

Research Article

Impact of a Prenatal Pedagogy Program Among Adolescent Mothers at a Public Hospital in Mexico City

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Abstract

Adolescent pregnancy remains a significant public health concern in Mexico and is associated with limited health literacy, reduced autonomy, and increased obstetric risk. The World Health Organization (WHO) defines adolescents as individuals between 10 and 19 years of age. The participants enrolled in this study were primigravid adolescents aged 14–19 years. The objective of this study was to evaluate the impact of a structured prenatal pedagogy program on prenatal knowledge, satisfaction with childbirth, authority behaviors, and obstetric clinical outcomes among adolescent primigravid women. A quasi-experimental design was conducted from January to July 2025 at a secondary-level public hospital in Mexico City with 94 participants, divided into an intervention group that received a six-session prenatal pedagogy program and a control group that received standard prenatal care. Prenatal knowledge was measured using a validated 15-item questionnaire, childbirth satisfaction was assessed with the Mackey Childbirth Satisfaction Rating Scale, authority behaviors were evaluated through structured observation, and obstetric clinical outcomes were extracted from medical records. Data distribution was examined using the Shapiro–Wilk test, and intergroup comparisons were performed with Mann–Whitney U and Chi-square tests. The intervention group demonstrated a significant improvement in prenatal knowledge compared with the control group, as well as higher levels of childbirth satisfaction, with a greater proportion reporting very high satisfaction. Authority behaviors such as active participation and decision-making increased among those who received the program. Additionally, fewer adverse obstetric events, including preterm birth and low birth weight, were observed in the intervention group. The findings suggest that structured prenatal pedagogy enhances health literacy, promotes empowerment, and contributes to more positive childbirth experiences among adolescent mothers, while also reducing risks associated with obstetric complications. Integrating such programs into routine prenatal care may strengthen quality of care and support adolescent mothers in achieving safer and more satisfying childbirth experiences.

Keywords

Prenatal Education, Adolescent Pregnancy, Birth Satisfaction, Maternal Empowerment, Patient-centered Care

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1. Introduction

Adolescent pregnancy continues to be a significant public health concern worldwide, particularly in low- and middle-income countries, where it is associated with elevated maternal morbidity, reduced autonomy, and limited access to high-quality prenatal care [1]. In Mexico, adolescent mothers represent a vulnerable population due to socioeconomic constraints, fragmented access to health services, and limited exposure to health education programs [2]. These conditions negatively influence maternal knowledge, decision-making, satisfaction with childbirth, and clinical outcomes for both mothers and newborns [3]. Recent global analyses continue to demonstrate that adolescent pregnancy is associated with increased risks of preterm birth, low birth weight, and adverse neonatal outcomes, particularly in low- and middle-income settings [11, 12].

Prenatal education has emerged as an effective strategy to improve maternal health literacy and prepare women for childbirth. Evidence indicates that structured prenatal education enhances understanding of labor physiology, reduces anxiety, fosters self-efficacy, and improves overall satisfaction with childbirth experiences [4, 5]. Programs designed specifically for adolescents have demonstrated potential benefits, although research remains limited and inconsistent across regions [6]. Furthermore, contemporary models such as CenteringPregnancy emphasize group learning, empowerment, and collaborative care, showing improvements in maternal satisfaction and perinatal outcomes [7]. Updated systematic reviews have reinforced the effectiveness of group prenatal care models in improving perinatal outcomes and maternal satisfaction, particularly among socially vulnerable populations [13, 14]. Despite these advances, few studies in Latin America have examined pedagogical approaches that combine participatory learning, empowerment, and adolescent-centered communication within prenatal care.

Authority behaviors—defined as the capacity of individuals to participate actively in decision-making, communicate needs, and exercise autonomy—represent a critical dimension of respectful maternity care. When adolescents receive insufficient information or are excluded from clinical decisions, satisfaction decreases, and risks of obstetric complications may increase [8, 9]. The World Health Organization underscores the importance of strengthening patient-centered prenatal care models that promote empowerment, informed consent, and shared decision-making [10].

Given the scarcity of evidence on educational interventions tailored for adolescent mothers in Mexico, this study aimed to evaluate the impact of a structured prenatal pedagogy program on prenatal knowledge, satisfaction during childbirth, authority behaviors, and obstetric clinical outcomes among adolescent primigravidae at a secondary-level public hospital in Mexico City. The findings of this study revealed that the intervention significantly improved maternal knowledge, satisfaction, em-

powerment behaviors, and reduced adverse obstetric events, underscoring the potential value of integrating structured prenatal pedagogy into routine adolescent prenatal care.

