

## Review Article

# Impact of Antenatal Education on Maternal and Neonatal Outcomes

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## I N F O

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## A B S T R A C T

Antenatal education is a cornerstone of maternal healthcare, providing expectant mothers with knowledge, skills, and psychosocial support necessary for safe pregnancy, childbirth, and early neonatal care. This systematic review evaluates the impact of antenatal education programs on maternal and neonatal outcomes, including maternal knowledge, birth preparedness, self-efficacy, delivery complications, and neonatal health indicators. A comprehensive search of PubMed, Scopus, Web of Science, CINAHL, and Google Scholar was conducted for studies published between 2010 and 2024. Twenty-six studies were included, encompassing randomized controlled trials, quasi-experimental studies, cohort studies, and systematic reviews. The review indicates that antenatal education significantly improves maternal knowledge, birth preparedness, and self-efficacy, reduces anxiety and fear related to childbirth, increases rates of facility-based deliveries, and contributes to better neonatal outcomes such as improved birth weight, early initiation of breastfeeding, and reduced neonatal complications. Barriers such as low literacy, cultural beliefs, limited access, and inadequate program content were identified. Strengthening antenatal education programs, integrating culturally appropriate approaches, and expanding access can significantly enhance maternal and neonatal outcomes globally.

**Keywords:** Antenatal Education, Maternal Outcomes, Neonatal Outcomes, Birth Preparedness, Maternal Knowledge, Systematic Review

## Introduction

Maternal and neonatal health remains a major public health concern, particularly in low- and middle-income countries, where maternal and neonatal morbidity and mortality rates are disproportionately high. Globally, approximately 287,000 women die each year due to pregnancy- and childbirth-related complications, and an estimated 2.4 million neonatal deaths occur within the first month of life (WHO, 2019). Many of these deaths are preventable with timely interventions, skilled care, and informed decision-making.

Antenatal education is an evidence-based intervention aimed at equipping expectant mothers with essential knowledge and skills regarding pregnancy, labor, delivery, postnatal care, and newborn care. These programs include health education on nutrition, hygiene, danger signs, breastfeeding, birth preparedness, family planning, and psychosocial support. Antenatal education improves maternal knowledge, reduces anxiety, enhances self-efficacy, and promotes informed decision-making during childbirth.<sup>1</sup>

Several studies indicate that antenatal education also positively impacts neonatal outcomes by improving birth

preparedness, increasing early initiation of breastfeeding, promoting immunization adherence, and reducing neonatal complications. However, the availability, content, and quality of antenatal education vary across regions, and barriers such as low literacy, cultural beliefs, and limited access may limit its effectiveness.

This systematic review aims to synthesize evidence on the impact of antenatal education on maternal and neonatal outcomes, identify key components of effective programs, and explore challenges and barriers in program implementation.<sup>2</sup>

## Methodology

This systematic review followed PRISMA guidelines to ensure rigor and transparency in reporting (Moher et al., 2009). A comprehensive search of PubMed, Scopus, Web of Science, CINAHL, and Google Scholar was conducted for studies published between 2010 and 2024. Search terms included combinations of “antenatal education,” “prenatal classes,” “maternal outcomes,” “neonatal outcomes,” “birth preparedness,” “maternal knowledge,” and “childbirth education,” using Boolean operators (AND, OR).

### Inclusion Criteria:

- Peer-reviewed studies evaluating the impact of antenatal education programs on maternal and/or neonatal outcomes.
- Randomized controlled trials, quasi-experimental studies, cohort studies, and systematic reviews.
- Studies published in English between 2010 and 2024.

### Exclusion Criteria:

- Studies focusing solely on neonatal outcomes without maternal data.
- Editorials, commentaries, conference abstracts, or opinion papers.
- Duplicate publications or studies lacking methodological clarity.

All identified articles were imported into reference management software (Mendeley), and duplicates were removed. Titles and abstracts were screened for relevance, followed by full-text review. Data were extracted using a standardized form including author, year, country, study design, sample size, type of antenatal education intervention, and maternal and neonatal outcomes.<sup>3</sup>

The quality of included studies was assessed using the CASP checklist for qualitative studies and Joanna Briggs Institute (JBI) tools for quantitative studies. Due to heterogeneity in study designs and outcome measures, a narrative synthesis was employed, categorizing findings under maternal knowledge, birth preparedness, maternal

self-efficacy, anxiety and stress, delivery outcomes, and neonatal outcomes.<sup>4</sup>

## Results

The database search identified 395 articles. After removing duplicates and screening titles and abstracts, 85 full-text articles were assessed for eligibility. Twenty-six studies met inclusion criteria, representing diverse geographical settings including Asia, Africa, Europe, and North America. Study designs included randomized controlled trials (n=12), quasi-experimental studies (n=6), cohort studies (n=5), and systematic reviews (n=3). Sample sizes ranged from 60 to 1,200 participants.

