



Effectiveness of mindfulness-based audio-visual interventions on self-efficacy in childbirth readiness among high-risk pregnant women

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ABSTRACT

Background: High-risk pregnancies in women under 20 or over 35 years are commonly associated with low self-efficacy, leading to anxiety, poor coping, and inadequate childbirth readiness. Few studies have targeted interventions to directly improve self-efficacy, and mindfulness delivered through audiovisual media represents a promising yet underutilized approach to enhance psychological preparedness in this population.

Objective: To evaluate the effectiveness of an audiovisual mindfulness intervention on self-efficacy in high-risk pregnant women preparing for childbirth.

Methods: A quasi-experimental pre-test–post-test control group design was conducted among 66 third-trimester pregnant women, purposively assigned to experimental (n = 33) and control (n = 33) groups. The intervention was delivered via the MIESRA application, providing audiovisual mindfulness exercises to promote maternal–fetal bonding and psychological well-being. The experimental group received three 15-minute sessions over seven days, while the control group received standard antenatal care. Self-efficacy was measured using a validated scale and analyzed with Wilcoxon, dependent t-test, and independent t-test.

Results: The mean self-efficacy score in the experimental group increased from 63.36 (SD = 5.18) to 67.82 (SD = 3.93), while the control group showed only a slight increase from 64.33 (SD = 6.44) to 64.55 (SD = 6.14). Statistical analysis confirmed a significant improvement in the experimental group compared with controls (p = 0.012). Participants receiving mindfulness reported feeling calmer, more confident, and better prepared for childbirth.

Conclusion: Audiovisual mindfulness intervention effectively improved self-efficacy among high-risk pregnant women. Integrating such tools into antenatal care may empower vulnerable mothers, foster resilience, and enhance psychological readiness for childbirth.

Keywords: mindfulness; pregnant women; risk age; self efficacy

Nursing and Healthcare Practices

- Nurses and midwives can integrate audiovisual mindfulness, such as the MIESRA application, into prenatal education and antenatal care to strengthen self-efficacy in high-risk pregnant women.
- Targeted psychological interventions, particularly mindfulness, should be prioritized to address emotional and cognitive challenges, improving childbirth readiness and confidence.
- Digital media offers an effective, non-pharmacological strategy for supporting maternal mental health, encouraging broader adoption of technology-based interventions in clinical and community settings.

INTRODUCTION

Maternal mortality is a serious public health challenge and a sensitive indicator of a region's welfare (Tajvar et al., 2022). According to WHO (2022), the maternal mortality ratio (MMR) in Indonesia reached 207 per 100,000 live births, which remains above the national target of 184 per 100,000 by 2024. Data from the Riau Provincial Health Office (2021) indicate that Riau is one of the provinces with a high maternal mortality rate, which has continued to rise over the past three years.

Maternal health encompasses multiple dimensions, including physical, mental, emotional, psychological, and social preparedness (Sofiyatin, 2022). Advanced maternal age, defined as pregnancy in women younger than 20 years or older than 35 years, is a major determinant of high-risk pregnancy. Women under 20 are more likely to experience complications such as preterm birth, preeclampsia, and low birth weight due to reproductive immaturity. Meanwhile, women over 35 face increased risks of gestational hypertension, diabetes, bleeding, and fetal chromosomal abnormalities, all of which contribute to maternal and perinatal mortality. According to the Central Bureau of Statistics (2021), 12.3% of pregnant women in Indonesia were under 20 years old, while 14.6% were

over 35 years old.

Pregnant women at risk must accept their condition and be equipped with adequate knowledge to prevent complications, making self-efficacy essential. Bandura (1997) defines self-efficacy as a person's belief in their ability to succeed in specific tasks. In pregnancy, self-efficacy reflects a mother's confidence in managing pregnancy and childbirth, with higher self-efficacy associated with better adaptation and satisfaction (Winangrum & Hutasoit, 2022). Previous studies have shown that high-risk pregnant women generally have lower self-efficacy compared with low-risk groups, due to concerns about maternal and infant health, limited knowledge, and insufficient social support (Pratiwi et al., 2023). Low self-efficacy increases the risk of stress, depression, reduced maternal-fetal bonding, and health complications during pregnancy and postpartum (Hajjan & Ratnawati, 2023).