2. Materials and Methods

2.1. Study Design and Setting

This quasi-experimental study was conducted from January to July 2025 at a secondary-level public hospital in Mexico City, Mexico. The study was designed to evaluate the impact of a structured prenatal pedagogy program on adolescent mothers. A comparison was made between an intervention group receiving the educational program and a control group receiving standard prenatal care. The methodological framework was constructed to ensure transparency and replicability, in accordance with international research standards.

2.2. Participants

A total of 94 primigravid adolescents aged 14–19 years were recruited consecutively from the prenatal care clinic. Participants were allocated into two groups:

- 1) Intervention group (n = 47): Received the prenatal pedagogy program
- 2) Control group (n = 47): Received standard prenatal care

Inclusion criteria:

- 1) Primigravidae aged 14–19 years
- 2) Singleton gestation
- 3) Gestational age 20–36 weeks at enrollment
- 4) Ability to provide informed assent and guardian consent where applicable

Exclusion criteria:

- 1) High-risk pregnancy requiring specialized care
- 2) Cognitive or language barriers preventing program participation
- 3) Transfer to external facilities before delivery
- 4) Sampling was based on feasibility and the adolescent patient volume during the study period

2.3. Prenatal Pedagogy Intervention

The intervention consisted of a structured six-session prenatal pedagogy program developed by a multidisciplinary team including obstetricians, nurses, and clinical educators. Each session lasted 90 minutes and was delivered in small groups (6–10 participants). The curriculum emphasized participatory learning, interactive discussion, and adolescent-centered communication.

Session content included:

- 1) Pregnancy anatomy and physiology
- 2) Stages of labor and warning signs
- 3) Pain management strategies and relaxation techniques

- 4) Birth preparedness and maternal rights
- 5) Immediate newborn care and breastfeeding
- 6) Emotional regulation, autonomy, and communication skills

Consistency in program delivery was ensured through standardized materials and facilitator training.

2.4. Measurement Instruments

2.4.1. Prenatal Knowledge Questionnaire

A validated 15-item questionnaire assessed cognitive understanding of pregnancy, labor, and postpartum care. Items were scored on a 0–20 scale, with higher scores indicating greater knowledge. The tool demonstrated internal consistency with a Cronbach's alpha of 0.81.

2.4.2. Childbirth Satisfaction

The Mackey Childbirth Satisfaction Rating Scale was administered post-delivery to evaluate satisfaction across domains including personal capacity, provider communication, and overall labor experience.

2.4.3. Authority Behaviors Assessment

Authority behaviors were defined as observable actions related to autonomy, participation in decision-making, and communication with healthcare staff. Behaviors were documented by trained observers using a structured checklist and classified as passive, moderately active, or highly active.

2.4.4. Obstetric Clinical Outcomes

Clinical data were extracted retrospectively from medical records. Variables included:

- 1) Preterm birth (<37 weeks)
- 2) Low birth weight (<2,500 g)
- 3) Mode of delivery
- 4) Intrapartum complications

2.5. Data Collection Procedures

Data were collected at three time points:

- 1) Baseline: Prenatal knowledge pre-test
- 2) Post-intervention (36–40 weeks): Knowledge re-test
- 3) Postpartum: Birth satisfaction, authority behaviors, and obstetric outcomes

Data collectors underwent standardized training to ensure uniformity and accuracy in measurement.

2.6. Statistical Analysis

Descriptive and inferential analyses were conducted using IBM SPSS Statistics version 26. Normality was assessed using the Shapiro–Wilk test. Due to non-normal distributions, nonparametric tests were used:

Mann–Whitney U test for quantitative variables

Chi-square test for categorical variables

Significance was established at $p < 0.05$. Missing data (<5%) were addressed through pairwise deletion.

2.7. Ethical Considerations

The study received approval from the Institutional Ethics Committee of a secondary-level public hospital in Mexico City. All procedures adhered to the Declaration of Helsinki. Informed assent was obtained from all adolescent participants, along with guardian consent when required. Confidentiality and data protection measures were strictly maintained.

3. Results

3.1. Participant Characteristics

A total of 94 adolescent primigravidae completed the study, with 47 participants in the intervention group and 47 in the control group. The mean age of participants was 16.9 ± 0.8 years, with no statistically significant differences between groups in sociodemographic characteristics, educational attainment, marital status, or gestational age at enrollment ($p > 0.05$). Baseline prenatal knowledge scores did not differ significantly between groups.

3.2. Prenatal Knowledge

Following the intervention, a significant increase in prenatal knowledge scores was observed in the intervention group, while the control group showed minimal change. Results of the Mann–Whitney U test demonstrated a statistically significant difference between post-test scores of both groups ($p < 0.001$).

