
The Effectiveness Of Integrated Antenatal Classes In Improving Knowledge And Childbirth Preparedness Among Pregnant Women

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Abstract

To reduce the Maternal Mortality Rate (MMR) in Indonesia often driven by delays in recognizing pregnancy risks and a lack of birth preparedness promotive efforts in the form of Integrated Antenatal Classes were implemented. The program's effectiveness in enhancing the knowledge and birth preparedness of pregnant women was evaluated at the Puruk Cahu Sebrang Community Health Center (Puskesmas). This pre-experimental study (using a one-group pretest-posttest design) involved 50 pregnant women selected via total sampling. All participants underwent a series of interventions, including a pretest, four integrated educational sessions, and a posttest. Data analysis was conducted using the Shapiro-Wilk test and the Paired t-test. A significant increase in mean understanding was observed a rise of 27.82 points, from 58.42 (± 10.36) to 86.24 (± 7.18) ($t=18.64$; $p<0.001$). Birth preparedness scores also rose by 26.98 points, increasing from 61.18 (± 9.54) to 88.16 (± 6.92) ($t=17.91$; $p<0.001$). The percentage of pregnant women with good knowledge levels grew from 16.0% to 84.0%, while the proportion classified as "prepared for childbirth" surged from 32.0% to 90.0%. These results demonstrate the clear effectiveness of Integrated Antenatal Classes in boosting knowledge and birth preparedness; consequently, it is highly recommended that this program be sustainably integrated into maternal health service.

Keywords: Birth Preparedness; Integrated Antenatal Class; Knowledge; Pre-Experimental; Pregnant Women.

INTRODUCTION

Reducing the Maternal Mortality Ratio (MMR) in Indonesia remains a critical challenge; the ratio of 189 per 100,000 live births—recorded in the 2020 Population Census—places Indonesia second-highest in ASEAN and falls short of the 2024 target of 183 per 100,000 live births (Statistics Indonesia, 2023; PKMK Training Unit, Faculty of Medicine, Public Health, and Nursing, UGM, 2025). This high figure necessitates strengthened promotive and preventive interventions, with the preparedness of pregnant women and their families for childbirth serving as a vital component.

Beyond mere physical examinations, the World Health Organization (2016) recommends that antenatal care foster a positive pregnancy experience through education on pregnancy risk signs and birth preparedness. The Indonesian Ministry of Health (2018, 2022) has implemented this directive by integrating "Classes for Pregnant Women" into comprehensive antenatal care; these classes provide a shared learning space to review the Maternal and Child Health (MCH) Handbook through direct interaction and experience-sharing with healthcare workers.

To prevent delays in care during maternal crises, the implementation of birth preparedness and complication readiness (BPCR) serves as a fundamental tool. Knowledge regarding pregnancy risk signs and well-planned childbirth scenarios has been shown to prompt rapid action by mothers and their families in seeking medical assistance (Nachinab et al., 2023; Singh et al., 2024). However, findings from India and Ethiopia indicate that BPCR levels among pregnant women remain suboptimal (ranging from low to moderate), highlighting a critical need for systematic educational interventions to address this issue (Bhattacharya et al., 2022; Pandey et al., 2022; Demsash et al., 2024).

Various characteristics—including education, age, and parity—directly influence the extent to which pregnant women absorb health information. A significant relationship between parity, education, and pregnant women's understanding of pregnancy risk signs was demonstrated in a study by Mahesa and Heryanti (2022). This aligns with research by Rusmita and Rahayu (2022), which found that knowledge regarding birth preparation among third-trimester pregnant women remained

suboptimal. Consequently, the implementation of integrated learning programs—such as Integrated Antenatal Classes—serves as a concrete, targeted measure to comprehensively enhance the knowledge of pregnant women.