Mindfulness has been proposed as an alternative intervention to improve psychological well-being during pregnancy. Hapsari et al. (2021) reported that mindfulness positively affects both physical and psychological aspects, including reducing maternal anxiety before childbirth. Misrawati (2023) found that smartphone-based mindfulness interventions designed to enhance maternal-fetal bonding were effective in reducing anxiety among pregnant women. The use of audio-visual media is increasingly preferred due to technological advancements, accessibility, and wider acceptance in the community. Mindfulness helps pregnant women become more aware of the physical and emotional changes occurring during pregnancy (Jumrah et al., 2022).

Pregnant women at risk due to age are particularly vulnerable to physical and emotional challenges. Younger mothers may lack reproductive maturity and adequate knowledge, while older mothers face a greater likelihood of medical complications. In both groups, limited family support and heightened worry may contribute to complications, depression, and anxiety, ultimately reducing maternal self-efficacy in preparing for childbirth. Therefore, interventions such as mindfulness are needed to strengthen the self-efficacy of at-risk mothers during pregnancy (Zarenejad et al., 2020).

Based on the issues described above, mindfulness can be utilized as a psychological intervention for pregnant women. However, to date, no research has specifically addressed

its effectiveness in improving self-efficacy among at-risk pregnant women in preparing for childbirth. Previous studies have primarily examined anxiety levels in pregnancy. In contrast, this study evaluates self-efficacy specifically in high-risk pregnant women based on maternal age (<20 years or >35 years). This distinction highlights the novelty of the study, as it focuses on psychological readiness for childbirth in a vulnerable population that has been less explored in earlier research. Therefore, this study aims to investigate the effectiveness of mindfulness through audiovisual media on the self-efficacy of at-risk pregnant women in childbirth readiness.

METHODS

Design

This study employed a quantitative quasi-experimental design with pre-test and post-test measures in both the experimental and control groups. Participants in the experimental group completed a pre-test questionnaire, received the intervention, and then underwent a post-test assessment. The control group completed the same pre- and post-tests but did not receive the intervention. The differences between pre- and post-test scores were compared to evaluate the effect of the intervention on the experimental group.

Sample and setting

This study involved pregnant women recruited from two public health centers in Riau, Indonesia. The initial target sample size was 60 participants, with 30 assigned to the experimental group and 30 to the control group, meeting the minimum adequacy requirement for research (Ruslan, 2013). To account for potential dropouts, the sample size was increased by 10%, resulting in a total of 66 respondents, with 33 participants in each group (Notoatmodjo, 2012).

Inclusion criteria were pregnant women of risk age (<20 years or >35 years), in the third trimester, capable of using a smartphone to access the MIESRA application, and willing to provide informed consent. These criteria ensured the study specifically focused on at-risk pregnant women for whom mindfulness interventions could be appropriately evaluated. Initially, the first 33 eligible participants were assigned to the experimental group. However, due to difficulties some participants

experienced in operating the application, group adjustments were made. With their consent, several participants were reassigned to the control group, ensuring balanced groups and concurrent data collection.

Variable

The variables in this study comprised the self-efficacy of at-risk pregnant women, measured at two points: before and after the intervention. The independent variable was the mindfulness intervention delivered through the MIESRA application, while the dependent variable was the self-efficacy of risk-age pregnant women in preparing for childbirth. The experimental group received the mindfulness intervention, whereas the control group did not. Differences between pre-test and post-test scores in both groups were analyzed to evaluate the effectiveness of the intervention.

