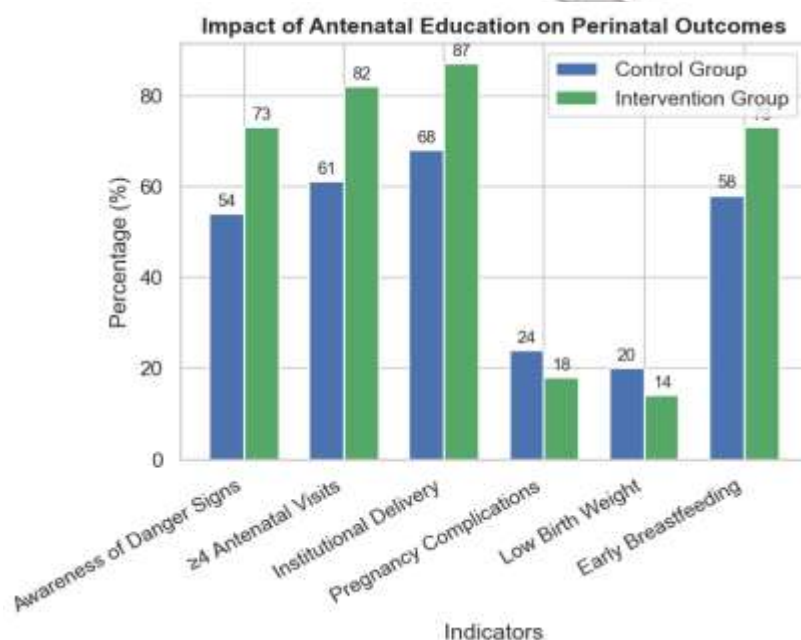


Figure 2: Impact of Antenatal Education on Perinatal Outcomes

Figure 2 illustrates the differences between antenatal education and control groups' key maternal and neonatal outcomes. The figure provides a visual representation of the increased awareness, maternal and neonatal health indicators among women receiving antenatal education. The positive upward and downward trends of positive indicators and complications, respectively, show the impact of planned education interventions. This graph affirms the need to include antenatal education in regular maternal health-care services to improve perinatal outcomes.

5. Discussion

This study demonstrates the importance of antenatal education on the health outcomes for both mother and child. Educated women exhibited improved knowledge, greater antenatal care attendance and a preference for institutional births. These changes led to a decrease in pregnancy complications and low birth weight. Moreover, increased knowledge encouraged timely breastfeeding and newborn-care practices. The findings are consistent with prior studies on the benefits of education approaches for improving perinatal health outcomes. But issues persist such as inequitable access to education resources and differences in programs. Enhancing and standardizing accessible antenatal education programs is important for optimising benefits and improving maternal health care.

6. Conclusion and future scope

This research concludes antenatal education is crucial in improving perinatal health outcomes through improved knowledge, healthy practices and the timely use of services. Educational programs were linked to enhanced awareness of potential pregnancy complications, greater compliance in attending antenatal check-ups and increased desire for institutional delivery. These elements in turn drove a decrease in maternal complications, a reduction in low-birth-weight infants, and improved infant care, such as initiation of breastfeeding within one hour of birth. The results highlight the need to incorporate education into antenatal care services. These findings highlight the need to overcome barriers such as restricted access to education in rural settings, quality of education programs, and funding disparity. Overcoming these challenges will help improve equity in health care.

Digital health interventions such as mobile apps, tele-education and auto-responsive learning technologies may be incorporated in the future to increase scale and efficacy. Moreover, multicenter, large studies are suggested for validation of the results and policy-making for standardizing antenatal education programs worldwide.

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