Sukawati (2024) reported a shift in childbirth preparedness from a minority of participants to the entire group ($p < 0.001$) following an educational intervention. These findings reinforce previous research examining the effectiveness of prenatal classes in boosting the knowledge and preparedness of expectant mothers. Devita and Riyanti (2022) and Lestari et al. (2022) also observed significant knowledge gains following prenatal classes, while Afranika and Pratama (2023) highlighted the importance of active participation by pregnant women to maximize educational benefits. Internationally, a systematic review of twenty studies by Mohammed et al. (2025) demonstrated that healthcare-led antenatal education has a moderate-to-large effect on maternal self-efficacy regarding childbirth, further substantiating that structured educational interventions have a tangible impact on the psychological and cognitive readiness of pregnant women.

The use of audiovisual aids and video presentations has been shown to accelerate the understanding and skill acquisition of pregnant women more effectively than traditional lecture-based instruction (Kuswanti & Rochmawati, 2021; Fitriani et al., 2021). This underscores the significant role that educational tools and approaches play in the effectiveness of prenatal classes. Beyond media-related factors, the mental and physical readiness of pregnant women is also shaped by the role of the family (Kurniawati & Mulyani, 2021), given that this form of social support acts as a key driving factor within the BPCR framework. To date, there has been no quantitative evaluation of the Integrated Antenatal Class program—part of primary-level maternal and child health services—at the Puruk Cahu Sebrang Community Health Center (Puskesmas). Against this backdrop, this 2026 study is designed to analyze the contribution of the Integrated Antenatal Class to enhancing pregnant women's knowledge and readiness for childbirth. The findings are intended to serve as an evidence-based foundation for strengthening maternal health policies in the Puruk Cahu Sebrang area and other regions with similar geographical characteristics.

RESEARCH METHODS

This study was conducted at the Puruk Cahu Sebrang Community Health Center (Puskesmas) between January and March 2026, utilizing a pre-experimental, one-group pretest-posttest design. In this design, repeated observations were made on a single sample group—both before and after the intervention—without the inclusion of a control group for comparison.

Using a total sampling technique, a sample of 50 pregnant women in their second and third trimesters was recruited from the population of expectant mothers registered for and actively attending prenatal check-ups within the Puruk Cahu Sebrang Puskesmas service area. Inclusion criteria required participants to be willing to serve as respondents and capable of completing the entire series of activities. All participants completed every stage of the evaluation—ranging from the pretest and four instructional sessions to the posttest—resulting in no dropouts during the study.

Based on the standards set forth in the Maternal and Child Health (KIA) Handbook and the Implementation Guidelines for Pregnant Women's Classes (Ministry of Health of the Republic of Indonesia, 2018, 2022), the Integrated Antenatal Class intervention was conducted over four interactive sessions. The material covered physiological and psychological responses and signs of pregnancy complications; the five elements of birth preparedness (personnel, location, funds, transport for referral, and blood donors); nutritional needs and infant care; and the crucial role of the family in decision-making. All sessions employed an integrated instructional approach featuring group discussions, lectures, and simulations using audiovisual presentations.

To ensure ethical compliance, all respondents signed informed consent forms prior to the commencement of data collection. Knowledge levels and birth preparedness were measured using a structured questionnaire—validated and tested for reliability—administered during the initial pretest

and the final posttest. Following a univariate analysis of respondent characteristics and variable distributions, the data were tested for normality using the Shapiro-Wilk test. Test results indicated a normal distribution of data ($p > 0.05$); therefore, the impact of the intervention was analyzed bivariately using the paired t-test with a significance level of $\alpha = 0.05$.

RESULTS AND DISCUSSION

A total of 50 pregnant women participated in the full series of Integrated Antenatal Classes conducted at the Puruk Cahu Sebrang Community Health Center in 2026, comprising the pre-test, four intervention sessions, and the post-test. Throughout the research process, all study subjects remained actively involved in every stage of the activities.