Instrument

The self-efficacy instrument used in this study had a minimum score of 23 and a maximum score of 92, with higher scores indicating greater self-efficacy. The score interpretation was categorized as low (23–51), moderate (52–67), and high (68–92). The scale was administered directly, and respondents selected one of four response options: Strongly Agree, Agree, Disagree, or Strongly Disagree. Items were arranged in both favorable and unfavorable forms. For favorable items, Strongly Agree was scored 4, Agree scored 3, Disagree scored 2, and Strongly Disagree scored 1. For unfavorable items, the scoring was reversed: Strongly Agree = 1, Agree = 2, Disagree = 3, and Strongly Disagree = 4.

The questionnaire had been previously tested for validity and reliability. Validity testing indicated acceptable values with Corrected Item-Total Correlation scores ≥ 0.3 , while the reliability test produced a Cronbach's alpha of 0.949, confirming the instrument as a reliable measure for assessing the self-efficacy of at-risk pregnant women (Astuti, 2020).

Intervention

The experimental group received a mindfulness intervention delivered through the MIESRA application, administered in three sessions over seven days. Each 15-minute session involved viewing a mindfulness video and listening to accompanying audio. The intervention incorporated guided breathing, relaxation, and

visualization techniques designed to enhance maternal–fetal bonding, reduce anxiety, and strengthen self-efficacy in preparation for childbirth. Self-efficacy was assessed before (pre-test) and after (post-test) the intervention to evaluate its effectiveness.

The control group did not receive the intervention during the study period but completed the same pre- and post-test assessments. To ensure ethical balance, the control group was later introduced to the MIESRA application following data collection. The MIESRA application, developed by Misrawati et al. (2023) and registered with the Ministry of Law and Human Rights (Reg. No. 000291880), was used with permission in this study.

Data collection

Data collection was carried out over a four-month period, from September 15, 2024, to January 25, 2025, in the Umban Sari and Rejosari Health Center service areas. The process was organized into three distinct phases: preparation, implementation, and finalization. During the preparation phase (one week), the research team obtained formal approval from the health centers, coordinated with local midwives, and conducted initial socialization to inform potential participants about the purpose and procedures of the study. Instruments, including the self-efficacy questionnaire and the MIESRA application, were pre-tested to ensure clarity and usability.

The implementation phase (one month) involved the recruitment of eligible participants based on inclusion and exclusion criteria. Informed consent was obtained prior to participation. Respondents in both the experimental and control groups first completed the pre-test self-efficacy questionnaire. The experimental group then received the mindfulness intervention through the MIESRA application over three guided sessions within seven days, while the control group continued with standard antenatal care. After the intervention period, both groups completed the post-test questionnaire to assess changes in self-efficacy. Throughout the process, trained research assistants provided guidance, ensured participant adherence to the intervention schedule, and addressed any technical difficulties related to smartphone use or application access.

The finalization phase (one week) focused on data checking, coding, and entry to ensure

accuracy and completeness. Any missing or inconsistent data were clarified with participants when possible. All study sites were anonymized to maintain confidentiality, and data were stored securely in password-protected files accessible only to the research team.

Data analysis

The research data were analyzed using SPSS version 20. Univariate analysis was employed to describe participants' demographic characteristics, including age, parity, occupation, and educational level, presented in the form of frequency distributions and percentages. Bivariate analysis was then conducted to examine differences in self-efficacy scores between and within groups. The dependent and independent t-tests were applied to normally distributed data, while the Wilcoxon signed-rank test was used for non-normally distributed data. These analyses were performed to determine the effectiveness of the mindfulness intervention in improving self-efficacy among high-risk pregnant women.

Ethical consideration

This research was conducted in full compliance with established ethical principles for studies involving human participants. Approval was obtained from the Ethics Committee of the Faculty of Nursing, Universitas Riau, under letter number 7732/UNI95.1.1.10/EP/2024. Prior to data collection, all eligible participants were informed about the study's objectives, procedures, potential risks, and anticipated benefits. Written informed consent was obtained from each respondent, ensuring voluntary participation. Participants were assured of their right to withdraw from the study at any stage without penalty. Confidentiality and anonymity were strictly maintained by coding all data and removing personal identifiers. Data were stored securely in password-protected files accessible only to the research team, and findings were reported in aggregate form to prevent individual identification. The study followed the principles outlined in the Declaration of Helsinki and adhered to national and institutional research ethics guidelines, thereby ensuring the protection, dignity, and rights of all participants.