Table 1. Prenatal Knowledge Scores Before and After the Intervention.

Group	Pre-test Mean $\pm$ SD	Post-test Mean $\pm$ SD	<i>p</i> -value
Intervention (n = 47)	10.5 $\pm$ 1.8	17.3 $\pm$ 1.9	<0.001
Control (n = 47)	10.4 $\pm$ 1.9	11.1 $\pm$ 2.0	0.21

3.3. Birth Satisfaction

Childbirth satisfaction levels differed significantly between groups. A higher proportion of participants in the intervention group reported very high satisfaction compared with the con-

trol group. Chi-square testing confirmed this difference as statistically significant ($\chi^2 = 12.34$, $p = 0.001$).

Very high satisfaction: 61.7% (intervention) vs. 25.7% (control)

Moderate satisfaction: 8.5% vs. 34.0%

Low satisfaction: 0% vs. 12.7%

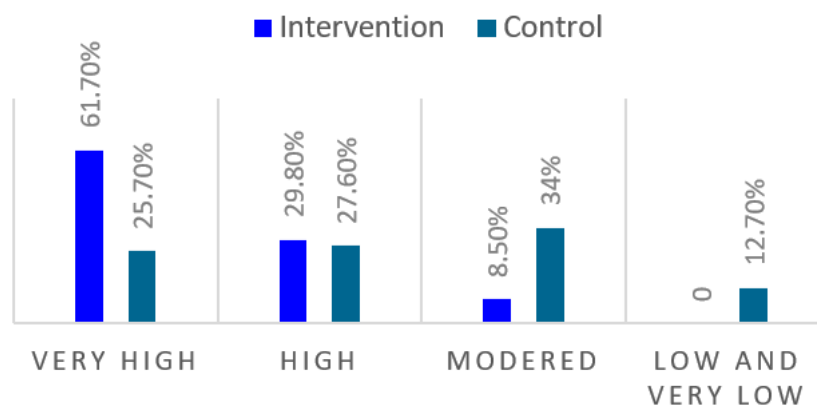


Figure 1. Distribution of Childbirth Satisfaction Levels in Both Groups.

3.4. Authority Behaviors

Authority behaviors, defined as active participation, questioning, and decision-making during labor, were more frequently exhibited by participants in the intervention group. Observational assessments showed:

- 1) Highly active behaviors: 53.2% (intervention) vs. 19.1% (control)
- 2) Moderately active behaviors: 36.2% vs. 44.7%

- 3) Passive behaviors: 10.6% vs. 36.2%

Chi-square analysis indicated significant differences between groups ($\chi^2 = 14.56$, $p = 0.002$).

3.5. Obstetric Clinical Outcomes

Analysis of obstetric events revealed fewer adverse outcomes in the intervention group compared with the control group. Significant differences were found in the incidence of preterm birth and low birth weight ($p = 0.03$).

Table 2. Obstetric Clinical Outcomes in the Intervention and Control Groups.

Outcome	Intervention (n = 47)	Control (n = 47)	p-value
Preterm birth (<37 weeks)	3 (6.4%)	9 (19.1%)	0.03
Low birth weight (<2,500 g)	4 (8.5%)	11 (23.4%)	0.03
Vaginal delivery	41 (87.2%)	39 (83.0%)	0.58
Cesarean delivery	6 (12.8%)	8 (17.0%)	0.54
Intrapartum complications	2 (4.3%)	7 (14.9%)	0.08
Outcome	Intervention (n = 47)	Control (n = 47)	p-value

No severe maternal complications or neonatal deaths were recorded in either group.

4. Discussion

The findings of this study show that a structured prenatal pedagogy program can substantially improve cognitive, experiential, and behavioral outcomes among adolescent mothers. These results are consistent with global evidence demonstrating that antenatal education enhances maternal health literacy, emotional preparedness, and autonomy during childbirth [1-3]. The significant increase in prenatal knowledge among the intervention group suggests that adolescents benefit greatly from structured and developmentally tailored learning environments. Similar studies have reported that participatory and learner-centered educational approaches lead to superior knowledge acquisition compared with traditional didactic formats [4, 5]. This alignment reinforces the growing consensus that interactive prenatal education is essential for promoting informed maternal decision-making.