Respondent Characteristics

Table 1. Distribution of Respondent Characteristics (n=50)

Characteristic	Frequency (n)	Percentage (%)
Age		
<20 years	3	6
20-35 years	39	78
>35 years	8	16
Pendidikan		
Elementary School	3	6
JUNIOR HIGH SCHOOL	9	18
Senior High School / Vocational High School	29	58
College	9	18
Work		
Housewife	31	62
Private Sector Employee	11	22
Civil Servant	3	6
Entrepreneur	5	10
Gestational Age		
Second Trimester	18	36
Third Trimester	32	64
Parity		
Primigravida	22	44
Multigravida	28	56

Sumber: Data primer, 2026

Consistent with the findings of Mahesa and Heryanti (2022) regarding the predominance of the productive age group and parity history among pregnant women, this study notes that 78.0% of respondents fell within the healthy reproductive age range of 20–35 years, and 56.0% were multigravida. Furthermore, the sample distribution included 58.0% with a high school or vocational high school education, 62.0% housewives, and 64.0% women in their third trimester of pregnancy.

Univariate Analysis

Table 2. Distribution of Pregnant Women's Knowledge Levels Before and After the Intervention

Category	Pretest n (%)	Posttest n (%)
Good	8 (16,0)	42 (84,0)
Satisfactory	19 (38,0)	8 (16,0)
Needs Improvement	23 (46,0)	0 (0,0)

Sumber: Data primer, 2026

A marked shift in the distribution of pregnant women's knowledge was observed following the Integrated Antenatal Class intervention. The category of "poor knowledge"—which initially accounted for nearly half the sample (46.0%)—was completely eliminated post-intervention, with 84.0% of those individuals moving up to the "good knowledge" category.

Table 3. Distribution of Birth Preparedness Before and After the Intervention

Category	Pretest n (%)	Posttest n (%)
Ready	16 (32,0)	45 (90,0)
Not Ready	34 (68,0)	5 (10,0)

Sumber: Data primer, 2026

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Table 4. Paired t-test Results for Knowledge and Birth Preparedness Scores

Variable	Pretest (Mean ± SD)	Posttest (Mean ± SD)	Difference in Means	t	p-value
Pengetahuan	58,42 ± 10,36	86,24 ± 7,18	27,82	18,64	<0,001
Kesiapan Persalinan	61,18 ± 9,54	88,16 ± 6,92	26,98	17,91	<0,001

Sumber: Data primer, 2026

The paired t-test yielded a p-value of <0.001, demonstrating that the 27.82-point increase in mean knowledge scores following the implementation of the Integrated Antenatal Class was statistically significant.

Statistical significance was achieved in the paired t-test (p<0.001), demonstrating the effectiveness of the Integrated Antenatal Class in boosting respondents' childbirth preparedness, with a mean score increase of 26.98 points.

Table 5. Percentage Increase in Knowledge and Birth Preparedness Scores

Variable	Mean Pretest	Mean Posttest	Improvement (%)
Knowledge	58,42	86,24	47,62
Birth Preparedness	61,18	88,16	44,10

Sumber: Data primer, 2026

The results indicate that the Integrated Antenatal Class intervention led to an increase of nearly 50% in knowledge scores and over 44% in birth preparedness scores.

The dramatic surge in the "good knowledge" group—rising from 16.0% to 84.0%—demonstrates that the Integrated Antenatal Class intervention was significantly effective (p<0.001) in enhancing the understanding of pregnant women. These findings align with research by Devita and Riyanti (2022) and Lestari et al. (2022), who also reported significant knowledge gains following structured antenatal classes. This improvement can be explained by adult learning principles (andragogy); as adult learners, pregnant women absorb information more effectively when the material is delivered through interactive, contextual, and experience-based methods—approaches utilized in the four sessions of the Integrated Antenatal Class in this study (Notoatmodjo, 2018).

The ability of audiovisual media and simulation videos to provide a concrete depiction of labor dynamics and pregnancy danger signs has proven more effective than one-way lectures (Kuswanti & Rochmawati, 2021; Fitriani et al., 2021). Consequently, the intervention in this study was designed to combine lectures, discussion forums, and media-based simulations to maximize the enhancement of participants' knowledge.