RESULTS

The study found that most pregnant women in the experimental group were of high-risk age (>35 years), accounting for 75.8%. The

Table 1. The characteristics of the respondents include age, pregnancy number, occupation, and education.

Characteristic	Experimental Group	(n=33)	Control Group	(n=33)	Total	(n=66)
	n	%	n	%	n	%
Age						
<20	8	24.2	11	33.3	19	28.8
>35	25	75.8	22	63.7	47	71.2
Pregnancy number						
Primigravida	9	27.3	13	39.4	22	33.3
Mutigravida	11	33.3	15	45.5	26	39.4
Grandegrivida	13	39.4	5	15.2	18	27.3
Employed status						
Unemployed	29	87.9	30	90.3	59	89.4
Employed	4	12.1	3	9.1	7	10.6
Education						
Elementary	7	21.2	4	12.1	11	16.7
Junior school	7	21.2	9	27.3	16	24.2
Senior school	16	48.5	16	48.5	32	48.5
High school	3	9.1	4	12.1	7	10.6

Table 2. The Frequency of Self-Efficacy Levels of Pregnant Mothers at Risk Before and After Receiving Interventions

Self-Efficacy	Pre-test		Post-test	
	n	%	n	%
Experiment group				
Moderate	20	60.6	6	18.2
High	13	39.4	27	81.8
Control group				
Moderate	16	48.5	18	54.5
High	17	51.5	15	45.5

majority were unemployed (87.9%), had a high school education (48.5%), and were classified as grandemultipara (39.4%). In the control group, a similar distribution was observed, with 71.2% aged >35 years, 48.5% having high school education, and multigravida status as the dominant parity (39.4%) (Table 1).

Before the intervention, 60.6% of respondents in the experimental group demonstrated moderate self-efficacy, while 81.8% reported high self-efficacy after the intervention. Conversely, in the control group, the proportion of respondents with high self-efficacy decreased slightly from 51.5% to 45.5% after the study period (Table 2).

In terms of mean scores, the experimental

group showed a notable improvement in self-efficacy, increasing from 63.36 (SD = 5.177) at pre-test to 67.82 (SD = 3.933) at post-test. By contrast, the control group exhibited only a marginal change, with a pre-test mean of 64.33 (SD = 6.436) and a post-test mean of 64.55 (SD = 6.139) (Table 3).

Statistical analysis reinforced these findings. The Wilcoxon signed-rank test in the experimental group produced a p-value of <0.001, indicating a significant increase in self-efficacy following the mindfulness-based intervention. In the control group, the dependent t-test yielded a p-value of 0.561, demonstrating no significant change. Furthermore, the independent t-test comparing

Table 3. Results of Pre-test and Post-Test of Self-Efficacy of Pregnant Mothers at Risk Before and After Receiving Mindfulness Interventions Through Audio Visual.

Variable		Mean	SD	Min	Max
Experimental group	Pre-test	63.36	5.177	57	78
	Post-test	67.82	3.933	62	76
Control group	Pre-test	64.33	6.436	52	79
	Post-test	64.55	6.139	54	77

Table 4. Differences in Self-Efficacy Before and After Audiovisual Mindfulness Intervention in Experimental and Control Groups

N	Experimental group				Control Group			
	Pre-test		Post-test		Pre-test		Post-test	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
66	63.36	5.177	67.82	3.933	64.33	6.436	64.55	6.139
P-value	< 0.001				0.561			
P-value Intervention	0.012							

post-test scores between groups showed a p-value of 0.012, confirming a statistically significant difference in self-efficacy outcomes between the experimental and control groups. Collectively, these results provide strong evidence that audiovisual-based mindfulness interventions are effective in enhancing self-efficacy among high-risk pregnant women preparing for childbirth (Table 4).