Beyond cognitive gains, the improvement in childbirth satisfaction observed in the intervention group illustrates the multidimensional impact of prenatal pedagogy. Satisfaction during labor and birth is shaped not only by clinical outcomes but also by communication quality, perceived control, and the ability to actively participate in care decisions. Studies conducted in adolescent populations have consistently shown that feelings of empowerment, clarity of expectations, and supportive interactions with providers positively influence the childbirth experience [6]. The present findings are consistent with such evidence, particularly in the increased frequency of authority behaviors—defined as assertive participation, questioning, and informed decision-making—among adolescents who received the intervention. Previous research has identified authority behaviors as central to respectful maternity care frameworks and associated with better maternal emotional outcomes [7].

The observed reduction in preterm birth (6.4% vs. 19.1%) and low birth weight (8.5% vs. 23.4%) among participants exposed to the educational program, although modest in absolute numbers, represents clinically meaningful differences. The relative reduction in preterm birth exceeded 60%, suggesting a potentially important public health impact in high-risk adolescent populations. These improvements may be partially explained by enhanced adherence to prenatal recommendations, earlier recognition of warning signs, improved stress regulation, and stronger engagement with healthcare providers. Increased knowledge and participatory behaviors may have facilitated timely care-seeking when symptoms emerged, thereby reducing preventable obstetric complications. Although causality cannot be definitively established due to the quasi-experimental design, the direction and magnitude of these findings align with contemporary evidence indicating that structured, empowerment-based prenatal education can positively influence both behavioral and physiological pathways associated with adverse perinatal outcomes. Emerging evidence suggests that maternal stress reduction and improved

psychosocial support during pregnancy are significantly associated with decreased risk of preterm birth [15].

An important aspect of this study is its focus on adolescents, who face unique barriers to care—including limited autonomy, stigma, and lower health literacy—compared with adult pregnant women. The literature documents that adolescents often report lower satisfaction with maternity care, diminished communication with providers, and poorer obstetric outcomes [10]. The results of this study, therefore, demonstrate the value of an intervention designed intentionally for this population. The incorporation of emotional regulation strategies, clarification of rights, and communication skill-building may have strengthened the adolescents' sense of efficacy and navigational capacity within the maternity care environment.

The strengths of this study include its comprehensive evaluation framework, which integrates cognitive, experiential, behavioral, and clinical dimensions. Few studies in Latin America have assessed prenatal education using such a multidimensional approach. Additionally, the use of validated measurement tools and standardized observation protocols enhances the credibility and replicability of the findings.

However, several limitations must be acknowledged. The quasi-experimental design introduces the possibility of unmeasured confounding variables, such as differences in social support, anxiety levels, or external educational exposure. The study was conducted in a single public hospital, limiting generalizability to other health systems or regions. Moreover, authority behaviors were documented by observers, which, despite standardized training, may be subject to observer bias. These limitations underscore the need for randomized controlled trials and multi-site studies to strengthen causal inferences and assess scalability. International public health agencies have emphasized the need to strengthen adolescent-centered reproductive health services as a strategy to reduce preventable maternal and neonatal morbidity [16, 17].

Future research should examine long-term effects of prenatal pedagogy, including postpartum adaptation, breastfeeding practices, maternal-infant bonding, and mental health outcomes. Studies exploring digital or hybrid modes of delivering prenatal pedagogy may also broaden accessibility for adolescents facing socioeconomic or geographic barriers. Additionally, qualitative research could provide deeper insight into adolescents' subjective experiences of empowerment and autonomy during childbirth.

5. Conclusions

This study found that a structured prenatal pedagogy program substantially improved prenatal knowledge, childbirth satisfaction, and authority behaviors among adolescent primigravidae. The intervention also contributed to more favorable obstetric outcomes, underscoring the importance of integrating educational and empowerment-based strategies into prenatal care for this population. These findings demonstrate that adolescent-oriented pedagogical approaches can strengthen

maternal readiness, enhance the childbirth experience, and support safer clinical trajectories. As adolescent pregnancy remains a persistent public health challenge, implementing structured prenatal pedagogy within routine clinical practice may represent an effective strategy to improve quality of care and promote more equitable maternal health outcomes. Continued research is needed to evaluate long-term effects and assess the feasibility of scaling this model across diverse healthcare settings.

Abbreviations

SPSS	Statistical Package for the Social Sciences
WHO	World Health Organization
MWU	Mann–Whitney U Test
SW	Shapiro–Wilk Test
CHI ²	Chi-Square Test
LBW	Low Birth Weight
PTB	Preterm Birth
SD	Standard Deviation

Author Contributions

Narda Castellanos Joo: Writing – original draft, Methodology, Data curation, Investigation, Formal Analysis

Arturo Gonzalez-Ledesma: Writing – review & editing, Supervision

Karla Patricia Pacheco Alvarado: Writing – review & editing, Validation

Data Availability Statement

The data is available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no conflicts of interest.

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