Respondent characteristics also provide context for the study results. The majority of respondents held a high school or vocational high school education and were within the productive age range of 20–35 years—factors that, according to Mahesa and Heryanti (2022), are associated with a greater capacity to absorb and comprehend health information. Furthermore, the higher proportion of multigravid women (56.0%) implies the benefit of prior pregnancy experience; however, findings by Rusmita and Rahayu (2022) caution that such experience does not always guarantee adequate knowledge in the absence of structured education, making the Integrated Antenatal Class intervention relevant for both primigravid and multigravid women.

The role of structured education in enhancing birth preparedness and complication readiness (BPCR) in areas with limited accessibility has been consistently demonstrated (Pandey et al., 2022; Demsash et al., 2024; Singh et al., 2024). This is reflected in the current study's findings, where the proportion of pregnant women in the "prepared" category surged from 32.0% to 90.0% ($p < 0.001$). This positive outcome supports the study by Sukawati (2024) at the Teluk Pucung Community Health Center, which reported total preparedness among mothers following the intervention. Drawing on Nachinab et al. (2023), this dimension of preparedness is evidenced by the recognition of danger signs, the designation of birth attendants and delivery locations, the provision of emergency funds and referral transport, and the establishment of backup blood donor schemes.

The self-efficacy framework offers a theoretical perspective that explains the phenomenon of increased birth preparedness among the study's respondents. Through a meta-analysis of twenty studies, Mohammed et al. (2025) found that healthcare-led antenatal education yields a moderate-to-large pooled effect on maternal self-efficacy regarding childbirth. The fourth session of the Integrated Antenatal Class, which actively involved families, further strengthened social support for pregnant women; this aligns with findings by Kurniawati and Mulyani (2021) that family support is a crucial determinant of birth preparedness, as it fosters a sense of security and facilitates decision-making leading up to and during labor.

Overall, the substantial increases in knowledge scores (47.62%) and birth preparedness (44.10%) observed in this study indicate a significant effect size compared to similar studies using comparable designs (Afranika & Pratama, 2023; Bhattacharya et al., 2022). The absence of a comparison (control) group—a characteristic feature of pre-experimental designs—is acknowledged as a primary limitation of this study, given that improvements in respondents' scores could stem from external factors such as mass media information. Consistent with the methodological critiques raised by Singh et al. (2024) regarding BPCR research in developing countries, it is recommended that future studies adopt quasi-experimental or randomized controlled trial (RCT) approaches incorporating control groups and long-term monitoring of birth outcomes to reliably verify the effectiveness of Integrated Antenatal Classes.

The practical implication of these findings is the importance of strengthening and institutionalizing Integrated Antenatal Classes as a routine component of antenatal care at Community Health Centers (Puskesmas), particularly in areas with limited access to referral services, such as Puruk Cahu Sebrang. Given Indonesia's persistently high maternal mortality rate—largely driven by delays in managing complications that are actually preventable (PKMK Training Center, Faculty of Medicine, Public Health, and Nursing, UGM, 2025)—enhancing knowledge and birth preparedness through structured education has the potential to help reduce delays in referrals and decision-making at the family and community levels.

CONCLUSION

The statistical significance observed in the paired t-test ($p < 0.001$) demonstrates that the Integrated Antenatal Class is effective in enhancing the knowledge and preparedness of pregnant women at the Puruk Cahu Sebrang Community Health Center (Puskesmas). This effectiveness is evidenced by a 27.82-point increase in the mean knowledge score, which aligns with a 26.98-point rise in the mean score for childbirth preparedness. The four-session interactive educational approach—covering physiological changes during pregnancy, birth preparation, nutrition and newborn care, and the role of the family—successfully shifted the majority of participants from categories of poor knowledge and unpreparedness to categories of good knowledge and readiness for childbirth. These findings underscore the importance of conducting Integrated Antenatal Classes on a regular and sustainable basis as a health promotion strategy to help reduce maternal mortality, particularly within the service area of the Community Health Center.

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