DISCUSSION

Pregnant women's self-efficacy is a critical psychological resource that influences how they perceive and manage pregnancy, childbirth, and postpartum challenges. It is shaped by complex factors, including previous pregnancy experiences, observation of others, access to social support, and physiological conditions such as fatigue, sleep disturbances, and anxiety. Additional determinants—such as maternal age, parity, educational level, knowledge, economic status, and general confidence—also play a role in defining self-efficacy levels (Yuksel et al., 2019). Women with higher self-efficacy are better equipped to manage stress, adapt to unexpected complications, and actively engage in health-promoting behaviors. Conversely, low self-efficacy is linked to increased vulnerability to fear, anxiety, and negative childbirth expectations, which may hinder maternal readiness and compromise both maternal and neonatal outcomes (Hikmah & Yuliani, 2019).

This study found that mindfulness delivered through audiovisual media effectively improved

self-efficacy among high-risk pregnant women. The intervention incorporated breathing, relaxation, and visualization practices that encouraged participants to become more aware of their bodily sensations and emotional responses. Such practices helped to cultivate calmness, strengthen maternal–fetal bonding, and enhance confidence in facing childbirth. The findings are consistent with prior research, such as Yantina et al. (2024), who demonstrated the effectiveness of mindfulness in strengthening maternal self-efficacy among primiparous mothers, and Zarenejad et al. (2020), who highlighted its benefits in reducing anxiety and enhancing confidence during labor. Mindfulness has also been widely recognized as a tool to promote psychological well-being by reducing depression and stress while increasing adaptive coping and emotional resilience during pregnancy.

The lack of improvement in the control group underscores the importance of structured interventions. Without guidance or specific strategies, pregnant women at risk due to age (<20 or >35 years) often rely solely on routine antenatal care, which primarily addresses physical rather than psychological readiness. This gap may leave them vulnerable to persistent fears about childbirth, anxiety regarding potential complications, and difficulty managing stress. These challenges align with findings by Adilla et al. (2023), who observed no improvement in maternal psychological outcomes among women who did not receive mindfulness interventions.

The results of this study contribute to the growing evidence base for mindfulness as a practical and accessible intervention for pregnant women. Audiovisual delivery via mobile applications makes mindfulness exercises widely available, even in community or primary healthcare settings, and is particularly suitable for populations with limited access to specialized psychological support. By offering flexible, technology-based tools, healthcare providers can extend psychosocial support beyond clinical visits, empowering mothers to build self-efficacy in their own environments.

Implications for Nursing and Healthcare Practice

From a clinical perspective, these findings emphasize the importance of integrating mindfulness into routine antenatal care, particularly for high-risk groups. Nurses and midwives play a central role in educating and supporting pregnant women and could incorporate audiovisual mindfulness sessions into prenatal classes or counseling. Such approaches not only improve self-efficacy but also foster maternal empowerment, resilience, and positive attitudes toward childbirth. On a broader scale, health policymakers should consider adopting digital health strategies, such as mobile-based mindfulness applications, as part of maternal health programs. This would ensure that psychological as well as physical needs are addressed in maternal care, ultimately reducing preventable maternal and perinatal complications.

CONCLUSION

The audiovisual mindfulness intervention delivered through the MIESRA application proved effective in enhancing self-efficacy among high risk pregnant women, strengthening their confidence and psychological readiness for childbirth. This finding highlights the potential of technology based mindfulness programs as accessible, nonpharmacological strategies to support maternal mental health. Future interventions are encouraged to incorporate additional elements such as spousal involvement, family support, and community based education to further reinforce maternal self-efficacy and foster a more positive and holistic pregnancy experience.

Declaration of Interest

There are no real or potential conflicts of interest in this article.

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Data Availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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