### Maternal Knowledge and Birth Preparedness

Antenatal education significantly improved maternal knowledge about pregnancy, labor, delivery, and postnatal care. Women who attended structured antenatal classes demonstrated greater understanding of danger signs, nutrition, hygiene, and newborn care practices. Several studies reported increased birth preparedness, including identification of delivery location, transportation planning, and arranging skilled birth attendants.<sup>5</sup>

### Maternal Self-Efficacy and Psychological Outcomes

Women receiving antenatal education reported higher self-efficacy in managing labor and newborn care. Education reduced anxiety, fear, and perceived stress associated with childbirth, enhancing confidence in decision-making. Studies from both high-income and low-resource settings indicated that structured antenatal education programs, particularly those including interactive and participatory components, were most effective in improving maternal self-efficacy and reducing fear of childbirth.

### Delivery Outcomes

Antenatal education was associated with positive delivery outcomes. Women attending antenatal classes were more likely to utilize facility-based delivery services and skilled birth attendants. Several studies reported reductions in unnecessary cesarean sections, labor complications, and prolonged labor in educated mothers. Participation in antenatal education also increased adherence to recommended interventions such as iron supplementation, tetanus immunization, and birth planning.

### Neonatal Outcomes

Antenatal education contributed to improved neonatal outcomes, including higher birth weight, early initiation of breastfeeding, and reduced neonatal complications such as hypothermia, infection, and low Apgar scores. Mothers educated on newborn care practices were more

likely to follow hygiene protocols, recognize early warning signs, and seek timely medical care. Evidence indicates that education programs incorporating both mothers and family members were particularly effective in enhancing neonatal outcomes.

### Program Effectiveness

The effectiveness of antenatal education programs was influenced by program structure, duration, content, and teaching methodology. Interactive sessions, practical demonstrations, culturally adapted content, and family involvement were associated with better maternal and neonatal outcomes. Programs delivered in community settings increased accessibility and participation among low-income and rural populations.<sup>6</sup>

### Discussion

The evidence reviewed demonstrates that antenatal education is a highly effective intervention for improving maternal and neonatal outcomes. Structured education programs enhance maternal knowledge, increase birth preparedness, and promote self-efficacy, which directly influences safe labor and delivery practices. Psychological benefits, including reduced anxiety and improved confidence, contribute to positive childbirth experiences and maternal empowerment.

Antenatal education also improves neonatal health outcomes by promoting early breastfeeding, hygiene practices, immunization adherence, and timely medical care. Family involvement in educational programs enhances understanding and support for both maternal and neonatal care, reinforcing positive health behaviors.

These findings are consistent with global recommendations by the World Health Organization (WHO) and other international bodies emphasizing the integration of antenatal education into maternal healthcare services to reduce preventable maternal and neonatal deaths. Antenatal education programs also support sustainable health practices by empowering women to make informed decisions, enhancing community awareness, and fostering behavioral change.

Despite the benefits, challenges limit the effectiveness and reach of antenatal education. Low literacy levels, cultural beliefs, gender norms, and socioeconomic barriers reduce participation and engagement in some communities. Limited resources, insufficient trained educators, and lack of standardized program content further hinder program implementation. Addressing these barriers requires culturally sensitive, accessible, and context-specific approaches, alongside policy support, adequate funding, and workforce training.

### Challenges and Barriers

Several challenges affect the implementation and impact of antenatal education programs:

- **Low Literacy and Educational Attainment:** Mothers with limited education may have difficulty understanding complex health information, requiring adapted teaching methods.
- **Cultural Beliefs and Gender Norms:** Traditional practices and family dynamics can limit participation in antenatal classes or adherence to recommended practices.
- **Limited Access to Programs:** Rural or remote populations may face barriers due to distance, transportation, or insufficient program availability.
- **Inadequate Program Content and Delivery:** Programs lacking interactive or practical components may be less effective in influencing maternal behavior and outcomes.
- **Insufficient Skilled Educators:** Lack of trained health professionals to deliver antenatal education reduces program quality and consistency.

Addressing these barriers requires multifaceted strategies, including community-based programs, culturally appropriate content, use of visual and participatory teaching methods, and engagement of family members. Policy support and investment in training healthcare providers are essential to expand access and effectiveness of antenatal education.

### Conclusion

Antenatal education is a critical intervention for improving maternal and neonatal outcomes. Evidence indicates that structured education programs enhance maternal knowledge, birth preparedness, self-efficacy, and psychological well-being, while contributing to better delivery and neonatal outcomes. Program effectiveness is optimized when education is interactive, culturally sensitive, community-based, and inclusive of family support.

Expanding access to antenatal education, integrating programs into routine maternal healthcare services, and addressing barriers such as low literacy, cultural beliefs, and resource limitations are essential for improving maternal and neonatal health globally. Continued research is needed to identify optimal program content, delivery methods, and long-term impact on maternal and child health outcomes.

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